Amateur Radio

JOURNAL OF THE WIRELESS INSTITUTE OF AUSTRALIA
VOL 55, No 1, JANUARY 1987

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SA JUBILEE Feature
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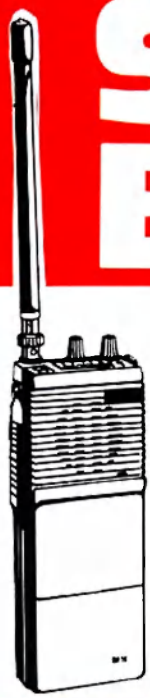

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Receiver Module Kit:
Operates over full 80 metre band with direct conversion receiver. Balanced mixer and FET VFO, all very easy to build on one pcb. 12V DC operated. Complete instructions with all components and PCB. Cat K-6328

$59.95

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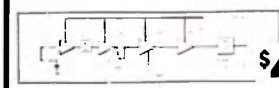


$49.95

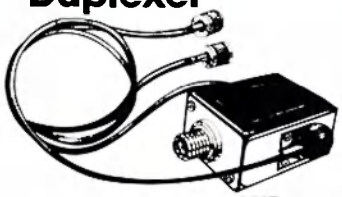
VFO Module Kit:
Gives full VFO control over 3.5-4MHz — designed especially for above transmitter, but can also be used as a general purpose variable frequency oscillator. Even has provision for FM modulation to give phone capability. Instructions include various modifications and options — and alignment details. Cat K-6327

$39.95

(Note: tuning capacitor not included in kit. Our R-2980 50pF tuning capacitor [$6.95] will give approx 300kHz tuning range. Other capacitors will give different ranges).

HURRY! REDUCED TO CLEAR

2mtr/70cm Duplexer



What convenience! Now VHF enthusiasts can connect two transceivers to one antenna... saves time and trouble disconnecting and re-connecting Cat D-3550

WAS $49.95 **$29**

6 mtr/2 mtr Duplexer

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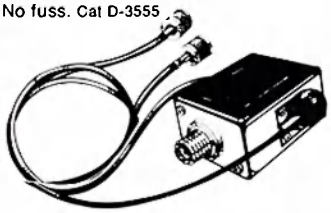

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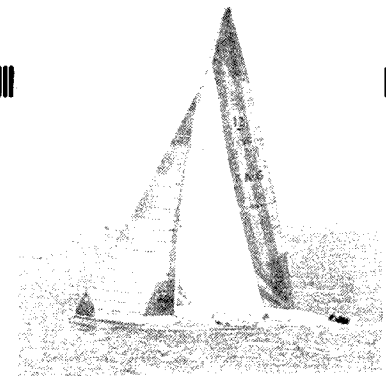

Australia II **in tests at Fremantle.** ***Australia II*** **ended 132 years of yachting history by winning the** ***America's Cup*** **in September 1983.**

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All copy for inclusion in the March 1987 issue of Amateur Radio, including regular columns and Hamads, must arrive at PO Box 300, Caulfield South, Vic. 3162, at the latest, by 9am, January 19, 1987.

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Editor's Comment

SQUABBLING SCHOOL-KIDS

There have always been examples in our hobby of rivalry between those of differing interests or concepts of how things should be. The oldest example by far is probably the rivalry, which still exists, between those who work CW and those who work phone. For a while the latter included the sub-groups of AM and SSB. We hear little of AM now, although some claim it still has a place. Others may be very uncomplimentary in saying where that place should be!

On VHF we have the FM group with its nets and repeaters, and also the SSB operators. Some members of each group can hardly bring themselves to admit that the other exists. Between the exponents of HF and VHF there is often a gulf of mutual ignorance.

We have within our own Institute two groups who handle third-party traffic. Each has its own way of doing things and tends to consider the others are ignorant or narrow-minded, or worse. "Over to You" has carried a number of letters on this theme lately. Then we have those whose purpose in life is to work 300-plus countries at the rate of six QSOs a minute. They seem to have little in common with those, frequently on the same band, who are content to "waffle" on for hours, making perhaps two or three contacts in an afternoon.

Dissension develops among DX diehards about the activation of rare countries. Aspersions are cast about the legitimacy of some activities. And then of course there are operating practices such as breaking-in on strangers, deliberate interference, etc. Do you enjoy having it done to you? Of course not, so why do it to others? But if it is done to you, tolerance will help more than "blowing your top"!

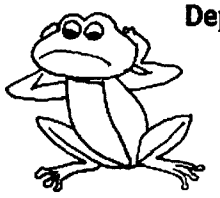
The number of divergent groups is even greater than the number of modes we may use. TV (fast scan, slow scan?). RTTY (AMTOR or not? ASCII or Baudot?). Packet (Vancouver or Tucson?). CW (manual or electronic?). Phone (AM, FM or SSB? USB or LSB?). Aircraft enhancement (reflection or refraction?). DX or ragchew? Contest or not? WIA or non-member?

Of course the last choice is a ring-in. It doesn't fit, does it? Or does it? Isn't it just another example of the all-too-common rationale that "My group is right or I wouldn't be in it. All the others are wrong!".

No one is wholly right. No one is wholly wrong. We ARE ALL radio amateurs! If we don't co-operate we collapse. Rivalry is all very well, but without tolerance we become squabbling school-kids.

The hobby of amateur radio is unique. There is no other with such impressive capability to unite the people of the world in friendly co- operation. Amateur radio can set an example to the world, to its leaders in politics or commerce, religion or economics, to show how understanding and tolerance can overcome all differences. Let us resolve, for this New Year of 1987, to stop our back-yard squabbling and begin to show the way!

Bill Rice VK3ABP
Editor



Department of Communications

Main QSP

VNG TO CONTINUE! for the time being

Refer page 58, November AR

The Minister for Communications, the Right Honourable Mr Michael Duffy MP, writes the following letter in reply to a letter from David Wardlaw VK3ADW, Federal President of the WIA.

I refer to your letter of 23 September concerning time and frequency signals from VNG Lyndhurst.

The attachment to your letter outlined the broad position in regard to Telecom's review of the VNG service.

Telecom wrote to all major Government users of the service indicating that if a Department or organisation wished to take over the operation of the service, Telecom would be prepared to make the existing transmitters available for installation at another site. Telecom could provide the necessary reference signals for any such relocated service through its own network at normal commercial rates. Telecom is also prepared to reinstall the existing equipment at cost.

An alternative proposal from Telecom was that a Department or organisation may wish to commission Telecom to provide the broadcast service on a commercial agency basis but from another site.

The response to Telecom's proposals was somewhat disappointing in that only three out of seven Departments replied, one indicating that their needs could be met by other technology now available and the others advised a continuing need for VNG but not specifically taking up the Telecom offer for the equipment transfer or provision of the service on an agency basis.

In view of the use identified by the Departments concerned, Telecom has indicated that it will continue with the VNG service for the time being. It will consult further with the Departments who have indicated future requirements for the time and frequency service.

However, Telecom's position is clear in that whilst it will continue to negotiate with interested Departments, it cannot continue indefinitely meeting the costs of a service for which it has no use itself nor any charter to provide.

Yours sincerely

Signed: Michael Duffy

8 November 1986

AMATEUR THIRD-PARTY TRAFFIC — DOC GUIDELINES

Following is text of a letter received by the WIA from the Department of Communications

I refer to the recent editorial in *Amateur Radio* (AR) magazine concerning amateur operators soliciting for third-party traffic.

At the outset I feel it important to explain that third-party traffic with another country is not something that may be simply approved by the Department on request. Australia is in fact required by international regulation to first negotiate a formal agreement with the other administration. No third-party traffic exchange can therefore be permitted unless such an arrangement is in force.

Natural disasters also require the formal consent of the other administration to be obtained before Australian amateurs can be authorised to pass third party messages. The Minister may only authorise amateur third- party traffic with the country concerned once this procedure has been completed. I would mention that approval would only be granted for the duration of the disaster.

In relation to the AR editorial, I would confirm that several years ago the Department did advise that *amateur operators* should not solicit for third-party traffic. This advice, however, was given prior to the introduction of the Radiocommunications Act 1983. Under this new legislation no specific regulations have been prescribed concerning the practice of soliciting for messages.

Due to the article and the number of recent inquiries, I consider that it is now necessary to establish a formal set of guidelines in regard to soliciting for messages. Accordingly, I would advise that:

- amateur operators should only solicit for messages as an aid to providing third-party traffic communications in a declared emergency situation or natural disaster; and
- any advertising for such messages should be conducted in a responsible manner and involve no pecuniary gain or other reward.

I trust that the information outlined serves to explain the Department's position in this matter. I would also mention that a suitable provision will now be incorporated in the revised *Amateur Operators Handbook*.

Signed: W May
A/g Manager Regulatory Operations Branch
Radio Frequency Management Division
Canberra

6 November 1986

Cover Story:

THE FIRST AMERICA'S CUP AMATEUR RADIO AWARD

The delightful silver cup is over 130 years old, but has only had two owners.

Who could forget that day in September 1983, when Australia broke 132 years of yachting history?

The America's Cup began in 1850, when a syndicate was formed by an American, John Cox Stevens, and commissioned George Steers to design a yacht, capable of being taken to Britain to race.

America, although designed for racing, was luxuriously appointed with saloons decorated in rosewood, walnut and green velvet.

When *America* arrived at the Isle of Wight, it was announced that she was ineligible to race as she was owned by a syndicate rather than one person. Stevens immediately tendered a $10 000 stake to any squadron yacht of the *Royal Victoria Yacht Club* prepared to race *America*.

The Club was embarrassed by the resulting furore and invited *America* to participate in the annual race around the Isle of Wight for a prize of a 100 guinea silver cup. *America* won convincingly and the Stevens syndicate took the cup home to New York.

In 1870, *Cambria*, of the Royal Thames Yacht Club, challenged the New York Yacht Club for an opportunity to win back the cup — she finished 10th and so began the United States monopoly of the cup!

In 1879, Sir Thomas Lipton (of tea-fame) began a quest for the cup. Sir Thomas was soundly beaten, 3-0, however, he returned in 1901 and was encouraged when he lowered the winning margin of the American yacht to only two seconds in the last race. In all, Sir Thomas made five challenges to win the cup but was unsuccessful.

In 1930, the venue for the challenges was changed to Newport but it was still impossible to wrest the cup from the United States.

Australia's first challenge for the America's Cup was in 1962, with the yacht *Gretel*. Although the competition was lost 1-4, *Gretel* certainly did not disgrace herself.

Dame Pattie a yacht named after Dame Pattie Menzies, wife of the late Sir Robert Menzies, was no match for the American *Intrepid* in 1967, and was beaten 4-0.

Gretel II participated unsuccessfully in 1970 and in 1974 Alan Bond began the first of his attempts to capture the cup with *Southern Cross*.

1977, saw the Bond yacht, *Australia* beaten by *Courageous*, a faster boat which was sailed by a crew with a better knowledge of the racing course. *Australia* was modified for the 1980 series but was again beaten — 4-1.

The 1983 challenge was to change the history of the America's Cup. Much controversy surrounded the unusual keel of *Australia II*. She lost the first two races, won the third, lost the fourth, then won three consecutively to bring the America's Cup home to Australia — it had taken 132 years and many challenges to finally take the America's Cup from America!

This summer, the best of the world's 12 metre fleet are contending for the cup. The finals begin on January 31, and will be a series of the best of seven races.

—Compiled by Bett McLachlan
VK

For the first time in the 135 year history of the *America's Cup*, a special event amateur radio station has been established and has operated from various locations in Perth and Fremantle. This station has the call sign VK6CUP. A special award is available to amateur radio operators and shortwave listeners, who establish communication with, or reception of, VK6CUP and achieve the required points.

Who could forget that day in September 1983, when *Australia II* ended 132 years of yachting history by winning the *America's Cup* and thereby changed the pschye of a nation. Not since the 1940s, during the war, had Australians been so united under one flag. This euphoric occasion resulted from the determination and dedication of a group of Australians to achieve their ultimate goal and this fighting spirit symbolised by the flag of the *Boxing Kangaroo*.

In Perth, the greatest sporting event of our time is now under-way. Australian yachtsmen will defend the nations yachting honour on home-waters for the first time. More yachts, more crews, more challengers ad sponsors than ever before.

The challenge to the *Royal Perth Yacht Club* for the America's Cup has come from 14 yacht clubs from six nations: Britain, Canada, France, Italy, New Zealand and the USA. The

The VK6CUP Special Event Station was in operation during the 1986 Jamboree on the Air in October. It was set-up on the banks of the Swan River at Matilda Bay 1st Pelican Point Sea Scouts, adjacent to the Royal Perth Yacht Club, the new home of the America's Cup Trophy. The station contacted many local and overseas amateurs and other JOTA groups.

six Australian yachts defending the Cup are from three yacht clubs: the Royal Perth Yacht Club, the Royal South Australian Yacht Squadron, and the Sydney Yacht Squadron. There has never been a sporting contest such as this, where the road to the race is so long and arduous. The crews and support teams competing in Fremantle face four full months of racing simply to earn the right to challenge and defend in the final best-of-seven races!

As Australia is the first and only nation to conquer the American 12 metre sailing machines, it is only fitting that the inaugural America's Cup Award for Radio Amateurs should be from Australia with the call sign of VK6CUR Our thanks go to the Department of Communications for their co-operation in granting this special call sign.

So, why don't you join in with the excitement of the America's Cup Defence and also receive an attractive award. When you hear VK6CUP on our amateur bands, make a contact or log a QSO if you are a SWL, and receive four points towards the achievement certificate.

The points scoring and requirements are as follows:

1 Stations outside Australia (DX), require four points to achieve the award by:
a. Contact with VK6CUP Special Event Station worth four points; ie one contact entitles you to the award
OR
b. Contact four licenced amateur radio stations in VK6 — each contact is worth one point.
2 VK Stations, require 12 points to achieve the award by:
a. Contact with VK6CUP (four points) and eight other VK6 stations
OR
b. Contact 12 licenced amateur stations in VK6.
3 All authorised bands and modes are permitted.
4 All contacts made after October 5, 1986 until the final deciding race in February 1987 will be eligible.
5 All contacts are to be listed showing Date, Time, Band or Frequency, and RS/T report.
6 Shortwave listeners are eligible for the award as per the above criteria.
7 QSL cards are not required for proof of contacts with VK6 stations, however the application is to be accompanied by an extract of the station log and/or QSL card and is to be certified correct prior to the award being issued.
8 Please include $A2 (or four IRCs) for post and packaging.

Following are the frequencies (±QRM) and times for VK6CUP:

1.825 MHz	0800-1500 UTC
3.525 MHz	1100-1500 UTC
3.585, 3.620 MHz	1000-1700 UTC
7.012, 7.080 MHz	1100-1600 UTC
10.137, 10.147 MHz	0100-1000 UTC
14.052. 14.187 MHz	0800-1200 UTC
14.212 MHz	2200-0100, 0400-1600 UTC
21.180 MHz	0100-0400 UTC
28.512 MHz	0100-0700 UTC

Send applications to:
VK6CUP Award (VK6XV), WIA VK6 Division, PO Box 10, West Perth, WA. 6005.

RESCUERS NET

Surf lifesavers on Tasmania's north-west coast have a new UHF network which includes a repeater on Round Hill, Burnie.

The system gives reliable link communications for the first time between clubs at Burnie, Davenport, Ulverstone, Penguin, Somerset and Boat Harbour.

NEW RTTY NIGHTOWL THEATRE

Jim Linton VK3PC
4 Ansett Crescent, Forest Hill, Vic. 3131

Something unusual and probably unique in amateur radio happens in the greater Melbourne area and Geelong district each Thursday night. The *New RTTY Nightowl Theatre* takes to the two-metre RTTY simplex frequency and it is 'loads of fun'.

Dave McAulay VK3EW, who mans the ticket-box (check-ins), runs the show (disc-stored) and chats with the theatre-goers at intermission, says the idea is to promote radio teletype and the enjoyment of doing something other than chase DX or rag-chew.

Dave says; "It is more than playing with computers all night, gets away from Packet Radio, which is interesting, and keeps RTTY alive. The Nightowl Theatre is enjoyment rather than just typing off a keyboard and having a *plastic* QSO."

Recently some of those in the Melbourne RTTY scene claimed RTTY was dead and people had moved on to other activities including Packet and AMTOR.

"RTTY is not dead — sure a lot more people are experiencing Packet and AMTOR — but look at RTTY on the HF bands — and with the RTTY Nightowl it is alive on VHF No matter what anyone says about RTTY being alive — there is always enjoyment in looking at a piece of text or a picture coming through," Dave says.

There is plenty of teleprinters sitting in shacks, particularly following the release of Siemens M100 machines through the WIA Victorian Division and the now defunct RTTY Fixers Group.

Dave says the RTTY Nightowl Library has about 175 pictures, the smallest with a running time of one minute at 45.45 Baud to the longest 130 minutes. The text library has 100 pieces — some humorous, others witty, the zany and helpful RTTY hints and teleprinter modifications. They range from about 45 seconds to the longest — a radio mystery serial "Who Killed the Signal?" in 54 individual pages, each running about 10-12 minutes which were typed by Lindsay Rohrlach VK3KAF

Lindsay, with help from John Brennan VK3BNE, ran RTTY Nightowl on a Wednesday night from 8 pm to midnight or later, for about 11 months until early 1986.

Due to other commitments, Lindsay ceased Nightowl — and VK3EW revived it in August 1986.

Dave says it usually has a format of three or four straight pictures, then some pieces of text, an overtyped picture with more contrast and then requests.

Held on Thursday nights, it starts between 8-8.30 pm on 146.600 MHz and finishes around 10.30 pm. Check-ins vary from four to up to 15 — but there would be many more listening, including unattended equipment printing out the night's activities.

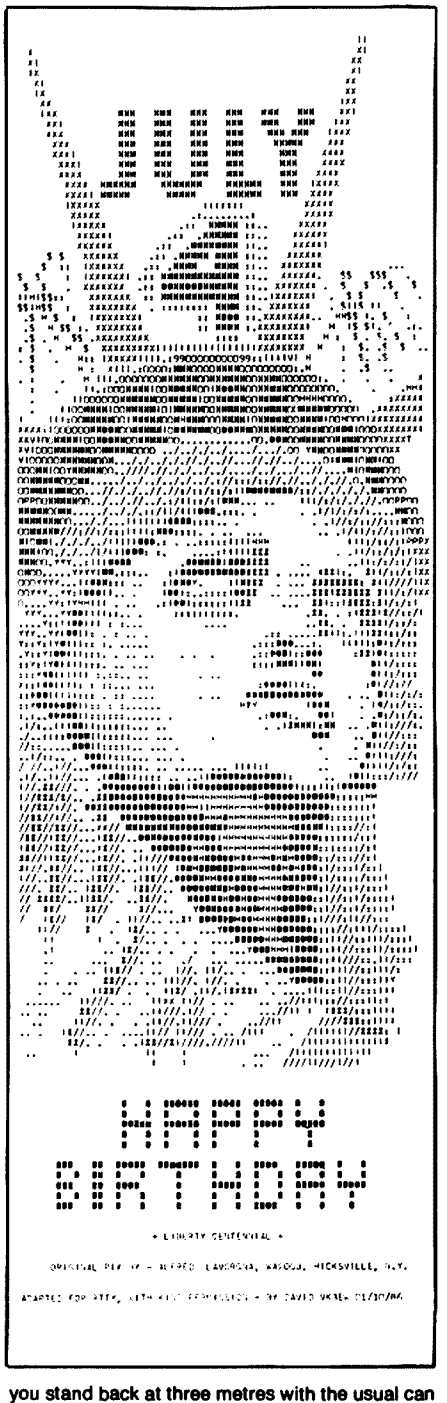
Dave has the picture and text library stored on computer disc. He can send the library index on request at a range of speeds in either Baudot or ASCII.

He is forever looking for new pictures or text, either off the air or via the mail. His favourite pictures include the cartoon characters by Bob Tippet VK3DRT, at Geelong.

Dave says; "He is one of these people who can look at something walk away and type it onto a teleprinter — Bob is a very gifted person in the way of pictures."

The pictures by John VK3BNE, also at Geelong, such as the Spitfire and Messerschmitt B109 are also very good.

"One of the best by Ken George VK3DKG, is a full size head of a tabby cat. The way we print it is, first the left hand side of the face and then the right side, and both print-outs are joined together. It runs for 130 minutes at 45.45 Baud — and when you stand back at three metres with the usual can of RTTY operator oil, it looks very, very nice," says Dave.



Congratulations VK3 *Electric Wireless for adding a dimension to the pleasure of machine telegraphy RTTY operations.*

EARLY RAAF TRANSMITTERS

Ted Roberts VK4QI
38 Barnard Street, Rockhampton North, Qld. 4701

AT-6

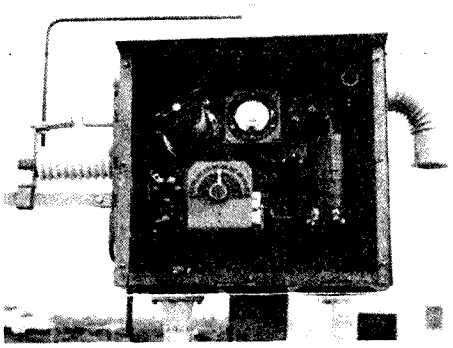
The AT6 was considered by the few amateurs who had any experience with it, to be an ideal post-war amateur transmitter.

It was developed as an artillery co-operation transmitter for use between Fortress Artillery and Spotting Aircraft under their control (usually Wirraways). In some units, the transmitter was installed in the fortress area, but serviced by the RAAF. Operators were supplied as needed by the RAAF at the fortress command posts and were commonly used as observers.

Associated receivers, usually AR10s, were also supplied by the RAAF.

The transmitter was a 100 watt CW transmitter, with a frequency range of approximately two to six megahertz. Because of the limited requirement for this type of unit, very few of them were manufactured by the supplier, AWA. The whole concept of aerial artillery spotting techniques were little changed from WWI, hence the use of telegraphy for control of the "shoots."

It was mounted in a cabinet of standard relay rack size, and stood about five feet (1.5 metres) high. The stages were a 6V6G crystal or master oscillator, a 6V6G buffer, 807 driver, and a single 813 PA. The HT power supply used a pair of 866A mercury rectifiers at about 1500 volts with a minor HT and bias supply. *(How many amateurs built their post-war transmitters to the same specifications?).* There was ample space in the cabinet for the later installation of an AM modulator for anyone lucky enough to obtain an AT6 through disposals sources, although I never heard of any attempts to modulate these units in the Services!



The AT-6 ATU, Darwin 1940. During the "Wet Season" the grass was higher than the ATU!

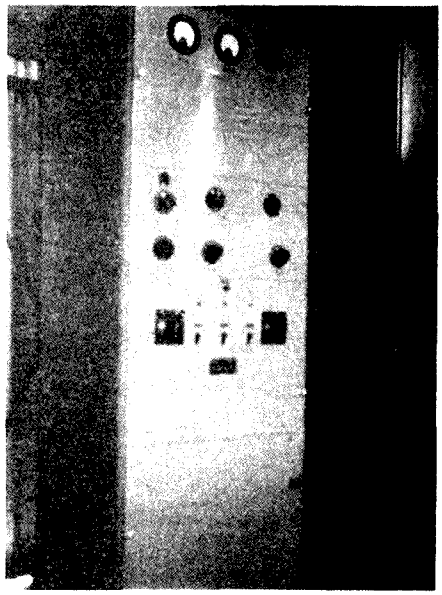
The transmitter output was fed via a 600 ohm line to an aerial tuning unit, which fed a quarter-wave vertical aerial, usually dropped from a triatic or another aerial system overhead, and the unit was usually on a fixed frequency. After all, it would be very unsporting for any potential enemy to jam that frequency when it was needed most!

T-77

This was a 4/500 watt MF CW/MCW transmitter of Air Ministry design. Not very many of these units were supplied to the RAAF.

They were sometimes referred to as "meat-safe" transmitters because of their construction in a perforated metal case with several glass access doors in the front panel. They contained English valve types and the HT rectifiers were mercury vapour types with giant Edison Screw Bases.

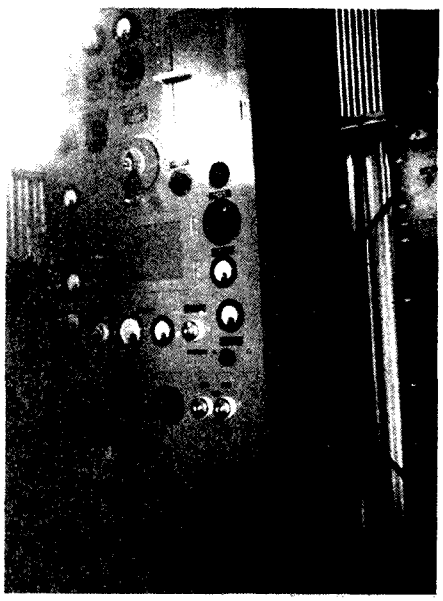
MF was never popular in the Darwin area due to the high noise level most of the time, so this virtually ruled out their use for the demanding ground/air service which they were intended to fulfill. However, they performed excellent service in more temperate climates, where the atmospheric problems were not so apparent.



AT-6 transmitter.

Consequently, the T77 at Darwin had little use and was left in an unserviceable state because of a major fault and no real incentive to repair it.

Eventually, one "Bluey" Shaw decided to rectify this situation and delved into the innards with eventual success and an amusing sideline. He had been working on the unit for most of one shift and at the conclusion of the shift, delivered his diagnosis to his relief, "Smoky" Gray, an Air Force W/T OP. Mechanic of many years standing, but an extremely wary man. Bluey emphasised his diagnosis by saying; "It's in here, Smoky," waving his hand back and forth in front of the HT section. Smoky's mouth was open but he was unable to utter a word because of sheer terror and could only keep pointing at the unit. Bluey finally turned and saw a small snake coiled around one of the rectifiers. Quick action ensued with a surge of power which resulted in one sizzled snake.



The T-77 MF transmitter located at the temporary W/T station, Darwin 1940.

AT-8

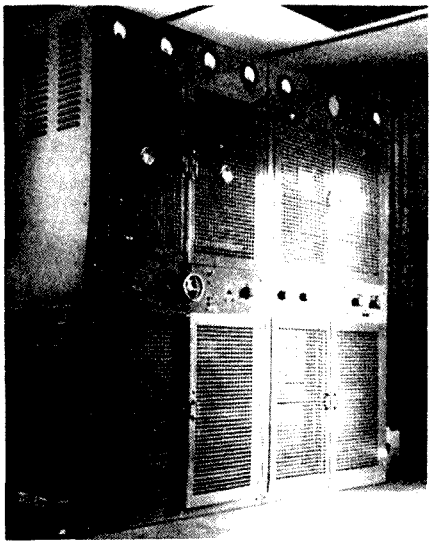
This 500 watt HF CW/MCW transmitter was constructed by STC with a frequency range of 2-20 MHz and first appeared at Darwin in late-1940, early 1941. The final was a 4251A.

The transmitter has an eight-position rotary switch on the front panel to select CW or seven different MCW tones as required. It used to cause consternation when the transmitting station operator, to relieve his boredom, switched from CW and would run up and down the MCW range a few times whilst the transmitter was being keyed. (It was wisely said, "The Devil finds work for idle hands!").

The 12 mile station, Darwin 1941.

At Darwin, the RAAF and the Department of Civil Aviation established a joint permanent transmitting station at "12-mile", or sometimes called "11-mile" — depending on the speed-o-meter. It was first used by DCA, who had an AWA multi-channel transmitter. Installed there — it was possibly a type J2876 which used four 805 triodes in the PA-stage. It was built like a battleship and was quite reliable provided there was no trouble in the telephone dial control system. This dial control operated through a Strowger Bi-motional switching system and could be controlled from the Aeradio or transmitter site, as required.

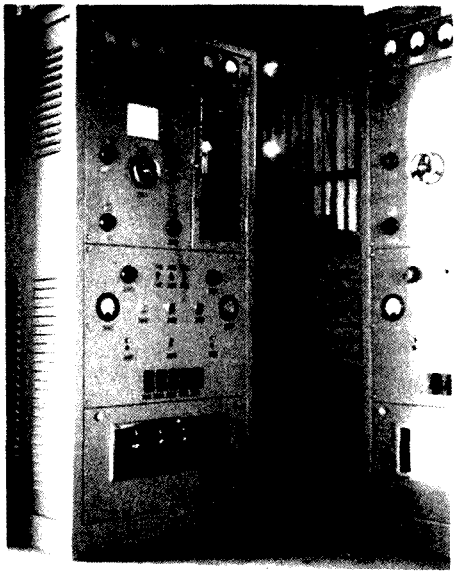
This was capable of dialling the transmitter functions, such as filaments on, frequency select, emission type select (CW, MCW or R/T), HT on, and close down, from VZDN Aeradio, the station at the Civil Aerodrome, Darwin, or from the transmitter site.



The AWA Multi-Channel Transmitter, 12-mile Darwin, 1941.

The temporary W/T station, situated at Parap.

Except for the first two AT8s, which were installed at the temporary W/T station at Parap, all new models of RAAF transmitters which arrived in Darwin were installed at this station.

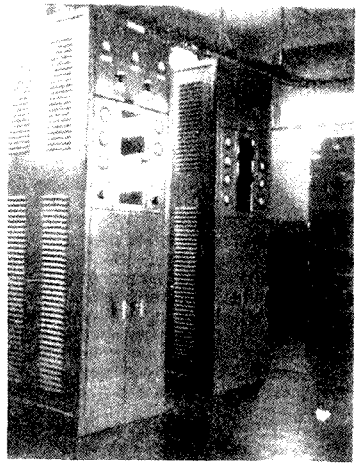


The AT-8 transmitter at the temporary W/T station, Darwin 1941.

Several STC type 14S transmitters arrived with a number of the AT8s. These were 1 kW multi-channel telephone dial controlled transmitters. The system for the 14S used a PMG uniselector switch to control all remote-control functions.

Each channel was selected by a solenoid operated push-rod (pull-rod?), about 13 mm diameter, which ran the height of the RF cabinet. The solenoids were massive devices and, just to make them operate, it was necessary to roster an extra stoker on duty at the local power house!

About mid-1941, I left Darwin after some time spent on squadron duties. Smoky Gray and I travelled overland by rail, drove in an early Army convoy from Birdum to Alice Springs, and then travelled by train to Melbourne. After some leave I was then posted to Richmond W/T station, west of Sydney. When this old W/T station was closed down I was posted in charge of the new replacement station at Londonderry.



Londonderry Station, 1942.

The AWA MF W/T Station, Richmond 1941.

At Richmond, I came into contact with many new types of transmitters and first became acquainted with the old T28.

As MF was the accepted mode for air-ground communication at Richmond, (had been for many years), I was interested in their modern version of a MF ground transmitter. This was a successful variation of an AWA marine transmitter with some 400 watts output. In marine applications it consisted of three units, with a common switchable power supply.

For RAAF use, an extra power supply was obtained and each RF unit was wired to its own power supply. This meant we had two transmitters, one HF and one MF The final was four 805s with output power about 400 watts.

The late Jack Parris VK2DN, was in charge of moving the transmitters from the old Richmond site, reinstalling them and ensuring they were operational at the new site. He received a bad RF burn to his right hand and wrist whilst adjusting the aerial coupling taps. He had switched the H.T off but the "switch" was only a mechanical drive to an ordinary light switch inside the transmitter and this had failed to operate. Consequently, Jack shook hands with 1500 volts and received plenty of RF as the transmitter was in a key-down condition!

T-1087

Another Air Ministry HF transmitter was the T1087, 500 watt transmitter. It used English valve types and the PA output was pi-coupled and could load into nearly anything (probably even the proverbial piece of wet string!).

The aerial feeder line from one of these transmitters ran very close to the outdoor chemical toilet. One day I was amazed to hear, and copy, a weather transmission whilst seated in this room. Apparently rectification of the signal took place in the toilet's exhaust pipe and was quite audible.

The RAAF, by this time, had perfected a system of "High Speed Morse" W/T transmission and, no doubt, many Old Timer RAAF W/T operators and telegraphists and WRAAF wireless ops would well remember it. Basically, it consisted of keying the point-to-point transmitters at 60 WPM, not I hasten to add, by very well-trained operators, but by punched tape running through Wheatstone Keying Heads. The tape was perforated by Kleinschmidt perforators; a typing keyboard driving a tape punching system. At the receiving end the receiver BFO was set to give a beat-note of about 2500 Hz. The receiver audio output was recorded on one of the oldest audio recording machines — a Dictaphone Wax Cylinder Recorder — running at three times normal speed. The resultant recordings were allotted to receiving operators, who replayed them at normal speed; ie at 20 WPM with an audio note of 800 Hz. Consequently, fair copy was made. This necessitated careful attention to keying relay adjustment to prevent unnecessary garbling of the transmission.

AT-13

Whilst on loan to the newly formed Central Area Headquarters at Point Piper, New South Wales, I was involved in the installation of a number of AT13 AWA transmitters at the DCA transmitter site near the mouth of the Cooks River, Brighton-Le-Sands.

These transmitters were HF units with 500 watts of output power, as were their mobile counterparts, the AT13B. (Another version was the AT13A MF/HF transmitter and the mobile version, AT13C). These transmitters all employed 4 x 813s in the output, driven by 807 drivers and buffers with 6V6Gs as oscillator and isolator stages.

The usual 866s HT and minor HT rectifiers and 5V4s for the lower HT supplies were used in these units. The main HT supply, with its rectifiers were the lowest slide-in unit in the transmitter. After a few days rain, the local field mice at Brighton would enter the station for warmth and what warmer place was there for them than these transmitters which were running 24-hours a day? Frequently, there was a flash, and a thump as the power supply hiccoughed and it was all in a days work to look for the transmitter that had overloaded, slide out the HT tray, dispose of the mouse remnants under the rectifier sockets and fire up the transmitter again.

The bulk of the Service CW Traffic was probably carried by the AT13 series transmitters, with an equal share being taken by the "Rolls Royce" of wartime RAAF transmitters, the AT20, manufactured by STC. The valve lineup of the AT20 was nearly identical to the AT13. The main difference in the design approach taken by the two manufacturers was their approach to the tuned circuits, particularly the PA tuning. The AT13 series used conventional variable C, switched inductance, whereas the AT20 switched C, and used roller inductors to effectively tune the PAs. A plate modulator was developed for the AT20 using a pair of 813s as modulators and made this unit a very effective HF R/T transmitter, where fitted.

AT14, AT14A, AT15, AT15A and AT17

Another local designer of ground transmitters for the RAAF was Thom and Smith, better known as "Tasma." Their contribution was the AT14, AT14A, AT15, AT15A and AT17. The AT14 series were HF transmitters capable of CW, MCW, and R/T operation. Their output power was 200 watts and the PA was two 813s, cathode modulated by a pair of 809s when in the R/T mode. These were very reliable short haul, point-to-point transmitters and were also very useful in the R/T mode. The main difference between the fixed and mobile versions was that the fixed version was complete in the one cabinet, whereas the mobile version comprised two units with an interconnecting wiring harness. It could, and usually was, operated with the RF unit seated on top of the power supply unit. (This was basically the design difference between all types of mobile and fixed transmitters designed to RAAF specifications during WWII).

Tasma's AT15 series of transmitters were 200 watt MF units with a similar valve line-up to the AT14s except for the different frequency range. The PA was tuned by a variometer-type variable inductance. They were used mainly as homing beacons at various aerodromes and operational bases.

Post-war, while working at DCA in Lae, New Guinea, we had an AT15 NDB running continuous carrier and keying identification -LA LA-. We used to rough check operation by drawing an arc from the aerial terminal with a screwdriver. Audio was clearly audible in the arc, although very distorted.

One of the PNG nationals, employed as a radio maintenance rouseabout was demonstrating this technical masterpiece to one of his "one talks" (from the same tribal village). Things did not go quite as he had planned and he received a nice RF burn, as well as "one heck of a fright." He flew out of the open door as though jet-propelled, closely followed by his "one talk." The last that was seen of him for a few days was his lap-lap way above his knees and his legs going like the connecting rods on a 38 Class Steam Locomotive at high speed!

AT-17

When posted back to the Darwin area for a second tour of duty in mid-1942, I made the acquaintance of the AT17, a 150 watt VHF AM transmitter with FM capability. It was the first RAAF VHF ground transmitter, although there were some Air Ministry VHF transmitters, receivers, D/Fs and aircraft transceivers used by 54 Fighter Wing *Spitfires* in Darwin earlier.

The AT17 had a pair of 100TH triodes in the final and had frequency multiplication of 36 or 48 from the crystal oscillator. One peculiarity was that either the neutralising or PA plate tuning was done by stretching or closing the appropriate coil like a spring by means of a threaded drive. These were used to fill the need for ground transmitters when the RAAF aircraft were equipped with VHF (SCR522) in 1944.

Before the SCR522 was brought into service, VHF was in use in 54 Fighter Wing, Darwin. The Wing consisted of three squadrons of *Spitfires* and their support facilities. The aircraft were equipped with Air Ministry type TR1133D transceivers, which the RAF technicians assured me were developed from a successful police net of mobiles in one of the provincial English cities.

The ground support equipment was mounted in vans and the portable design philosophy was outstanding. All cables and 27 metre aerial masts, jury mast and aerials were capable of being broken-down and fitted into/onto the vans or their trailer AC power units. The masts were three-sections of cast magnesium alloy, and were extremely light although the maximum diameter was four inches (101 mm) or more. A fourth section of this mast was used as a jury mast to enable quick erection of the mast and aerial system. The aerial system consisted of two J-aerials mounted at each end of a short boom at the mast-head.

The final valves in the transmitter were an English-based version of the RCA 834 triode. When spares were no longer available from RAF sources, a shipment of 834s from AWA was arranged, the valves were re-based and everything was operational again.

Associated ground equipment included a receiver unit, a modified receiver from the aircraft transceiver. (This receiver was also used in conjunction with suitable aerial systems for direction finding).

Three D/F stations were employed in a triangular arrangement on the ground and one aircraft in each formation was D/F Guard. His transceiver was automatically switched to Channel D for 15 seconds transmission and then returned to the operating channel for the remaining 45 seconds of each minute. Three bearings were forwarded to the Fighter Control Unit, where I was stationed, and the formation position was plotted by triangulation. This gave our own fighter positions at all times, thus lessening the need to distinguish the fighters from all the other radar plots on the table, whether friendly or otherwise. This ensured a much quicker and more flexible means of vectoring or directing the fighters to a successful interception.

TELERADIO 3BZ

In the Radar Stations, which were the heart of the Fighter Control System, the need for reliable communication to the Fighter Control Unit was of paramount importance. They began with a well proven unit manufactured by AWA. This was the Teleradio 3BZ, and many found their way into the shacks of amateurs after the cessation of hostilities. Some of the performances achieved by these units were almost incredible.

Quite a number of the radar station operators were bitten by the DX-bug as a relief from the boredom that months of isolation with the same faces brought-on. DXing was strictly frowned upon, but was still a change and a relief to talk to someone different.

Later the 3BZs were left as backups and the radar stations were issued with AWA AT5/AR8 aircraft radios. The radar stations were usually powered by a Ford 10 engine driving a 3 ½ kVA 240 volt alternator. The 3BZs and the AT5/AR8s were battery powered and keeping the main and standby batteries charged was quite a headache until a "bright-spark" started the practice of charging his batteries in series with the DC field voltage of the alternator.

Other types of ground transmitters were used, but I never had any direct contact with them, however I was impressed by one pre-war transmitter I saw as a visitor to the Point Cook Transmitting Station. This was an English STC transmitter, type R16, with a power output of 4 kW. It was housed in two large black cabinets with the larger cabinet being the power supply. STC was an ardent exponent of the merits of the selenium rectifier. Apparently, the HT supplies were rectified by many selenium rectifiers. On of the W/T operator mechanics said it was a nightmare-operation checking through all the rectifiers whenever the transmitter failed because of lost HT, replacing the MR906 or whatever, or else shorting it out as a temporary measure.

One of the major requirements with transmitters is ensuring they remain on frequency. The Service methods of doing this also became more modernised (should I say civilised), as time went by. The measuring systems were, at all times, state-of-the-art, although they were becoming a little hoary by the outbreak of WWII.

Frequency meters in common use with the RAAF when I was first involved, were usually absorption-types. There were two models — W66 and W67. The W stood for Wavemeter. One was an MF, the other HF absorption type, with a neon lamp indicator. They were robust and well made and reasonably accurately calibrated. How did we know the accuracy? By checking several units against each other!

At the temporary transmitter station, Darwin, the point-to-point transmitter would be set-up on 14.505 or 7.800 MHz by the wavemeter. We would then net to zero-beat with the receiver output fed down the phone line from the Signals Office after they had tuned to zero-beat with the Air Board. This was hardly an ideal method, but it worked! So long as we never strayed onto the Japanese Press Station nearby, nobody seemed to worry.

I may add, that at the same time this system was in operation, the RAAF had a general Radio primary frequency standard at the Signals School, Laverton, but this didn't help the squadrons or distant stations.

Some of the older stations were the first to receive the type W42 heterodyne wavemeter. This was a fine piece of equipment and beautifully constructed. This was another Air Ministry device and the tuning condenser has rarely been surpassed for precision workmanship. It was driven by a long bakelite handle directly — no reduction gears or friction drive — and the vernier reading was made through a magnifying lens over the scale.

The technique was to divide the required frequency by two prime numbers; say 3 and 7, set the frequency to zero-beat with the third harmonic of the wavemeter, and then check the seventh sub-harmonic of the required frequency. If a beat was heard there, the transmitter could only be on the correct frequency.

We then moved into the more modern era of the Bendix frequency meter, which remained the standard method of frequency measurement for the remainder of the war. These meters are better known to amateurs as the SCR211 frequency meter in its various versions.

The first Bendix frequency meter used in the RAAF was the type LM8. These were virtually identical electrically but were much smaller. They were supplied with the original purchase of the *Catalina Flying Boats*. These units soon revolutionised the accuracy of transmitter frequency checking throughout the Service.

HF AERIALS

The HF aerials used by stations gradually changed from aerial/counterpoise and centre fed dipoles to more sophisticated models. For air ground circuits, ¼ wave verticals were sometimes used for their omni-directional properties and eventually the RAAF were using delta fed dipoles almost exclusively.

This concludes a brief look at the service ground transmitters. I am indebted to Group Captain E R (Bon) Hall for permission to quote details such as power outputs, etc. Anyone interested in RAAF radio history would be well advised to read Group Captain Hall's book A Saga of Achievement. If readers get a small amount of enjoyment out of these articles I will count myself well repaid for the pleasant task of compiling them, and the pleasure of the memories of those days and the people who made them so memorable!

er

QSP

INTERNATIONAL RECOGNITION

A Western Australian circuit board manufacturer has refined a technology of US origin so successfully it is now exporting defence-standard boards back to the USA.

Circuit Technology Australia's (CTA) ElectroWire boards are used in both Australian and US ground support systems for the F/A-18 fighter plane now coming into service in the two countries.

ElectroWire is a multilayer circuit board incorporating discrete wiring layers with the electroplating finish of a multilayer board.

Through its own development program, CTA has refined the combination of discrete wiring technology in Multiwire, licenced from Kollmorgen Technologies (US), with conventional multilayer processing.

—From *Electronics News*, August 1986

POWER GUARD

Power Tech has released an upgraded version of its successful Power Guard Series of computer grade power supply systems.

The latest Power Guard is a compact and cost-effective way to protect small computers and word processors from all types of power supply faults and line noise, providing a safe single point earthing system which is required by computer manufacturers.

The improved unit has been designed for Australian conditions, and is suitable for desk mounting and comes complete with four outlets for computer and peripherals and contains a circuit breaker for complete protection.

—From *Electronics News*, August 1986

Gordon Thurston VK4AGM
Gordon Lane, Mount Morgan, Qld. 4714

SLOW-SCAN

A computer program that should make slow-scan television a little less of a mystery for the average amateur.

```
10 PCLEAR8
20 AUDIOON
25 PC=1
30 CLEAR200,29999:CLS
35 DEFFNP(X)=PEEK(X)*256+PEEK(X+1)
36 DEFFNPO(X)=((X/256)-INT(X/256))*256)
40 FORA=30000TO31082:READP:POKEA,P:NEXT
50 'LOADM"DSPLY"
60 L1=&H7536:L2=&H7537:L3=&H7538:L4=&H7539:L5=&H753A:SP=&H7531:LL=&H77C1:LH=&H77
C3:SL=&H77C7:SH=&H77C5:WT=&H77C9:FL=&H7625:PT=&H774165 POKESL,0:POKESL+1,38:POKE
SH,0:POKESH+1,45:POKELL,1:POKELL+1,244:POKELH,7:POKELH+1,208
70 AUDIOON:CLS
80 PRINT@96,STRING$(32,150)
90 PRINT"   ********* SSTV **********"
100 PRINT"   ********** BY ***********"
110 PRINT"   **** GORDON THURSTON ****"
120 PRINT@288,STRING$(32,150)
130 IFINKEY$=""THEN130
131 GOSUB135:GOTO250
135 S$="CFLMPRSVW"+CHR$(94)+CHR$(10)+"AT"
140 CLS:PRINT"R - RECEIVE PIC
150 PRINT"C - CHANGE CONSTANTS
160 PRINT"F - FILTER PICTURE
170 PRINT"L - LOAD PICTURE
180 PRINT"M - MENU
190 PRINT"P - PRINT PICTURE
200 PRINT"R - RECEIVE PICTURE
210 PRINT"S - SAVE PICTURE
220 PRINT"V - VIEW PICTURE
230 PRINT"W - WAIT FOR SYNCS
231 PRINT"^ - VIEW TOP OF PIC
233 PRINT"A - AUTO TAPE MAKE CONNECTIONS
234 PRINT"T - TRANSMIT PICTURE"
235 PRINT"<CLEAR> - EXIT TO M/L"
239 RETURN
250 A$=INKEY$:IFA$=""THEN250
260 ONINSTR(1,S$,A$)GOSUB300,400,500,600,700,800,810,820,830,840,850,860,870
270 GOTO250
300 CLS'CHANGE
310 PRINT"L1 - SYNC",PEEK(L1):PRINT"L2 - BLACK",PEEK(L2):PRINT"L3 - DK GREY",PEE
K(L3):PRINT"L4 - MD GREY",PEEK(L4):PRINT"L5 - LT GREY",PEEK(L5):PRINT"SP - SPACI
NG",PEEK(SP)
330 PRINT"SYNC DET PARAMETERS":PRINT"LL - LNLNGTH LO",FNP(LL):PRINT"LH - LNLNGTH
 HI",FNP(LH):PRINT"SL - SYNCLN LO",FNP(SL):PRINT"SH - SYNCLN HI",FNP(SH)
335 PRINT"BRIGHTNESS - BL - BH
336 PRINT"CONTRAST   - CH - CL
340 INPUT"PARAMETER";N$:INPUT"CHANGE TO";N
351 IFN$=""THEN CLS:PRINT"CHANGED":RETURN
360 IFN$="L1"THENPOKEL1,N
361 IFN$="L2" THENPOKEL2,N
362 IFN$="L3"THENPOKEL3,N
363 IFN$="L4"THENPOKEL4,N
364 IFN$="L5"THENPOKEL5,N
365 IFN$="LL"THEN M=LL:GOSUB390
366 IFN$="LH"THEN M=LH:GOSUB390
367 IFN$="SL"THEN M=SL:GOSUB390
368 IFN$="SH"THEN M=SH:GOSUB390
369 IFN$="SP"THENPOKESP,N
370 IFN$="CH"THENPOKEL2,31:POKEL3,30:POKEL4,29:POKEL5,28
371 IFN$="CL"THENPOKEL1,37:POKEL2,31:POKEL3,29:POKEL4,27:POKEL5,24
372 IFN$="7"THENPOKESP,21
373 IFN$="8"THENPOKESP,23
374 IFN$="12"THENPOKESP,37
375 IFN$="BL"THENFORA=&H7536 TO&H753A:POKEA,PEEK(A)-N:NEXT
376 IFN$="BH"THEN FOR A=&H7536 TO&H753A:POKEA,PEEK(A)+N:NEXT
379 GOTO300
390 POKEM,N/256:POKEM+1,FNPO(N):RETURN
400 'FILTER
410 SCREEN1,1:EXEC&H7625:SOUND50,1:RETURN
500 'LOADPIC
510 CLS:INPUT"LOAD PIC";L$:IFL$=""THENRETURNELSE SCREEN1,1:LOADML$+"/PIC":RETURN
600 'MENU
605 GOSUB140:RETURN
700 SCREEN1,1:EXEC&H7741:POKE&H6F,0:SOUND100,1:RETURN
800 'RECEIVE
810 CLS:INPUT"SAVE PIC";N$:IFN$=""THENRETURNELSE SCREEN1,1:P=PEEK(&HBC)*256:SAVE
MN$+"/PIC",P,P+&H1E00,0:RETURN
820 SCREEN1,1:RETURN
830 CLS:PRINT"WAITING FOR SYNC"
831 POKE&HFF21,PEEK(&HFF21)OR8:EXEC&H7709
832 IFINKEY$=""THENGOSUB890:GOTO831
833 MOTOROFF:RETURN
840 PMODE4,2:SCREEN1,1:RETURN
850 PMODE4,1:SCREEN1,1:RETURN
860 VERIFY OFF:CLS:PRINT"AUTO TO DISK"
861 EXEC&H7709:IFINKEY$<>""THENRETURNELSEGOSUB890:MOTOROFF
862 IFINKEY$=""THENP=PEEK(&HBC)*256:N$=RIGHT$(STR$(PC),LEN(STR$(PC))-1)+".SAVEMN
$+"/PIC",P,P+&H1E00,0:POKE&HFF40,0:PC=PC+1:GOTO861ELSEMOTOROFF:RETURN
870 EXEC&H784F:EXEC&H784F:RETURN
890 POKE&HFF21,PEEK(&HFF21)ORB:PMODE4,1:SCREEN1,1:PCLS:PMODE4,5:PCLS:PMODE4,1:EX
EC&H7559:MOTOROFF:RETURN
1000 DATA 75,23,0,53,17,160,37,31
1010 DATA 29,27,24,43,234,89,224,92
1020 DATA 39,17,33,15,116,255,32,37
1030 DATA 246,92,39,7,33,5,116,255
```

This computer package is capable of receiving a range of different speeds. There is a screen dump program in it, a transmit program, and an enhancement program to filter out noise from the screen.

It occurred to me when I first bought a computer that it would be capable of decoding a wide range of signals from the air. There were some programs available overseas but I had not seen any locally. This has taken at least two years to write and I am pleased to be able to share it with others.

The program is written for the Tandy Colour Computer. It was written for a 64k machine, but it should work on a 16k machine with changes. If anyone is interested, would they please write to the address above and I could alter the program to suit their machine, if there is enough interest.

I use the program with disc drives but it works equally well with a cassette. The program works by putting in an audio signal from the receiver to the cassette input lead, which is a standard connector. Each audio cycle is timed by a zero crossing detector, and recognised as a synchronous pulse, or something between black and white. Synchronous pulses are 1200 Hz, black is 1500 Hz and white is 2300 Hz. After decoding, four pixels are placed on the screen, giving five levels of gray from white to black. This is limited by the 256 x 192 pixel screen on the COCO, but by using an extra portion of the next screen, the whole 128 element by 120 line picture is received.

The resulting picture is then manipulated by BASIC, and can be saved to disc, cassette, sent to a printer, enhanced, borders added, etc. Simple commands *can be added* to add borders, captions, etc. The picture can be re-sent, or a screen built-up and sent as a written message such as CQ SSTV. The possibilities are numerous. A digitiser could be used to put a photograph on the screen to send.

Type the program in, and save it to disc or cassette before running, as just one mistake in typing can cause the Machine Language portion to run rampant over the program in memory, and lock-up the computer.

When the program is running, tune an SSB receiver to 14.230 MHz or 21.340 MHz Upper Sideband. Push any key to enter the menu. Most of the commands are listed in there, however a little more explanation may help.

C enters change mode. The parameters are originally set for eight second video. This can be changed by entering 7 or 12 for 7.2 or 12 second video.

```
1040 DATA 32,36,246,57,196,2,126,117
1050 DATA 164,150,188,95,31,1,252,117
1060 DATA 61,51,139,255,117,59,26,80
1070 DATA 134,253,183,255,2,48,136,224
1080 DATA 48,136,32,51,136,32,255,117
1090 DATA 52,182,255,0,132,64,16,39
1100 DATA 0,146,134,1,167,132,127,117
1110 DATA 51,198,1,141,178,241,117,54
1120 DATA 35,247,198,1,141,169,241,117
1130 DATA 54,34,247,95,16,142,0,220
1140 DATA 49,63,38,252,141,153,247,117
1150 DATA 48,251,117,51,247,117,51,43
1160 DATA 163,127,117,50,246,117,48,241
1170 DATA 117,55,165,136,32,241,117,57
1180 DATA 165,132,241,117,56,165,136,32
1190 DATA 241,117,58,165,132,36,29,48
1200 DATA 1,188,117,59,39,62,134,1
1210 DATA 167,132,188,117,52,39,145,182
1220 DATA 117,51,176,117,49,183,117,51
1230 DATA 42,16,32,26,198,0,251,117
1240 DATA 50,247,117,50,30,136,30,136
1250 DATA 32,229,198,7,251,117,50,247
1260 DATA 117,50,30,136,32,174,198,9
1270 DATA 251,117,50,140,170,170,16,140
1280 DATA 170,170,32,144,57,255,255,255
1290 DATA 255,255,255,20,192,14,0,255
1300 DATA 0,43,224,44,0,150,188,95
1310 DATA 31,1,51,137,29,224,255,118
1320 DATA 33,51,132,255,118,29,51,201
1330 DATA 30,0,255,118,35,51,136,32
1340 DATA 255,118,27,134,128,95,141,54
1350 DATA 141,67,23,0,91,141,62,141
1360 DATA 45,141,43,23,0,140,141,46
1370 DATA 141,44,141,42,141,40,188,118
1380 DATA 27,38,226,188,118,33,38,5
1390 DATA 190,118,29,134,64,168,118,35
1400 DATA 38,1,57,48,136,32,51,136
1410 DATA 32,255,118,27,32,199,73,36
1420 DATA 3,48,31,73,73,57,70,36
1430 DATA 3,48,1,70,57,16,142,0
1440 DATA 6,48,136,192,141,63,141,238
1450 DATA 16,142,0,6,48,137,255,64
1460 DATA 141,51,141,226,48,136,128,57
1470 DATA 16,142,0,2,48,136,192,141
1480 DATA 36,48,136,64,16,142,0,2
1490 DATA 141,27,141,202,48,137,255,64
1500 DATA 16,142,0,2,141,15,48,136
1510 DATA 64,16,142,0,2,141,6,141
1520 DATA 181,48,136,128,57,165,132,39
1530 DATA 1,92,48,136,32,49,63,38
1540 DATA 244,57,203,4,84,84,84,48
1550 DATA 136,32,52,2,68,170,132,167
1560 DATA 132,166,228,90,42,7,68,168
1570 DATA 132,167,132,166,228,48,136,224
1580 DATA 170,132,167,132,166,228,90,42
1590 DATA 6,168,132,167,132,166,228,48
1600 DATA 136,32,170,132,167,132,166,228
1610 DATA 90,42,6,168,132,167,132,166
1620 DATA 228,48,136,224,68,170,132,167
1630 DATA 132,166,228,90,42,7,68,168
1640 DATA 132,167,132,166,228,53,2,57
1650 DATA 2,255,255,255,255,43,225,43
1660 DATA 225,134,254,151,111,134,41,151
1670 DATA 150,150,188,95,31,1,195,29
1680 DATA 225,253,119,63,48,136,31,51
1690 DATA 137,29,224,255,119,61,134,27
1700 DATA 173,159,160,2,134,71,173,159
1710 DATA 160,2,134,26,173,159,160,2
1720 DATA 134,27,173,159,160,2,134,73
1730 DATA 173,159,160,2,134,0,173,159
1740 DATA 160,2,134,239,173,159,160,2
1750 DATA 166,132,67,173,159,160,2,166
1760 DATA 31,67,173,159,160,2,48,136
1770 DATA 32,188,119,61,38,234,182,255
1780 DATA 0,132,64,39,11,188,119,63
1790 DATA 39,6,48,137,226,30,32,167
1800 DATA 134,27,173,159,160,2,134,30
1810 DATA 173,159,160,2,57,255,255,255
1820 DATA 0,1,244,7,208,0,45,0
1830 DATA 38,206,0,0,255,119,191,255
1840 DATA 119,191,134,253,183,255,2,23
1850 DATA 253,101,18,198,1,23,253,95
1860 DATA 182,255,0,132,64,39,81,241
1870 DATA 119,200,43,77,241,119,198,36
1880 DATA 75,79,253,119,191,247,119,189
1890 DATA 198,3,33,45,23,253,64,182
1900 DATA 255,0,132,64,39,50,84,116
1910 DATA 119,189,251,119,189,247,119,189
1920 DATA 241,119,200,43,20,241,119,198
1930 DATA 42,15,79,243,119,191,253,119
1940 DATA 191,198,5,33,4,31,136,32
1950 DATA 211,252,119,191,16,179,119,193
1960 DATA 43,151,16,179,119,195,42,145
1970 DATA 57,188,170,170,33,250,33,248
1980 DATA 33,246,198,3,32,151,255,0
```

CH changes to high contrast.

CL goes back to normal.

L1 sets the level below which the synchronous levels are detected.

L2 to **L5** set the levels of gray.

BH <enter> and a number (try **2**) changes the level of brightness the computer sees.

BL just the opposite.

SH and **SL** set the levels between which the synchronous detect portion works. Spacing sets the time of each line.

LL and **LH** set the length of synchronous pulse detected.

These parameters have been included for experimenting, and the program works well without changing then in most cases.

The voice portion of the transmission is used for tuning, and the slow-scan should then be right. If it is saved to tape, it can be used again and again and the parameters changed to see their effects.

F Filter runs a Machine Language program to average the pixels around it. It does not work well, but its effect is interesting.

L Load picture from disc.

M return to Menu.

P send Picture to Printer. This works with DMP 110 printer and probably others.

R Receive picture does not wait for synchronous pulse.

S Saves the picture.

The voice portion of the transmission is used for tuning, and the slow-scan should then be right. If it is saved to tape it can be used again and again, and the parameters changed to see their effects.

V View picture on screen.

W Wait for synchronous pulse so that picture starts at top of the screen.

▲ (UP ARROW) view lower portion of screen out of view (usually not needed).

CLEAR causes an exit from any Machine Language that might be running. It may not exit if there is not any audio applied.

T Transmit sends two frames to the cassette output lead. This should be filtered before applying it to the microphone input on the transmitter. The remote control lead can be used to key the transmitter. Transmitting is probably the hardest part, as there are a few leads, and some audio switching needed for the microphone. (I have only tried this once and did not have a microphone connector, so I recorded the sound on tape and put the microphone to the tape recorder. It worked, but does leave a lot to be desired).

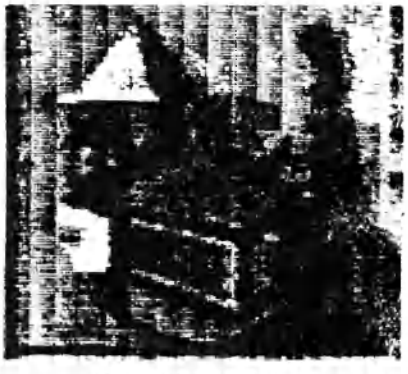
The machine code is poked to memory from data statements, and could be saved as a Machine Language program to speed loading, but this is the easiest way to publish it. It takes a few seconds to poke to memory.

Sometimes, the program locks on printing, and re-setting, and a *goto50* gets back into the program. The printer works on the second try. (I have not figured that one out yet!).

There is a lot of typing involved, but I feel it is well worth it. If anyone is interested in the program on tape, send a blank tape and sufficient return postage, and I would be pleased to copy the program to it. (This also applies for a disc as well).

The source code is available for the cost of return postage upon request.

```
1990 DATA 3,24,43,224,43,224,33,127
2000 DATA 120,72,150,188,95,31,1,51
2010 DATA 137,31,224,255,120,76,51,136
2020 DATA 32,255,120,74,198,128,134,253
2030 DATA 183,255,2,134,82,183,120,71
2040 DATA 26,80,206,0,36,127,255,32
2050 DATA 125,120,71,16,38,0,190,125
2060 DATA 120,72,42,18,182,120,72,187
2070 DATA 120,73,183,120,72,84,84,36
2080 DATA 16,86,48,1,32,14,18,33
2090 DATA 220,16,140,170,170,18,18,30
2100 DATA 136,18,30,136,79,229,132,39
2110 DATA 3,76,32,3,18,33,245,229
2120 DATA 136,32,59,3,76,32,3,18
2130 DATA 33,234,84,229,132,39,3,76
2140 DATA 32,3,18,33,223,229,136,32
2150 DATA 39,3,76,32,3,18,33,212
2160 DATA 16,142,121,85,166,166,183,120
2170 DATA 78,68,128,9,23,0,123,30
2180 DATA 136,30,136,33,144,134,128,183
2190 DATA 255,32,125,120,71,38,90,84
2200 DATA 36,5,48,1,66,32,3,18
2210 DATA 30,136,182,120,72,176,120,78
2220 DATA 187,120,73,183,120,72,182,120
2230 DATA 78,68,64,187,120,78,128,5
2240 DATA 23,0,71,16,188,120,74,16
2250 DATA 38,255,90,127,255,32,188,120
2260 DATA 76,39,79,48,136,32,51,136
2270 DATA 32,255,120,74,33,59,134,11
2280 DATA 183,120,71,198,128,127,120,72
2290 DATA 134,17,32,160,18,134,18,18
2300 DATA 122,120,71,16,140,0,0,32
2310 DATA 147,134,18,18,122,120,71,16
2320 DATA 140,0,0,32,187,33,30,28
2330 DATA 26,23,74,30,126,16,131,170
2340 DATA 170,74,38,247,30,136,57,53
2350 DATA 144,57,0,0,0,2,16,252
```



VARIABLE FREQUENCY ANTENNAS

Emil Barkovic VK5NMT
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For the last three years, the author has been experimenting with variable antennas. He finds it very convenient to have just one antenna and be able to operate on all wanted frequencies with a low SWR.

The antenna can cover a wide range of frequencies, and may be vertical or horizontal. Antennas as shown in the drawings have been tested and found to operate between 3.5 and 30 MHz. However, the same principle can be extended to a much wider range of frequencies, to which the limits have not yet been established.

The vertical antenna is only three metres long when fully extended. A similar portable model is only 2.2 metres long. The antenna is very practical for marine mobile or portable use on top of a car roof-rack or caravan. The antennas will not withstand high speed travelling, so cannot be used for land mobile applications. They must be removed from the vehicle or laid against the roof in these cases.

Patents have been applied for with the Australian Patent Office in January 1984. The inventor hopes to be able to manufacture these antennas in the near future, but is willing to allow individual amateurs to build their own. To this end, the drawings illustrate the concept rather than the precise dimensions and method of assembly.

Further information on constructional details can be provided by the author if required.

LEGEND OF FIGURES 1 AND 2

Figure 1 is a variable vertical antenna.
Figure 1a is the brush assembly used on vertical and horizontal antennas.
Figure 2 is a variable horizontal antenna. An SWR of 1.0 is obtainable with this antenna on all frequencies within its range.

1 The coil and tube element assembly, which consists of 40 metres of copper wire, helically wound on a rod or tube. The wire is one millimetre in diameter on home base antennas, but on the portable model I have used 0.7 mm diameter wire.
2 Aluminium tube.
3 The brush assembly which consists of 0.5 mm brass shim cut as shown in Figure 1a, then rolled around the tube 2 and held in place by PVC sleeve 4 and two screws.
4 PVC sleeve.
5 A spring or neoprene O-ring is used to hold the brushes against the turns of the coil.
6 Coaxial cable.
7 Pipe supporting the antenna. On the vertical antenna a steel pipe is used but on the horizontal antenna, fibreglass is used.
8 Clamps.
9 Push rod, connected to tube 2 for either extending or retracting the antenna. On the horizontal antenna two six millimetre fibreglass reds are used and connected to a common *rod* at the mast.

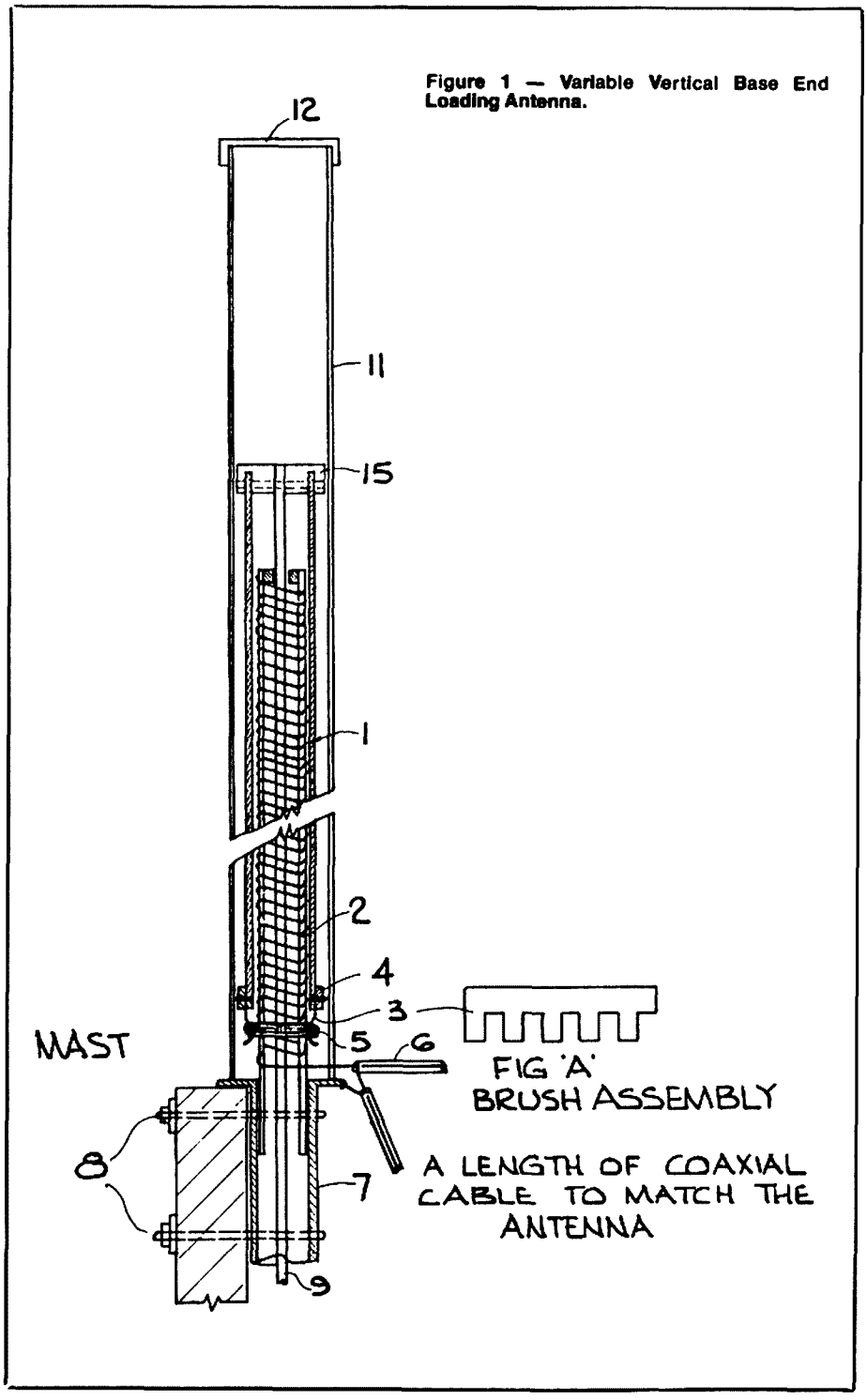


Figure 1 — Variable Vertical Base End Loading Antenna.

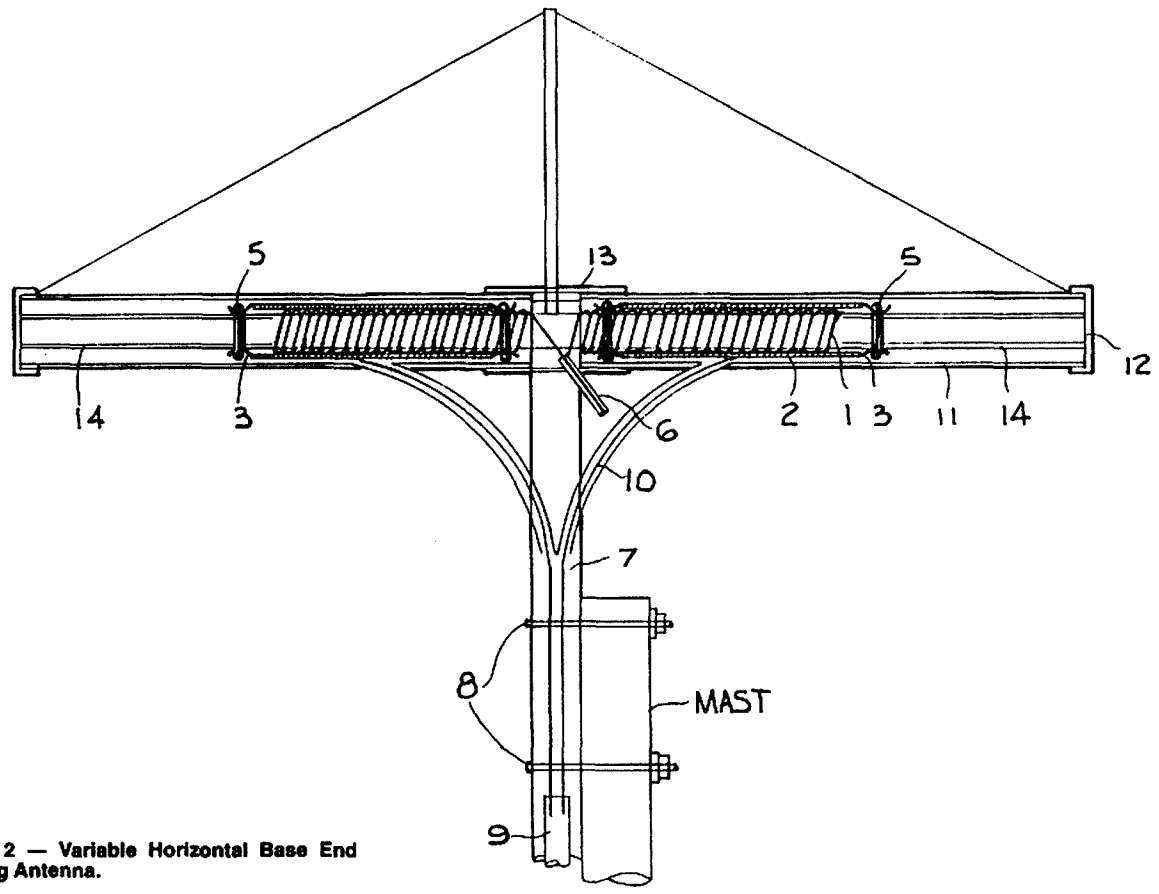


Figure 2 — Variable Horizontal Base End Loading Antenna.

10 Two PVC push rod guides (used on horizontal antenna only).
11 PVC weather shield.
12 PVC weather shield cap.
13 PVC sleeve.
14 Aluminium tube used on horizontal antenna only. The tube is used to give the antenna drive element a fixed length. Further experimenting will be carried out by adding director and reflector elements to the antenna to find how directional the antenna will become.
15 Bush used to connect rod 9 to tube 2.

ar

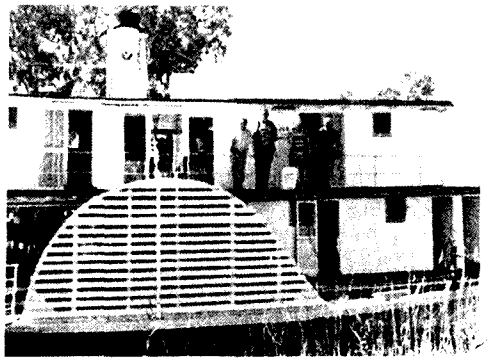
PS INDUSTRY & VI5JSA

A special event amateur radio station set-up on the Paddle Steamer PS *Industry* on September 19-22, was a great success with 327 contacts being made.

Awards were available for all amateurs contacting the station. The event was organised in conjunction with the Jubilee 150 celebrations.

—Adapted from *The Murray Pioneer*, Friday September 26, 1986 and supplied by Doug Tamblyn VK5PDT

Operating VI5JSA Special Event Station on the PS *Industry* from left: Kingsley VK5NOU, Doug VK5PDT, Hugh VK5BC (with microphone), and John VK5ARK (keeping the log).



Kingsley Brain VK5NOU, and Doug Tamblyn VK5POT, erecting the antennas in preparation for VI5JSA aboard the PS *Industry*.

Kingsley Brain VK5NOU, John Ruston VK5ARK, Hugh Lloyd VK5BC and Doug Tamblyn outside the Operations Room.

Leo McNamara and Roger Harrison

Predicting the size of the next maximum of the solar cycle

Kiss your last big solar maximum goodbye!

The solar cycle — that 11-year recurrence of activity on the sun delineated by an outbreak of 'spots' on its 'face' — is a familiar, but often mystic, phenomena to radio communicators the world over. Radio amateurs, shortwave broadcasters, HF network operators, space engineers, geophysicists and communications engineers variously exploit it, curse it and muse over it. In the past, efforts at predicting it have not been too successful. But recent work has given good results. So what's the forecast?

This article is published, by special arrangement, simultaneously in the January 1987 issues of *Amateur Radio* magazine and *The Australian Electronics Monthly*.

KISS YOUR LAST big solar maximum goodbye! For the many thousands of radio amateurs and shortwave listeners the world over who were active over the period of the last solar maximum, between 1978 and 1982, count yourselves lucky for it is unlikely you'll ever experience the phenomenal propagation conditions again in your lifetime. For those who were also around earlier, during the 1956-61 maximum, count yourselves especially lucky; that was the largest maximum ever recorded.

There have been numerous attempts over the years to predict the size and timing of upcoming solar maxima. Until recently, it was more miss than hit. This article pulls together the threads of recent work on solar cycle prediction, which says that we can expect a maxima *around* 1990 a little lower than that experienced in 1969.

Background on the solar cycle

Sunspots are small dark patches that appear on the visible surface (the 'photosphere') of the sun. They appear dark because they are somewhat cooler than their surroundings. The earliest recordings of sunspots seen with the naked eye go back to the first century BC when the Chinese observed them. It was Galileo however, who made the first systematic observations of sunspots, starting in 1610 just after the invention of the telescope. His observations occasioned some controversy at the time.

While sunspot observations on some sort of scientific basis extend from Galileo's time, reliable systematic observations commenced in the mid-1800s. A German amateur astronomer, Henry Schwabe, noted in 1843 what appeared to be a 10-year cycle in the number of sunspots, based on observations he'd made over the preceding 17 years. Until that time, periodicity in sunspots had not been noticed despite some 200 years of telescopic observations. Shortly after, Rudolf Wolf of the Zurich observatory organised a program of solar observations among professional astronomers that extended world-wide. A similar program continues still. It was Wolf who, from a search on earlier sunspot data, concluded that the average solar cycle period was around 11 years. Wolf's definition of "sunspot number" is in use to this day. However, the literature cautions that prior to 1850, sunspot data is inferior and unreliable. John A Eddy of the US National Centre for Atmospheric Research, categorises the data from 1852 to 1818 as good, from 1817 to 1750 as fair and from 1749 to 1700 as poor.

There is evidence that the solar cycle is much older, though. Searches for periodic variations in tree-ring records and other paleoclimatic data, while throwing up a rich and formidable array of data, have not shown evidence of any 11-year periodicity or any positive link between solar activity cycles and terrestrial climate until recently, however. An article on "The Solar Cycle in Precambrian Time" by George E Williams, in *Scientific American* August 1986, shows distinct evidence of cycles in laminated sandstones and siltstones from the Elatina formation in South Australia that have characteristics paralleling, if not matching, the characteristics of sunspot cycles. These precambrian rocks were laid down some 680 million years ago and Williams argues that the data implies that the sun's activity has changed little since that time.

The sunspot cycle has a mean period of 11.1 years, with a minimum period of about eight years and a maximum period of around 14 years. The rise to the peak is shorter than the fall to the minimum. The height of the peaks varies from lows of about 60 to an all-time high of 190 in 1957, and apparently follow a longer period of seven or eight 11-year cycles which was first noted by Wolf, more recently studied by W Gleissberg, detailed in a paper published in 1944. These longer cycles are now known as The Gleissberg Cycle. The minima seldom reach zero, averaging around six.

Sunspot numbers

In following up Schwabe's observation on a possible solar cycle, Wolf devised a method of counting sunspots and sunspot groups, giving rise to the term "sunspot number". The Wolf sunspot number, R, counts the individual spots and the number of spot groups, making one sunspot group as important as 10 individual spots. The sunspot number is expressed as a weighted sum, as follows:

R = 10 x No of spot groups + number of individual spots

The sunspot number will be zero when no spots are apparent, 11 with one sunspot (which is also regarded as one group) and may range as high as 250 (which has been observed).

Predicting the size of the next maximum

There are many good reasons for trying now to estimate how high the sunspot number will go at the next peak of the solar cycle, expected in around 1990. We saw in July 1979 the effect of the Marshall Space Flight Centre's very low forecast for the 1979/80 peak of cycle 21 — the mission to boost SKYLAB into a higher orbit was scheduled several years too late, and Skylab spread itself all over Western Australia. This was because the unexpectedly high level of solar activity, as indicated by the high sunspot numbers, heated and expanded the earth's atmosphere to such an extent that the atmospheric drag experienced by Skylab was much greater than predicted, and resulted in a premature decay of its orbit.

Atmospheric drag thus requires that all satellite mission planners have correct predictions of the general levels of solar activity so that they can estimate the lifetimes of their satellites, in order to know when to have the replacement satellites ready, when to line up their launch facilities, and so on. These are important financial decisions, and the competitiveness of the market place forces planners to take advantage of every available piece of information.

A similar situation exists in HF and satellite communications. Frequency Regulation Authorities in each country, and the international governing body, all require long-term estimates of the size of cycle 22 in order to be able to plan the allocation of frequencies in the HF band. These things are not done overnight, especially with the increasing pressures on the HF spectrum, which makes the task even more daunting.

A large system user who has to choose between HF and satellite communications for a new system would be heavily influenced by the predicted long-term levels of solar activity — provided he has a good measure of faith in these predictions. Higher levels of solar activity are more favourable to HF users because they give rise to higher MUFs, although they also bring with them an accompanying increase in the number of ionospheric storms caused by solar flares. Satellite users, on the other hand, are better off at lower levels of solar activity because of the diminished effects of the

ionosphere on the trans-ionospheric propagation of VHF-SHF signals (less refraction, shorter time delays, less scintillation, and so on).

This brings us to look at some techniques already being used to predict the value of the cycle 22 maximum in around 1990. I am going to describe three methods here. Broadly speaking, these can be described as "Historical perspective", "Recurrent geomagnetic activity" and "Mathematical methods".

Historical perspective

In a series of papers presented over the last few years, Tad Sargent of the Space Environmental Laboratories in Boulder, Colorado, has predicted that the next sunspot maximum will be in the range 90 to 100, somewhat lower than the average maximum over the last 13 cycles, which was 117.5. Flying in the face of convention, Tad has argued that we should not predict that the sun will do something that it has not been observed to have done before.

It sounds too simple to be important, but most operational forecasting is done on the basis of the concept of average behaviour. If our entire history of observations contains only two or three examples of the phenomenon we are trying to forecast, then the average value may be all the useful information we have. A good forecaster would start by considering the average behaviour and would then search for clues which may shade the forecast one way or the other from the average. It makes good sense to use this average as a starting point, but it also makes good sense to use any additional little bits of information to produce a better forecast, provided we think that we can interpret this information correctly. Tad has studied the last 13 cycles in some detail, to see what extra information can be gleaned from them, especially their variations about the average behaviour. Along with others in the field, Tad has much greater faith in data recorded after about 1840, which unfortunately leaves us with only 145 years of data, or about 13 cycles.

The data described here comes from one of Tad's papers. Table 1 lists the maxima and minima of cycles 9 to 21, along with the month and year in which they occurred, while Figure 1 shows the annual average sunspot numbers since 1750. Figure 1 is of particular interest because it illustrates the 80-90 year quasi-periodic changes in the heights of the maxima known as the Gleissberg Cycle. While a small amount of faith is required to accept the reality of the Gleissberg cycle as seen in Figure 1, other data such as auroral records confirm the reality of this so-called "secular" cycle. The current Gleissberg cycle must begin to end soon if the sun is to keep on doing what it has done in the past.

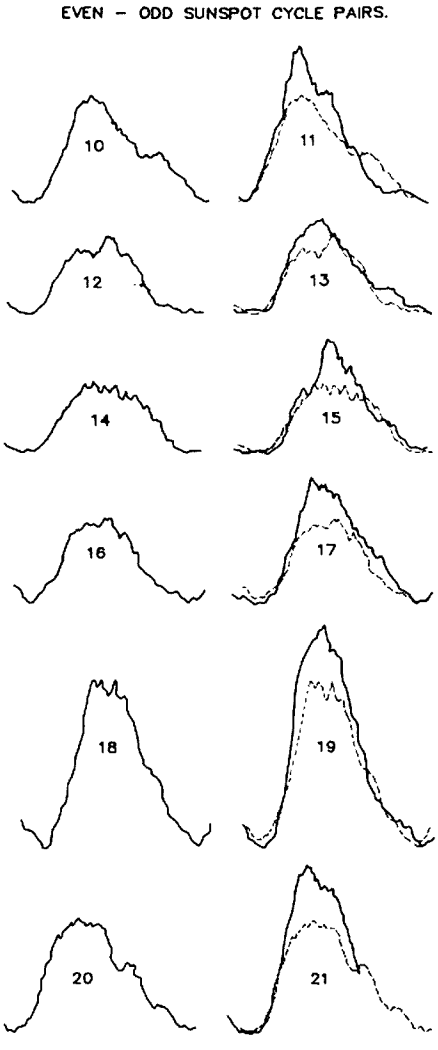


Figure 2.

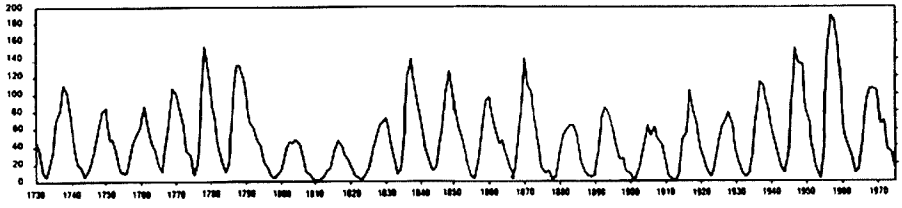


Figure 1.

Table 2 gives a listing of the ratios of odd-cycle to even-cycle amplitudes for the last 130 years. Remember that there is nothing magical about whether a cycle is odd or even, since this is determined by an accidental convention. What is important is that alternate cycles seem to be very similar to each other. Figure 2 shows that the even-numbered cycles look very much like the odd-numbered cycles that follow them, except that they are truncated — each even-numbered cycle looks like an odd-numbered cycle with its top knocked off. Table 2 shows that the maxima of the odd cycles are on average 1.44 times as great as those of the preceding cycle. We all know that the pattern could break at any time, but at present the assumption that the pattern will persist is a reasonable one. It would be easier to forecast the next cycle at this point if it were to be an odd-numbered cycle. However, since we are trying to forecast an even cycle, we have to stretch a little for the forecast.

The sub-table in the lower right-hand corner of Table 2 shows what values cycle 23 is likely to have, for particular values of cycle 22. As we can see, if cycle 22 is to be an average cycle of 117.5, we can expect cycle 23 to be as large as cycle 21. This poses a problem for us, because it says that cycles 22 and 23 would not even begin to end the current Gleissberg cycle. If the current Gleissberg cycle does not end until cycle 24, sometime around the year 2013 (1980 + 33), the current Gleissberg cycle will last longer than 100 years, even if it ends abruptly and does not taper off over several solar cycles. On the other hand, if cycle 22 goes to only 90 to 100, the implied maximum for cycle 23 establishes the trend towards a minimum in the Gleissberg cycle. Tad therefore concludes that cycle 22 needs to be at least as low as 90 to 100 in order to begin the end of the current Gleissberg cycle.

We can get another estimate for cycle 22 by considering the maxima for the even cycles which, as we have seen, seem to belong to a different group for the odd cycles. The numbers in Table 2 allow us to calculate the average maximum value for the even cycles 10 to 20 , which turns out to be about 96. Thus if we assume that cycle 22 will be a 'typical' even cycle, we can expect the peak to reach about 90 to 100.

Tad is therefore shooting for a value of 90 to 100. Given the flat tops of even cycles which we saw in Figure 2, we can expect the next maximum to cover the period 1990 to 1993, or thereabouts. Incidentally, Tad is going for a February 1988 minimum before cycle 22 starts up.

Recurrent geomagnetic activity

There is a group of sunspot number forecasting methods which rely on the relationship between the general level of geomagnetic activity during the decreasing years of a solar cycle with the sunspot number reached during the following sunspot maximum. Figure 3 shows the sunspot number for cycles 12 to 21 (solid lines) and the smoothed monthly mean aa indices of geomagnetic activity (dashed lines). Recall that most geomagnetic activity during the reclining phase of a cycle is due to recurrent storms associated with HSSWSs (see Radio Communicators Guide to the Ionosphere, *Australian Electronics Monthly*, August 1986, p 77).

It was the Russian, Alexander Ohl who pointed out the remarkable correlation between the average level of geomagnetic activity during the last three years of one sunspot cycle and the maximum amplitude of the next cycle. The cross- hatched areas in Figure 3 show the values of a variable depending on the index aa, which Ohl introduced. We can see that the cross-hatched areas do appear to relate very closely to the peaks of the

next cycle — the larger the cross- hatched areas, the higher the following cycle.

The correlation between the geomagnetic activity averages and the peak values of the succeeding cycle is an impressive 0.93. The Ohl method was used in 1977 to forecast the cycle 21 maximum, which it did fairly successfully (see Radio Communicators Guide to the Ionosphere, *Australian Electronics Monthly*, October 1985, p 106). Unfortunately we shall have to wait until we have reached the approaching minimum before we can obtain the Ohl geomagnetic parameter and make a reliable estimate for cycle 22 using the Ohl method.

It is possible to have a good guess at what the Ohl parameter will be, based on what has happened in the last year or so, and thence to estimate the corresponding value for the sunspot maximum for cycle 22. This has been done by various authors, who have also developed their own versions of the Ohl method. A group of experts at the Solar-Terrestrial Physics Workshop in Paris during 1984 came up with a consensus opinion that cycle 22 would be a little above average, but many have no doubt all changed their minds since then, as more geomagnetic observations have become available. We will not go any further into this group of forecasts here, since they really should not be made until we are sure that we have reached solar minimum.

Mathematical methods

The third class of forecasting methods we will describe here are almost purely mathematical, with no regard to the underlying physics of the situation. Cycle 21 saw the general abysmal failure of these methods, with the notable exception of Adolf Paul's Anharmonic Frequency Analysis (AFA) technique which was applied by Jay Hill and yielded a good estimate for the value of the maximum.

In a recent paper, Adolf has used an improved version of his AFA technique to forecast a sunspot number of around 100 for cycle 22. Adolf pays particular attention to the quality of the data he uses (cycles 9 to 21), and to the noise level in the data. Figure 4 shows Adolf's forecasts for the next three solar cycles — with declining peaks until at least the year 2040. The noise level is about ±20.

Adolf's mathematical techniques are not for the faint-hearted (including the present writer!), but they have been shown to be very powerful in the analysis of other data such as tide heights, and do not suffer from the defects of some other techniques when applied to real (noisy) data. Adolf is at the Naval Ocean Systems Centre in San Diego.

Conclusion

Much has already been written, and more will continue to be written, about the sunspot maximum of cycle 22. We have just scratched the surface here, but the bottom line is that we can expect a below-average cycle for cycle 22, with the sunspot number reaching only 90 to 100. In all probability, the following two cycles will be even lower. It is comforting to see that methods as disparate as Tad's and Adolf's agree about the size of cycle 22, and also that the current Gleissberg cycle appears to be on the decrease.

ABOUT THE AUTHORS

Leo McNamara

Leo obtained a BSc from the University of Queensland in 1961, BSc (Hons) in 1964 and his PhD in 1969. Subsequently, he gained MSc & Soc from the University of NSW in 1979. Leo's PhD was in solar physics. He worked as a post-doctoral research associate at the University of Colorado during 1969-70, in the Joint Institute for Laboratory Astrophysics. From 1970 through 1979, Leo was Head of the Ionospheric Prediction Service low-latitude (equatorial ionosphere) research section.

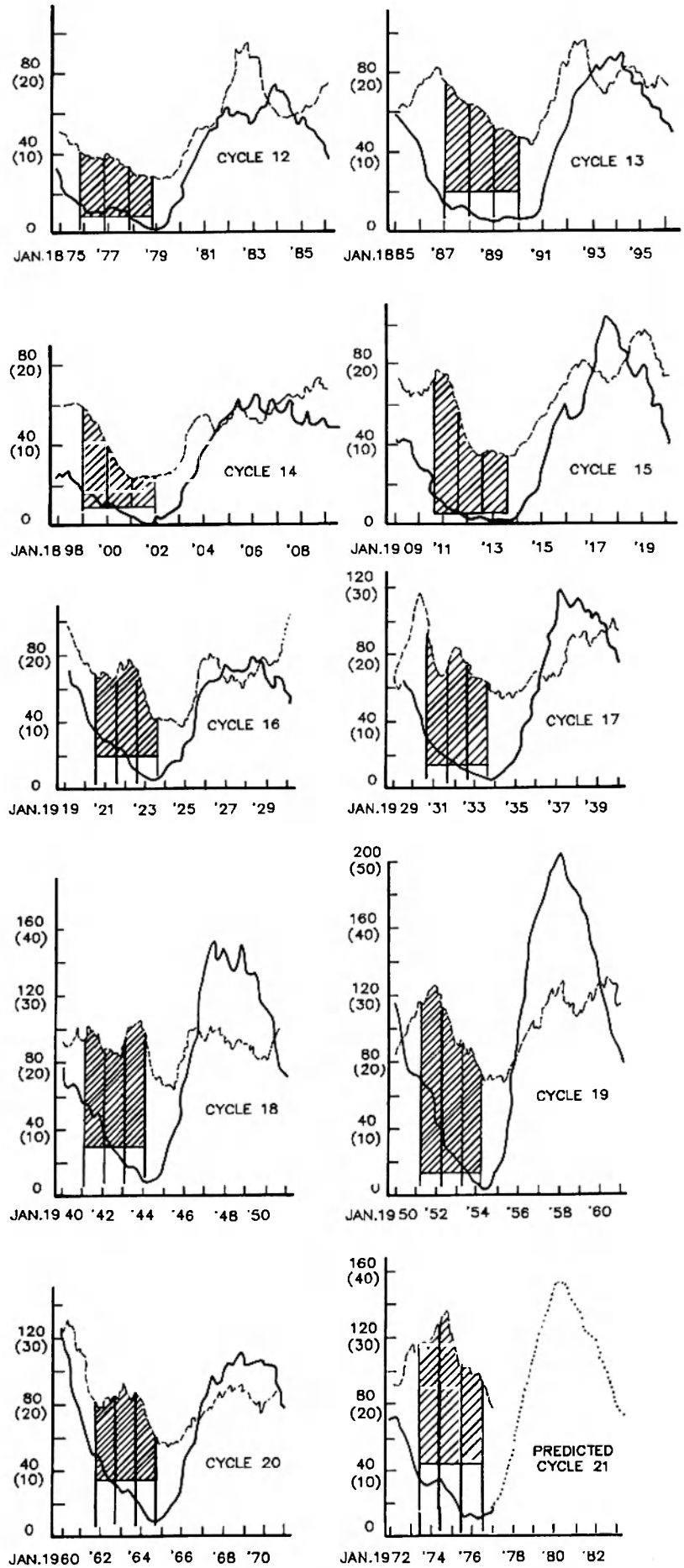
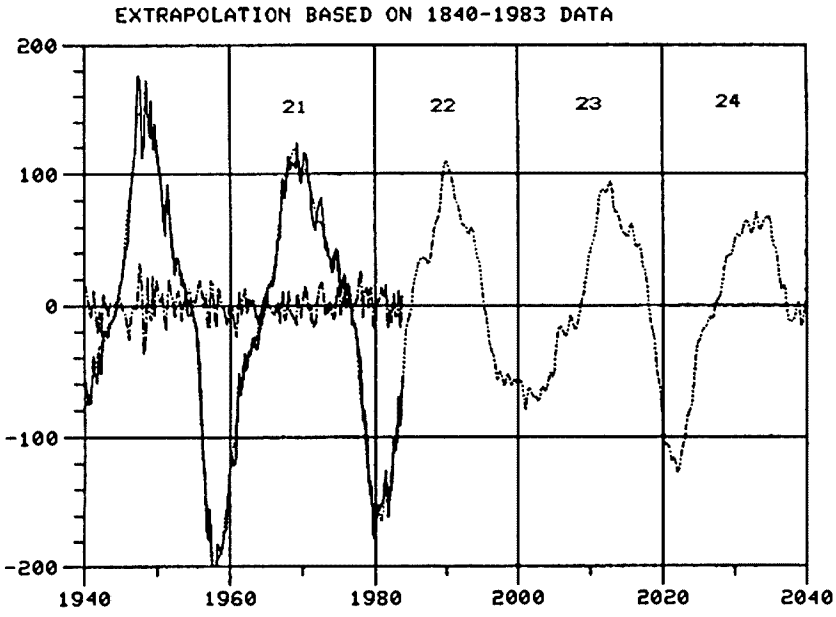
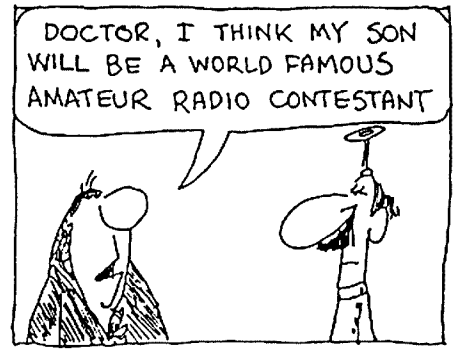
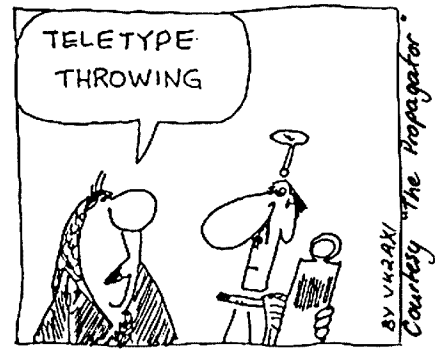


Figure 3.







Roger Harrison worked with him during 1971-73 on transequatorial propagation.

During 1977-78, Leo again worked at the University of Colorado, as Visiting Scientist at the World Data Centre for Solar-Terrestrial Physics. Upon his return, in 1979, he was appointed Head of the Prediction Section at the Ionospheric Prediction Service Radio and Space Services, part of the Department of Science. During 1982-83 he worked in America again, this time at the US Air Force Geophysics Laboratory in Boston, Ma.

During late 1985 — early 1986, he worked at Lowell University, Ma. Returning to Australia in 1986, Leo took up his current position with Andrew Antennas in South Australia.

Leo is widely known among the international scientific community through his work on various committees. He is a prolific author, with some 58 papers to his credit, many appearing in international scientific and engineering journals such as Nature, Australian Journal of Physics, Radio Science, Advances in Space Research etc. Together with Roger Harrison, Leo has authored 'The Radio Communicators Guide to the Ionosphere', currently being serialised in The Australian Electronics Monthly, soon to be published as a book. Aside from his prolific print output, Leo is an accomplished lecturer.

Leo is married with two children. He lists his hobbies as "doing nothing".

Roger Harrison VK2ZTB

Probably one of Australia's best-known amateurs, Roger gained his licence as VK3ZRY in 1963. An inveterate 'builder/modifier' in those years, Roger was prevailed upon to write-up some of his more notable efforts for *Amateur Radio*. His first article, "Some Six Metre Antennas" appeared in AR in 1964, sowing the seeds for what became a career in technical writing/journalism.

He pursued a course in Communications Engineering at RMIT during the 1960s, taking a sharp left turn in 1970 when he joined the 1970 ANARE expedition to Casey base, Antarctica, conducting a geophysical survey. He operated under AX0GR there, the call sign of the late Heinz Gehrke VK5GR.

Returning in 1971, Roger moved to Sydney and changed his call sign to VK2ZTB. As he always maintained a strong interest in propagation since his SWL days in the late '50s, it seemed only natural he should join the Ionospheric Prediction Service where he worked with Leo McNamara on transequatorial propagation from 1971 to 1973. His classic two-part article on "Transequatorial VHF Propagation" published in AR in 1972 has been published in several languages around the world. From 1973 to 1976 he worked on the development of a solid-state ionospheric sounder for the IPS, and wrote the handbook for it.

Roger was instrumental in having six metre beacons established by IPS at Casey and Mawson in 1971, and was an author of the seminal 1971 VK2 VHF Group 'Beacon Manifesto', along with Mike Farrell VK2AM and Rod Graham, then VK2ZQJ. This document established the fundamental parameters of the Australia-wide network of beacons and the beacon bandplans.

From 1971 through 1976, Roger was a major contributor to journals such as 73 Magazine, Ham Radio and ETI (Australian edition). Roger is also known from the VHF-UHF journal 6UP he and his wife Val published during the '70s. 6UP was revived recently by Roger, in partnership with Andrew VK2YLA. From 1976 to 1979, he worked as a full-time freelance technical journalist, amongst other things editing a CB magazine. From 1979 through 1984, he edited ETI. In 1985, Roger launched The Australian Electronics Monthly, which he partly owns and is currently the Editor.

Roger has had, over the years, written and had published hundreds of articles, papers and technical notes in journals all over the world. He is a widely sought after lecturer and speaker and regularly addresses meetings and seminars.

■■

Write an Article for AMATEUR RADIO!

THE TDM 80 METRE CW TRANSCEIVER

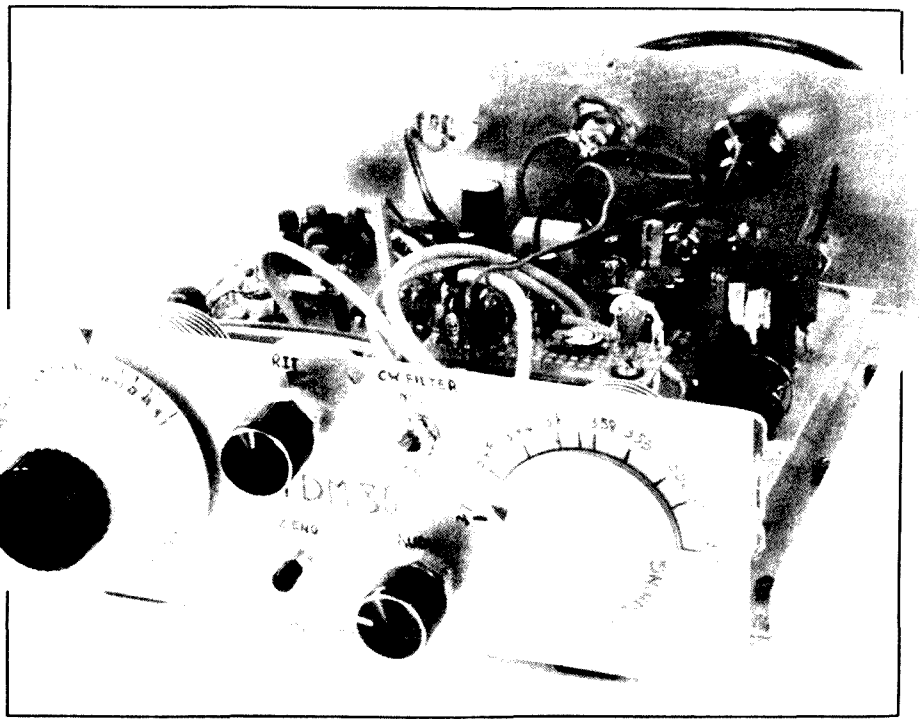
Ian Smith VK7IJ
101 Flinders Esplanade, Taroona, Tas. 7006

Here is a way to get "on-air" relatively cheaply with a "tried and tested" transceiver.

The low power transceiver described below was born out of economic necessity. It is presented so that others may have the pleasure of both constructing and using home-made equipment.

The unit features:

Variable Frequency Oscillator (VFO)
Direct Conversion Receiver (DC)
Receive Incremental Tuning (RIT)
CW Filter
Side-tone Generator
Automatic Aerial Change-over, Receive to Transmit
Automatic Receiver Audio Mute with Semi-Break in
Push Button Zero Beat Transmit Frequency Set
1.5 watts RF Output Power
8 ohm Audio Output Impedance for Loudspeaker or Headphones
Low, 30 mA Receiver Standing Current
Single Printed Wiring Board Construction
Minimal Alignment and Test Equipment Requirements
Uses Standard Components

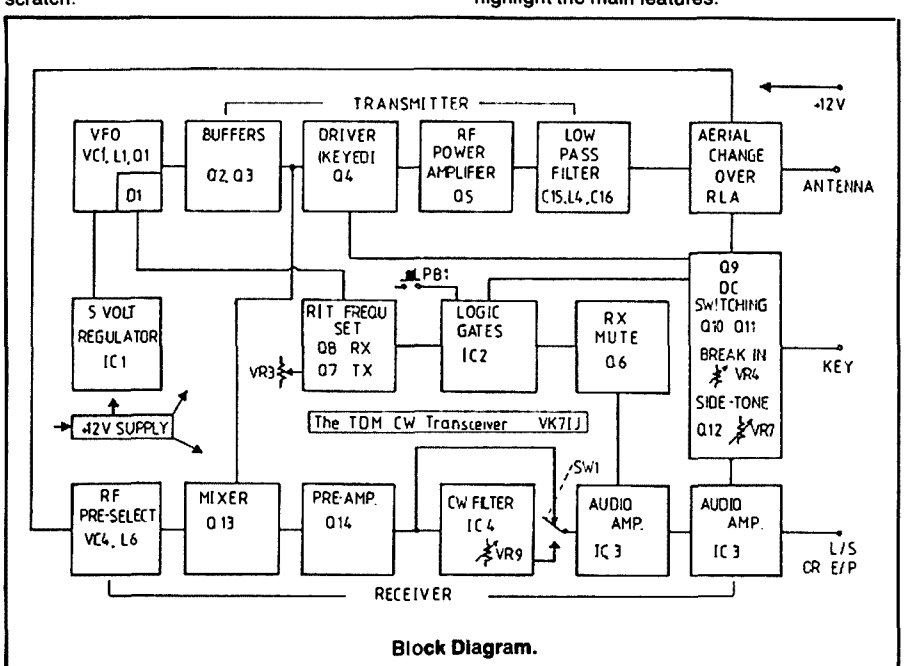


CIRCUIT DISCUSSION

Much of the circuitry is conventional and acknowledgment is given to the fact that this transceiver design is an extension of my original attempt to build the "SCD" described by the G-QRP Club and republished in the CW Operators ORP Club magazine, *Lokey*. Authorship is claimed for the upside-down driver stage, Q4, and the use of CMOS ICs in this application. A printed wiring board layout has also been designed completely from scratch.

CIRCUIT DESCRIPTION

The description relies heavily on the old adage that a picture is worth a thousand words. Therefore, please refer to the block diagram and the circuit diagram. An attempt is made to highlight the main features.



Block Diagram.

A Colpitts VFO comprising Q1, L1, VC2, C3, C4 forms the heart of the transceiver. Diode D1 acts as a voltage dependent capacitor. Its capacitance is set by a fixed voltage, supplied via Q7, on transmit and a variable voltage from VR3, supplied via Q8 on receive. This variable voltage provides the RIT function.

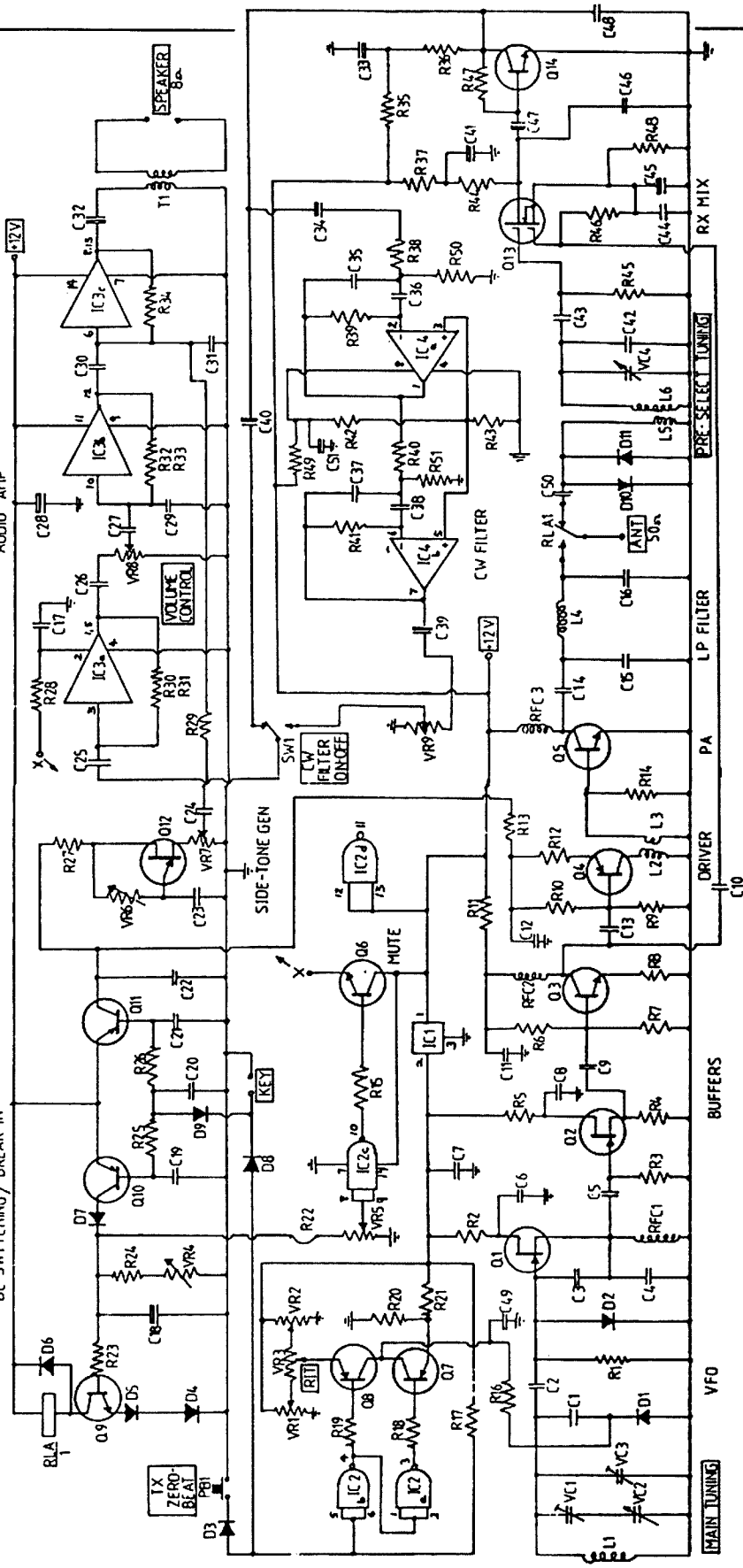
The VFO output is buffered by Q2 and further amplified by a class A stage Q3. This RF signal is applied to the keyed class A driver stage and to gate 2 of the dual gate MOSFET mixer, Q13, in the receiver.

During receive, the desired signal from the antenna is peaked by varying VC4. The VFO frequency is set slightly below or above that of the incoming signal. Due to the mixing action of Q13, the difference (and sum) frequency, ie the desired audio, appears at the drain of Q13. The RF component is removed by C46. The audio signal is lifted in level by Q14 and IC3.

Although IC3 is considered to be a digital CMOS device, it is biased to linear operation by R30, 31, 32, 33, 34. Output power is low, being only a few hundred milliwatts, however the use of this device has some advantages. Firstly, due to operating conditions, overload inputs tend not to be clipped, but instead are progressively rounded off, thus harsh audio quality is avoided. This produces the impression of high signal power.

Secondly, because of this "soft" clipping action, the peak output and average output powers are similar and hence the operator is protected from the nasty experience of loud clicks when using headphones, caused by electrical appliances being switched on, or by static crashes. This allows the volume control to be advanced for weak incoming signals without the fear of being zapped. (The author

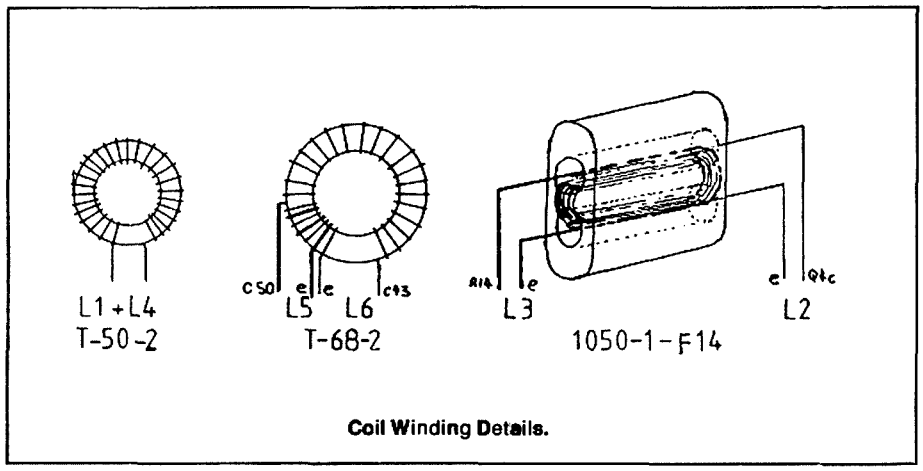
The TDM 80 metre CW Transceiver.



as had the somewhat shattering experience of listening to headphones powered by devices such as the LM380. These devices are capable of several watts peak!). Another advantage of using the 4007 is the very low current consumption (15 mA).

When receiving CW signals a filter, IC4, can be selected via SW1 to reduce the problems of band noise and adjacent channel interference. The filter has a centre frequency of 800 Hz and a bandwidth of 150 Hz.

When the key is pressed for transmit many things happen. The 12 volts supplied via R17 is grounded and the wired inverter gates IC2a and IC2b change state causing Q7 to conduct and Q8 to switch off. This action sets the transmit frequency. Q10 conducts and applies DC to the base of Q9 causing Q9 to conduct and activate the relay RLA. This action connects the transmitter output to the antenna. C18 charges and prevents RLA releasing, for a time set by VR4, when the key contacts are opened. This prevents the relay from chattering during normal character sending speeds. Q6, which is normally conducting, is switched off by the action of IC2c gate via VR5. This removes the supply voltage from IC3a, thus muting the audio amplifier. Voltage is supplied via Q11 to both Q12, a relaxation oscillator, and Q4. The audio output from Q12 is applied to IC3c via VR7 to provide side tone from the speaker or earphones. Q4 is keyed on, amplifies the RF signal from the VFO/Buffer chain and drives the class C final stage, Q5. The 1.5 watt output from Q5 is fed through the single-pole low pass filter to reduce the harmonic content.



Coil Winding Details.

The driver stage, Q4, evolved from some experimentation:

Firstly it allows keying by means of the 12 volt supply being applied to the emitter. Emitter keying is desirable as it reduces break through leakage of the RF signal via the base-emitter junction during the key-up condition. Secondly, it allows one side of both the windings L2 and L3 to be earthed. This feature appears to improve stability. It is, however, still necessary to find the best polarity of these windings for the best drive to Q5. Finally, even allowing for the lower F of the PNP device, the stage has been found to have very high gain thus reducing the required RF input level and hence the loading on the VFO.

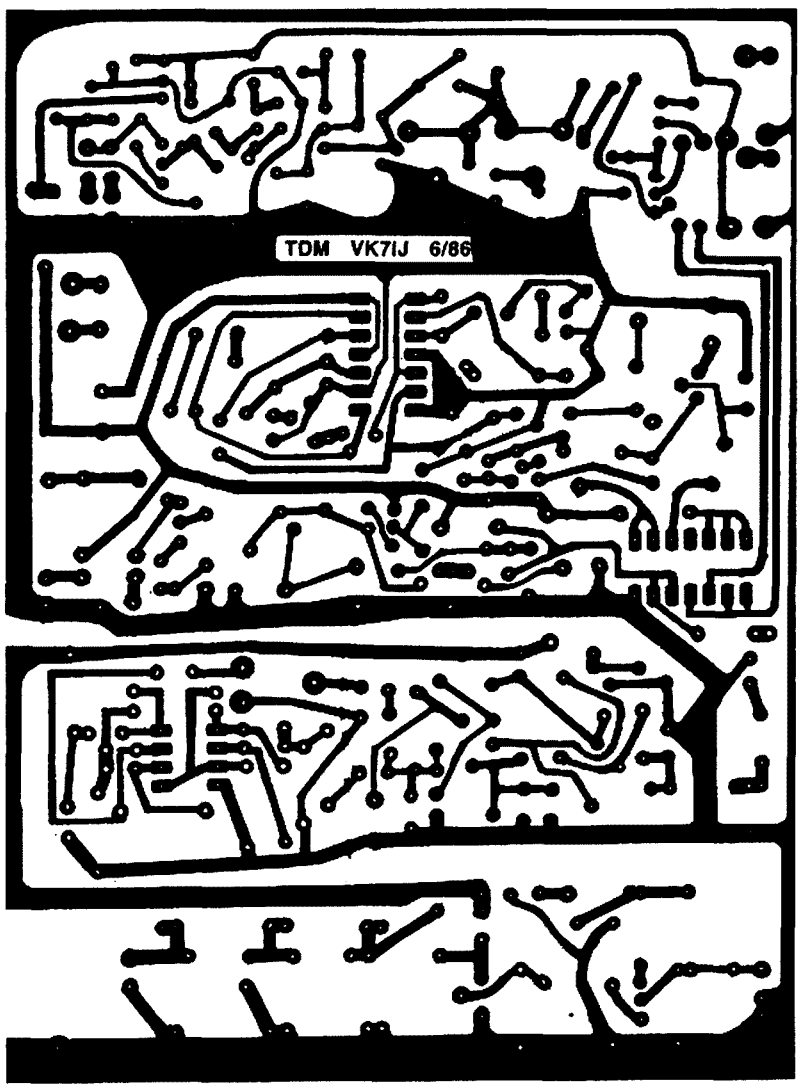
Power supply requirements — well regulated 12-13.5 volts DC at one amp.

CONSTRUCTIONAL NOTES

The usual precautions for handling CMOS IC devices should be observed. Care is also needed regarding the polarity of polarised components and the pin layout of transistors. It is recommended that the VFO be constructed and aligned first. It may be necessary to add a capacitor across VC3 in order to lower the frequency to within the required range. Such trimming will be dependent on the actual value of VC2. Check the five volt supply from IC1. Then, using a frequency counter or the station receiver, adjust VC3, with VC2 fully unmeshed, so the top-of-band frequency is set (3.7 MHz). Then, with VC2 fully meshed, adjust VC1 so the bottom-of-band frequency is set (3.5 MHz). Repeat these steps until both frequencies are correct.

Next construct the receiver, CW filter and audio amplifier. Remember to connect the RF from the VFO to Q13. Nothing will be heard from the speaker until the audio amplifier is unmuted, so temporarily connect 12 volts to R28. Then, with an antenna connected to C50 (during the evening) it should be possible to hear both CW and sideband signals. By switching to CW filter and then altering VC2 it should be possible to place CW signals in the passband of the filter. VR9 is adjusted so that the audio output level is a little higher than with the filter off.

The driver, PA and output filter stages can now be constructed. Temporarily connect a suitable dummy load/power meter to C16 and, having connected the VFO RF output to C13/Q4, momentarily connect the 12 volt supply to R13. Power output should be observed. At this point check the polarity of L3 to ensure maximum output. C13 should be adjusted (reduced) until the power output



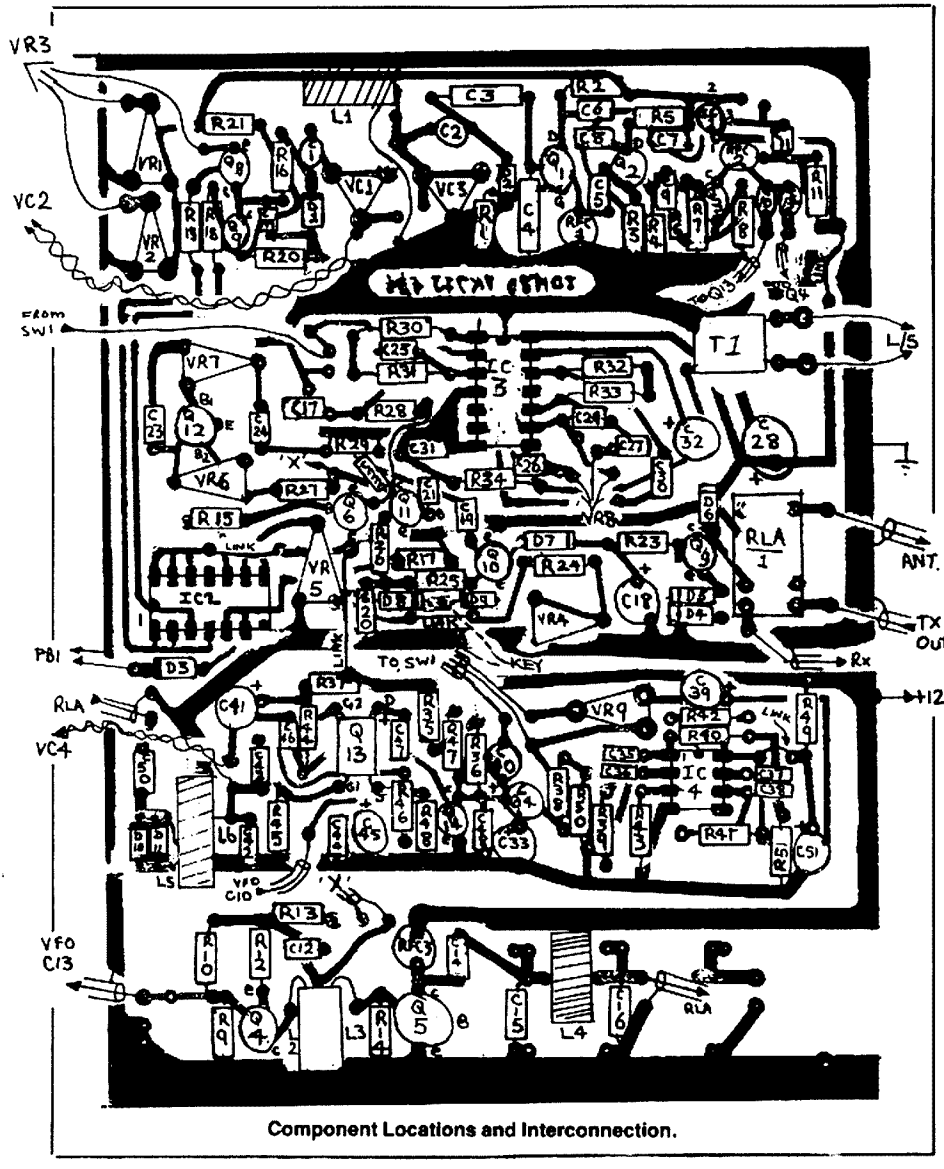
Printed Wiring Board Artwork.

begins to reduce — this should be 1.5 to 2 watts. Ensure a heat sink is fitted to Q5 and do not hold Q4 keyed too long (five seconds) or Q5 may be damaged. It is a good idea to fit a 5-30 pF trimmer in place of C13 so changes in drive level can be readily made. This adjustment is important because, even though no greater than two watts can be produced, it is possible to overdrive the base-emitter junction of Q5. Once adjusted, Q5 will get only moderately hot after a "key-down" of 15 seconds or so.

Finally, the DC switching stages can be constructed — leave R13 disconnected meantime. Measure the voltage at the collectors of Q7, Q8 while adjusting VR3, some variation should be noted depending on the setting of VR1 and VR2. Now press PB1 and the voltage should be fixed at approximately two volts — similar to that at the junction of R20, R21. With PB1 still pressed tune to a CW station until the signal is zero beat, ie tuning VC2 to either side of the incoming signal the frequency of the audio tone increases. (Make sure the CW filter is off). Release PB1 and adjust VR3 (RIT) to its mid-mechanical position. Now adjust VR1 so the voltage on the wiper is about 0.5 volts less than that at the junction of R20/R21, ie 1.5 volts. Adjust VR2 until the voltage on its wiper is about 0.5 volts greater that that at the junction of R20/R21, ie 2.5 volts. By careful adjustment of VR1, VR2 it should be possible to again obtain a zero-beat at, or near, the mid-position of VR3 and simultaneously obtain an approximately equal plus and minus changes in audio pitch when VR3 is turned from one end of its travel to the other. This procedure sets the RIT range. About ±3 kHz is ample but the circuit is capable of ±10 kHz or more if required. Connect a key and close the contacts, the voltage at the collectors of Q8, Q7 should be the same as when PB1 was pressed. Also, the relay should operate and side-tone should be audible — set the level by adjusting VR7. The side-tone frequency is set by VR6. Release the key and the relay should release, adjust the release time, using VR4, so the relay remains operated during normal keying.

Connect Q6 emitter to R28 and again key the circuit, muting of the receive signal should be noted. Adjust VR5 until the mute releases at about the same time as RLA when the key is released.

If all is correct, connect the collector of Q11 to R13 and the dummy load/power meter to the antenna socket. Key the transmitter and RF power output should be observed. The transceiver is now ready for air testing.



Component Locations and Interconnection.

OPERATION

Switch the unit on and allow to stabilise for about 30 minutes. With a 50 ohm antenna connected tune to a desired CW station while pressing PB1 and with the CW filter off. Zero-beat the signal and then release PB1. Adjust the RIT to give the desired audio pitch. If the CW filter is used, set the RIT to give the passband frequency, about 800 Hz. Adjust the RF preselect tuning to peak the response. Do not adjust the main tuning as this alters the transmit frequency.

PERFORMANCE

No station equipment is available to measure receiver sensitivity but it lives up to all the claims made in published literature. The main testimony to performance is the variety of contacts and reports given. The author has had regular contacts into VK3, 2, 1, 5, and 7, some contacts into VK4, 2 and VK6. Reports range from 599 (VK5) to 329 VK6. Several contacts have been had with ZL stations receiving good reports, 4/5 39. These contacts have all been made using a standard dipole located about six metres up. SWLing has also been a pleasure with signals from W/K, JA, P29 being regularly copied, not withstanding QRM, QRN and QSB!

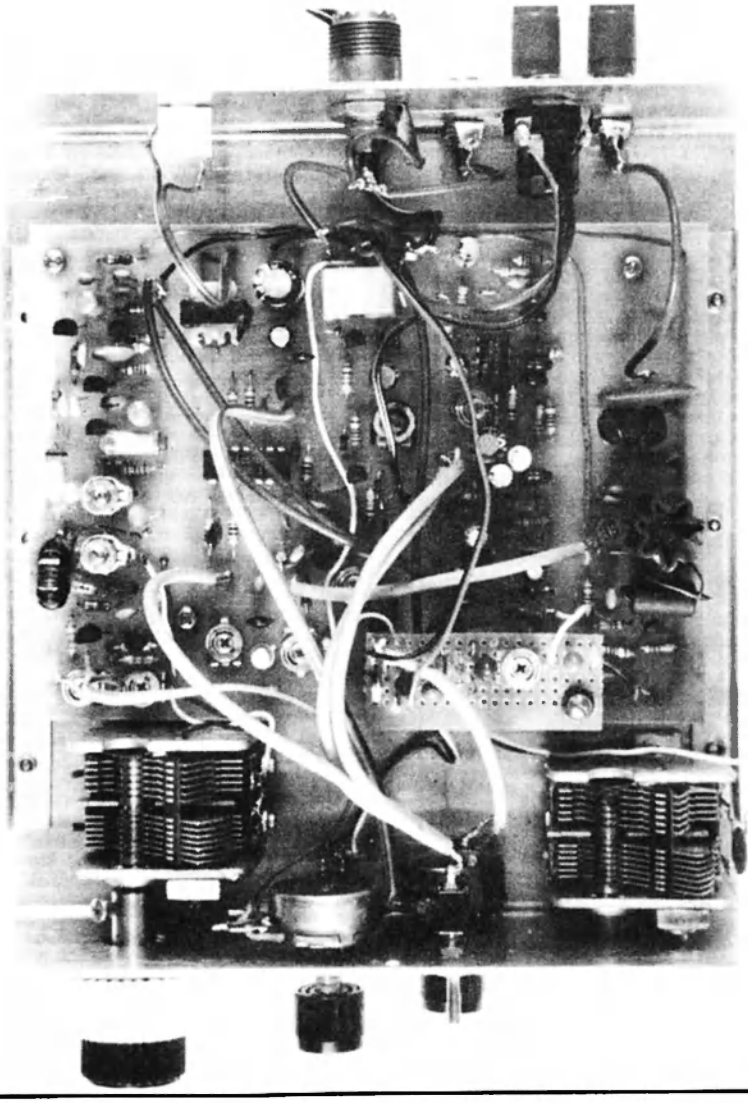
Since the completion of the original circuit, audio triggered RF automatic gain control has been developed and successfully installed. This circuit irons out some of the level differences due to strong local and weak distance stations. It also helps prevent overload in the mixer due to very strong local stations. The circuit will be published in a later article.

I wish to thank my family for their patience and support, Mrs C Fern for typing the manuscript and Mr A Howard for the photography.

PLEASE NOTE

It is necessary to use miniature 50 ohm coaxial cable to connect the VFO output to the receiver and transmit sections. This cable also needs to be used to connect the antenna to relay; relay to receive and to transmitter LPF

IC 1 78LO5A	Five volt Regulator for VFO
IC 2 HCF4011 CMOS	Switching
IC 3 HEF4007 CMOS	Audio Amplifier
IC 4 LF353N — TL072 etc	CW Filter
Q 1 MPF102 JFET	VFO Oscillator
O 2 MPF102 JFET	Buffer
Q 3 BC548 NPN	Preamplifier
Q 4 2N3905 PNP	Transmit Driver
Q 5 2N3019 - 2N3054 NPN Power	Transmit Preamplifier
Q 6 BC548 NPN	Audio Amplifier Mute
Q 7 2N3905 PNP	Transmit Frequency set key down
Q 8 2N3905 PNP	Receive Frequency set key up
O 9 BC548 NPN	Relay Driver
Q10 2N3905 PNP	DC Switch/timing
Q11 2N3905 PNP	DC Switch
Q12 2N2646 UJT	Side-tone generator
Q13 MPF121 —131 Dual gate M-FET	Receiver Mixer
Q14 BC548 NPN	Receive Audio Preamplifier
RFC 1 1.5 mH	
RFC 2 1.5 mH	
RFC 3 3t 22 SWG Philips six hole ferrite bead	
L 1 34t 28 SWG T — 50 — 2	VFO tuned CCT
L 2 8t 28 SWG	Balun Former 1050/1/F14
L 3 2t 22 SWG	Balun Former 1050/1/F14
L 4 21t 22 SWG T — 50 — 2	LPf
L 5 4t 22 SWG at ground end of L6	T — 68 — 2
L 6 34t 22 SWG	T — 68 — 2



SW1 SPDT miniature	CW Filter on/off
T1 1000 — 8 ohm miniature	
PB1 SPST momentarily-action push to make	
D1 IN4001	
D2-11 IN914 etc	
RLA Miniature PCB mount 320 ohm SPST	DS cat S7112
VC1 10-140 pF trimmer	Low frequency set
VC2 0-150 pF tuning gang	
VC3 10-140 pF trimmer	High frequency set
VC4 0-150 pF tuning gang	
VR1 20k linear horizontal preset	RIT limit set
VR2 20k linear horizontal preset	RIT limit set
VR3 20k linear pot	RIT
VR4 10k linear horizontal p eset	Break in delay set
VR5 20k linear horizontal preset	Mute release set
VR6 20k linear horizontal preset	Side-tone frequency
VR7 5k linear horizontal preset	Side-tone level
VR8 500k log pot	Audio output
VR9 20k linear horizontal preset	CW filter level

RESISTORS — quarter watt resistors, five percent (Metal-oxide preferred)

R 1	100 k	R18	68 k	R35	220
R 2	100	R19	68 k	R36	4.7 k
R 3	100 k	R20	47 k	R37	220
R 4	1 k	R21	68 k	R38	22 k
R 5	470	R22	LINK	R39	100 k
R 6	27 k	R23	10 k	R40	22 k
R 7	3 k	R24	1 k	R41	100 k
R 8	100	R25	10 k	R42	10 k
R 9	6.8 k	R26	10 k	R43	10 k
R10	1 k	R27	3.3 k	R44	4.7 k
R11	100	R28	4.7 k	R45	100 k
R12	100	R29	100 k	R46	33 k
R13	47	R30	10 M	R47	1 M
R14	100	R31	10 M	R48	1 k
R15	47 k	R32	10 M	R49	1 k
R16	220 k	R33	10 M	R50	1 k
R17	220 k	R34	10 M	R51	1 k

CAPACITORS

C 1 68p (s) styro	28 470u (e)
C 2 150 p (s)	29 220p (c)
C 3 680p (s)	30 0.0022u (g)
C 4 680p (s)	31 220p (c)
C 5 47p (c) ceramic	32 10u (e)
C 6 0.1u (c) mondithic (m)	33 100u (e)
C 7 0.1u (c) (m)	34 0.22u (e)
C 8 0,1u (c) (m)	35 0.022 (g)
C 9 68p (c)	36 0.022 (g)
C10 30p (c)	37 0.022 (g)
C11 0.1u (c) (m)	38 0.022 (g)
C12 0.1u (c) (m)	39 1u (e)
C13 30p (c) or 5-30p trimmer	40 0.22 (e)
C14 0.1u (c) (m)	41 100u (e)
C15 750p (s) or (c)	42 150p (c)
C16 750p (s) or (c)	43 150p (c)
C17 0.1uF (c) (m)	44 0.02 (c)
C18 47u electrolytic (e)	45 25u (e)
C19 0.1 (c) (m)	46 0.047 (c) (m)
C20 0.1 (c) (m)	47 0.47 (e)
C21 0.1 (c) (m)	48 0.022 (g)
C22 0.1 (c) (m)	49 100p (c)
C23 0.1 (c) (m)	50 100p (c)
C24 0.0022u green cap (g)	51 22u (e)
C25 0.0047u (g)	
C26 0.0047u (g)	
C27 0.0022u (g)	

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Try This!

BARGRAPH SWR INDICATOR

Ivan Huser VK5QV
7 Bond Street, Mount Gambier, SA 5290

A little SWR indicator which may be used as a separate unit built into a small commercial utility box or as an integral part of a larger project such as a linear amplifier or antenna tuning unit.

A SWR meter connected in the feedline at the transmitter is a very useful device if correctly interpreted. Depending on the match or more precisely the mismatch of the system, the SWR may appear to be very high, very low or somewhere in between depending on the actual match.

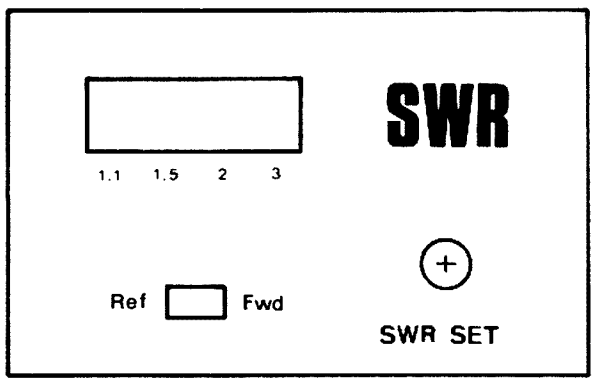
The apparent SWR measured at this point may be quite meaningless. However, any sudden or gradual change in the reading will indicate a possible change in the antenna or feedline parameters and hence trouble. This is where this little bargraph indicator can be useful.

CIRCUIT

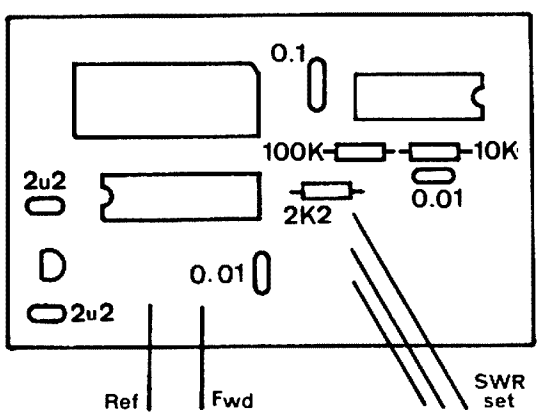
The RF sensing head is similar to that found in many publications such as the *ARRL Handbook*, where adjustment procedure is also generally given.

The respective output from the RF section is amplified by an operational amplifier ahead of the LM3914 bargraph driver.

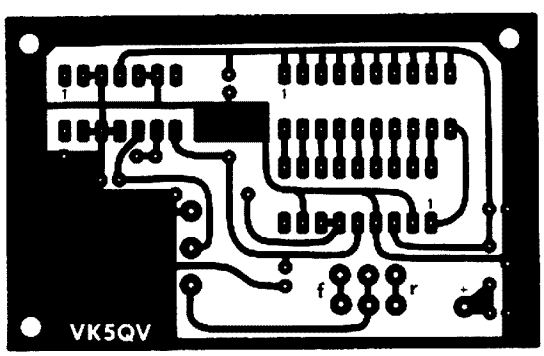
When correctly calibrated, the last LED represents a SWR of 3:1. Due to the particular characteristic response of the LM3914, the other segments of the bargraph do not relate directly too easily, to interpret SWR values. However, the first segment is very close to a SWR of 1:1, the fourth segment close to 1.5:1 and the seventh segment close to 2:1. This is quite satisfactory in all but the most critical applications.



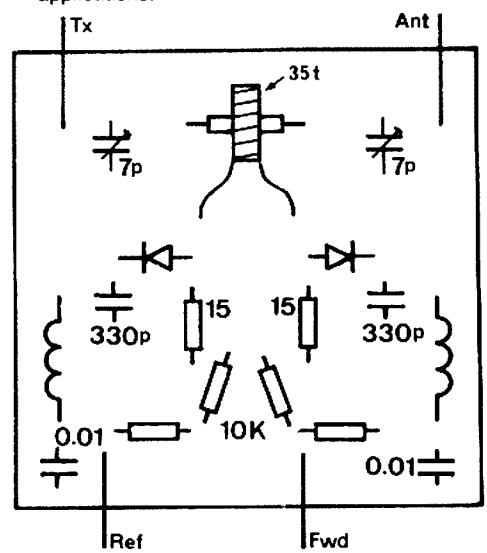
Front Panel (Full Size).



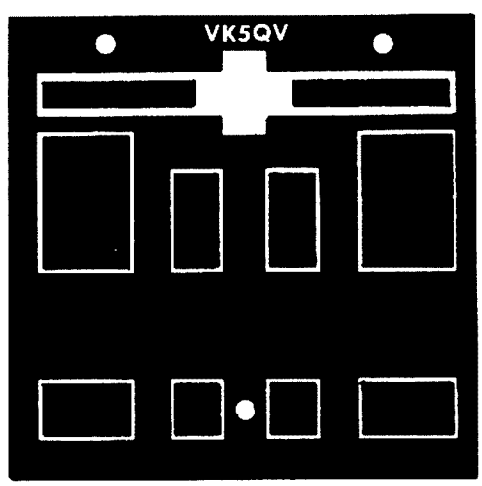
Component Overlay.



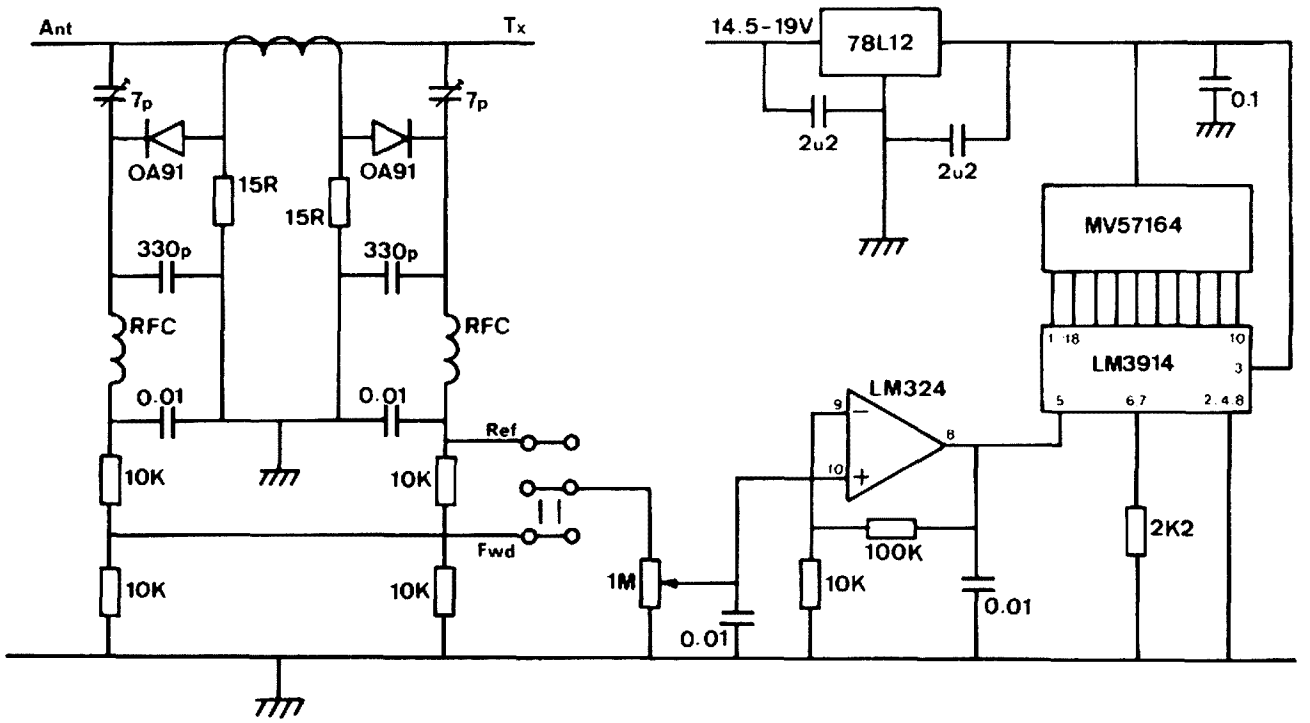
PCB Pattern (Full Size).



RF Board Layout.



RF Board (Full Size).



Bargraph SWR Indicator.

Because of this, the bargraph SWR indicator will be found to be most useful where a knowledge of the relative SWR is required rather than an absolute value.

CONSTRUCTION

All the information necessary for constructing the unit is given in the diagrams.

Ideally, the RF section should be built separately and well shielded from the indicator section. However, with care there is no reason why the RF section and indicator cannot be built into the same box.

It is standard practice of course to use a red filter with the bargraph.

References:

Linear Data Book — National Semiconductors.
In-Line RF Wattmeter — *ARRL Antenna Book.*

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QSP

GEOSYNCHRONOUS STUDY PLAN

The dream of an easily accessible amateur satellite communications system apparently has taken a giant step forward. In a concept for the next generation of satellites, AMSAT sees intercontinental QSOs via hand-held transceivers, high-speed packet trunks and even digital ATV by the decade's end.

AMSAT Engineering Vice-President, Jan King W3GEY, has just completed a "Phase 4 Technical Study Plan" by which AMSAT hopes to determine the viability for a pair of geosynchronous AMSAT satellites.

According to Jan, the main thrust of Phase 4 should be public service. Only in this way, he says, can the program work. Phase 4 needs support of a much broader coalition of amateurs than has ever previously thought of itself as satellite communicators. And, significantly, amateurs need to promptly justify their use of (especially) the UHF spectrum; as a resource of incalculable worth!.

To garner support, the Phase 4 Study Plan proposes a multi-transponder package using the two-metre, 70 cm, 24 cm and 13 cm bands. Features would include linking selected repeater teleports through the satellite for dial- up inter-city or intercontinental communications between stationary or mobile platforms . . . even hand-held transceivers; a dedicated high-speed packet transponder for linking terrestrial regional networks into a semi- global network; a linear transponder for SSB and CW; a special facility for ATV using digitised video and, for the UHF experimenters, a microwave beacon experiment. "Receive-Only" teleports or gateway repeaters by the thousands could be linked to receive bulletins upon receipt of a special alert code transmitted via satellite.

The network thus established would comprise one of the most robust networks anywhere and would be available to support emergency operations. Simple one- metre dishes aimed at the satellite with inexpensive integrated LNA/mixers at the feed would suffice to capture the 13 cm downlink.

While the traditional linear transponder-type access will continue in the form of a Mode JL transponder, the emphasis of Phase 4 clearly will be on ease of access, convenience, predictability and reliability and availability. The traditional tracking and predicting access will be gone as one will merely point one's antennas at a given spot in the sky . . . and "weld" them in place!

ATVers, microwave experimenters, repeater organisations and repeater consortia interested in a risk-sharing partnership with AMSAT are sought. Whilst Phase 4 is a long-term program, early indicators of interest and helpful suggestions are most welcome. Write to AMSAT, Phase 4 Program Manager, PO Box 27, Washington, DC, 20044.

—Abridged from *The ARRL Letter* September 29, 1986.

ADVICE

Anyone in need of circuit details, alignment notes, or technical advice in regard to the STC MTR 151 VHF mobile transceivers, recently released by the WIA Victorian Division, may contact VK3QQ, QTHR.

May I remind all amateurs that these VHF transceivers require no modifications to get them on to the two-metre amateur band. Alignment is quite straight forward and a good unit will produce at least 25 watts with a receiver sensitivity of 0.3 uV for 12 dB SINAD.

VIDEO REVOLUTION

○ Japanese companies involved in the home video market are set to bring out a range of new equipment, according to reports from the 25th Japan Electronics Show, in Tokyo.

Sony has launched a new compact video camera using the eight millimetre standard, and JVC has unveiled the world's smallest and lightest video camera using the half-inch VHS format. The Sony unit weighs 1.7 kg with batteries and cassette, but also features a self-focus lens and can play two-hour cassettes.

The JVC model is lighter, more compact and cheaper but only has a one-hour cassette.

—Contributed by Jim Linton VK3PC

THE GLICHER PADDLE

Gil Griffith VK3CGG
7 Church Street, Bright, Vic. 3741

If you know anything about CW you will probably have heard of the Bencher Paddle which is said to be the "Rolls Royce" of paddles.

No one would dream of building a modern HF transceiver at home these days, me included, but a good paddle can be just as useful, and when I first saw the *Bencher Paddle* I naturally wanted to own one but it was well out of my price bracket! And, as my junk-box runs to steel sections, nuts and bolts, rather than transistors and resistors, etc, I thought I could home-brew a facsimile. ***So could you!***

It is amazing just how many amateurs have built the EA-78 keyer, which was sold in kit form, so if you can locate one of these, all you need is a good paddle and you are in business. A paddle is really only a double-pole switch so, do not forget that you will need the electronic keyer (or the one from your rig if it has one), to go with the paddle.

If you have read thus far and you have no interest in CW, it would be worth noting that, if you learn to use a paddle and keyer, you will find that your fingers will send good CW of their own accord, you will not have to think about it and you will not get tired. Let's face it, you don't have to think about how to work your voice, do you? Well, your fingers will simply be an extension of your voice. It is a whole new language!

Back to the task . . .

An hour or so rummaging in various places located the basic ingredients:

1 a solid steel plate for the base, approximately 120 x 75 x 12 mm, but it can be any convenient size provided it is heavy
2 one piece of brass-bearing stock approximately 40 mm OD and 25 mm ID, however, any piece of pipe would suffice as this is for the frames
3 two teaspoons with attractive engraved handles, for the handles of the keyer
4 four assorted gold nuggets from the Ovens River (not easy to locate but they provided an interesting summer — fossicking). Why settle for silver contacts?
5 scraps of Perspex, courtesy of the local chemist
6 about 75 mm of 12 mm copper bar, but could be almost anything for the fixed contact mounts
7 four small silver plated brass pins approximately 1.8 mm diameter by 10 mm long. These are for the hinge points, but slightly heavier ones would be better
8 16 assorted 3 and 4 mm metric screws and nuts
9 one spring, tension, about 70 mm long with weight to your requirements
10 rubber feet, wire and a 6.5 mm stereo plug.

TOOLS REQUIRED

You will need a drill, taps — 3 and 4 mm metric to suit the screws, a hacksaw, emery paper, brass polish, hammer, screwdriver, and a grinder is possible.

It is possible to make the frames by hand but I thought the lathe needed oiling so I used it to turn the three identical frames — one spare, one to cut in half for the hinges, and one as a main frame.

My lathe is large and has a 16 inch (400 mm) swing and 60 inch (1.5m) bed, with a 12 inch (300 mm) four jaw chuck, so it is not ideal for this type of work!

METHOD

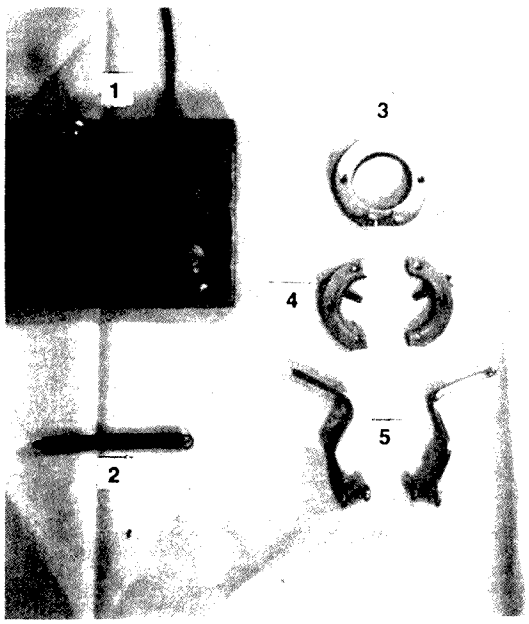
The main frame — a flat was ground on one side (which became the bottom) and two holes were drilled and tapped to take 4 mm screws. I used 10 mm spacing which turned out to be a mistake so 15 mm spacing would be better. Two holes were drilled in the base to mount the frame slightly forward of centre. Here 10 mm spacing was used on the four hinge pins (this was the mistake as they interfered with the mounting screws) the four holes must be drilled to the same depth so that the pins all protrude about 6 mm above the front face of the frame. Two more holes were tapped into the sides of the frames to take the stop-adjusting screws.

The hinges — the second frame was cut in half and ground so that there was a gap of 3 mm when they were laid on top of the frame, a little filing was also required at the bottom so that they don't touch the base. (Remember, you ground the frame off to mount it!). Four holes were drilled, all to the same depth, to mate with the hinge pins, using a 3 mm bit.

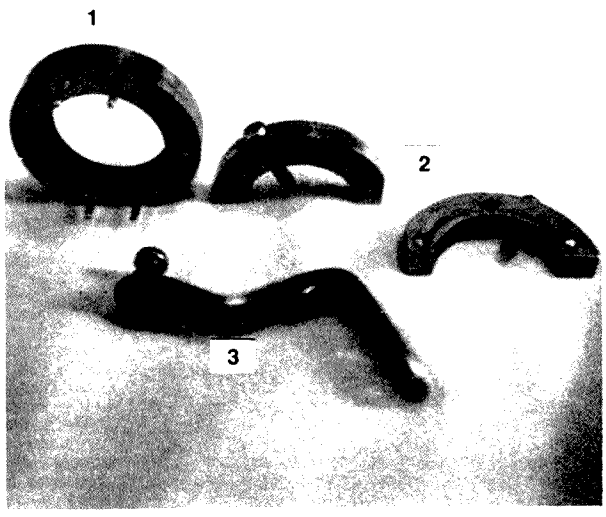
Lever mounting holes of 4 mm were drilled and tapped in the sides to mate with the stop adjusting holes in the frame. Two 3 mm holes are then drilled and tapped slightly above these, pointing to the centre (inwards and downwards) to accommodate the screws which hold the spring.

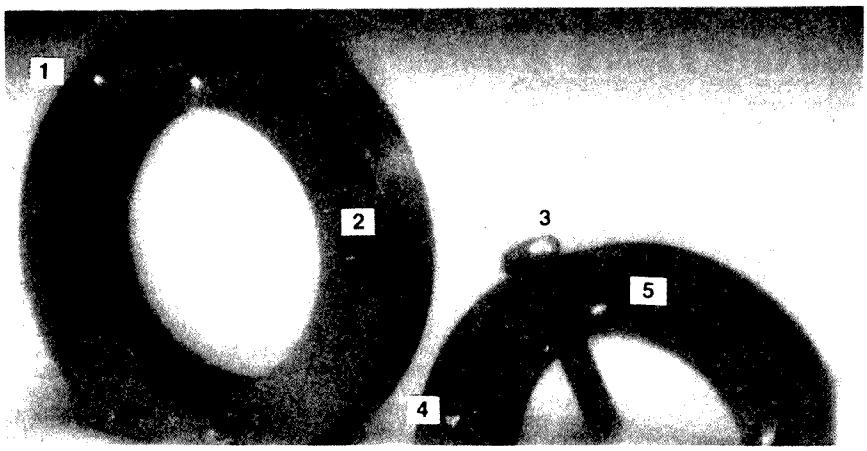
The levers — these are subject to a fair amount of abuse during operation so I used teaspoon handles made of stainless steel which were fairly difficult to bend. The shape that is needed depends on the placement of the frame, hinges and the fixed contact mounts so the bending was done bit-by bit in a vice. Two holes were drilled on the narrow ends of each to take the Perspex handles, one in the centre to mount it and one on the wider-end to take a

Basic Ingredients.
1. Base; 2. Spring; 3. Frame; 4. Hinges; 5. Levers; 6. Screws; 7. Handles.



1. Main Frame. 2. Hinges. 3. Lever.





1. Hinge Pins; 2. Stop Screw Hole. 3. Lever Mounting Screw Hole. 4. Hinge Pin Hole. 5. Spring Mount Screw.

contact screw, although a screw is not really necessary.

The base — having already drilled the holes to mount the frame, two large holes of about 12 mm were drilled for the fixed contact mounts and one in the centre at the back to take the spring mount, which I tapped for 7/16 Whitworth and used a bolt with the head cut off for the mount. I turned the bolt in a drill and filed it to shape to take the spring then polished it with emery and brass polish whilst still in the drill.

The fixed contact mounts were turned down to about 10 mm at one end and pressed into plastic sleeves to insulate them from the base. These were then pressed into the base with such force that no glue was required. They are also drilled and tapped to take the contact adjusting screws, which have to be at the right angle and height to meet with the moving contacts on the levers. They were tapped at the bottom to take screws for connecting the wires to the iambic keyer.

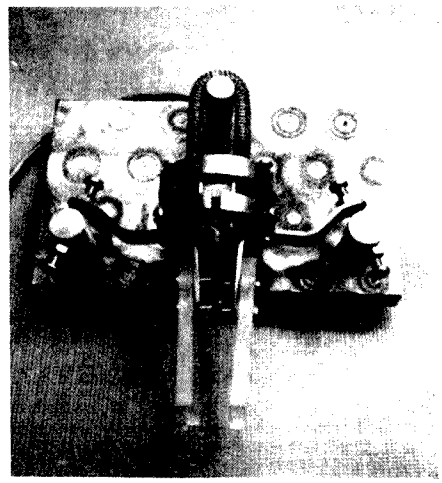
The handles — simply cut out and sand the two together to your desired shape. Two holes were drilled in each to mount them to the levers.

The contacts — I drilled a 1/16th inch (1.5 mm) hole in the end of each screw and very carefully hammered a small gold nugget into the hole, shaping it with the hammer and then polishing it with brass polish.

At this stage I assembled the whole thing to see if it would work and to adjust the spacings, etc. The really hard part was yet to come with the polishing!

I used fine emery on the frames to take out the tooling marks then, with a couple of layers of cloth on the bench, soaked in brass polish, then lots of rubbing to get a mirror shine. Round items such as screws were mounted in a drill chuck and polished.

The base-plate was ground to a smooth finish on the edge of a cut-off wheel then jewel



polished with a wire brush in the drill. An hour extra polishing would have improved the looks here.

For a couple of finishing touches I made a box out of Perspex to keep off the dust and a name plate using a piece of 25 x 6 mm aluminium flat, which I had engraved and polished with brass polish so that it looks like silver. All the scratches can be removed from Perspex by using brass polish too.

The total time was about 18 hours but the cost was only $2.50 for the engraving, so I think it was a worthwhile project especially as it works as well as a *Bencher*, with even more adjustments to suit any individual taste.

I mounted the base on four rubber feet and as it is heavier than a *Bencher* (which has only three feet), it does not hop around on the bench when I get excited.

I am more than pleased with the results and if you "have a go," you will be too. Then call me on air and let me have a listen!

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QSP

JA PACKET REPORT

Following is an extract of a report by Kenji Rikitake JJ1BDX from *Gateway* the *ARRL Packet-Radio Newsletter*, September 5, 1986.

From August 22 to 24, a "Ham-Fair' was held in Tokyo where many companies and radio clubs demonstrated packet radio with PCs. Packet Radio User's Group (PRUG) of whom Kenji is the Public Relations Officer, was represented.

PRUG demonstrated an original electronic-mailing system written in Modula-2 language by JN1OLJ. Also, a simple written-in-BASIC bulletin-board system was demonstrated. The program, written for an IBM PC by Joe Speroni 7J1AAA/AH0A and modified for PC-9801 by Kenji, has a 'language-selection' system and the user can choose the character-code-set for system messages (some Japanese amateurs can read Kana (Japanese phonetic scripts) and Kanji (Chinese ideograms).

QSP

SCHOOL DATA NETWORK ON HF RADIO

Some years ago the Education Department of Victoria initiated a scheme to install an HF SSB radio system to cover some 44 of their schools located in various rural and remote areas of the State.

The scheme was instigated to ensure that remotely located students would not be disadvantaged through the lack of personal contact with their tutors which can inevitably occur when subjects are conducted purely by correspondence.

Following the successful introduction of this radio network, the Correspondence School decided a further improvement in student services could be gained by introducing computer networking to these same remote schools.

The network would be used both for tuition in the computer subjects as well as a medium via which students could speedily return their work for correction to the Correspondence School in Melbourne. Apple 11C and Apple 11E computers were used throughout.

Although highly successful, the computer network made use of the Telecom public telephone system as its communication medium. All calls to schools in the network were STD and sometimes lasted for long durations. Inevitably overall operating costs became prohibitively high.

An alternative to using the high cost telephone system was to study the possibility of using their existing high frequency radio network as the data communication medium. However, it was obvious that signal fading, high noise levels and distortion may cause unacceptably high error rates in the data to be transferred.

A solution to this problem was an intelligent radio data modem manufactured by GFS Electronics in Mitcham, Victoria.

The CPU-100 radio modem operates as a master slave system using a specially developed block exchange compelled sequence protocol (BECSP) to provide error detection and correction.

Trials with the radio modems commenced in late 1985 between the Correspondence School's Mount Waverley radio centre and a number of north- western Victorian schools. The unit was able to handle a range of varying radio conditions and still provide error free data communication.

The radio data system, using Codan transceivers and Apple computers, has introduced a previously unavailable facility to the network, with negligible operating costs compared to networking through Telecom's dial-up network.

—From *Electronics News*, August 1986

CLAMP-ON CHOKE FOR RFI SUPPRESSION

Novatech Controls has announced a new component from EMC Datacare, the D910 Series clip on radio frequency choke, for RFI suppression. An introductory D918 kit of eight choke cores and associated hardware is available complete with application notes that will help the user to install them successfully.

Most RFI problems arise from cables acting as aerials. Usually unwanted signals are common mode, that is they can be visualised as travelling along the outside of the cable and can be reduced without affecting the normal function of the circuit.

D910 series common-mode chokes can be installed on cables of up to 10 mm diameter without the removal of any connectors, it is not essential to have any access to the ends of the cable.

For large or rigid cables several pairs of cores are required. For smaller flexible cables multi-turn chokes may be fashioned from the same components to provide substantial impedance to interference currents at a modest price.

—From *Electronics News*, August 1986

SMIS: Improving Productivity and Service

WHAT IS SMIS?

SMIS is the acronym for the Spectrum Management and Information System being introduced by the Department of Communications (DOC).

Effective spectrum management depends on reliable and up-to-date information on who is using the radio frequency spectrum and under what conditions; ie actual frequency, power level, method of modulation, characteristic of the antenna (aerial) etc. SMIS provides a central database storing this information with direct and immediate on-line access to every DOC office.

WHY WAS SMIS CREATED?

Usage of the radio frequency spectrum for communications is growing rapidly — it is doubling every six or seven years. The handling of information on use of the spectrum by using manual and various batch-mode ADP systems is becoming increasingly difficult and labour intensive. SMIS is a means of improving labour productivity while simultaneously improving the standard of service provided to spectrum users.

WHAT WILL SMIS DO?

SMIS is being implemented in stages. The first stage, which is now being introduced, creates a single unified and centralised database to replace a variety of manual record-keeping systems and small computer system databases. Each of these has to be separately maintained — often with duplicated data in each system. Simultaneously, on-line computer access via SMIS enables staff to extract information for their immediate day-to-day work. Stage one activities have concentrated principally on the clerical functions of licensing radio communications systems and handling the money aspects of departmental operations. At the same time, limited access is provided to technical staff to provide information to assist with interference and other necessary investigations. The immediacy of this access, even in the limited form provided in Stage one, will improve the productivity of these aspects of departmental operations.

The logistics of the operation in Australia are that there are approaching 600 000 licenses on issue to private users — this excludes government users like Defence, Aviation, Telecom, OTC, etc. The total revenue generated from licence fees and other spectrum use charges is some $30 million annually.

A useful side benefit of SMIS is the elimination of paper records, which will lead to operating economies in departmental file registries. SMIS is, in fact, a small start in the direction of a paperless office.

WHAT DOES SMIS COMPRISE?

The SMIS installation includes a central computer in Canberra connected to 91 terminals located in Canberra, and the six State and 20 Divisional Offices of the Department. The communications network providing the interconnection between the terminals and the central computer is leased from Telecom.

In each State Office of DOC there are three printers located in the administrative, licensing and frequency assigning areas. The licensing printer is loaded with pre-printed licensing stationery and is used solely for reproducing licenses.

In each District Office there are two printers, one being dedicated normally to the issue of licenses.

HOW DOES SMIS WORK?

The heart of SMIS is in the central computer and the unified database in Canberra. The terminals

DEPARTMENT OF COMMUNICATIONS

are functionally simple devices which interrogate and receive information from the central installation in Canberra, but do not participate in the processing of the information. The communication network is therefore vital to the operation.

By use of the terminal an operator can:

- prepare a bank list for presentation to the bank when making deposits
- maintain other essential finance records
- print-out licenses for despatch to customers or as a duplicate for administrative purposes
- alter licence records when requested (change of address, etc)
- authorise the annual renewal of licenses — the printing and despatch of renewed licenses is centralised in Canberra
- make inquiries concerning the status or details of any licence.

SMIS is a computer-assisted rather than an automated system and its functioning is entirely under the control of the operator. It does, however, provide a very substantial degree of operator assistance. Typical examples are:

- call signs for radio communications transmitters or stations can be allocated automatically from a central list unless overridden by the operator
- a customer search facility is provided to enable incoming requests to be identified as belonging to an existing customer — this simplifies processing and minimises redundant records and transactions
- the operator can request calculation of licence fees for specified periods (the standard fee is for one year) or alternately request a common expiry date for new and existing licenses — these calculations enable overall processing of licence applications to be streamlined, minimising paperwork and actions involved in dealing with customers with multiple licenses.

SMIS operates on a table-driven principle. Stored in the central database are sets of tables detailing standardised information associated with various classes of licence. When the operator requests the issue of a particular licence, the computer processor automatically derives all the standard information that necessarily must appear on that type of licence. The operator then adds the specific information (licence name, address, frequency (if required) and any conditions that might apply to the particular licence) from a standard list held in another table in the central computer. The computer assembles all this information and prints out a licence.

The computer does not hold the information on a licence in this form. Each time the licence is viewed or reprinted the computer must look at the licence record and reassemble the information from the various tables and files. This is done to reduce the data storage capacity required in the on-line system.

SMIS is not just a licensing system. It also provides facilities to improve financial and management control functions.

Particular features in this area are:

- an inbuilt control that prevents the issue or re-issue of a licence unless sufficient money has been registered for the transaction
- licence issue is also prevented unless the processing officer has the appropriate delegation to issue the particular class of licence
- various reports are derived from the operating system for statistical, management and audit purposes.

WHO PAYS FOR SMIS?

The $2 million investment and $300 000 annual charges will be paid for by improvements in productivity arising from the introduction of SMIS. Establishment costs will be recovered in four years.

It may not be generally realised that Radio Frequency Management is a self-financing operation with the costs of administration being recovered from licence fees — there is, in fact, a surplus which becomes a royalty on the use of the spectrum which is paid to the Government.

Ultimately the introduction of SMIS will benefit the licensees in terms of lower licence fees than would otherwise be imposed if less productive and efficient manual methods were to be retained.

WHAT CAN SMIS DO IN THE FUTURE?

The availability of on-line access to a centralised database will open the door to further productivity improvements and to achievement of goals not currently possible.

The DOC already has firm plans (designated SMIS Stage two) to:

- improve the quality and speed of response in the technical aspects of determining interference-free frequencies for radio communications services — currently this is a major source of delay in responding to applications for licenses; SMIS Stage one will assist in reducing delays while SMIS Stage two will enable a 24-hour turn-around to be achieved in many cases
- introduce a system of label registration for mobile radio communications transmitters — this is necessary to bring unlicensed operation of mobiles under better control. In some services estimates indicate that 50 percent or more of operating units are unlicensed. This places an unfair financial burden on licensed users. Unlicensed operation also leads to a lack of discipline in radio communications operations which prejudices efficient use of the spectrum and interferes with the legitimate communications of licensed users
- make extensive use of the data communication network for internal communications within the DOC; this will reduce existing telephone and telex costs
- further development of the SMIS system to improve the efficiency of money handling and file-handling activities

Other projects listed for future development are:

- provision of direct access to the database by field officers investigating interference complaints or conducting other necessary investigations
- direct inter-communication between the SMIS database and ADP systems of major users of the spectrum; eg Telecom. This will lead to further substantial operating economies.

Pirie radio club congratulates city

The Recorder, Friday, September 5, 1986

About 20 members and guests of the Mid North Amateur Radio Club and Port Pirie's Deputy Mayor, Mr C. Robertson, formed part of a link-up with the rest of the State to con... late the Mar... Council on ... centenary on Tu...

Club secretary, ... Phillis, said the ... joined Port Linco... Whyalla, Port Augusta, Naracoorte, Mount Gambier and Murray Bridge clubs in forming the network which was used to transmit messages of congratulations to Marion from the various councils' mayors and deputy mayors.

The Port Pirie club made its broadcast from its regular meeting rooms at the Port Pirie aerodrome late on Tuesday afternoon.

The idea came from the South Australian branch of the Wireless Institute of Australia which decided to operate a special event station with the theme "Service to the community by amateur radio" to mark the council's centenary.

Marion council is celebrating "A century of service" as a Jubilee 150 event.

The District Council of Marion was proclaimed on September 2, 1886. It has grown to a population of over 70,300 covering the south-western Adelaide suburban area and has experienced extensive industrial development on the southern boundary.

As part of the South Australian Jubilee 150 Marion is sharing exchanges of historical material and personal visits with its J150 twin town, El Paso in Texas.

The Jubilee radio station VI5JSA was used to receive the messages of congratulations from Port Pirie and the other

Victor's Mayor goes on the air...

Victor Harbour Times, Friday, September 5, 1986

... Mayor, Mr Eric ... the district of ... by amateur ...

Radio amateurs

The Murray Pioneer, Tuesday, September 2, 1986

Renmark will be involved in an event conducted by the SA Radio Amateurs, on September 2, to celebrate the centenary of the District of Marion.

... radio station will ... from the Marion ... from August 26 to ... ber 5, and exchange greetings with various towns throughout the State.

The radio transmitted greeting will be received in Renmark in the studio of Mr J. Ruston.

The special event station has been called the Wireless Institute of Australia (SA Division) Jubilee 150 Station, VI5JSA.

Mayor greets Jubilee

State radio groups join in

Port Lincoln Times, Tuesday, September 9, 1986

• Port Lincoln's Mayor Tom Secker, gives a greeting on the State radio round-up conducted by amateur radio groups as part of Marion City Council centenary celebrations. Lower Eyre Peninsula Radio Club operator Jack Kleinrahm tuned Mr Secker into the link-up and president Carol McKenzie presented him with a special memento certificate. The Jubilee 150 event ...

Amateur radio station to run August 25 until September 5

Special 'call sign' for council

Guardian Messenger, Wednesday, August 27, 1986

MARION Council will operate a special event amateur radio station (call sign VK5JSA) from Tuesday to Friday, August 25 to September 5, as part of its centenary celebrations.

The council will be 100 on Tuesday, September 2, and the radio station is just one of many special events planned to mark the event.

A display of old communications equipment, literature, documents and QSLs (ham radio call cards) will be set up in Marion Library, Duncan Avenue, Park Holme, and Sturt Road Library, corner of Morphett and Sturt roads, Marion.

The station will operate in normal library hours from the library at Park Holme extending to 9.30 p.m. on Friday, August 29, and Wednesday, September 3.

Before council's centenary meeting on Tuesday, September 2, local mayors will radio congratulatory messages to Marion Mayor Kevin Hodgson.

On the same day radio operators hope to contact Marion's twin city El Paso, Texas, and speak to Mayor Jonathon Rodgers.

After the council meeting, a centenary dinner will be held at Marion Hotel where the guest speaker will be SA Governor Sir Donald Dunstan.

To involve all residents in the celebrations a centenary ball will be held at Westfield Marion on Saturday, September 20.

Admission to the dinner, entertainment and refreshments will be $22, and tickets are available at the council office.

Marion celebrates its centenary

Sou-Wester, Tuesday, August 19, 1986

The Council o... the midst of accelerating development, despite the more general national forecasts of 'doom and gloom'.

Within Marion's immediate development plans are the office tower at Westfield Shoppingtown (which will provide six floors of office space) and an extension of the Quarterdeck Restaurant.

Plans are also under way for the Edwardstown district centre, which will be a combination of supermarket, specialty shops and offices. This will be located adjacent Target on South Road.

Land formerly zoned for industry has been opened up at Clovelly Park, and this will provide about 140 dwellings.

'Division of land' applications have been lodged for most of the ... re land within ... Marion

Mining, brickm... and farming were in... tant facets of its ... foundation, but it ... best-known for its ... yards and almond g... This led to Marion ... called the 'garde... Adelaide'.

Marion ... rem... mainly a rural com... ty until the 1950s, ... the area became mo... dustrialised, highl... by the purchase of ... tates of land by Ch... Australia.

It now has a p... tion of more than 7... making it the fifth ... in the Ad...

... statistical division, covering an area of 54 square kilometres.

Mayors speak

Naracoorte Herald, September 28, 1986

THE centenary of Marion council w... acknowledged in N... coorte next week.

Mayor of the airwaves

The mayor, Mrs Joy Baluch, took to the airwaves last week to congratulate the Mayor of Marion, Mr Kevin Hodgson on his council's 100th year.

Ten may... from across the State took part i... ...dio link up which was organise... Wireless Institute of Australia ... ...ion) as Jubilee event on Tu...

...rs Baluch tuned into ... on an amateur radio ... the president of the ... mateur Radio Club.

... congratulated Mr ... lf of the residents ... nd spoke of her ... n district coun...

... father, Mr ... ...ey, was dis... council from ... 's relatives still reside in Marion.

"There are times when I misbehave my councillors say I picked up my bad habits from my ancestors in Marion," she told Mr Hodgson.

Mr Hodgson thanked Mrs Baluch for her good wishes and replied: "If you have any bad manners you couldn't have got them from Marion."

... District Council of Marion ...med on September 2, 1886 ... population of more than 70,... the South-Western Adela... area.

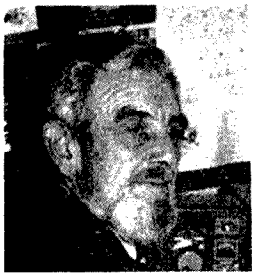
Mayors from Port Lincoln, Whyalla, Port Augusta, Port Pirie, Renmark, Murray Bridge, Victor Harbor, Naracoorte, Mount Gambier and Adelaide took part in the broadcast.

The Member for ...ard, Mrs June Appleby, ...ke on behalf of the Premier, Mr Bannon, to close the broadcast.

Transcontinental, Port Augusta, September 10, 1986

South Australian regional newspapers provided strong support for the J150/Marion Centenary Special Event Station. The coverage brought amateur radio to the notice of over 280 000 readers.

TV TOO — Viewers saw operators link country centres during news telecasts on Channel 5A Loxton, Channel 4 Port Pirie, Channel 6 Eyre Peninsula and Channel 5 Port Lincoln.



VI5JSA CELEBRATES MARION CENTENARY

'Serving the Community Through Amateur Radio'

John Hampel VI5SJ
Marion Centenary J150 Amateur Radio Co-ordinator
16 Mitchell Street, Glengowrie, SA. 5044

This development of a simple idea into a full scale special event station focuses on the potential which may exist for radio groups to draw attention to the role of the Amateur Radio Service in their local community.

In December 1985, a notice in the Marion Library invited groups to utilise a display area in the foyer to attract local interest in crafts or hobbies. Ideally, there would be links with historical material, periodicals or books on the particular theme as a Jubilee 150 event during 1986.

A glass case offered secure storage for old radio equipment, magazines and documents. The adjacent area suggested an ideal site to set up a special event station and QSL display.

An initial contact with Miss Margaret Campbell, Special Activities Organiser at the Library, met with enthusiastic response. A suggestion that further areas within the library-proper be used for demonstrating various facets of amateur radio was also approved.

A program for the WIA (SA) Jubilee 150 Special Event Station was already well under way when the project was endorsed by the SA Divisional Council at the end of February 1986, so the operation would need to be in the latter half of the year.

Further meetings with Miss Campbell set the date for a period which would include September 2, the date of Marion Council's Centenary. By the time we both met with Assistant Town Clerk, Jeff Tate, to finalise arrangements, the operation was scheduled for August 26, to September 5, adopting the theme *Service to the Community Through Amateur Radio.*

A suggestion that the special event station should link up with other centres throughout the State so that mayors could send their messages of congratulations to Mayor Kevin Hodgson, was quickly approved by His Worship. Various clubs or individual stations were then contacted and accepted the role of providing communications for this event.

When the much revised project was finally passed by a Marion Council meeting in June, the JSA Station had already spread the message of the State's Birthday in 1986 from Cape Willoughby Lighthouse on Kangaroo Island, across the Nullabor on the Indian-Pacific and from various South Australian centres on board the Trade Train. Now amateur radio would add the Council Centenary which had been included as a Jubilee 150 event. Council's approval was also secured to issue a Marion Centenary Award to mark the celebrations.

Photograph courtesy Jack Peatfield VI5AF

"... through these facilities provided by the WIA (SA), it has been an exciting 20 minutes speaking to various mayors throughout South Australia as we celebrate the Centenary of the District of Marion. On behalf of the Council and the people of Marion, I thank all those radio operators who have made this possible." His Worship the Mayor of Marion, Kevin Hodgson.

The rather small project envisaged at the outset had grown to a considerable operation. Initial support was slow to the point where a scaling-down to a simpler operation was considered even in late July. However, with almost uncanny timing, responses started to come in and a full roster of operators and installation personnel could be completed before this drastic move was necessary. The success of the project was assured by all those who are acknowledged through the photographs of the station or in references later.

Further concern was a lack of response from amateur radio clubs in Texas. During 1986, Jubilee 150 was linking South Australian cities and towns with "twin-towns" in that state, also celebrating its 150th birthday. Marion's sister city was El Paso, where Mayor Hodgson had visited over Easter and had met with Mayor Jonathan Rogers. It was planned to establish a 14 MHz contact on September 2, to exchange greetings.

Fortunately the J150 amateur radio co-ordinator, Graham Horlin-Smith VI5AQZ, had now arrived in the US on a trip which extended the J150 radio operation, as he signed VI5JSA/W5 and /W6. During a contact with Graham from Los Angeles, he confirmed that mail had gone astray but reassured us that arrangements had been made with Jack KB5QV, past-President of the El Paso Club. Earlier, ideas were revived to secure the use of a four-element beam for 14 MHz contacts.

Meanwhile, responses to Sunday morning VI5WI Broadcasts started to come in, offering old radio equipment. As some of the items were from amateurs who would be away on holidays in August, a mini-museum developed at the home QTH as the items were dusted-off and prepared for display.

Cataloguing and arranging the various pieces was taken over by Jack Peatfield VI5AF and Peter Thomas VI5ZPT. Peter has a unique collection of vintage equipment. He is a member of the Historical Radio Society of Australia and corresponds with enthusiasts in other countries. This ensures that his restorations are carried out with exacting accuracy. Many of his pieces were included in the display.

On Saturday, August 23, Peter Maddern VI5PRM, marshalled his antenna crew — Alan Roocroft VI5ZN, David Doye VI5KDD, Gordon Welsh VI5KGS, Don McDonald VI5ADD, David Oates VI5ADO, Rod Durbridge of South Coast ARC and Lindsay Collins VI5GZ. Erection of WIA trapped dipoles and a Hustler trapped vertical from the Adelaide Hills ARS started smoothly, but a sudden weather change soon slowed things down.

Rowland Bruce VI5OU, arrived triumphant that he had found the 204BA beam which had eluded all until now. Peter reworked the antenna location so that the 'monster' could be used. The crew were not so enthusiastic as the rain became heavier! Negotiating the beam into position on the slippery roof was a tricky exercise. By now, the Library had fortunately closed to the public so that borrowers did not have to fathom the strange language coming from the rooftop — they were certainly not technical expressions!

Rowland joined John Mount VI5EV, and Grant Willis VI5ZWI, and the ATV VHF antenna installation proceeded more smoothly on the other side of the building. By 2 pm, everyone had abandoned the rooftop. The bedraggled group sipped coffee and decided to come back the next day just as the rain ceased. Within 10-minutes of everyone arriving back at their rooftop posts, Murphy exceeded himself. The rain returned with a vengeance, this time with wind gusts which made securing guy lines an exciting experience. The crew stuck to it and finalised with all antenna in place, coaxial cable through circuitous paths to the foyer by 4 pm. Originally, it was estimated this would be a two-hour job!

VI5JSA operated from the Marion Library at the Council Administration Centre, eight kilometres south-west of Adelaide.

The area, proclaimed a District Council on September 2, 1886 flourished as a rural community supported by market gardens, fruit and almond orchards and extensive vineyards. The vegetable growing gave way to housing as the Town Council was proclaimed in 1944.

The suburban spread overtook the orchards and vines as the area was proclaimed a City in 1953.

Today, the housing development is flanked by vigorous industrial activity on the southern boundary of the total area of 5430 hectares, as the Council celebrates a 'Century of Service' to a community of 70 550.

MAYOR PAYS TRIBUTE TO AMATEUR RADIO

Photograph courtesy Paul Richardson VI5BVR

Speaking to Mayor Hodgson at Marion, His Worship the Mayor of Naracoorte, Neil Smith commented; "... amateur radio has, in so many ways in the past, been of inestimable service and assistance in making contact across the airwaves when other, more sophisticated means have been unsuccessful. So it is fitting that on this historic occasion, amateur radio, through the J150 station VI5JSA, should make it possible for me and other mayors to recognise your achievement of 100 years of Service to the Community."

The antenna compliment was trapped dipoles for 3.5, 7 and 14 MHz, at about six metres above the roof with the 204BA beam for 14 MHz about another four metres above them. The antenna farm was topped by the all band trapped vertical. For ATV there was a long boom Yagi, a stacked collinear panel, plus a J-pole for 144 MHz liaison.

When we arrived at the Library on Monday morning to complete the equipment installation and various displays, the rooftop attracted much attention. The 204BA looked impressive locked-off on its beam path to El Paso, Texas, but we were less than impressed as it flapped up and down in the high wind. There would be many times that day when one of the group would slip outside to check that all was well up-top.

When the station opened on Tuesday, August 26, at 0001 UTC, the public were greeted by an extensive display. The entrance foyer had been transformed into two complete HF operating positions each side of the display case. Hundreds of QSL cards formed a checker board pattern on the red wall beyond. Just inside the library entrance a RTTY station on 7 and 14 MHz demonstrated various teleprinters, tape perforators and readers.

The attractive WIA display dominated the centre of the Library. This stand received a constant stream of inquiries, many from would-be amateurs. Brochures on the hobby, copies of *Amateur Radio,* literature on examination procedures and Amateur Television were in constant demand.

Other displays which attracted interest were QSL cards from the Royal Naval Amateur Radio Society, while another told the story of ALARA with QSL cards and photos. Both of these were prepared by Bernie Edwards VI5ABG.

Peter Koen, Secretary of the 2nd Adelaide Scout Group ARC, VI5BPA, contributed a multi-panel display of JOTA stations and camps from recent years which drew attention of younger visitors to the Library.

The amateur television was always popular when stations transmitted from their metropolitan and country stations via the Adelaide ATV repeater at O'Halloran Hill. At other times, a short video tape, prepared by John Ingham VI5KG, played continuously on the monitor — *Amateur Radio the National Resource of Every Nation.* This tape initiated further inquiries about our hobby. (It is an excellent public relations presentation which is commended to any other club groups who stage a public demonstration to promote amateur radio).

Thursday, August 29, was a worrying day for the operators on duty. Adelaide experienced wind gusts up to 114 km/h. Two guys broke away allowing the 204BA to see-saw as its element tips touched the roof. It was also an experience we would not like to see repeated when the vertical assumed an almost horizontal position as it whipped back and forth — Lindsay VI5GZ left his CW post to attempt temporary repairs with equipment he luckily had in his van. At one point, he was close to being swept across the flat roof as the wind thrust both him and a ladder up against the masting.

Lindsay managed to prop up the main antenna support by forcing the ladder under the beam's boom, where it remained until the station was dismantled nine days later. He also reported that we had lost the trapped dipoles which were now scattered as pieces in various directions. As soon as the wind subsided, Don VI5ADD helped Lindsay rig an inverted Vee dipole from a convenient gum tree. This antenna proved to be a most useful radiator on 3.5 MHz in the following days.

Friday evening, August 29, was one of the extended hours operations and a busy time for all concerned. During the evening, seven different transmissions kept the VI5JSA call sign active on the 3.586 MHz J150 Net, CW on 7 MHz, HF RTTY on 14 MHz, VHF RTTY on 144 MHz, ATV liaison on VHF, a base station working the Adelaide repeater and various hand-helds working simplex on 144 MHz.

When the station closed at 9.30 pm, His Worship Mayor Kevin Hodgson, accorded the operators and helpers with their wives a Civic Reception at the adjacent Council Chambers. During the evening, the Mayor and Mrs Hodgson, had shown keen interest in the activities at the Library. They participated in some of the transmissions from VI5JSA and received congratulatory messages on phone and RTTY. A highlight was when the Mayor acknowledged wishes on ATV — the first time he had seen this mode in use. His only previous contact with our hobby had been when his son had participated in JOTA from the station of Bob VI5MM.

The Mayor thanked about 50 guests for their participation in the Special Event Station and spoke at length on the important role of amateur radio in every community. John VI5SJ responded on behalf of the group and Jenny Warrington VI5ANW, President of the SA Division, acknowledged the Mayor's thanks to the WIA.

Centenary Day, Tuesday, September 1, was the highlight of the operation. Conditions on 14 MHz, up until then, had been atrocious with very few DX contacts. However, right on 1.30 pm schedule, Jack KB5QV, called "El Paso, Texas calling Marion, South Australia." Adam N6JFG and Chuck VK6CF were also on 14.286 MHz to help with relays.

Initial disappointment came when Jack advised that Mayor Rogers could not be available for personal reasons. However, an interesting few minutes of exchanges between Mayor Hodgson and Adam followed when they found they had mutual friends in Los Angeles, whom Mayor Hodgson had visited on his recent US visit.

At 6 pm, VI5JSA called-in stations for the exchange of greetings from mayors of country centres. The conditions on 3.675 MHz were perfect for this history-making amateur radio broadcast. A tape recording, made by Bill Smith VI5ASW, of 25-minutes duration, has been copied for presentation to the various mayors who took part.

Intensive early planning, tight operating procedures and careful attention to every small detail by the network of country stations, who demonstrated the efficiency of our communications facility, brought high praise from all the mayors who were involved. Honorary Marion Awards were forwarded to the individuals or club stations who participated. Awards certificates were also presented to each of the mayors who spoke to VI5JSA Marion.

Over 8000 visitors and library borrowers saw and heard amateur radio serving the community by celebrating Marion's Centenary. The original concept of an all-embracing operation beyond the usual special event station contacts had been fulfilled. Inquiries from the visitors confirmed a better understanding of our hobby. Both young and old potential future amateurs have been noted at radio clubs and WIA meetings, seeking information on how to enroll in novice classes.

When Nick VK2VYS, just managed to make the last contact with 30 seconds to spare after a hectic drive to reach home and be eligible for a Marion Award, 923 QSOs were in the log after 10 days operation. Maria VI5BMT, took on the chore of sorting the special QSL cards which were sent to every station. She also kindly typed this article.

At the time of writing (mid-October), 130 Awards have been processed. Further applications will be accepted as QSL cards reach stations via the Bureau. Full details of the certificate appeared in the Awards Columns of *Amateur Radio* September page 40 and October page 50.

As over 90 amateurs contributed to the success of this project, it would be very easy to overlook some acknowledgments. As co-ordinator, may I express sincere thanks to all involved, even if you have been omitted. Your reward is in the satisfaction of promoting our hobby — in every sense 'Serving the Community Through Amateur Radio.'

TWO J150 EVENTS LINKED BY RADIO

A Jubilee 150 event during August was the re-enactment of horse transport of wool bales by a team of 11 Clydesdales — a sight which attracted large groups of sightseers as they progressed through each country centre.

Atop this spectacle for part of the journey, on Wednesday, August 27, near Tarlee, 80 km north of Adelaide, was Steve Mahoney VI5AIM, complete with hand-held.

Contact was made with VI5JSA Marion via the Adelaide 144 MHz repeater for an appropriate exchange of greetings.

Steve, who signed *Woolpack/Clydesdale Mobile* commented on the excellent conditions via the repeater and ". . .this zero ignition interference is terrific!"

Photograph courtesy Peter Koen

Two of the Young Ladies, Maria McLeod VI5BMT and Myrna Marnie VI5YW, who kept 7 MHz SSB active despite poor band conditions during daytime operation.

Photograph courtesy Peter Koen

Jenny Warrington VK5ANW, SA Divisional President, presents the WIA history cassette *Sounds of Amateur Radio* to Miss Blanche Landers, Chief Librarian of Marion City Library. A recording of the Mayoral exchanges transmissions will also be available for loan from the Library's Audio-Visual Section.

MAYORS SPEAK TO MARION VIA VI5JSA

Photograph courtesy Transcontinental

The Mayor of Port Augusta, Joy Baluch, spoke to Marion from the Port Augusta Amateur Radio Club, operated by the President, Bill Offler VI5BWO. Mrs Baluch told Mayor Hodgson the radio exchange was a further link with the area as her great-grandfather had been District Chairman of Marion Council in 1892.

Photograph courtesy Whyalla ARC

After speaking from club station, VI5BWR, Her Worship the Mayor of Whyalla, Mrs Aileen Eckblom, receives her Marion Award from John Thompson VI5BWB, Secretary of the Whyalla ARC.

Photograph courtesy Port Lincoln Times

Carol McKenzie VI5PWA, President of the Lower Eyre Peninsula RC, visited the Marion Station during the day, then flew back to present an award to His Worship the Mayor of Port Lincoln, Tom Secker, after speaking from VI5ALE.

Photograph courtesy Jack Lester VI5LR

Another South Australian Radio Pioneer who took part in the historical broadcasts was Jack Lester VI5LR, who presented His Worship the Mayor of Victor Harbour, Eric Ashby, with his award. Jack used his station at Inman Valley for the Mayoral congratulations.

Photograph courtesy Port Pirie Recorder

Some of the 20 members of the Mid-North ARC who welcomed Port Pirie's Deputy-Mayor, Charles Robertson, to the microphone at VI5PP. From left: Joe Burns VI5UJ, Treasurer Kevin Watts VI5PKG, Secretary Graham Phillis VI5AGP, Kingsley Francis VI5NFK, Leslie Stephens (President's wife), Harry Johnston VI5AAJ and President, Bill Stephens VI5AWS.

Photograph courtesy Doug Head VI5NDH

Jennifer Warrington VI5ANW, President of WIA (SA); "... on behalf of the Council and member of the South Australian Division of the Wireless Institute of Australia, radio amateurs congratulates the City of Marion...I now have pleasure in introducing Mrs June Appleby, MP, Member for Hayward..."

Photograph courtesy Doug Head VI5NDH

Mrs Appleby; "...on behalf of the Premier John Bannon, who is unable to be here personally, on behalf of our State, I must thank the Wireless Institute of Australia for making this historic broadcast possible over the Special Event Station, VI5JSA. By amateur radio, I convey congratulations to Marion achieving its Centenary — on behalf of the Premier, the Government and people of South Australia."

Photograph courtesy Murray Pioneer

His Worship the Mayor of Renmark, Lloyd Sims, conveys congratulations from the Riverland to the people of Marion, using the station of John Ruston VI5ARK.

Photograph courtesy Richard Bowyer VI5NRB

His Worship the Mayor of Murray Bridge, Ray Helps, at the microphone of the Lower Murray ARC, VI5ALM.

Photograph courtesy J Richardson

His Worship the Mayor of Naracoorte, Neil Smith, receives his Marion Award from Paul Richardson VI5BVR, who operated the Naracoorte ARC station, VI5ARN.

Photograph courtesy Trevor Niven VI5NC

His Worship the Mayor of Mount Gambier, Don McDonnell, speaks to Marion from VK5SAJ/5SR, the club station of the South-East RG.

PUBLICITY PAYS OFF

About 130 letters were sent to Clubs, Nets and WIA Broadcast Officers. This publicity was appreciated as many stations commented on hearing the news in their area.

For one station, Peter Sampson VK4MKT, of Middlemount, it meant the possibility of a family reunion by radio.

Peter's mother arrived at Marion a few minutes before 6.30 pm saying she had received a letter about VI5JSA and hoped she could speak to her son. Conditions were doubtful to VK4 at that time on 3.586 MHz, but right on 6.30 pm, there was VK4MKT, loud and clear!.

It was a warming experience for all who heard the happy exchanges of family news after a long parting. Luckily, Gordon Welsh VI5KGS was monitoring and made a tape recording which, it is felt sure, will be valued by the family.

Mayor Kevin Hodgson, later commented on the value of 'Serving the Community through Amateur Radio' in this way. He was pleased that it was the Marion station which made it all possible.

Photograph courtesy Peter Koen

Jennifer Warrington VI5ANW, President of the South Australian Division presents Marion Centenary Award Certificate No 1 to Mrs June Appleby MP, following her contact with VI5JSA through VI5WI.

An earlier plan to demonstrate cameras and a television transmitter in the Library was changed because of the complexity and hours involved in setting up for each session.

However, avid ATV enthusiast, John Mount VI5EV, rallied the SA ATV Group to transmit from home stations. Video greetings with caption cards of "Congratulation to Marion by Amateur TV' appeared on the screens at regular intervals.

John's dedication to this part of the station was admired by all who knew the hours of organising he devoted to making sure it would be a success. He was most ably assisted by Grant Willis VI5ZWI, so that there was always something for the public to see and prompt a steady flow of inquiries.

The following members of the SA ATV Group are thanked for their operating time, loan of equipment or preparing special tapes to transmit to an appreciative audience.

Jim VI5ZSA (Kadina), Bill VI5AWS (Port Pirie), and Ron VI5ZVA (Whyalla). These stations were cross-linked via the Mid-North Repeater.

John VI5KG; Bill VI5KTV; Rod VI5AWA; Dom VI5ZDG; Chas VI5ACF; Graham VI5ZGV; Trevor VI5ATW; Jamie VI5ZAA; George VI5GG; Lee VI5NK; Ben VI5ZBA; Brian VI5KBU; Greg VI5ZBD; Tony VI5ZTC; Mike VI5KMJ; Bob VI5ZAX; Dave VI5ADV and John VI5ZZ.

Photograph courtesy Peter Koen

South Australian Federal Councillor, Rowland Bruce VI5OU, with radio pioneer Gordon Ragless (ex-VK5GR), inspect the display of old equipment. Gordon recalled using many of the 1930s sets and components loaned for the exhibition. A happy coincidence was that, in the case, there was a 1936 *QST* which carried the VK/ZL Contest Results when Gordon was Contest Manager.

NOSTALGIA AT MARION

Some of the early equipment on display included a 1918 set used by the BEF in France during World War I (believed to be the oldest working set in Australia), a 1924 Crystal Set made by Green Bros, Norwood, SA, a restored 1927 three-valve English receiver and parts from the Spark Transmitter of XVT (Charlie Othen A5ON-VK5ON).

Early editions and anniversary issues of *Amateur Radio*, old *QST*s (including No 1, dated December 1915), and 1920s text books drew appreciative interest. Colin Heath VI5FX, loaned 1936 RSGB, BERU and ARRL Awards from the estate of his brother Alan (late-VK5ZX). From the same collection were most of the pre-1939 QSL cards with exotic prefixes which formed the backing for the display.

Commercial receivers included a Hammarlund HQ-120, National HRO, Hallicrafters SX28, Kingsley AR7 plus KS9er, Eddystone 640 and 770.

Word War II disposals equipment used by amateurs included BC348, B28 receivers; Type 3 Mark II, FS6, 108, No 11, No 19, and No 62 transmitter/receivers; BC221 by Bendix and Class C Wavemeters from AWA, together with numerous other test equipment units.

Fine examples of home-brew equipment and owner built components also were shown. From many of the younger visitors came the question: "What is a valve?"

Equipment was loaned by:

Brian VI5CA; John VI5BL; Colin VI5NCE; Peter VI5PRM; Bernie VI5ABG; Lionel VI5ACW; Bill VI5FR; Colin VI5FX; Marshall VI5FN; Gordon VI5KGS; Ron VI5ON; Peter VI5ZPT and John VI5SJ.

Photograph courtesy John Hampel VI5SJ

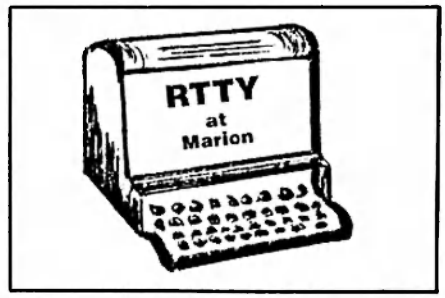
John Mount VI5EV, explains ATV to Amber and Tiffanae Kenna. The girls had travelled 20 km to see the displays after reading publicity in their local newspaper.

Photograph courtesy Peter Koen

Mayor Hodgson and Mrs Hodgson received congratulatory messages via ATV. During the evening the Adelaide Repeater, VK5RTV, at O'Halloran Hill, was cross-linked with the Mid-North Repeater VK5RCN. The operator for this link-up was young ATV enthusiast, Grant Willis VI5ZWI, who had passed his limited licence examination only four days earlier.

Photograph courtesy John Hampel VI5SJ

During the open night displays, Jack Peatfield VI5AF, always attracted an interested audience as RTTY congratulations to Marion Council came in on 7 and 14 MHz.



A RTTY station was set-up to provide contacts on this mode on 7 and 14 MHz using a FT-200, Siemens 100 plus a tape perforator and tape reader.

The few stations who used RTTY to contact VI5JSA sent congratulatory messages which were displayed in the library as they came in.

A prepared tape was used to print-out souvenir texts about the station to hand-out to visitors.

The operating area was complimented by a static display of early Model 12, 14 and 15 machines.

Shorter periods of operation provided opportunities for RTTY contacts on 144 MHz.

The interest shown in this mode indicates that a special event station should include RTTY in planning, as the interest generated will be worth the effort.

Photograph courtesy Peter Koen

Chris Owen VI5UH, at the keyboard of his home-brew terminal equipment while operating VHF RTTY. Many inquiries came from younger radio enthusiasts who were interested in this mode of amateur radio transmission.

TO JUBILEE STATION VI5SJA' — CONGRATULATIONS TO MA'RION COUNCIL ON YOUR CENTENA'RY (by RTTY)

Photograph courtesy Peter Koen

Some of the 50 guests at the Mayoral Reception listening to Mayor Hodgson thanking them for their support to the Marion Centenary Celebrations. The Mayor expressed appreciation on behalf of Council and the people of Marion for the continuing contribution of amateur radio in the community.

Photograph courtesy Peter Koen

Gordon Ragless (ex-VK5GR), recalls memories of his early radio days as a young radio operator in the Marion District and founder of the Blackwood Radio Club, VK5BR (now Adelaide Hills Amateur Radio Society, VK5BAR), to Mayor Hodgson. The equipment he used is now in the Telecom Museum, Adelaide and features in the book *History of Marion on the Sturt* held by John VI5SJ.

Photograph courtesy Peter Koen

Don McDonald VI5ADD, Secretary of the South Australian Division, with Ron Burt VI5ON, who loaned many radios and documents, dating back to 1913, of his late father-in-law Charlie Othen (ex-XVT and VK5ON), Lindsay Collins VI5GZ (CW), and Jack Peatfield VI5AIF (RTTY).

Photograph courtesy Peter Koen

Old Timer, Clem Tilbrook VI5GL, whose crystal grinding expertise was eagerly sought by amateurs throughout Australia, now devotes his time exclusively to ATV. Clem is seen here with Gordon Welsh VI5KGS, Secretary of the Adelaide Hills Amateur Radio Society, whose members assisted with equipment and operators.

Photograph courtesy Peter Koen

Alan Roocroft VI5ZN, has been involved in most JSA Special Events during the year. His brisk procedures and courteous operating were appreciated by all who contacted the Marion station.

Photograph courtesy Peter Koen

Lindsay Collins VI5GZ, assists the antenna team on HF while the ATV Group ready an impressive array for VHF. Lindsay contributed over 70 hours to the project. His Auto-CW Keyer (see AR, May 1986) attracted interest as he maintained CW contacts on the Jubilee 150 frequencies.

'A GUIDE (!) TO JOTA

During Jamboree on the Air, many children and adults pass through Jamboree station.

David Johnson VK3YWZ
62B Naples Road, Mentone, Vic. 3194

From left to right: Michelle Dodson (2nd Bayswater Guides Leader), Marianne Punshon (4th Bayswater Guides Leader), Frances Campbell (3rd Bayswater Guides Leader).

Seated: David Johnson VK3YWZ, Nadine Clode (2nd Bayswater), Janine Hedley (4th Bayswater) and Siobhan Punshon (3rd Bayswater).

Last year, marked my fifth year of involvement in the Annual Jamboree on the Air (JOTA). This gathering together of Scouts and Guides with radio amateurs has done much to stimulate communication between members of the Scouting and Guiding movements, world-wide. The event occurs on the third full weekend of October each year. Activities start for most groups on Saturday, the previous night being taken up by antenna erection and setting up of portable stations.

Many children and young adults pass through Jamboree stations. While there, any number of activities await them. For some it is building simple electronic kits; for others field communications orienteering; but the mainstay is talking with other stations.

Ambitious endeavours by groups have seen RTTY, ATV, Facsimile and ASCII employed to bring the groups together. The limits of the activities are only set by the ideas of those involved, and the preparation and time to see the ideas implemented.

PLANS AND PREPARATIONS

Just as in any other endeavour, time spent in planning is never wasted. To many of the Scout and Guide Leaders, JOTA is an unknown field. They will appreciate some guidance on what will be available, and on the expectations of themselves. This briefing pays big dividends on the weekend.

Murphy's Law ensures that the moment you drive up to your station for the weekend, you will remember *that* important item left on your shack bench. This is not much of a problem if you are portable at a local hall, but when you are camping two or three hours drive away, it is frustrating. And almost invariably, the electronics stores have just closed for the weekend.

Make a list over the previous two or three weeks, and check it before you leave home. Even with a list, 1986's activity saw me forget one or two minor items.

Planning for 1986 JOTA began for me on the last day of JOTA 1985. Over the following 12 months, I defined my goals, briefed the leaders in two meetings, built some new items of gear and prepared my set of connectors and cables.

IT NEVER WORKS FIRST TIME!

The complete set of equipment was then taken to Bayswater, and unloaded. Fine weather greeted the erection of the mast, a lucky thing since a couple of mast clamps needed persuasion. But, the mast was soon up, the cables run into the hall and testing and assembly began.

The main antenna support was my 10 metre homebrew telescopic WICEN mast. Atop this was the 16 element VK3UR ATV Transmit Beam. This was flanked by halfwave verticals on two metres and 70 cm. ATV was fed with half-inch Heliax, and the others with RG-213 and N-connectors were used throughout to minimise loss and ensure waterproofing. The weather soon showed this decision was worthwhile.

The station comprised a TS-520 on HF, FT-290R with PA on two-metres and FT-430R with PA on 70 cm. The ATV transmitter comprised the ubiquitous RoadShow Gang Exciter and Modulator boards, feeding Mitsubishi PA Modules. Power for the system was supplied by a homebrew 15 amp device finished only two weeks previously. Unfortunately, it's over-voltage sensor proved sensitive to HF and tripped out with annoying regularity.

With the help of Neil VK3BCU, an ATV station was set up. Some problems arose, starting with the absence of the correct power cable for a borrowed porta-pack. In addition, I had never used the transmitter before, the antenna had never 'accessed the device' before and my home signal was too bad to adequately check the receive system.

ON AIR AT LAST

The whole project was ambitious. With hindsight, I would say improbable. But after working until 3.00 am, it all came together, in a fashion. The porta-pack was powered up and interchanged with video from a second camera and graphics from my computer. The video was 'conditioned' through a VCR and the result was acceptable.

Pictures were sent, and received, and everything worked. Unfortunately, video 'hash' was desensing the two-metre receiver and 'wiping out' some weaker signals. Lesson 1 — Use a different mast for your ATV transmit antenna, otherwise desensing and video 'hash' will spoil reception.

Saturday dawned, seeing us exchanging pictures with David VK3UR, Richard VK3YLH, and Andrew VK3KIR, at Waverley. The children had a lot of fun and two Guides in particular enjoyed cross-band QSO with Scouts at VK3SCD, located in Cheltenham. I was kept busy controlling the station and directing my keen, but inexperienced camera operator. Lesson 2 — unless you are very experienced, get plenty of help with ATV.

Making kits: David Swallow VK3YXE helped by Frances Campbell, Marlene Lamont and Lynette Prislam.

AIMS AND GOALS

My first intention on planning the weekend, was to stimulate interest in amateur radio. With Guides, this can be difficult, they are often shyer than Scouts. However, the job was made easier by the Communications Activity Badge. We decided to give the girls the chance to earn these badges.

Assistance from Jim Linton VK3PC, saw the girls tested in Morse code. (Since I am AOLCP, I felt some help might be wise!). While there, Jim also tested the girls on the theory aspects of the badge, and prepared them for the weekend's activities. All this in the three weeks leading up to JOTA.

On the weekend, he also found time to help with the operation of the station, and briefing of the extra girls who arrived on the Sunday. The end of the weekend saw one Guide unit fully tested, and two others programmed for final testing by the end of the year.

One of the stumbling blocks was the practical kit exercise. After some research, a flip-flop design was settled on. Produced by Chris Bell and Steve Maidment of Cheltenham Scouts, it was the ideal kit. They 'came to the party' with 50 kits for the girls to build. Now, who was going to supervise construction?

An old friend stepped in and organised the whole thing. David Swallow VK3YXE, arranged the tools, arrived on Saturday and took 32 girls through the kit from opening the bags to plugging the battery in. He had a minor problem when some of the girls demurred at wearing safety glasses while soldering. I still do not know how he persuaded them, but he did! Perhaps he convinced them about "guys", "passes" and "glasses"!

After that it was all plain sailing. The girls worked out their microphone shyness (through group involvement) and talked quite happily to other groups. The leaders were there to help the girls, and one of the guides helped out as part of her *Baden Powell Guide Award*.

During the period, over 100 girls had visited the station. Thirty had completed their Communications Badge and 40 are programmed for completion by the end of the year. Letters from the girls expressing their appreciation, and video and photographs reflect and record its success.

I am delighted it went so well and have already promised to be at next years JOTA. Next year's video will see some initiatives, and we might even try some fox-hunting. Some more help can be arranged, with adequate preparation and briefing, from Rangers and BP Guide applicants. I will utilise this help more next year. What about you?

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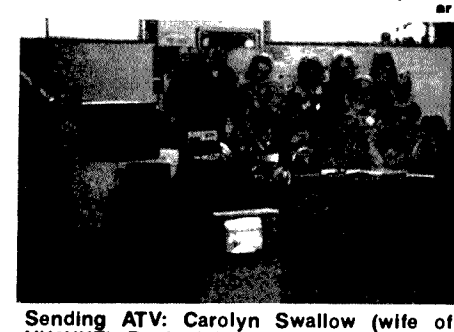


Sending ATV: Carolyn Swallow (wife of VK3YXE), David Johnson VK3YWZ, Monica Vollmer, Lynette Prislam and members of the 3rd and 4th Bayswater Guide units.

Thumbnail Sketches

Joe Ellis VK4AGL
Burnside Road, Nambour, Qld. 4560

I've got a crystal set and I can hear music!

One Saturday in the summer of 1933, a mate of mine came down on his bike and said excitedly: "I've got a crystal set and I can hear music." Peter and I were 12-year-olds and living in Lismore, a country town in northern New South Wales, then in the grip of a world depression.

I hurried back with him to his home and sure enough, there was this wondrous instrument, and music was indeed issuing from the earphones.

Over subsequent nights, I shared an earphone with my friend, who told me that the set had been made by a friend of his father, and an expert on crystal radios. I sought an interview with this gentleman and one winter's night, found myself standing outside his front door.

Through the glass panels I saw a kerosene light come down the hallway and soon I was paying my first visit to a "radio shack." The man clamped a pair of headphones over my ears and said: "that's 3LO, Melbourne coming through nicely tonight." At that moment, I became hooked on radio, a love affair that has lasted over 50 years. The man gave me a circuit diagram and the gift of a tuning condenser and the promise of help if I could not get the set going. I scrounged most of the parts, but I remember ordering a crystal and crystal-holder from Levensons, in Sydney. This was the 'in- place' for radio components in those days.

I finally got all the bits and pieces together and then came the moment of truth. Not a sound came from the headphones. I checked and rechecked the circuit, to no avail.

At the first opportunity I returned to the "expert's" house. Shock, horror. I found only smouldering stumps — burned down last night a bystander advised. What to do?

Why not take it down to the local broadcast station and see if I could get any joy alongside the transmitter site?

I did just that, attaching the antenna connector to an old rusty barbed- wire fence at the back of the property. Still no luck!

I was sitting on the grass contemplating suicide when a friendly voice said; "What's the trouble, son." It was George Exton, the owner of the station, so I poured out my troubles to him. "Well, my son will soon fix it for you," he said, "come on in, our afternoon session is nearly over."

I received a guided tour of the station — whirring generators, racks seemingly full of radio valves the size of footballs — I tried to show intelligent interest. "What's that" I inquired, pointing to a huge engine in the background. "That's our emergency supply," George said, "it's a gas engine connected to the main Lismore gas supply. We have only used it once. Every gas stove in the town went out and we were besieged with angry ladies whose dinners had been spoiled." George's motto was *Never spoil a story for the sake of the truth.*

When I left the station, crystal set operational, I had already decided to make "wireless" my career. I remained friendly with the Exton family long after their radio station had been taken over by big "business."

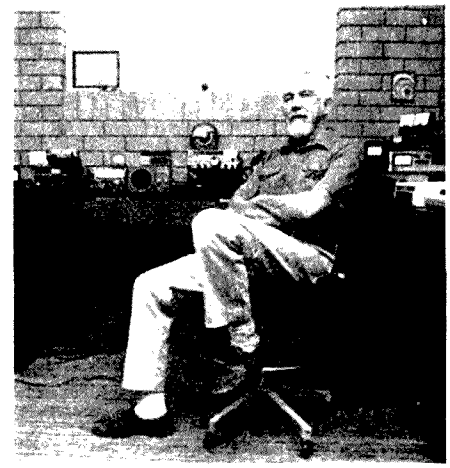
I was soon into valve radio, and in 1936, after spotting an article on a 56 MHz transceiver in *Popular Mechanics*, I made my first tentative experiments in the transmission mode. These spurious signals soon drew me to the attention of the local amateur radio operators, then grouped together in the *Richmond Rivers Listeners League*. They descended on me in a fairly heavy-handed way, insisting that I become respectable and get a licence.

With the friendly help of this group, and the Chief Telegraphist of the local Post Office, who trained me in impeccable Morse code at a speed of 15 WPM, passing the examination was a breeze.

During 1937, the radio pioneer, Marconi, passed out of this world about the same time that I obtained my Amateur Radio Operators Certificate. Despite even recent articles denigrating this radio pioneer, Marconi was my inspiration in those early days. Little was I to imagine that 20 years later I would meet and converse with his widow and his youngest daughter, whilst based in Rome.

The *Richmond Rivers Listeners League* operated under the call sign of VK2GL. It broadcast music on the 300 metre band. The drill was that we all went off to the movies on Saturday nights, came back and waited until 2UE, in Sydney, went off the air. We then tuned up on that frequency, and were then ready for the Sunday transmission.

As the youngest sprog about the place, my job was to collect and return the records lent by the town jeweller, but I finally got to do announcing as well! Under the tuition of these keen young enthusiasts, I learned how to solder and unsolder circuits of increasing complexity, forever chasing more power output or better receiving performance.



The shack in 1986.

I assaulted receiving valves with plate voltages undreamed of by the manufacturers and was soon throwing out bakelite components in favour of ceramic, as the operating frequencies went higher and higher. I thought nothing of riding my bike really long distances to check-out amateur radio stations allegedly getting better results than myself. I soon discovered that the top operators lived in high locations and had big antennas, a lesson well learned and put into practice at this QTH.

Between all of this activity, I was doing a correspondence course with the Marconi School of Wireless, and the final papers coincided with the outbreak of World War II. My station and Yagi beams (monobanders on 10 and 20 metres), were dismantled and, like others in the town, I packed my bags and went off to join in this madness, as a ship's radio operator.

At the end of hostilities, I became custodian of the old Lismore Club call sign, VK2GL, and it appeared in the first Call Book issued during 1946 under my name.

I have always maintained the letters ***GL*** in my suffix ever since that date as a remembrance of the young friendly men who introduced me to amateur radio.

I often sit in my shack these days surrounded by elegant radio equipment and muse that none of this would have happened if my mate had not come down that summer day and said: "I've got a crystal set and I can hear music."

The station prior to dismantling in 1940. In country areas, the equipment was stored in sealed containers at the local Post Office until hostilities ceased.

QSP

CANADA-JAPAN RECIPROCITY

On September 17, 1986, Canada signed a reciprocal licensing/operating agreement with Japan, to be effective from November 16, 1986.

This is the third country that the Japanese government has entered into such an agreement with, the other two being the United States and the Federal Republic of Germany.

Amateurs operating in Japan under a reciprocal licensing/operating agreement sign 7J, eg 7J1AAA in Tokyo, 7J1ACH on Minami Tori-shima, 7J3AAA in Osaka, and 7J8AAA in Sapporo.

—Abridged from *The ARRL Letter* September 29, 1986.

How's DX?

Ken McLachlan VK3AH
Box 39. Mooroolbark. Vic. 3138

As usual, the January DX column has a guest writer contributing either their thoughts on doing or a profile of their history in electronics and the hobby we all enjoy.

This year's guest writer is none other than Percy Anderson VK3PA, known world-wide as controller of the Pacific DX Net on 14.265 MHz and the ANZA Net, 14.135 MHz and on 21.204 MHz when conditions are favourable. Percy is an avid DXer, who it is believed, has never applied for any DXCC awards. With the sunspot minima, the ANZA Net has been forced down to the DXers band of 20 metres. Percy has carried the chores of controller in excess of a decade and, in my opinion, would be a leader in the field of net controllers. In the time I have known him, there has never been heard a bitter vitriolic remark or innuendoes, even under heavy stress when a rare DX station has appeared, and these occasions have been innumerable over the years. Incidentally, the longest running nets are SEAnet, the Pacific DX Net and the ANZA net. Some other nets that have been operating for a similar period are the Maritime and the Travellers Nets, which are a great service to their participants.

Percy notes than many object to net operation, however they operate on one frequency taking up minimum spectrum space and allow amateurs with simple equipment, without linears and beam antennas, to work DX countries, alleviating trying to get through impossible pile-ups. Other benefits of nets, correctly run, are helping out during emergencies, which has been done on many occasions, and the welcoming of amateurs with physical handicaps, through patience and perseverance by the controller.

One such amateur was a quadraplegic who operated his equipment with a rod attached to his head by a suction cup. As Percy says, "It makes one think!" My comment is that this is what the hobby is about — helping others — in all forms and think of the horizons amateur radio opens for a person such as Percy was referring to. This person was only one of many with disabilities that joined the nets.

Percy is very critical of persons who have equipment capable of placing a signal on the amateur bands and they go out of their way to cause interference. Whether they are licensed, do not like nets, or others enjoying their hobby is their prerogative, but if caught (and many have been brought to ground) the authorities in all countries deliver harsh penalties for their misdemeanors.

A keen gardener, Percy has a garden which is a delight to behold. As I have seen it there is not one blade of grass would be game enough to become out of place or one shrub or tree drop a leaf. It is immaculate!

Percy first became interested in wireless, as it was then called, when attending West Melbourne Technical School, at the age of 14-years. A group of enthusiasts had the use of a room in the complex which was equipped with crystal receivers and some newer valve type equipment. At lunchtimes, Percy used to peer through the glass door as he munched on his sandwiches.

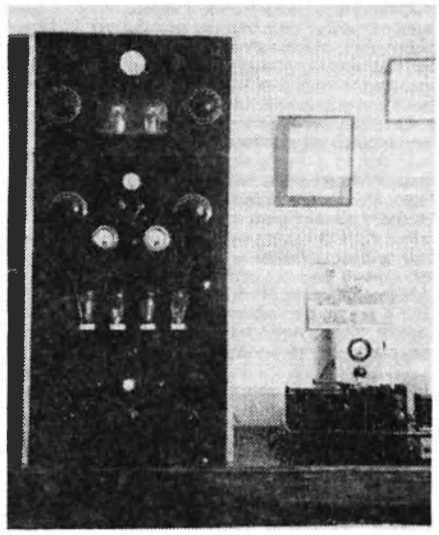
Curiosity got the better of him and with the help of a friend, he constructed a Crystal Set. The broadcast stations were experimental, stations such as 3AR (built and operated by Associated Radio), 3UZ (under the Oliver J Nilsen banner), and 3NS (owned by Norrison Scalley). The latter two were owned by businesses pertinent to the electrical engineering field.

These stations operated for a few hours each day and, at the time, amateurs were allowed to operate and broadcast music on the broadcast band. The receivers, abundant around Melbourne, were complimented by two oregon masts around eight to nine metres high, and orientated to receive as much energy as possible from the antenna strung between them.

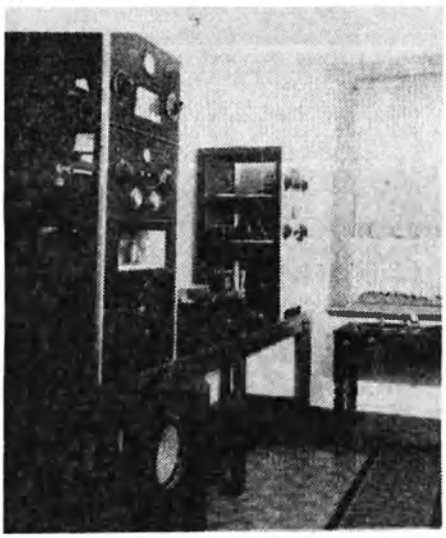
Percy graduated very quickly from the crystal set to a one valver, using a UV199 (my first set was a 1D8GT and I still have vivid memories of getting it to receive... 3AH), it was a dull emitter type valve different to the Philips type-E valves of the day, which lit up like neon signs. To control the volume, a rheostat was placed in the filament line in early valve sets.

Later sets, like the Neutrodyne, had two triode RF stages which had to be neutralised and the coils were unshielded. The power supply was a 60 volt dry B-battery and the bias was supplied by a 4.5 volt battery tapped at 1.5 volts. A commercial company, Philips, produced an eliminator which provided all the voltages required. Quite a godsend and easier on the expenditure, however the filament voltage was still derived from accumulators.

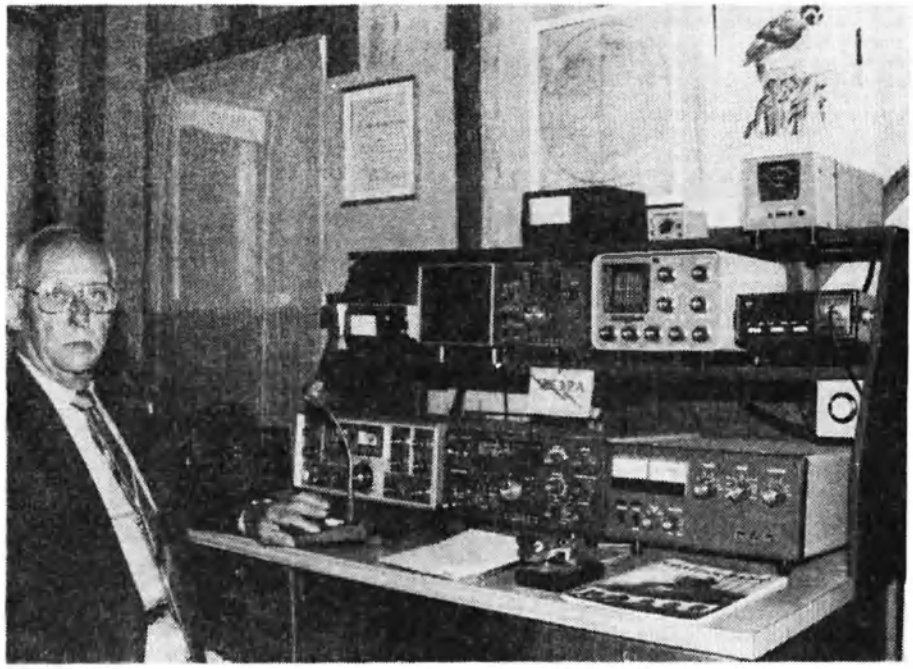
Around 1927, Percy became an avid SWLer and built many receivers using "honeycomb" coils which were constructed by wire being wound around nails placed into board. The heads were cut off after winding and the coil was placed on ebonite strips. The coils were so arranged that the



The broadcast transmitter that gave excellent service over a long period of time. It was used with a homemade Reiss carbon microphone and the twin spring-wound turntables are shown in the foreground.



The shack prior to 1935. The transmitter is the foreground used four UX281 rectifiers for the PA and modulator, located at the bottom of the rack. Centre was a crystal oscillator and buffer amplifier. The top section housed the UX210 finals and metering.



Percy VK3PA, the Voice of Wellington, in his shack of modern times.

proximity could be altered to suit conditions as were the oscillator coils to produce the correct frequency. Rather crude by todays methods but effective at the time.

Percy upgraded to transmission, with his first set being a UX210 tube. The UX210 cost £2.15.0, a considerable amount of money in those days. The HT and LT transformers were homemade on a lathe, the rectifiers were 'S' tube cold cathode gaseous types, which were rather impracticable due to voltage regulation, and were eventually replaced by two UX281 rectifiers.

Two Tuned Grid Tuned Plate (TGTP) transmitters were built, one for 28 MHz, the other for 14 and 7 MHz, low voltage supplies being switched by a DPDT switch. The antenna was a full wave 20 metre Zepp with tuned feeders. During 1929, some interesting 10 metre openings to New Zealand, Japan and the USA were utilised. Percy had his share of problems during this period as a considerable amount of his equipment was stolen. (It happened in those days too, regrettably... 3AH). This was a setback to him as he missed out on the rare DX of those days.

The arrival of indirectly heated screen grid valves, giving greater amplification without going into oscillation, was an immense step forward in the hobby, complimented by the advent of the metal chassis and front panel. This assisted in many problems which were associated with "hand" capacity being eliminated and considerable headaches being solved in the constructional area.

In 1931, Percy built a five metre Colpitts transmitter with a halfwave dipole as the radiator. The feedline was electric light cord, similar to figure-eight we know today. Losses must have been very high, however it worked and at that time, to the best of our knowledge, worked efficiently!

In the *Listener In* May 10, 1931, the late Max Howden VK3BQ, wrote that VK3TA had his five metre receiver going, (they also had typos then too... 3AH), and we can start the five metre "ball" going.

About this time, Percy built a transmitter for the broadcast band using a crystal oscillator and a buffer state driving a pair of UX210s. The modulator used a pair of UX210s in class B. Earlier this was written up in *QST* giving full details of transformer windings and associated data.

Many of the commercial stations of the era showed much interest in Percy's "perfect modulation" the first in this country which was of broadcast quality, according the another amateur of that time, Arthur VK3UX. Arthur states that Percy had a wide listening audience each Sunday morning.

Percy remembers vividly the use of 30 and 40 metres using the cross-band facility when USA contacts were frequent. Eventually the 30 metre band was lost to VKs and 40 metres became the norm.

The next major step forward was the superheterodyne receiver, the volume being altered by the cathode bias applied to the mixer and IF strip. Later AGC was introduced.

Many antennas were tried on the bands — two halfwaves in phase and vertical types were some of the more popular. Percy states, "it must be understood that all equipment was mainly homebrew due to the availability of parts and economics."

Just before the outbreak of WWII, the authorities sent urgent telegrams to all licensees that they were to cease transmissions, dismantle their equipment and forward it to a secure area where it would be stored. At the cessation of hostilities in 1945 it was the amateurs responsibility to arrange transport at his or her expense to have the equipment returned.

In early 1940, Percy passed a trade test in transmitting and receiving Morse at not less than 20 WPM, and an examination in radio and engineering theory. After paaing he was placed on the RAAF Reserve until July 1940. He was then called-up and posted to Point Cook Radio School, sent to Number 2 Squadron, onto the instruction staff at Number 2 WAGs and thence to Number 3 Instructional Staff with the duty of being in charge of maintenance. Valuable equipment en route to Australia was lost at sea due to enemy action and Percy's experience as an amateur and professional was used to the fullest.

He was endowed with the task of building two CW transmitters using available parts, and chose to use VT25 triodes (familiar to the amateur service). Sockets had to be fabricated and power supplies obtained. Luck was with him as he obtained four 425 volts a side transformers at about 150 milliamps rating. For each power supply using a UX280 rectifier, two were connected In series with electrolytics which gave a nominal 900 volts DC output, were constructed and pressed into service for two transmitters. This equipment, with series Hartley oscillators performed magnificently until replaced by commercially made equipment.

The RAN also was assisted during Percy's time in the forces when a Corvette, with a full crew aboard, was unable to commence proving trials until assistance was given by this ingenious technician. He had them on air the same day — no mean effort!

Percy comments, "...most of the amateurs of the day were either in the three armed forces or on reserve as it was essential that trained personnel were available to improvise as only amateurs can do in the wartime situation that they were faced with."

He was posted to the Fighter Squadron at Merauke, in Dutch New Guinea, where equipment had to be tested under high temperature and humidity. This is where one discovered what worked and what didn't in such unpleasant conditions.

Posted back to Townsville before spending time at Moratai, where Percy remembers the station WVTL, operated by the US armed forces on the MF band. This was heard on a converted RA8 with a tuner for shortwave transmission stations and other frequencies. One BBC station would be okay until sunrise when, with a couple of deep fades, it would disappear. One would then change frequency and listen to shortwave from New Delhi. The sporting results from Australia were eagerly sought by the troops.

Returning to Australia in early 1945 as a "walking patient", Percy had a short stay in the Heidelberg Repatriation Hospital until being discharged in October 1945. His duty to his country as a serviceman was completed with exemplary conduct.

In December 1945, VK3PA joined the staff of the National Broadcasting Corporation, Radio 3AR and 3LO, where he qualified as a technician and later a senior technician — radio and broadcasting. He was promoted to Officer in Charge of the Western Regional Area in 1964 and was based at 3WV, located at Dooen, 10 km north of Horsham.

During late December 1945, amateurs were allowed to participate in their hobby again. Percy constructed a four crystal controlled transmitter. The crystals were ground to amateur frequencies from available disposal source crystals that were switched. The number of amateurs populating the bands necessitated the building of a VFO which was fed into the cathode of the oscillator stage in lieu of the crystal. This transmitter on the frequencies of 7, 14 and 28 MHz was in service until 1964, with associate receiver and antennas. The advent of SSB necessitated another transmitter being constructed and this was in service until 1968. Until this time all of Percy's equipment was 100 percent home-brew.

In 1968, Percy bought his first commercial equipment, a transmitter/receiver and beam antenna. This equipment has been upgraded gradually over the years. Percy has constructed a few items from kits, but still yearns for the DIY days (do-it-yourself). He notes that he was a keen CW exponent with a hand key but has become lazy over the years. His comments on hand and bug keys are worth noting — with the hand key one could recognise the operators by their fist, however some of the latter sound excellent in the right hands but with an inexperienced and sloppy operator they are terrible and virtually unintelligible. Incidentally, Austine VK3YL, a keen exponent of Morse still uses a hand key and her sending is impeccable.

Percy says that some of the modern modes such as SSTV, RTTY, VHF, UHF, Moonbounce and others are an adjunct to the hobby never thought possible in the pioneering days. He is very critical of speech compression and speech tailoring, which cause distortion and splatter if not used correctly.

The DX scene has changed dramatically, the DX orientated are always on the lookout for a new country and when a rare country comes on the air the call sign is not given frequently and one has to be very patient to hear the correct call and sometimes QSL information.

Percy has many recollections of the early days of our hobby, including a vast knowledge of early vacuum tubes, including the first "peanut" valves and the valve that Telefunken brought out with at least two filaments — when one burnt out you switched or connected the next! Economy-plus when one thinks of the ingenuity.

Thank you Percy for your insight to the early days of radio, the history of yourself and your thoughts on the hobby to commence 1987, hopefully the year when the solar cycle starts to improve and gives many new DX contacts and countries to the waiting mass. It is hoped this will give many more stations the incentive to call you and discuss old times, as to my knowledge this is the first time your experiences have been published. I am sure it will trigger off many items of interest to other amateurs including newcomers to the hobby.

On behalf of readers of this column we trust you enjoy many more hours of operating the nets you so competently MC and rag-chew with your friends. All DXers appreciate your contribution to the hobby. Percy has also intimated he has a couple of technical tips for *Amateur Radio* and we look forward to reading them in due course.

The start of the New Year and a hope that the Solar Cycle will improve. We, as DXers, can only trust conditions will improve, as with other items concerning our hobby, such as the resolving of the ARRL DXCC controversy, whether new countries will be allowed lor credit and how many will be deleted.

MORE ROOM ON 40 METRES

Radio Beijing has not suffered "jamming" since October 12, with its Russian Broadcast on 40 metres and other bands. Hence more room for DXing on this quite interesting band. Of course, if this and other 'BC' removed themselves there would be lots of room for everyone.

The West German World Radio Service *Duetsche Welle* says there has been a noticeable increase in Soviet-bloc interference of its own and other western transmissions to the Soviet Union, Bulgaria, Czechoslovakia and Afghanistan. At the same time, jamming of Radio Beijing, the Albania service and Radio Tirana has ceased.

The Technical Director of Duetsche Welle, Guenter Roessler, says the Soviets spend millions of dollars each year to operate an estimated 3000 jamming stations, use mainly against shortwave broadcasters.

Who would like to estimate the power used to generate the unknown number of kilowatts that flood the bands?

ST JUPAT — HG4SEA

The two Hungarian *Round the World* sailors (see August 1986 AR), left Sydney Harbour on November 15, in their 11.5 metre, four tonne vessel, bound for Auckland, intending to arrive on the first of last month, where they intended to stay about four weeks.

Then commences the perilous journey from Auckland to Buenos Aires in Argentina, non-stop, across the Southern Pacific in an easterly direction, rounding the notorious Cape Horn, where the waves can reach up to 10 metres in height. A stopover before they continue to their home port of Opatija in Yugoslavia sometime in 1988.

The amateurs that were assisting in the Tasman crossing were VK2s BNR, OG, PS and ZL1s MA and BIN.

A note from Lajos HA5DW, states that the band conditions will be poor on the long crossing and information gleaned from any source would be greatly appreciated in the seafarers homeland.

MORE US AMATEURS

An increase of 20 979 new licensees were listed in the fiscal year, October 1985 to September 1986, as against 17 373 in the previous period. This brings the total for all grades to 421 082 licensees in America.

WORLD-WIDE BEACONS

There are presently nine beacons on 14.100 MHz that operate around-the-clock. The beacons are located at:

TIME	STATION	LOCATION
00	4U1UN/B	New York
01	W6WX/B	California
02	KH6O/B	Honolulu
03	JA2IGY/B	Japan
04	4X6TU/B	Israel
05	OH2B	Finland
06	CT3B	Madeira Island
07	ZS6DN/B	South Africa
08	LU4AA	Buenos Aires

The beacons are crystal controlled and the same sequence recommences at 10 minute intervals with the following text transmitted by each beacon.

POWER LEVEL	CW MESSAGE
100 W	OST de (stations call sign) beacon
100 W	● -9 second dash-
10 W	● ● -9 second dash-
1 W	● ● ● -9 second dash-
0.1 W	● ● ● ● -9 second dash-
100 W	SK (stations call sign)

Transmission time: ±58 seconds.
Speed: 20+ words per minute.
Power attenuated in 10 dB steps.

Have a listen and find out where the bands are open to. You will be amazed at the low power signals that can be heard when propagation is even fair.

BITS AND PIECES

The United States has signed a Third Party Agreement with Sierra Leone for communications by amateur radio of a technical or personal nature. As always, business communications are prohibited. ** **Graham G4KLP** was QRV from Amman using the call **JY8KL**. QSL to the home call. ** **Rag JW7FD** is now back home after his tour of duty. ** **Bob KD7P** has given up on operating Peter 1 Island after much time spent trying to obtain the documentation. Next year may be a different story or a far different location. ** All cards for **FO0XX** that were accompanied by IRCs or "stamps" were mailed by September 25, last year. ** **KA2CC** is now QRT from Minami Torishima. ** **Kimsan XU1SS** is quite active and QSLs go to JA1HQG. ** The USSR Arctic Net, ably MCed by **UA1MU** meets at 1300 UTC on Sundays. ** Do not overlook 15 and 10 metres for some good openings. One has to monitor these bands at various times as they are very unpredictable. ** Do not forget the Antarctic stations, generally below 14.170 MHz, who like to chat back-home when duties permit.

CW SWLing WITH ERIC L30042/VK5

It is pleasing to welcome Eric back to the fold as he continues recuperating.

1.8 MHz
VK2BHO; VK2HC; VK3BEE; VK3CGG; VK3QI; VK2RS/3; VK5ADX; VK5BC; VK7BC; W6FX.

3.5 MHz
JA4ESR; VK4KGR; VK7EDZ.

7 MHz
FK25FS; I4EAT; KP2J; VK9XI; VU2TEC; N1EA/MM.

10 MHz
JA2KXL; F3NB; UA9MD; W2NS.

14 MHz
DL3GK; FK8EJ; VK8FN; VK0AV; HA5SO; VK6OI; HL4GAE; HK3YH; LZ2EV; OK3KII; YU1KQ; YB4FN; VK0BRT; 4X6MP.

21 MHz
A35KM; BV2DA; KK7K/DU2; HL2AZJ; UC2ADX; UJ8JCC; VE7NH; VS6DT; YB1DVW; VK2BNJ; VK3ON; YC4BRX; YC0KKI; 7J1ACH.

28 MHz
JA2OLJ; JE2YHS; JR6APW; VK4NCC; VK4NJQ; VK4XA; VK5WI (beacon).

THANKS

Sincere thanks to the Editors of weekly, bi-weekly and monthly publications such as: *ARRL Newsletter; BARG; CQ-QSO; The DX Family Foundation Newsletter; Inside DX, The W6GO/K6HHD QSL Manager List KH6BZF Reports; Long Island DX Bulletin; Papakura Radio Club Bulletin, QRZ DX; RSGB DX News and the Westlakes Amateur Radio Club Newsletter*

Magazines including *Break In; cqDX; DX Post; JA CQ; JARL News; KARL News; QST; Police Life; RadCom; Veron; Weather News* and *Worldradio*, to mention but a few.

Individual contributors this month include HA4DW; VKs 2PS 3PA, PC, YJ, YL; 6NE; L30042/VK5; ZL1s AMN and AMM. Thanks to one and all.

—73, Ken VK3AH

The Ham Bands . . . by Beat Note

We ware slouched in front of the receiver, stripped to the waist. Beyond our open window, trees were etched into the intense radiance of this sweltering afternoon. Only the infra-throb of the sun broke the silence of a world heat-drugged into a death-like slumber. Moo-Moo, the feline, lay on its back, with feet in mid-air, to lazy to stalk the fly dozing on the wall.

We knocked the receiver onto 20 and listened abstractly to a scattering of twos and nines yawning at each other. The air was dead. We dozed a bit.

Dusk rolled in like a damp cloudbank. A bird took wing for its nest; a few leaves fluttered; Moo-Moo stretched, and the fly drew itself up to the ceiling. Twenty rolled over and murmured. The drone of heterodynes issued from the mud. Gs, LUs and VPs were stirring in the slowly gathering froth of QRM. The nines were commencing to bust up the east coast. The world was rubbing its eyes after a deep siesta.

When the curtain of darkness fell, the heat gave to the evening that queer magic of the tropics that quickens the senses. Anything could happen, we told ourself — anything within reason or without reason. Even a VU could break through the ever-increasing growl of 20, and it was with this absurd thought in mind that we threw the lever on the automatic electrical bank spreader and plastered 20 over 300 degrees.

We took a 5 kc slice off the low end and picked out a few insignificant CW boys a mere 4000 miles out, and an SU on phone. While running over a YN birdie we heard what could have been an audio image, but excessively sharp. A mere touch on the vernier crank gave little more than an indication of the presence of some form of carrier. We increased the spread to 1000 degrees, and after careful retuning were rewarded with a constant unmodulated carrier beating with the double low-frequency oscillator.

We tried audio-frequency heterodyning without success, and finally resorted to doubling the 1000-degree spread through a harmonic amplifier. It was immediately evident upon tuning back into the carrier that, what had at first seemed to have been a single wave was, in truth, a multiple affair. Excitedly we threw in a five-stage push-pull preselector equipped with an inverse silencer and shot balancer, and upon applying a negative resistance to the super-regenerative AVC amplifier, learned to our complete surprise that, not only was each carrier being modulated but, more surprising still, each was without a doubt the carrier of an amateur phone station. There was no mistaking the crystal clear amateur idioms.

But what modulation! Never had we heard such dulcet tones, such succulent sibilants, such breathless bass response . . . and this, mind you, with nary a trace of interference!

With trembling fingers we moved the micrometer adjustment on the split- frequency control and brought the nearest carrier into zero beat with the double low-frequency oscillator. Then, de-energising the beat oscillator, we sat with bated breath awaiting the sign-off. It was not long in coming, but the shock we received left us completely unstrung . . . could it have been possible? — but yes, we had heard it as clearly as our own laboured breathing — CO13CZ signing with W12AM!

With a madness born of an indescribable fear of the unknown, we rocked from one station to another . . . ZB-F2, CY27-F1, XL44-F . . . Cold sweat trickled down our back. We wanted to smash our receiver into bits to escape from this nightmare, *because we know by a chance remark about the war of 1950 that we were listening in on the future!*

Stark, shrieking fear is a mental enema that often leaves the brain in a transcendent stage, and this is undoubtedly the effect it had on our intellect, for with surprising rapidity for one as slothful as ourself, we grasped the immense truth underlying the mode and manner of these future communications. It came as a flash that a sub-harmonic of the third multiple frequency would undoubtedly do the trick. With surprising calm we hooked in an absorption trap and used the output to excite a single-ended doubler. We switched in the transmitter and cautiously called W11SM-F2 whom we had previously heard. We confess to a bit of excitement when we flipped the standby switch on the receiver and kicked up the intermediate RF gain. As the distant carrier came on, the shot noise balanced out and we heard the clear voice of W11SM-F2 coming back.

"I believe this is out first QSO," he said.

We commenced working duplex, and we said, "It most certainly is, if it is a QSO at all, because I am a fighter and I suspect I will have been killed in the war of 1950 and so, if I am dead, how can I talk to you?"

"You are talking nonsense," he shot back. "Don't you know your FCC regulations regarding coyness in the amateur bands? Coyness has no place in the amateur bands, nor poor modulation for that matter. Yours is terrible. And, by the way, what is your complete assignment? You made no reference to your frequency area, and I am beginning to doubt that you are licensed to operate in region F2. Putting everything together, there is something decidedly queer about your mode of operation."

"There ought to be," I replied. "You may be surprised to learn that I am working from the year 1936."

"By Harry!" he exclaimed. "so your year finally broke through. Let's see, now — QRX just a second — yes, you're working your frequency against the 27th multiple of the terrestrial cycle which clearly places you in the year 1936. Well, congratulations, old man — we talk to lots of the boys in the 1937 to 1949 period, but you're the first '36 to get through. There will be no end of excitement when the ARRL hears of this and, by the Lord Harry, it means I will get the first WAY Certificate ever issued."

"What," I asked, "is a WAY Certificate?"

"Worked All Years, of course," he shot back. "You see, due to the lunar variation, no signals previous to the year 1936 can be received; they fall into a complete Dellinger Fadeout. Besides, the earlier years are the more difficult catches, just like the distant stations in your time cycle, so you can see that you're a rare catch for any amateur."

"Well, arc my tank condenser, if that isn't the damnedest," I said. "Imagine hunting for years instead of DX. Here in New York we consider ourselves pretty good if we can hook a VU, but wow, hooking the years is a new stunt in this game."

W11SM-F2 laughed. "My father was an amateur before me, and I recall his speaking of VUs. If I am correct, that was — or is, I should say, the territory known in your time as India. Incidentally, old timer, it may interest you to know that I am a distant descendant of yours. I've just checked you in a '36 call file and find that my great-great-great- grandfather is none other than yourself."

"The hell you say," I gasped. "It's incredible. Why, son, you're not even born yet, and still — well, it's beyond me. I'd rather we changed the subject. Tell me, what district is W11 . . . we don't have any such area in '36."

His carrier dropped into a slow fade. "Hold it," I shouted, "you're dropping out of the picture."

He came back about an R7. "Sorry," he said, "we're falling out of synchronism with the time cycle. I'll be out completely in another minute if I can't hold the beat. We'd better sign now while it's still a 100 percent QSO."

Slowly his signals were reaching the shot noise level. I kicked the gain a bit and said, "Okay, son, glad to have met one of my future offspring. Tell your mother I'm going to fight in the war of 1950 to keep up the family traditions . . . and where did you say W11 was?"

I had to put on the cans to get him at all on the comeback, he was so weak, but I squeezed him through. I heard him say very plainly, "Mother is here and says she knows all about you. During the battle of San Antonio you dropped five enemy planes and picked up as many medals. She has them in front of her now! W11 old man? Why W11 is the US possession on Mars. Well, cheerio and happy landings. W11SM-F2 signing off and clear and pulling the switches. . ."

We awoke with a start. The light was on and Moo-Moo had just scrambled off our lap in hot pursuit of the fly which, we learned from our better half, had landed on our nose.

—The original of this fictional article appeared in *All Wave Radio* just over 50 years ago, August 1936, and was contributed to *Amateur Radio* by Alan Cook VK3AUC

ar

SPLUDOS AMIGOS

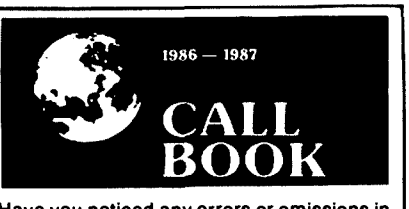
Just a line to say I'm living, that I'm not among the dead,
Though I'm getting more forgetful and more mixed up in the head,
For sometimes I can't remember when I stand at foot of stair,
If I must go up for something, or I've just come down from there.

I stand before the fridge so often, my poor mind is filled with doubt,
Have I just put food away, or have I come to take some out,
And there's times when it is dark out, with my night cap on my head,
I don't know if I'm retiring, or just getting out of bed.

So if it's my turn to write you, there's no need in getting sore,
I may think that I have written, and don't want to be a bore,
So remember I do love you and wish that you were here,
But now it's nearly mail-time, I must say good bye dear.

POSTSCRIPT
There I stood beside the mail box, with a face so very red,
In lieu of mailing you my letter, I opened it instead.

Contributed by Bill VK3CFL, via Bruce Bathols VK3UV



Have you noticed any errors or omissions in the 1986/87 Call Book?

Please advise the WIA of any corrections as work has commenced on the 1987/88 edition.

Write to: PO Box 300, Caulfield South, Vic. 3162.

Please enclose information as in Call Book and corrected information!

VHF UHF — an expanding world

Eric Jamieson VK5LP
1 Quinns Road, Forreston, SA. 5233

All times are Universal Co-ordinated Time and indicated as UTC

AMATEUR BANDS BEACONS

FREQUENCY	CALL SIGN	LOCATION
50.010	JA2IGY	*Mie*
50.060	KH6EQI	*Honolulu*
50.075	VS6SIX	*Hong Kong*
50.109	JD1YAA	*Minami Tori-shima*
52.013	P29BPL	*Loloata Island*
52.020	FK8AB	*Noumea*
52.100	ZK2SIX	*Niue*
52.150	VK0SJ	*Macquarie Island (Keyar)*
52.200	VK8VF	*Darwin*
52.250	ZL2VHM	*Manawatu*
52.310	ZL3MHF	*Hornby*
52.320	VK6RTT	*Wickham*
52.325	VK2RHV	*Newcastle*
52.350	VK6RTU	*Kalgoorlie*
52.370	VK7RST	*Hobart*
52.420	VK2RSY	*Sydney*
52.425	VK2RGB	*Gunnedah*
52.440	VK4RTL	*Townsville*
52.450	VK5VF	*Mount Lofty*
52.460	VK6RPH	*Perth*
52.465	VK6RTW	*Albany*
52.470	VK7RNT	*Launceston*
52.485	VK8RAS	*Alice Springs*
144.019	VK6RBS	*Busselton*
144.400	VK4RBB	*Mount Mowbullan*
144.410	VK1RCC	*Canberra*
144.420	VK2RSY	*Sydney*
144.430	VK3RTG	*Glen Waverley*
144.465	VK6RTW	*Albany*
144.460	VK8VF	*Darwin*
144.485	VK8RAS	*Alice Springs*
144.550	VK5RSE	*Mount Gambier*
144.565	VK6RPB	*Port Hedland*
144.600	VK6RTT	*Wickham*
144.800	VK5VF	*Mount Lofty*
144.950	VK2RCW	*Sydney*
145.000	VK6RPH	*Perth*
432.057	VK6RBS	*Busselton*
432.160	VK6RPR	*Nedlands*
432.410	VK6RTT	*Wickham*
432.420	VK2RSY	*Sydney*
432.440	VK4RBB	*Brisbane*
432.450	VK3RAI	*MacLeod, Melbourne*
432.535	VK3RMB	*Mount Buninyong*
432.540	VK4RAR	*Rockhampton*
1296.171	VK6RBS	*Busselton*
1296.420	VK2RSY	*Sydney*
1296.480	VK6RPR	*Nedlands*
10300.000	VK6RVF	*Roleystone*

BAND CONDITIONS

Six metres is beginning to liven up and occasional contacts are occurring mostly between VK5 and VK2 and VK4. Signals to S9 of course, and one constant customer is Lyn VK4ALM. As we have now entered November (at time of writing) one could expect activity and openings to considerably increase very soon.

On the two metre scene, I am still at some disadvantage due to the antenna rotator being locked in a south-easterly direction. The weather has not been hot enough yet to soften the grease up-top, so little to report other than fairly constant reception of the Mount Gambier Beacon, VK5RSE, in and out of the noise most times.

EME CONTACTS

Doug VK3UM, continues to keep the flag flying and had considerable success during the recent contest weekend of 25/10 and 26/10. After the big flame-out of the 4CX250B amplifier, help flowed in from a number of amateurs enabling Doug to test and select suitable tubes to put the amplifier on the air again. Just to make sure everything was in order for the contest, Doug fired up the day before (24/10) and at 2020 worked YU1AW at 549 sent and received.

On 25/10, the following were worked: 1625 NC1I 439 sent 449 received; 1645 N4GJV 439 439; 1701 K1FO 549 539; 1715 JA1JRK 439 439 (probably using a dish); 1725 W0RRY 439 439; 1730-1742 a mass of signals and difficult to sort out; 1755 K5AZU 559 449; 2118 OH2DG 0 339 'dish); 2143 SM4IVE 429 439; 2152 YU1AW 439 439 (dish); 2218 DF3RU 449 439; 2225 OH2TI 439 439 (dish); 2243 DL9KR 439 439.

On 26/10: 1700 KD8R 449 449; 1750 JA4BLC 0 339 (perhaps 0); 1800-1835 a pile of weak stations; 1835 JA6CZD 559 549; 2150 SM3AKW 0 0; 2309 ZL2AQE 0 0.

Some observations made by Doug were that conditions were excellent to the USA with optimum Faraday rotation, signals were poor to Japan while signals from Europe appeared to be cross-polarised. Moon-set was 2350 on 26/10 (UTC Monday) so only a short time for the window to Europe. Overall he had more contacts than last year, but worked less countries. He noted K2UYH was missing.

Doug VK3UM, also advises he has set up a program suitable for those equipped for EME in *Pascal* and giving calculations for the sun, moon and sky noise. There are 113 locations stored on software for the IBM. Send a disc to Doug if you would like a copy.

Of interest also is that David VK3AUU, from his new location, worked W5UN on two metres at moon-rise on 24/10. Good work David.

IC-551 NOISE BLANKER

In the November 1986 issue of AR I gave some further hints which came from David VK3ADM, on how to set up the modifications to the IC- 551 noise blanker, and promised to let you know what happened when I completed the modifications.

The job has been done, except that I used a 2N2222A instead of the 2N2222, but I could not see that this would matter. I found doing that actual modification quite straight forward. but was unable to check results before modification as power leak was absent at the time. However, after completing the job I got out the power drill and wrapped a couple of turns of hook-up wire around it and fed the wire into the antenna terminal as advised. The drill certainly kicked up a racket, but the noise from it was fluctuating. After a while, it settled down and by adjusting L19 and R65, I reduced the noise from S9 with the blanker off to S2-3 with the blanker on, which seemed satisfactory in view of the comments by VK3ADM. Still no power leak when I had finished!

Two days later, when the power leak was S9+, I switched on the noise blanker and the S-meter dropped to zero. At the moment, the modifications appear most satisfactory and can be recommended. I will wait for final proof when summer arrives and the noise can be S9 +40 dB, if I can silence that it will be a dream come true!

One thing I did notice was that under conditions of high noise with the blanker on I could hear some backchat from the very strong signal of the local beacon for about 30 kHz on the low side of the beacon. If the noise was absent the beacon was its normal narrow self, whether the blanker was on or off, so some cross-modulating must be occurring under conditions of extreme noise. Just what effect this will have when the band is well-stocked with stations I cannot say at the moment because when stations have been there lately the noise has not! More on this later.

AUSTRALIAN VHF/UHF/SHF RECORDS

The *1986/87 Australian Amateur Call Book* has an updated listing of distance records for the various bands. Since not everyone has such a call book and as the distances will be of interest to overseas readers, the following are the Australian record-holders.

BAND MHz	CALL SIGNS	DATE	KM
50	VK3OT — VP2VGR	17/03/81	16663
144	VK4ZSH/4 — JA7OXL	24/04/83	6617
432	VK3ZBJ — VK6KZ/6	23/01/80	2716
576	VK4ZRF/4 — VK4ZSH/4	07/12/81	378
1296	VK5MC — VK6KZ/6	23/01/80	2289
2300	VK5QR — VK6WG	17/02/78	1885
3300	VK3KAJ/3 — VK3ZBJ	25/01/86	246
5650	VK2AHC/2 — VK2SB /2ZND/2	12/04/75	114
10000	VK3KAJ/3 — VK3ZBJ/ 3	08/02/86	252

EME RECORDS

144	VK3ATN — K2MWA/2	28/11/66	16761
432	VK6ZT — K2UYH	29/01/83	18726
1296	VK3AKC — W2NFA	06/10/73	16713

ATV RECORD

432	VK7EM/T — VK3ZPA/ T	13/12/72	413

FROM CANBERRA

I was pleased to receive a letter from Graham VK8GB/1, who now resides in Canberra in which he advises of some six metre openings to VK3 and VK5, of recent times in the evenings and an opening to JA and VK4 on 26.10 during the afternoon. Stations in Sydney have reported working ZL, VK3, 4, 5, and 7.

Graham has antennas set up for six, two and 70 cm, but suffers, as do most South Canberra residents, with local terrain losses due to the close proximity of hills and mountains. (I know the feeling . . . 5LP). Tropo path losses to Sydney and Melbourne are increased by about 15 to 20 dB. The direction to Adelaide has much the same losses. Despite the losses, most Canberra stations can hear the VK2RSY beacons on six, two and 70 cm most of the time. Graham is able to hear them weakly with occasional peaks due to aircraft enhancement.

Local activity has been fairly limited during winter. On six metres, stations heard include VK1VP and VK1ZDX, VK2AKU (Tumut) and VK2ZRE (Adaminaby). On two metres, the regulars are VK1BG, VK1RK, VK1VP, VK2AKU and VK2ZRE. On 70 cm VK1BG, VK1BUC and VK1VP.

Most activity is centred around aircraft enhancement tests to Melbourne on Saturday and Sunday mornings with VK1BG having outstanding results. Eddie VK1VP is limited by the proximity of Black Mountain, while those in the south are limited by path geometry.

David VK3AUU, runs a signal regularly on 144.1 in the evenings at 2030 (local) and is nearly always readable on CW and often works VK1RK and VK1BG. Graham also confirms the earlier mention in these notes about David VK3AUU working W5UN by EME.

THE ROSS HULL CONTEST — AGAIN!

My copy of AR for November has just arrived and I note that changes to the Ross Hull Contest, which are largely in line with some recommendations I was able to make as the result of some correspondence I received earlier in the year. The major change is the use of three bands, 52, 144 and 432 MHz only, which should now bring the contest within the working parameters of more stations with chances to compete for the certificates being awarded. The scoring table is simpler than in most previous years and does give some incentive to work distant stations.

I do not propose to make any more comment in this issue on this year's rules, there will be time for that after the contest is over and the flak has settled. However, whatever your views, ***please send in a log, if for no other reason than to keep the contest alive for the moment!***

Throughout the year, I have been asking for feedback on the contest but only a handful of people have been prepared to place pen to paper despite dozens of on-air grumbles I heard last year. Most letters contained worthwhile suggestions and where possible, these have been acted upon. Surely there must be more people out there with good suggestions who do not bother to write. With the arrival of January 5 the contest will be behind you. After you have prepared your log and posted it to the FCM, why not write me a letter and

give your thoughts in a constructive way. Anyone can knock a contest, it takes more to be constructive, so please say something!

One person who has finally written to me is Graham Baker VK8GB/1 who makes a few interesting proposals for me to consider and then to pass on to the appropriate authority. That authority for the moment should be you, the readers! He says: "The basic objections to the current rules can be summarised as follows:

1 IT IS TOO LONG — For many it is not possible to be continuously active for a period of several weeks. Because of the sporadic nature of the openings to have a real chance of winning, you need to be there all the time. The majority of people can only operate after work and at weekends.
I propose the contest to limited to a period when most people are on holidays during a good prospective propagation period which would be 0000 UTC December 26, to 0000 UTC January 2, each year.

2 YOU DO NOT HAVE A REAL CHANCE OF WINNING — At the moment, there are only two awards given, one for the best seven day score and the other for the best one day score. If the awards were based on a State or call area basis, the opportunity for success would be greater and you would be competing on a more equal basis. A greater sense of competition would result and the problem of how to deal with the people in the west would be overcome.
I suggest a certificate award for the best seven day score and one day score for each call area. In addition, one overall winner for the best seven days score in Australia could be awarded the existing Ross Hull Trophy. (The 1986 rules do provide for State awards for seven days and the trophy to the top Australian score, see page 40 Column 3 November 1986 AR . . . 5LP).

3 YOU HAVE TO OPERATE ON ALL BANDS TO WIN — The current rules make use of as many bands as possible obligatory to success. Many people are well equipped on one or two bands and on the basis of the above mentioned premise that people must stand a chance of winning, I suggest that the certificate awards be made on a band basis as well. This would mean awards for the best seven and one day performance on six, two, 70 cm and UHF for each State.
To establish an Australian winner on each band would be an advantage and I suggest that the best seven day score for each band in Australia have the certificate marked *Winner for Australia and VK**, thus no extra certificate would be required, but the prestige would be there.

4 THE METHOD OF SCORING IS NOT FAIR — The method of scoring in the past has been based on a rather complicated arrangement which purports to award points on the basis of perceived contact difficulty.
I suggest a simplified method of scoring would be more appropriate and to give the contest a new lease of life I suggest the adoption of a *Maidenhead Grid Square* system of multipliers. Each contact would be worth one point and the exchange would be signal report and Maidenhead number.
To simplify matters when working overseas stations, multipliers for call areas could be used with only signal report exchanges required.
For New Zealand it may be possible to incorporate them into the contest for award purposes and they could then also be Included in the Maidenhead multiplier system.
For multi-band operators, band multipliers would apply as at present, but this would be only applicable to those stations seeking the Ross Hull Trophy. A summation of daily scores is suggested as distinct from a total seven day multipliers basis. This would assist those stations operating in the one day category by having more stations available to work.

5 NO ADVANTAGE FOR PORTABLE OPERATION — To encourage activity from rare grid squares, an award for portable operation could be considered. I have some reservations as to it's necessity, as such a station may be positioned to take into account advantageous geographical locations and may be in considerable demand.

6 ADDITIONAL NON-CONTEST AWARDS — To take into account a greater awareness of grid squares it may be opportune to institute a grid square certificate similar to the system in the USA.
I hope these thought may be of some use in revitalising interest in the Ross Hull Contest."

The only comment I want to make on all these matters at the moment is, in the area of signal report exchanges. To give a signal strength report followed by your grid square number may be alright for the first contact which would require the readability to be good enough to get all the details. But what about, say, having a weak two metre contact with very marginal conditions. All you would need would be to decipher the RS report and by looking in your log you could add the grid square number if you did not get it! I think such a system is open to possible abuse in some cases whereas the need to correctly identify five or six figures makes a certainty of the contact.

I would suggest you read the above suggestions along with those set out in the letter from Peter Gamble VK3YRP, on pps 60 and 61 of November 1986 AR. I already had an advance copy of Peter's letter and did not print it myself as I knew it was to appear in AR anyway.

BITS AND PIECES

The November issue of *The Propagator* carries an item under the EME Report by Lyle VK2ALU, that, on arriving at the site of their dish on 26.10 for the EME Contest, they found intruders had broken into the building yet again, items taken and operating cables ripped out, generally considerable damage being done.

One wonders at the mentality of people who do such things. Either they are spiteful because some people have something they have not or are simply anti-society anyway and must destroy the work of others, or there is a vendetta against the EME installation as such. It must be heartbreaking to discover such destruction — one can only hope further security measures can be undertaken.

On 31/10, at 0650 on Adelaide Repeater Ch 5, I had a contact with Mick VK2FBW/5, who was passing through on his way to Perth. Mick is actually W3ILG, and is a keen six metre operator. He has worked all 50 US States and about 43 countries. He runs two kilowatts to an 11 element Yagi on a 30 foot boom. His wife is WB3FUR.

A brief message came from Mark VK0AQ, which advised he was leaving in late- October for another stint at Mawson base in the Antarctic and would have six and two metre gear. He expects to actuate the six metre beacon again (VK0MA) and will be active on the satellites. David VK0CK, is also In the Antarctic at Davis base and will also be active on VHF These two amateurs present two possibilities for Es contacts on six metres at least. I hope to be keeping contact with them on 20 metres as I did before and will report any happenings to readers.

VK0SJ, is at Macquarie Island, so there may be a possibility of a six metre contact from there. It is not possible to be too specific about what form of operating any of these people are able to undertake as they have to fit in with certain work schedules at their bases and when they are free these may not be the best VHF operating times. They often have to share radio facilities with others so it is not until they actually get themselves settled in at their locations and report back on HF that we have much knowledge of what they may be able to do.

Courtesy of Steve VK5AIM, I am being supplied with a very interesting series of articles by Ken Ellis G5KW, in *The Short Wave Magazine* from the UK. Part one deals with the reception of the Gibraltar beacon, ZB2VHF, on 50.035 MHz, operated by Jimmy Bruzon ZB2BL. Part two covers F2 propagation over the North Atlantic path from the Isles of Scilly, 1979 to 1981. Part three covers Transequatorial propagation (TEP) during sunspot cycles 18, 19, 20 and 21. Part four, which I have not received yet, is to cover 50 MHz during the International Geophysical Year, 1957-58.

CLOSURE

As these notes are being prepared not much more than two weeks after those for the previous issue, due to printing deadlines for the Christmas/New Year period, there has not been a very great supply of fresh information and, apart from the six metre band openings from time to time, not a lot to report. However, the next issue should contain a run-down on the Es season for December and it will be Interesting to see if we have another bumper year on two metres!

Closing with two thoughts for the month: *Probably the best thing about the future is that it only comes one day at a time* and *A politician thinks of the next election; a statesman thinks of the next generation.*

Have a Happy New Year. 73 *The Voice in the Hills.*

er

QSP

COMPUTER-AGE ELECTRICITY METER

New technology may allow Australians to use off-peak electricity in the same way they can now save money with off-peak STD telephone calls.

The digital meter, a world first with a multi-million dollar export potential, would replace the electro-mechanical disc meters which have been used for the past 70 years.

It could be used as a direct replacement for existing meters or as a multiple meter to handle off-peak tariff metering.

The State Electricity Commission of Victoria (SECV) has been testing a multi-tariff system with a potential savings for consumers who shift their power use to off-peak times, weekends and public holidays.

Electric supply authorities could save millions of dollars a year in their power generation and transmission costs of smoothing electricity demand peaks.

Australian Ladies Amateur Radio Association

Joy Collis VK2EBX
PUBLICITY OFFICER, ALARA
Box 22, Yeoval, NSW 2868

Having sung our *Auld Lang Synes* and celebrated the arrival of 1987 in the appropriate manner, perhaps we should take one last backward look at 1986 before it finally disappears from view, and see what we have achieved.

Our special 11th Birthday Activity Day was celebrated on Saturday, July 7, from 0400-1200 UTC. This proved to be such an enjoyable occasion that it has been decided to make it an annual event.

The ALARA Birthday Net on 80 metres was held on July 28, with quite a good roll-call, and several luncheons and get-togethers were held to mark ALARA's 11th year of operation, notably in VK5 and VK3.

Members of ALARA participated in many activities connected with amateur radio, such as WICEN, JOTA, CW Practice, etc and there were many individual outstanding achievements.

The WIA 75th Anniversary Medallion was presented to:
Marilyn VK3DMS, Austine VK3YL, Joan VK3NLO, Barbara VK3BYK, Gwen VK3DYL (and family), Margaret VK4AOE, Jenny VK5ANW, Marlene VK5QO, Joy VK5YJ, Christine VK6ZLZ, Gill VK6YL, and Daphne Hugo.

Marlene VK5QO, received the Al Shawsmith Journalistic Award 1985, for her history of the VK5 Division of the WIA.

Jenny VK5ANW, became the first woman president of the South Australian Division of the WIA.

Helene VK7HD and Marilyn VK3DMS, were involved with the amateur radio section of the ABC program *Airwaves* broadcast early in the year.

Austine VK3YL, became a member of the WIA 50 Year Honour Roll with 56 years of membership to her credit, 55 of them as a licenced operator.

Mavis VK3KS and OM Ivor, became the first to attain the Jubilee of South Australia 150 Award on two-way CW. Mavis was also the first YL to receive the Award.

Maria VK5BMT, attained the Jubilee 150 Award on VHF

Marilyn VK3DMS, became the first VK member of the Belgian Young Ladies' Club.

Phyllis W2CLB/7 gained third place in the phone section of the YLRL YL-OM Contest.

Bev VK6DE, Christine VK6ZLZ and Gill VK6YL, operated field station during the John Moyle Field Contest.

Maria VK5BMT, assisted with the operation of VK5JSA during the Australian Grand Prix in Adelaide.

It would appear that we have not let the grass grow under our feet during 1986. Congratulations to all on your various achievements. Congratulations too, to all the girls who have achieved call signs during the past year, and to those who have upgraded.

August saw some changes in the ALARA Committee, with the retirement of Helene VK7HD (President), Valda VK3DVT (Treasurer), Marlene VK5QO (Newsletter Editor), Jessie VK3VAN (Sponsorship Secretary), and Joyce VK3VBK (Souvenir Custodian).

Helene remained on the committee as VK7 State Representative. Bron VK3DYF, took over as Newsletter Editor, with other positions being filled by Marilyn VK3DMS (President), Meg VK5AOV (replacing Marilyn as Minute Secretary), Val VK4VR (Treasurer/Souvenir Custodian), and Gwen VK3DYL (Sponsorship Secretary). Margaret VK4AOE, became Vice-President in place of Marilyn.

Sadly, one of our DX members, Hisako JJ1LQI, became a Silent Key in February 1986.

The ALARA Contest was held over 24 hours on Saturday, November 8, UTC. Hopefully we will have a report next month.

Thanks to Mavis VK3KS, for conducting CW practice after the Monday night ALARA nets. Although not too many took advantage of this opportunity, for various reasons, it was appreciated by those who did. Do not forget that during Daylight Saving Time, the Monday night net is held at 1000 UTC.

FLORENCE MCKENZIE

The following article was published in the Mount Isa newspaper The North-West Star, *Monday, September 22, 1986, and was sent to me by Steve VK4KHQ.*

Women celebrate role in the navy

SYDNEY: Australia's war-time Navy Minister Billy Hughes was remembered with wry affection yesterday as women whose skills he was loath to acknowledge celebrated their part of the Navy's 75th anniversary.

The Women's Royal Australian Naval Service (WRANS) was formed in 1941 with a corps of 14 telegraphists who performed vital Morse communications.

However, the story of their entry into the war effort is a tale of an obstinate Minister confronted by a forthright women who stood five foot nothing" and pursued vigorously the belief that "her girls" trained in Morse code could free men to fight.

Florence Violet McKenzie was an electrical engineer who ran a shop in the old Royal Arcade in Sydney, operated amateur radio, corresponded with Einstein, and was also notable for writing the Sydney County Council's first recipe book from cover to cover when electric stoves came in.

"She was a remarkable and delightful woman," remembers Jess Doyle, one of six surviving members of "Mrs Mac's" civilian wireless telegraphy school who went on to found the WRANS.

"She was Australia's first female electrical engineer — and that was in the days before women's lib," she said.

"In December 1940 she wrote to Hughes suggesting her 600 highly trained operators should be permitted to join the Navy's communications division but he refused.

"She made several train trips to try to convince Hughes but he wouldn't believe her."

In 1941, Hughes' lack of faith in the women's technical skills was overturned when a Navy communications director travelled to Sydney to test them.

"He found us highly proficient and recommended we be employed by the Navy," Mrs Doyle said.

"It was not until April that they agreed — and it was another five months before we were allowed naval uniforms."

The Morse operators worked naval watches (split shifts of four and six hours a day), in an often tense and frightening atmosphere as they passed messages to ships in combat.

Mrs McKenzie's girls also set about training a total of 23 000 men in Morse code.

"There was no hanky-panky with Mrs McKenzie, it was all work," said a wistful Mrs Doyle.

The transition into a male domain was not all smooth: others remembered the embarrassment all round as the young women lined up before Navy men on Anzac Day in 1941 for their first "medical."

Yesterday, six of the original 14 WRANS joined a congregation of around 600 people for the unveiling of a commemorative stained glass window in the Royal Australian Navy's Garden Island dockyard chapel.

Past and present Navy women from all states of Australia and as well as New Zealand took part in the ecumenical service to dedicate the window, which depicts the original dark war-time telegraphists' uniform, the white peace- time WRAN uniform and badges of office.

It was unveiled by Lady Stephen, wife of the Governor General Sir Ninian Stephen, who said it commemorated 40 years of service beginning with "the wonderful women who played a 'fighting role' in World War Two."

Mrs Doyle told the congregation it was because of Mrs McKenzie's "foresight, dedication and persistence" that the WRANS were born.

Principal Navy chaplain Ian Dempsey said the history of the WRANS was "a struggle to get started, a struggle to survive and a struggle for equality in what was traditionally a man's world."

Rear Admiral David Martin, flag officer of the Naval Support Command, said the original WRANS had "joined because they were determined to serve Australia, and they set a fine example to the men."

"The Navy accepted them somewhat grudgingly and doubtfully, came to rely on them and then paid them off when the war was over," he said.

The 2500 WRANS were demobilised in 1947 but they were "welcomed back on board" in 1951 and the women continued to serve as WRANS until June last year, when they became members of the RAN.

The absorption into the RAN is regarded with mixed feelings by some of those original servicewomen.

"It's good the girls are getting the same pay but somehow when they join up now they are competing against the men, and that special lovely feeling between the WRANS and the Navy is beginning to go," Mrs Doyle said.

"It's sad in a way but then of course it's the right thing to do — they should be part of the Navy," said Denise Johnson (nee Owen), another original WRANS member who travelled from Hawaii to take part in the service.

Mrs Johnson said the women knew nothing of Mrs McKenzie's battle with Hughes until it was almost won and she asked them if they would be willing to join a women's emergency signalling corps.

She said she did not regard Hughes as old-fashioned then as "after all we were the first of the services to open up to women."

The other surviving original WRANS are Joan Peck, Joan Cohn (nee Cade), Judy Saunders (nee Alley), and Shirley Grylls (nee Drew).

Mrs McKenzie died in 1982.

As we look toward 1987, plans are well under way for the Get Together to be held later in the year. More details will be available next month.

At the time of writing, propagation is definitely improving and it has been wonderful to talk to some of our DX friends again after such a long period.

Wishing you all a very happy and prosperous 1987.

73/33 Joy

QSP

YOU'RE NICKED, MATE . . .

Early In August 1986, Harold Crawford GM4VAN, of East Kilbride, was fined £250 after pleading guilty to a charge of fraud. Crawford admitted forming a fraudulent scheme to obtain a City and Guilds of London Institute Certificate with David Boyd, of Glasgow.

Boyd had previously sat the Radio Amateur's Examination twice and failed. Crawford took the examination on Boyd's behalf at Leith Nautical College, Edinburgh on May 13, 1986; he falsely stated that he was Boyd and forged Boyd's signature. Boyd was fined £200.

—From RSGB RadCom, November 1986

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The FXR-550 decodes facsimile transmissions such as weather maps, weather forecast, marine forecast and sea ice forecast available through public facsimile broadcasts. The FXR-550 provides outputs for monochrome or R.G.B. monitors and a dot matrix printer. **$899**

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Everything built in — including software. Nothing else to buy! RTTY, bit inversion (RTTY), ASC 11, AMTOR Mode A (ARQ), Mode B (FEC and SEL FEC), Mode CW. Any speed any shift (ASC11 and Baudot). **$729**

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SP-250 SWR/P 1.6-60 MHz	$129
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CT-300 250 MHZ Dummy Loads	$159
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TP-05X 50/144/430 MHz P Meter	$49
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Alinco EP 3030 30A	$549
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ANTENNAS

Ground Plain	$159
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3 & 4 Band Trap Dipole	$110
5 Band Vertical	$149
3 EL Tribander	$399
3 EL HF Beams	$299
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ANTENNA WIRE — MULTISTRAND HEAVY DUTY COPPER WARE — $0.75/m
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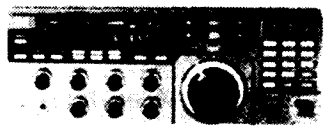
NEW GENERAL COVERAGE RECEIVER The JRCNRD525



The enthusiastic short wave listener knows all too well the excellent performance of the NRD505 and NRD515 general coverage receivers from the JAPAN RADIO COMPANY.
Building on the experience gained from the production of these outstanding receivers, JRC introduces a new model, the NRD525 combining advanced performances with the first class construction of the NRD505.

KENWOOD R-5000 COMMUNICATIONS RECEIVER

The R-5000 is a new competition grade communications receiver which incorporates every conceivable operating feature. Designed for all modes of reception (SSB, CW, AM, FM, FSK), the R-5000 covers the frequency range from 100 kHz to 30 MHz, and with the addition of the optional VC-20 VHF converter, will also cover the 108 to 174 MHz range, again with all mode reception. The R-5000 has been designed with high performance in mind, and has an excellent dynamic range, together with carefully chosen operating facilities to match today's conditions. Microprocessor control is used for main functions, including dual digital VFOs, 100 memory channels, memory scrolling, memory and programmable band scan, and many other facilities.

R-71A COMMERCIAL RECEIVER

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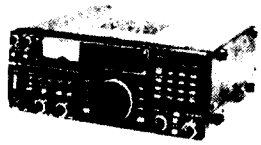

ICOM introduces the IC-R71A 100kHz to 30MHz superior-grade general coverage receiver with innovative features including keyboard frequency entry and wireless remote control (optional). This easy-to-use and versatile receiver is ideal for anyone wanting to listen in to world-wide communications. Demanding no previous shortwave receiver experience, the IC-R71A will accommodate an SWL (shortwave listener), Ham (amateur radio operator), maritime operator or commercial operator.

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FEATURES

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FEATURES

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- Modes: AM NBFM WBFM
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- Clock
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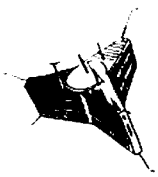

AMSAT Australia

Colin Hurst VK5HI
8 Arndell Road, Salisbury Park, SA. 5109

NATIONAL CO-ORDINATOR
Graham Ratcliff VK5AGR
INFORMATION NETS
AMSAT AUSTRALIA
Control: VK5AGR
Amateur Check-In: 0945 UTC Sunday
Bulletin Commences: 1000 UTC
Primary Frequency: 3.685 MHz
Secondary Frequency: 7.064 MHz
AMSAT SW PACIFIC
2200 UTC Saturday
14.282 MHz

Participating stations and listeners are able to obtain basic orbital data, including Keplerian elements from the AMSAT Australia Net. *This information is also included in some WIA Divisional Broadcasts.*

ACKNOWLEDGMENTS
Contributions this month are from Bob VK3ZBB, Graham VK5AGR, and AMSAT-Telemail.

The January column is always a very difficult one to prepare due to the very long lead times required. Each year I look for items that are not going to be obsolete by the time they are distributed. This time round, I have two such items. The first relates to the next series of Russian satellites. The document to hand is from the ITU and details the specifications of the respective satellites.

The second item is a short tutorial from Jim Miller G3RUH, on the PSK Telemetry format. As we are all aware, OSCAR-10 put PSK up front, and by now Fuji-OSCAR-12 would also be emanating PSK for its telemetry and the packet radio experiment.

First the item from the ITU

INTERNATIONAL TELECOMMUNICATION UNION
INTERNATIONAL FREQUENCY REGISTRATION BOARD (IFRB)

IFRB Weekly Circular/Data 1740/16.09.86
Special Section No AR11/A/320 Satellite Network: RADIO-M Responsible Administration: URS
Information received by the board on 12.06.86

The information contained in this Special Section has been received by the IFRB pursuant to RR1042 and is published in accordance with RR1044.

Any administration which is of the opinion that unacceptable interference will be caused to its existing or planned space radio-communications services will send its comments to the administration concerned, with a copy to the IFRB, within four months after the date of this publication.

EXPIRY DATE FOR THE RECEIPT OF COMMENTS: 18.01.87
The information reproduced hereunder has been arranged in the form prescribed in Appendix 4 to the Radio Regulations

INFORMATION SUPPLIED FOR ADVANCE PUBLICATION FOR THE RADIO-M SATELLITE NETWORK
General Information

In the USSR, work is in progress for the development of amateur- satellite service systems (ASSS). In particular, it is planned to launch one or two amateur satellites, designed for use by radio amateurs throughout the world and also for educational and scientific experiments.

Section B General Characteristics
Item 1 — Identity of the satellite network
RADIO-M
Item 2 — Date of bringing into use
31 December 1986
Period of validity of frequency assignments to the space station (Resolution 4, World Administrative Radio Conference, Geneva, 1979)
10 years
Item 3 — Administration or group of administrations submitting the advance information
USSR
Ministere des postes et telecommunications
7, rue Gorki
MOSKVA
MINSVIAZ, MOSKVA
Item 4 — Orbital information relating to the space station

Inclination of the orbit: 83 degrees
Period: 105 minutes
Altitude of the apogee: 1000 km
Altitude of the perigee: 1000 km
Number of satellites: 1 or 2

Section C — Characteristics of the Satellite Network in the Earth-to-Space Direction

Item 1 — Earth-to-Space service area
The whole Earth, depending on the position of the satellite in orbit and the position of the satellite orbit in relation to the Earth.

Item 2 — Class of stations and nature of service
AT, CR

Item 3 — Frequency range
Modes of operation I, II, IV:
21.120 and 21.415 MHz
transponder bandwidth — 40 kHz in one section of the range:
1. 21.260-21.300 MHz
2. 21.210-21.250 MHz
3. 21.160-21.200 MHz

Mode of operation III:
145.787-146.000 MHz
transponder bandwidth — 40 kHz in one section of the range:
1. 145.960-146.000 MHz
2. 145.910-145.950 MHz
3. 145.860-145.900 MHz

Item 4 — Power characteristic of the transmitted wave
These depend upon the design of the station available to the amateur. For good quality relay, an equivalent isotropically radiated power (EIRP) of not more than 100 watts will suffice.

Item 5 — Characteristics of the space station receiving antenna
For all modes — a halfwave dipole, gain G = 2 dB, width of radiation pattern: 80 degrees.

Item 6 — Noise temperature of the receiving space station
2000 K

Section D — Characteristics of the satellite network in the Space-to-Earth Direction

Item 1 — Space-to-Earth service area
The whole Earth, depending on the position of the satellite in orbit and the position of the satellite orbit in relation to the Earth.

Item 2 — Class of stations and nature of service
EA, CR

Item 3 — Frequency range
Modes of operation I and III:
29.360-29.500 MHz
transponder bandwidth — 40 kHz in one section of the range:
1. 29.460-29.500 MHz
2. 29.410-29.450 MHz
3. 29.360-29.400 MHz

Mode of operation II:
145.857-146.000
transponder bandwidth — 40 kHz in one section of the range:
1. 145.960-146.000 MHz
2. 145.910-145.950 MHz
3. 145.860-145.900 MHz

Mode of operation IV:
Simultaneous transmission on the bands 29.360-29.500 MHz and 145.857-146.000 MHz

On each transponder section two beacons operate in the following centre frequencies:

Modes I, III and IV:
1. 29.457 and 29.500 MHz
2. 29.407 and 29.453 MHz
3. 29.360 and 29.403 MHz

Modes II and IV:
1. 145.957 and 145.997 MHz
2. 145.907 and 145.953 MHz
3. 145.857 and 145.903 MHz

Item 4 — Power characteristics of the transmission:
Maximum spectral power density:
29.260- 29.500 MHz: -41 dBW/Hz
145.857-146.000 MHz: -39 dBW/Hz

Item 5 — Characteristics of space station transmitting antenna
For all modes, antenna gain: 1 dB
Radiation pattern: omnidirectional
Polarisation: linear

Item 6 — Characteristics of receiving earth stations
These depend on the facilities available to amateurs. It will suffice to have a receiving antenna with a gain of 1 to 2 dB and a receiving system with an equivalent noise temperature of 1 000 K to 1 5 000 K.

Now the short tutorial from Jim G3RUH, in which he gives some of his design reasonings on his soon to be released Packet Radio PSK Demodulator for Fuji-OSCAR-12. Although very brief it may give a better appreciation of what PSK (Phase Shift Keying) is about.

PSK — THE THEORY
PSK DEMODULATOR. Demodulating a Phase modulated signal calls (in principle) for two things; a phase reference signal, and a phase detector where the input signal is compared with that reference.

Sometimes the implementation of these requirements lead to a circuit in which it is hard to spot that they are separate requirements — but they are.

PHASE REFERENCE. This has to be extracted from the input signal, and is usually called "carrier recovery." There are two common circuits which do this, the "Costos Loop" and the "Squaring Loop" there are also hybrids. For practical purposes their performance is the same.

PHASE DETECTOR. Its function is to compare the local recovered carrier phase with the incoming signal phase, and output some measure of their difference. There are quite a number of ways of implementing this function, and the choice has to be based on diverse criteria on the one hand, and say economy on the other.

Three typical kinds can be instanced, in descending order of circuit complexity; the analogue multiplier, the modulus or commutator, and the digital EXOR gate. The spread in signal processing performance of these is about 2 dB; in complexity as much as 10:1.

FO-12 MODE JD DOWNLINK LIKELY SNR. Assume the following. Satellite TX power 1 watt EIRP, range 4600 km, f=435 MHz, RX antenna gain 18 dB, RX noise temperature 1000 K, RX bandwidth 2400 Hz.

These figures give a probable received SNR of 24.3 dB. For the satellite overhead (R=1500 km), the SNR rises to 34 dB there will be fluctuations due to tumbling.

REQUIRED SNR BASED ON BIT ERROR RATE. Assume packets of 1000 bits, and repeats of 1 in 10 packets. Then the Bit Error Rate needs to be no worse than 1 in 10000. This requires a theoretical E/No (energy/bit to Noise power/Hz) of 9 dB.

Allow 3 dB decoding loss (no receiver/decoder is ever perfect), this E/No need rises to 12 dB, or 16:1. Given the bit rate of 1200 bits/sec, and a RX bandwidth of 2400 Hz (say), the channel SNR

OSCAR-10 APOGEES — JANUARY 1987

			SATELLITE				BEAM HEADINGS				
			APOGEE CO-ORDINATES			SYDNEY	ADELAIDE		PERTH	
DATE	OAY NO	ORBIT NO	UTC HHMM:SS	LAT DEG	LON DEO	AZ DEO	EL DEO	AZ DEG	EL DEG	AZ DEG	EL DEG
1	1	2671	0651:14	-4	167	62	33	71	23	86	4
2	2	2673	0610:14	-4	157	69	26	78	15		
3	3	2675	0529:17	-3	148	76	18	83	7		
	3	2676	1708:48	-3	323					273	2
4	4	2677	0448:20	-3	139	82	10	89	-1		
	4	2678	1627:51	-3	314					278	10
5	5	2679	0407:22	-3	129	87	2				
	5	2680	1546:53	-3	305			271	-1	284	18
6	6	2682	1505:56	-3	295			277	8	290	26
7	7	2684	1424:59	-3	286	275	4	283	14	298	34
8	8	2686	1344:01	-3	277	280	11	289	22	307	41
9	9	2688	1303:04	-3	267	287	19	297	29	319	48
10	10	2690	1222:06	-3	258	293	27	305	36	334	53
11	11	2692	1141:09	-2	248	302	34	316	43	351	55
12	12	2694	1100:11	-2	239	312	41	329	48	10	55
13	13	2696	1019:14	-2	230	324	47	345	51	27	52
14	14	2698	0938:17	-2	220	339	51	2	52	42	47
15	15	2700	0857:19	-2	211	356	53	19	50	53	40
16	16	2702	0816:22	-2	202	13	52	34	46	62	33
17	17	2704	0735:24	-2	192	29	49	46	41	69	25
18	18	2706	0654:27	-2	183	42	43	56	34	75	17
19	19	2708	0613:29	-2	174	53	37	64	27	81	9
20	20	2710	0532:32	-1	164	62	30	71	19	86	0
21	21	2712	0451:35	-1	155	69	22	77	11		
22	22	2714	0410:37	-1	145	75	14	83	3		
	22	2715	1550:08	-1	321					276	3
23	23	2716	0329:40	-1	136	81	6				
	23	2717	1509:11	-1	311					282	11
24	24	2718	0248:42	-1	127	86	-2				
	24	2719	1428:14	-1	302			275	-1	287	19
25	25	2721	1347:14	-1	293			280	7	294	27
26	28	2723	1306:18	-1	283	278	4	286	15	302	34
27	27	2725	1225:19	-1	274	284	12	293	22	312	41
28	28	2727	1144:21	-0	265	290	20	301	30	324	47
29	29	2729	1103:24	-0	255	298	27	310	36	339	51
30	30	2731	1022:26	-0	246	306	34	321	42	357	53
31	31	2733	0941:29	-0	237	317	41	335	47	14	52

SATELLITE ACTIVITY FOR THE MONTH OF SEPTEMBER 1986

1. LAUNCHES

The following launching announcements have been received:

INTL NO — 1986	SATELLITE	DATE	NATION	PERIOD min	APG km	PRG km	INCL deg
066A	Cosmos 1775	Sep 03	USSR	90.4	405	216	70.3
067A	Cosmos 1776	Sep 03	USSR	94.5	521	478	74.0
068A	Molniya 1-68	Sep 05	USSR	12h15m	40558	645	63.0
069A	USA-19	Sep 05	USA				
070A	Cosmos 1777	Sep 10	USSR	100.6	819	781	74.0
071A	Cosmos 1778	Sep 16	USSR	11hr15m	19123	19123	64.8
071B	Cosmos 1779	Sep 16	USSR	11hr15m	19123	19123	64.8
071C	Cosmos 1780	Sep 16	USSR	11hr15m	19123	19123	64.8
072A	Cosmos 1761	Sep 17	USSR	90.4	405	217	70.4
073A	NOAA 10	Sep 17	USA	101.2	826	808	98.8

2. RETURNS

During the month 39 objects decayed including the following satellites:

1962-071A	Transit-5A	Sep 25
1986-053A	Cosmos 1764	Sep 11
1986-063A	Cosmos 1772	Sep 03
1986-066A	Cosmos 1775	Sep 17

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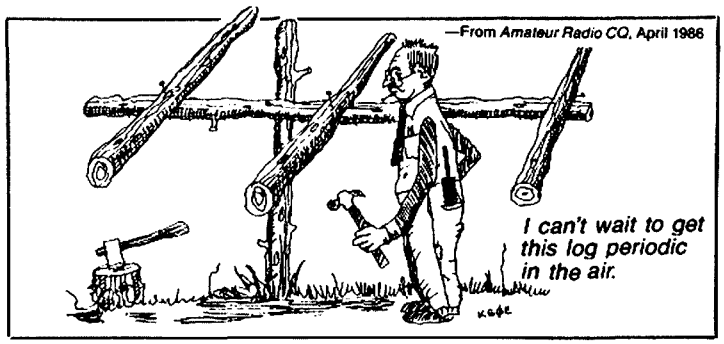

—From *Amateur Radio CQ*, April 1986

needs to be better than 16*1200/2400=8:1 in power (3:1 in voltage), ie a minimum of 9 dB.

THE PRACTICE

For my JAS-1/FO-12 modem design I had to choose 1. a carrier recovery circuit, and 2. a phase detector.

The Carrier Recovery Circuit had to be simple, robust and repeatable. I saw no need for analogue processing here — a digital squaring loop is simple and adequate, and caters automatically for a wide range of input signal levels.

I tried out several circuits for the squarer; the simplest consisting of an RC network and an EXOR gate. It worked beautifully — but was just not repeatable. In the end I returned to my AO-10 design based on 1/4 cycle delay line — tried, trusty, robust.

In choosing the Phase Detector, I looked at the signal-to-noise expectations for this application, A minimum received SNR of 9 dB is needed (see above). Yet, the likely received SNR was going to be +15 dB up on this, rising +10 dB more as the satellite approached, less any tumbling effects.

Weighing this up I came to the conclusion that for practical purposes the satellite signal would appear to be pretty well noiseless most of the time for a modestly equipped station.

Was there any point therefore, in trying to drag the last couple of dB out of the ether, I felt not — hence the choice of a simple EXOR gate phase detector.

—de Colin VK5HI

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Awards

Ken Hall VK5AKH
FEDERAL AWARDS MANAGER
St George's Rectory, Alberton, SA. 5014

AWARDS ISSUED RECENTLY

WAVKCA

1505 Thomas Berezowski JE2ZXX
1506 Jiro Anzai JA8IYI
1507 Toruo Sato JA7COE

YASME AWARD

Here is a list of eligible calls, correct at May 16, 1986. It is necessary to work 30 call signs for the Award.

3C0AN
3C1EG
3D2KG
3D6QL
4T4WCY
4W1WY
5L2KG
5T5KG
5V1KG
5V4MY
6L6MY /Qatar
6T1YP — Marty
6W8CD
7P8KG
8P6QL
9G1KG
9J2LC
9K2QL
9L1KG
9M1OAT
9Y4KG
AA5LES
AC0MLY
AJ3AA
AX2HD
C21MI*
CN8HF
CR1OAB
CT2YA
CT3AU
CT3BZ
CT9AT
DL4ZB
DL4ZBD
DL4ZC
EA8CR
FA8JD
FG0FOK
FG0FOL /FS
FK0KG
FL8MY
FW0FOL
FO0DCW
KL7KG
FO0XX
FO0XX /MM
FO8AN
FW8DW
FY0FOL
G2DC
G5ACI /AA
G7DM /MM
GC5ACH /W6KG
GC5ACI /WB6QEP
GD5ACH /W6KG
GD5ACI /WB6QEP
OH2BH /ZD3X
OJ0DX — Marty
OJ0MR — Marty
PJ8KG
SV1GA /A
TI9RC — W0MLY
TU2CA
TY2KG
TY2MY
VK2EO
VK2HD
VK9TM
VP1KG
VP2ARS
VP2AY
VP2DM
VP2EEQ
VP2GDW
HC2VB
HC8VB
HI6XQL
HI8XAL
HK0AA — Danny
HK3NBB
HR0QL
HS1ABD
HS3AL
HS5ABD
HZ1AB**
HZ1MY
J2AHI
J2ODU
J2USA
J3ABV
J6LOO
J7DBB
JA1KSO
JA2KG
JA2US
JY8KG
K2CC
K3ZO
K3ZO /KH3
K4BVD
K4KCV
K4WAB
K5JLQ
K5RC
K6ALH
K6AN
K6WAP
K7JDG
K7JG
KC6SZ
KE6ITU
KG4KG
KG6SZ
KG6SZ /KC6
KL7DTB
KL7JDG
KL7USA
KM6ALH
KV4AA
KZ5WD
LU5HFI
W6KB
W6SF
W7MG
OH0AM
OH0M
OH2AM /OH0
OH2BH
W6BSY
W6WS /KG6
W6DOD
W6GN
W6IPF
W6KFD
W6KG
W6KG /4X
W6KG /A4
W6KG /A7
W6KG /AJ3
W6KG /CE0
W6KG /CP6
W6KG /HC8
W6KG /KH0
W6KG /KG6
W6KG /PZ1
W6KG /SV5
VP2KAH
VP2KF
VP2KFA
VP2LW
VP2MAQ
VP2MX
VP2SAX
VP2SW
VP2VB
VP2VDJ
VP4DM
VP5VB
VP7VB
VQ6MY
VR1B
VR1Z
VR2EO
VR4AA
VR8B
W0MLY
W0MLY /TJ8
W0MLY /TL8
W0MLY /TN8
W0MLY /TR8
W0MLY /TT8
W0MLY /TZ2
W2USA
W4KE
W4DVL
W4QDZ
W4TO
W4ZEW
W5OGJ
W5NC
W6AHI
W6AM
W6ANS
W6KG /SV9
W6KG /TI5
W6KG /ZS
W6LDD
W6LY
W6OAT
W6QL
W6QL /6Y5
W6QL /8R1
W6QL /CE0
W6QL /HC1
W6QL /HK3
W6QL /PJ2
W6QL /SV5
W6QL /VP2A
W6QL /Z2
W6QL /ZP5
W6RGG
W7JFG
W7KG
W7YA
W8EWS
W9AC
W9SZR
WA5LES
WA6DFR
WA7MIN
WW6ITU
XE2FU
YJ8KG
YV0AB
ZB2AX
ZD3I
ZF2CI
ZK1BY
ZM6AW
ZS3/ W6QL

* 3/1/76 through 3/25/76
**2/19/83 through 2/20/83

The YASME Award Custodian is:
Dick McKercher W0MLY

ORARI AWARDS PROGRAM

Organisasi Amatir Radio Indonesia (ORARI) has pleasure in announcing a new awards program.

1. The *Jakarta Award* (JA/SWL-JA), for confirmed contacts with, or having heard from, licenced amateurs in Jakarta (0 call area only), the capital of the Republic of Indonesia.
2. *Worked All Indonesia Award* (WAIA/SWL-WAIA), for confirmed contacts with, or having heard from, licensed amateurs in each of the Indonesia call areas.
3. *Worked The Equator Award* (WTEA/SWL-WTEA), for confirmed contacts with, or having heard from, licensed amateurs in countries along the Equator.
4. The *Danau Toba Award* (DT/SWL-DT), for confirmed contact with, or having heard from, licensed amateurs in the Province of North Sumatra, Indonesia (6 Call Area).
5. The *Borobudur Award* (BA/SWL-BA), for confirmed contact with, or having heard from, licensed amateurs on the Central Part of Java, Indonesia (2 Call Area which includes the Provinces of Central Java and Yogyakarta).

GENERAL RULES

ORARI Awards will be issued to licensed amateurs for two-way SSB, CW, RTTY, Mixed or Single Mode, Mixed or Single Band in the 80, 40, 20, 15 and 10 metre bands only. The SWL Awards in the same category will also be available. The applicant may request endorsement for such distinction accordingly.

To be valid, all contacts or listening must be made on or after July 9, 1968.

Claims must be accompanied by a QSL Card List (GCR) furnished with the call signs of stations worked, dates, bands and modes of contacts meeting the requirements of the award concerned. Rules and requirements will be specified, when required, in each of the award programs.

The QSL Card List must be accompanied by a statement from the applicant's national society, club station, or from any two amateurs other than the applicant, that the QSL Card of the contact listed is in the possession of the applicant, and that the items of the cards are correctly listed.

A fee of US$8 or 16 IRCs will be charged per award and should be sent along with the application to the respective award manager.

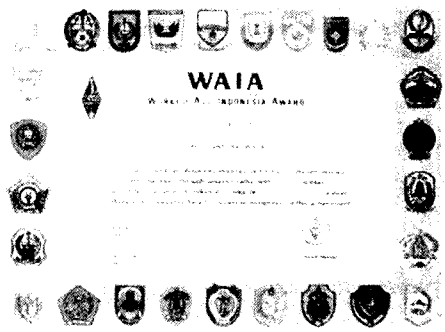
Only contacts with land stations within the same country will be acceptable.

JAKARTA AWARDS (JA/SWL-JA)

DX stations need confirmed contacts with, or having heard from, a total of 20 stations including at least one Jakarta Club Station.

Send log extract (GCR) in alphabetical order by prefix along with the awards fee to the Award Manager, M S Lumban Gaol YB0WR, PO Box 96, Jakarta 10002, Indonesia.

Club stations in the 0 call area are:
YB0s — ZAA, ZAB, ZAD, ZAE, ZAF, ZBA, ABB, ZCA, ZCB, ZCD, ZCE, ZDB, ZDC, ZDD, ZDE, ZDG, ZEA, ZEE, ZZ.



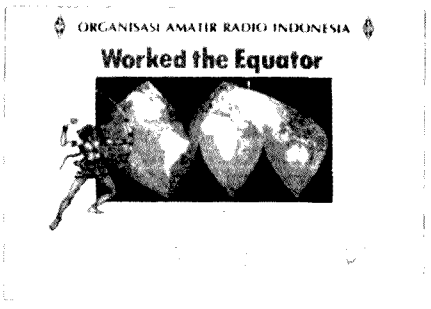
WORKED ALL INDONESIA AWARD (WAIA/SWL-WAIA)

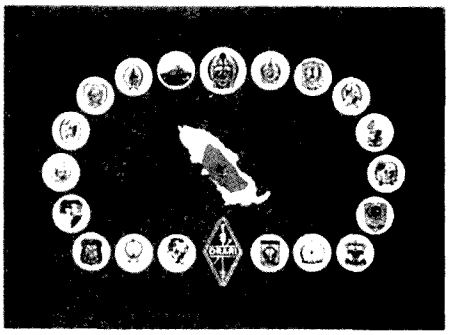
DX stations other than those in CQ Zone 28 need confirmed contacts with, or having heard from, two stations from each area; a total of 20 QSL Cards.

Send log extracts (GCR), in alphabetical order of prefix, a total of 30 QSL Cards together with award fee, to the Award Manager, M Maruto YB0TK, PO Box 96, Jakarta, 10002, Indonesia.

WORKED THE EQUATOR AWARD (WTEA/SWL-WTEA)

Is issued for confirmed contacts with, or having heard from, countries according to the ARRL DXCC country list along the Equator as follows:
C2, HC, HC8, HK, KH1 & KB6, PR-PY, PY0 (St Peter), S9 (Sao Tome), T30, T31, T32, TN, TR, YB5, YB7, YB8, 5X, 5Z, 6O, 8Q, 9Q.





The WTEA/SWL-WTEA is issued in three classes:

i For confirmed contacts with, or having heard from, 15 countries.
ii For confirmed contacts with, or having heard from, 12 countries.
iii For confirmed contacts with, or having heard from, eight countries.

For all Classes, contact with or having heard from YB5, YB7, and YB8 is obligatory.
Send log extracts (GCR), in alphabetical order by prefix along with the award fee to the Award Manager, Ban 'S Samsu YB0EBS, PO Box 96, Jakarta, 10002, Indonesia.

DANAU TOBA AWARD (DT/SWL-DT)
DX stations need confirmed contact with, or having heard from, a total of 10 stations in the Province of North Sumatra including at least one North Sumatra Club Station.

Send log extract (GCR), in alphabetical order by prefix along with the award fee to the Award Manager, H Jans Fauzy YB6MF, PO Box 232, Medan, North Sumatra, Indonesia.

Club stations are as follows:
YB6s — ZAA, ZAB, ZAC, ZAD, ZAE, ZAF, ZAG, ZAH, ZAI, ZAJ, ZES, ZZ.

BOROBUDUR AWARD (BA/SWL-BA)
DX stations need confirmed contact with, or having heard from, a total of 25 stations in the 2 Call Area.

Send log extract (GCR), in alphabetical order by prefix along with the award fee to the Award Manager, Timmy Dhanuwijaya YB2BGZ, PO Box 88, Semarang, Indonesia.

AWARD NOTES
When applying for an award, courtesy demands that you observe the following:
Print your name, call sign and address.
Clearly state what award and endorsements you are applying for.
Send the application to the respective award manager according to the award claimed and enclose the award fee (in money order or IRCs) as requested. Personal cheques are not accepted.
ORARI stresses the honour of fair play and sportsmanship of the applicant working towards these awards. Use of poor ethics will result in permanent disqualification.

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JUST DREAMING

Bob Colsell
7 Marlin Close, Emerald Beach, Qld. 2456

Most people are aware nowadays of the close parallel between computer memories and human brains. Although a type of circulating delay-line memory exists along some of the connections between different parts of the brain, biological studies have shown that the human memory is largely digital in concept. The number of neurons, or binary bits, has been estimated at 10 to the power of 17. Even if the popular estimate of only using about 15 percent of one's brain were true, we still appear to have some numerical advantage over even the mightiest electronic computers, say about a billion times — an American billion, that is. So why can't I remember peoples names when I want to introduce them?

Many years ago, when I was only middle-aged, I remember a very interesting discussion with one of my fellow programmers on this subject. We were, at the time, involved with the new-fangled linked index files (that will tell you how long ago it was!), and we decided that the problem had two facets.

One was the fact that the pulse handling process of the brain was electro- chemical involving osmosis. Not only was the transfer rate slow by electronic standards, but also it seemed probable that the memory cells would suffer from a slow leakage unless periodically refreshed. Thus it is easy for us to recall a frequently used telephone number, whereas a number not used for some time may be hard to remember.

The other factor could be the method of addressing the memory cells. It seemed likely that, with the enormous number of cells available, there was considerable redundancy. A telephone number for example, was held in many places each with a different address; that is to say, it could be accessed from different stimuli. It might be associated with the person's name, with the sound of the number when spoken, with the sight of the number when written down, even with the physical act of dialling it, and no doubt, with many other things. This seemed to explain how sometimes I could not recall a particular number, so picked up the phone and dialed inquiries — and promptly dialled the wanted number correctly! It also explains how an item suddenly comes to mind hours after it is wanted. The 'background' part of the brain (or sub-conscious, if you wish) discovered a new address that had not been used when you were trying desperately to remember the item via a normal stimuli.

Now let us consider dreams. It has been established that there are two types of sleep. One is the normal restful type of sleep of which almost all people require between seven and eight hours in every 24. But, cunning devices attached to sleepers show that there is another type of sleep during which there is rapid eye movement (REM). During this period (usually several minutes) an electro-encephalogram shows violent waveforms instead of the peaceful alpha rhythms. Most people have four or five such REM periods per night. If the subjects were woken up during a REM period they said they had been dreaming. But if woken during a peaceful period they had no knowledge of any dreams even though the EEG showed that they had had several REM periods during the night. The conclusion seems inescapable that the REM periods are when we dream and that our dreams may last several minutes.

During this experiment, they also kept some of the subjects without any sleep at all for extended periods. The absolute limit appeared to be about a week, but after some 48 hours the subjects became irritable and aggressive. Can't say I blame them! But the really interesting thing was that, when they deprived them of REM sleep only (by waking them up as soon as the instruments indicated REM then letting them back to sleep again) they showed exactly the same reactions as if they had had no sleep at all. Even though they had enjoyed their full ration of normal sleep. So, clearly dreams are necessary. But why?

Well, from now on I can refer to no previous experiments but only offer suggestions and possibilities. I recall many years ago reading a book called *An Experiment in Time* by J W Dunne (or was it Donne). Anyway, he persuaded a group of people to keep a note book and pencil under their pillow and to write down furiously as soon as they woke up all they could remember about their dreams. Then a week or so later, to scan the book looking for events before and after the date of the dream. His rather fanciful idea was, that during sleep, the mind wandered in time both past and future. The conclusions he arrived at were somewhat specious being heavily oriented to what he wanted to believe. The book was written a long time ago and was insignificant except for one point.

In one of his 'explanations' he pointed out how the brain can misinterpret an experience or an effect. One example he gave was a dream that somebody was throwing lighted cigarette-ends at him. What had actually happened a few days previously was that he had poked a log on the fire and it threw out a shower of sparks. This concept has enabled me to 'interpret' almost all the dreams I have nowadays and to relate them to isolated and disconnected incidents in the recent past. Sometimes three or four such incidents are included in one dream. Being unrelated, they make up a typical weird dream story. The brain seems to be doing its best to relate them in some way so as to make some sort of sensible story. But why?

Well, with all the mass of data presented to the brain every day it would not be unexpected for the occasional error to creep in. I wonder if some items of data have not got a proper address? Maybe the brain is taking all these loose ends and trying to hook them in somewhere and generally tidy things up. What computer disc pundits would call 'house-keeping.' It seems possible, doesn't it?

Or am I just dreaming?

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Education Notes

Brenda Edmonds VK3KT
FEDERAL EDUCATION OFFICER
56 Baden Powell Drive, Frankston, Vic. 3199

This month's Education column presents a sample theory examination paper for NAOCP candidates. Select the correct or most appropriate alternative and check against the answers at the end of the paper.

1 An electric current consists of a flow of:
a. protons.
b. electrons.
c. atoms.
d. neutrons.

2 The filter in a power supply serves to:
a. *reduce the ripple frequency.*
b. convert the AC into pulsed DC.
c. provide a constant load.
d. reduce the ripple amplitude.

3 Rapid fading of long distance HF signals may occur because of:
a. changes in sunspot numbers.
b. weather variations around the transmitter.
c. temperature variations in the upper atmosphere.
d. signals travelling different paths and arriving out of phase.

4 In comparison with a single conversion receiver, a double conversion receiver has:
a. better image rejection.
b. better CW reception.
c. greater bandwidth.
d. fewer IFs.

5 The inductive reactance of a coil depends on the:
a. conductivity of the wire.
b. voltage applied.
c. frequency applied.
d. current flowing in it.

6 A quarter-wave vertical antenna has:
a. a voltage maximum at the tip.
b. higher input impedance than a dipole.
c. high gain.
d. a voltage maximum at the feed-point.

7 The operating frequency of a VFO is varied by altering the:
a. feedback voltage or current.
b. series resistor.
c. capacitance or inductance of the circuit.
d. capacitance across the crystal.

8 'Key clicks':
a. are caused by dirty key contacts.
b. occur only when the oscillator stage is keyed.
c. may be cured by using a keying relay.
d. occur due to the sharp make and break of unfiltered keying.

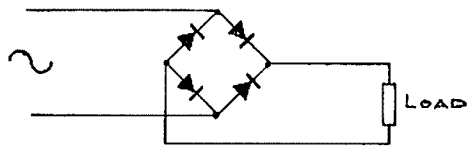
9 The power in each sideband of a 100 percent modulated AM signal is equal to:
a. the power in the carrier.
b. 50 percent of the power in the carrier.
c. 25 percent of the power in the carrier.
d. 10 percent of the power in the carrier.

10 A correctly operated novice transmitter causes severe interference to one television set in close proximity but not to others. The problem is probably due to:
a. harmonic radiation.
b. front end overload of the television set.
c. cross-modulation with a nearby broadcast station.
d. radiation of parasitics.

11 The IF filter stage in an SSB transceiver:
a. *prevents radiation of harmonics.*
b. removes one sideband.
c. regulates the power supply.
d. suppresses the carrier.

12 'Splatter' occurs when:
a. the oscillator frequency changes during transmission.
b. two SSB signals are separated by less than 3 kHz.
c. a transmitter is modulated in excess of 100 percent.
d. a receiver cannot reject an unwanted image frequency.

13 If the maximum load current is 1.5 amps, the current rating of each diode should be no less than:



a. 1.0A.
b. 2.0A.
c. 0.5A.
d. 0.15A.

14 The detector stage of an AM receiver:
a. separates the audio modulating frequency from an RF signal.
b. requires positive feedback to maintain operation.
c. reinserts the original carrier frequency.
d. may consist of back to back diodes.

15 To raise the strength of a received signal by 6 dB, the output power of the transmitter would need to be:
a. doubled.
b. tripled.
c. quadrupled.
d. multiplied by six.

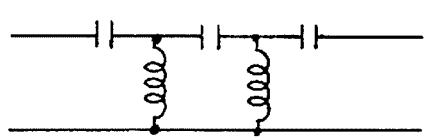
16 The parasitic elements of a Yagi antenna:
a. *increase the angle of radiation.*
b. increase the gain.
c. are most effective when spaced at half wavelengths.
d. are usually longer than the driven elements.

17 In a thermionic vacuum tube, the HT voltage is applied to the:
a. *filament.*
b. cathode.
c. control grid.
d. anode.

18 The SWR of a transmission line:
a. depends on its impedance.
b. is a measure of the power dissipation in the line.
c. is the ratio of the maximum to minimum current in the line.
d. depends on the power output of the transmitter.

19 A class C amplifier could be used as:
a. the final stage of an SSB transmitter.
b. an audio amplifier stage in a receiver.
c. a microphone preamplifier.
d. the power amplifier for a CW transmitter.

20 This device could be used:



a. at the output of a novice transmitter to prevent radiation of harmonics.
b. at the antenna input of a television receiver to reduce amateur TVI.
c. in the earth lead of a television receiver to prevent power line interference.
d. at the input of a novice receiver to reduce cross-modulation.

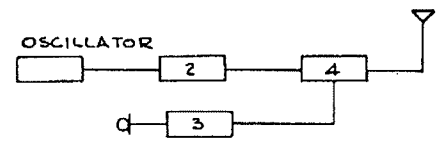
21 A silicon diode will conduct when:
a. the anode potential is more than 0.6 volt positive to the cathode.
b. the N material is more than 0.2 volt positive to the P type.
c. the PIV rating is reached.
d. subjected to heat.

22 The impedance of a transmission line depends on:
a. its length.
b. the diameter and spacing of its conductors.
c. the frequency applied.
d. the resonant frequency of the antenna being fed.

23 The quality of a CW transmission can be checked by:
a. monitoring the power at the transmitter output.
b. watching the swing of the S meter needle.
c. listening on a simple diode detector receiver.
d. monitoring the wave envelope on a CRO.

24 When tuning the output circuit of a transmitter, the direct current reading dips because:
a. the drive to the final stage is reduced.
b. the final amplifier goes into current limiting.
c. the output circuit impedance is maximum at resonance.
d. the HT voltage to the output stage drops.

25 The function of stage two in this simple AM transmitter is to:



a. prevent changes in the load from affecting the oscillator frequency.
b. prevent radiation of parasitics.
c. amplify AF.
d. mix the RF and AF signals.

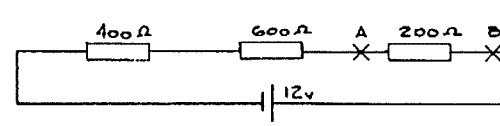
26 A zener diode voltage regulator provides a:
a. constant resistance network.
b. steady current regardless of forward bias.
c. constant voltage drop when the reverse bias exceeds a specified value.
d. secondary function as an AC rectifier.

27 The D layer of the ionosphere:
a. is most intense at night.
b. is an efficient reflector of high frequencies.
c. is present only at the peak of the sunspot cycle.
d. absorbs the high frequencies.

28 The mixer stage in an SSB transmitter:
a. converts the signal to the desired output frequency.
b. converts AF to RF.
c. combines the two sidebands so that either can be selected.
d. removes the unwanted sideband.

29 A 'balanced' transmission line has:
a. one conductor earthed.
b. no standing waves.
c. an impedance equal to the output impedance of the transmitter.
d. both conductors at the same potential relative to earth.

30 The potential difference between points A and B is:



a. 12 volts.
b. 6 volts.
c. 4 volts.
d. 2 volts.

31 In an NPN transistor, the P type material is the:
a. *base.*
b. *source.*
c. *emitter.*
d. *collector.*

32 Percentage modulation of an AM signal can be measured by:
a. *displaying the wave envelope on a calibrated CRO.*
b. *inserting an RF power meter in the antenna lead.*
c. *listening on a monitor receiver.*
d. *calculation from the current flowing in the final amplifier.*

33 Ground propagation at HF:
a. *improves at higher frequencies.*
b. *varies with the conductivity of the ground surface.*
c. *is more effective by day than by night.*
d. *is more effective using vertically polarised signals than horizontally polarised signals.*

34 In a varicap diode, the depletion layer:
a. *width increases as the device temperature rises.*
b. *is decreased when the reverse bias is increased.*
c. *acts as a capacitor dielectric when the diode is reverse biased.*
d. *acts as a capacitor when the diode is conducting.*

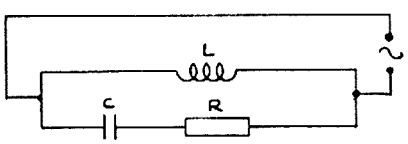
35 A broadcast receiver is likely to be suffering cross- modulation interference when:
a. *a weak unwanted signal is on the same frequency as the desired signal.*
b. *a strong unwanted signal is superimposed on a weak wanted signal.*
c. *the image frequency of a broadcast station falls within the broadcast band.*
d. *the interfering signal is heard at approximately 15 kHz intervals across the band.*

36 The local oscillator frequency in a superheterodyne receiver is set so that:
a. *the sum of it and the wanted signal frequency equals the IF.*
b. *the difference between it and the wanted signal frequency equals the IF.*
c. *it is twice the IF.*
d. *it is usually below the wanted signal frequency.*

37 A vertically polarised radio wave:
a. *has a vertical magnetic field.*
b. *can only be received on a vertical antenna.*
c. *is radiated from a vertical antenna.*
d. *will be less prone to interference.*

38 Radiation of harmonics from a novice transmitter could be reduced by:
a. *minimising stray capacitance and inductance in RF circuits.*
b. *using a more directional antenna.*
c. *changing to open wire transmission line.*
d. *connecting a low pass filter at the transmitter output.*

39 The impedance of this circuit will:



a. *be maximum at the resonant frequency.*
b. *depend only on the values of L and C.*
c. *be zero when $X_L = X_C$.*
d. *be minimum at the resonant frequency.*

40 A test instrument containing a moving coil meter together with a source of DC energy is used to measure:
a. *AC voltage.*
b. *RF voltage.*
c. *resistance.*
d. *reactance.*

41 The ability of a receiver to separate signals on closely adjoining frequencies is known as:
a. *dynamic range.*
b. *stability.*
c. *sensitivity.*
d. *selectivity.*

42 For safety reasons a mains powered amateur transmitter should be wired so that the:
a. *fuse is in the neutral lead.*
b. *fuse is in the earth lead.*
c. *power switch is in the active lead.*
d. *chassis is connected to the neutral lead.*

43 To enable an AM receiver to also receive CW it is necessary to add a:
a. *BFO.*
b. *linear amplifier.*
c. *diode detector.*
d. *second IF stage.*

44 The arrow in this JFET symbol indicates:

a. *that it is an N channel type.*
b. *the direction of electron flow.*
c. *the emitter.*
d. *the base.*

45 The DC input power to a transistor final amplifier stage can be calculated from:
a. *supply voltage and β of the transistor.*
b. *emitter current and base voltage.*
c. *base current and base voltage.*
d. *supply voltage and collector current.*

46 A novice station operating on 21.150 MHz causes harmonic interference on only one television channel which is most likely to be:
a. *channel 0 (45-52 MHz).*
b. *channel 2 (63-70 MHz).*
c. *channel 4 (94-101 MHz).*
d. *channel 6 (174-181 MHz).*

47 An electrolytic capacitor differs from a normal capacitor in that it:
a. *must be connected so that correct polarities are observed.*
b. *has a mica dielectric.*
c. *is most useful at RF*
d. *has a time constant of zero.*

48 A mains voltage of 240 volts RMS will have a peak-to-peak voltage of about:
a. *170 volts.*
b. *340 volts.*
c. *480 volts.*
d. *680 volts.*

49 An EMF is induced in a conductor when the magnetic field around it:
a. *has a high value.*
b. *is parallel to it.*
c. *changes.*
d. *is at right angles to it.*

50 The domestic mains power in most of Australia is usually:
a. *220 volts AC, 25 Hz.*
b. *240 volts AC, 50 Hz.*
c. *110 volts AC, 60 Hz.*
d. *240 volts DC.*

ANSWERS TO NAOCP TRIAL EXAMINATION PAPER

1 — b	11 — b	21 — b	31 — a	41 — d
2 — d	12 — c	22 — b	32 — a	42 — c
3 — d	13 — b	23 — d	33 — b	43 — a
4 — a	14 — a	24 — c	34 — c	44 — d
5 — c	15 — c	25 — a	35 — b	45 — d
6 — a	16 — b	26 — c	36 — b	46 — b
7 — c	17 — d	27 — d	37 — c	47 — a
8 — d	18 — c	28 — a	38 — d	48 — b
9 — c	19 — d	29 — d	39 — a	49 — c
10 — b	20 — b	30 — d	40 — c	50 — b

BEACONS

A reminder that the *Beacon Policy Paper* is in course of preparation and will be presented to the 1987 Federal Convention. To date, member input has been limited.

If you have an interest in beacons, why not spend the holiday period putting your thoughts on paper and sending it to: FTAC, PO Box 300, Caulfield South, Vic. 3162.

The framework of the paper is being prepared by Ron VK1RH.

—Contributed by Tim Mills VK2ZTM

Thumbnail Sketches

Alan Shawsmith VK4SS
35 Whynot Street, West End, Qld. 4101

VINCE JEFFS VK4VJ — AOCP Brisbane 1931

The rather premature death of this talented and erudite amateur in 1970, at the age of 58-years, was very much the WIA's loss. He was a dedicated member, involved in almost every facet of the Institute's affairs. A regular lecturer at classes, he imparted his considerable technical knowledge to students, especially in the then new theory of transistors, SSB and five metre activity; and being a capable code operator, he instructed in Morse.

VK4VJ first began operating from Taringa, Brisbane, conducting several successful five metre and 200 metre tests from this QTH. His endless efforts included many home-brewing projects — one being an exact duplication of the then modern *Racal* amateur band receiver, a masterpiece.

Radio work occupied almost his whole life. First employed by Motor Traders (generator rewind section), Vince then moved to Crammond Radio, North Quay, Brisbane (design and service) during WWII. Finally, he set up his own shop, *Jeffs Radio* in the Valley and remained there until he became too ill to work.

Vince's interest in Field Days (HF and VHF), Scouting and Conventions never flagged. For a time he operated and managed the WIA official station, VK4WI. It is gratifying to know that before he became a Silent Key the Institute recognised his tireless efforts and talents by bestowing Life Membership upon him (1970).

Mark Anthony's eulogy to Brutus fits Vince VK4VJ, very well: "His life was gentle and all the virtues so put together in him that nature might stand up and say to all the world, 'This was a man!'"

TECHNICAL MAILBOX

PREVENTATIVE & FIRST-IN MAINTENANCE

VK5 . . . Glenelg, SA

What preventative maintenance can be carried out on amateur station equipment?

Judging from most shacks I know Ken, the first step would be the use of a broom and vacuum cleaner! In some cases, the hiring of a large trailer and several trips to the local dump would be a prior step!

Well Ken, I covered in November's AR, replacing final PA tubes in transceivers. Here we will have a look at the transceiver.

Many adopt the viewpoint that while something is running okay, then do not touch it as preventative maintenance may cause more faults than it prevents.

It is a little like going to the dentist. Miss for some time and the resulting fix will be both painful and expensive.

Any equipment that uses forced air cooling just has to be looked after. This covers the usual tube and some solid-state PAs as well as linear amplifiers.

Heat, fans and high voltage *are* a sure *fire* combination for failures. High voltage electrostatically attracts dust. Fans suck in more dust. Moisture plus dust enters the fan bearings as well as accumulating on the blades. The fan slows and the motor heats. Tubes get hotter and the tube dissipation increases further. Dust arcs over. Problems!

Leaving your AR on top of the ventilation inlets/outlets, or placing rigs in a position close to the wall, restricting air flow, should be avoided. Similarly, sitting a rig on soft foam also will reduce ventilation.

Nowadays, with the rigs becoming smaller and output powers increasing, the heat generated must be radiated somewhere. Hence, the heat sinks and fans. Preventing their efficient operation by restricting air flow must be avoided.

It is beyond most amateurs' capability to maintain a rig to the manufacturer's specifications. Maintaining commercial equipment that is found in the majority of amateur stations these days is impractical unless you have more than the basic test equipment. Simply put, if you have not the equipment, the knowledge (obtained from the manufacturer's maintenance handbook) will be of little use. Amateurs, being as they are, are not prone to accept the situation without first "having a go."

Tweaking everything in sight, hoping for a miracle cure to manifest itself, is a guarantee of butchering the rig and may finish by costing you far more to have it fixed by an authorised dealer.

Nevertheless, many of us are prepared to at least attempt to locate the fault area. Hopefully, when the rig "stops" and the fuse remains intact it just may not be too serious. If you have a service handbook it is worth trying to go a little further.

Before removing the covers, analyse the nature of the fault.

Naturally, you have checked that your antenna has not fallen down or other seemingly obvious, but sometimes overlooked situations. It is a little hard to load into an antenna on the ground and it surely does not tend to hear too well either!

Does it receive? Does it transmit? Is the fault common to both? Is it band related? Is it intermittent? And if so, is it related to temperature changes? Try and gather as many facts as possible.

Study the manual and establish the signal paths. Look at the layout and define what boards do what and where they are physically located.

Next turn to the manual and find out just what screws have to be removed to gain access. Undoing each *screw* in sight can, and generally does, cause consternation when parts start to fall off that should remain in place!

Before commencing, clean an area of the work bench where you can work comfortably and where any dropped screws can be readily located. If you have the misfortune to accidentally drop a screw into the rig, ***do not*** leave it there, difficult as it may be to find and extract. Murphy dictates that it will have lodged in a place that will cause the most damage should power be applied. It will, of course, never shake loose easily and when it does it will rocket off into oblivion! Naturally, you have the power disconnected before starting this operation.

Now that you have access, know the fault area and can relate the boards to the signal paths, the next suggested step is to look for interconnect or mechanical board failures. It is probable that this may only be your problem. Wriggle and move connectors, plugs, sockets, etc in the areas dictated by your fault analysis. If it is a "permanent fault" and no amount of wriggling will change the situation, the next step for most amateurs is to "button it up" and take it to the authorised dealer.

Some amateurs may be fortunate to have at hand a RF Signal Generator, RF Power Meter, CRO, and VTVM (or equivalent) that will enable further delving into the "innards." Naturally, those with such equipment would know how to drive and use such equipment. However, the compactness and construction of modern rigs is such that it can be most difficult to service without having the correct extension cables on hand. Even then, when the fault is located, getting the replacement part could give rise to difficulties. It appears from several stories I have been told, at least one quite large dealer seemingly is most reluctant to carry the most basic of spares! Cases of having to wait two months for output transistors, for a rig under warranty, indicates little concern is given to the buyer after purchase!

To Summarise:

1. Ascertain that the fault actually exists and is not the effect from an external device.
2. Define as best you can the nature of the fault for this, as a last resort, will help the service organisation.
3. Study the handbook to help define the fault, locate the respective boards, and method of access to the inside of the rig.
4. Remove the covers with the power removed from the rig and thereafter be aware of voltage hazards.
5. Do not touch any of the internal presets, tuning slugs, etc but confine your probing towards a loose connector, intermittent connection.
6. Stop when you have exhausted the above steps and seek help, and,
7. Accept that although you are technically capable of finding the fault you are limited by inadequate test equipment or accessories to progress further.

OX1SN/SM

Dear Nick

Firstly, congratulations on obtaining DXCC on your two-metre hand-held on the 24/25.

Regret, unable to offer any further suggestions, other than those you have tried, to rid your hand-held of soot.

Noting your position surely you could place an order (with yourself) for a replacement transceiver for next years activities!

ar

THE OBSERVER'S LOVE STORY OR CORRUPTED CALL SIGNS

Especially written for *QTC* Christmas Supplement by oa- 4PM

NOTE: To obtain the sense of this rhyme simply substitute the name of the operator (obtained from the key below) for the call sign of the amateur mentioned — and forgive the poet's licence.

He gazed into her pale puce eyes. "Darling" he cried, "You are my 4LJ. 4SM make you 4CR beyond your wildest dreams. 4CG I have in plenty. Dearest, you are 4YN to me are you not?"

The girl looked out into the 4RK and sipped her 4KY. "But you are only a 4HB" she said, "the 4DC you live in would not suit me. Why 4BD everywhere!" "Ah" he cried, "I 4JG that but what were you before you inherited your 4CG. Just a 4AK. Remember you will not always be 4WA." She tossed her pretty head and swept her 4RB hair from her eyes. "You are not 4AZ enough" she scoffed, "My love is 4BN. In the race to success you are but a 4DO." "The prospects are not 4PG for me" he sighed and rising began to 4AC way. "What tram do you catch? she teasingly asked. "4BWroo," he despairingly replied. "Well if you like I'll let you take me to a dance to- 4RK" she said, "but mind if you 4AW with another girl or sit out in a shady 4AT then it is all off." "That's 4PJ piece of spite" he angrily flung back and disappeared into the darkness. "Well I am no longer the 4HG of his ball I can see" she moaned and fell backwards into the cruet!

KEY:

4LJ — Feenaghty	4WA — Young
4SM — Ikin	4RB — Browne
4CR — Rich	4AZ — Sharpo
4CG — Gold	4BN — Cooling
4YN — Harkin	4DO — Hobler
4RK — Knight	4PG — Golden
4KY — Coffey	4AC — Walker
4HB — Baker	4BW — Couper
4DC — Crlbb	4RK — Knight
4BD — Grimes	4AW — Walz
4JG — Grant	4AT — Bauer
4CG — Gold	4PJ — Jessop
4AK — Milner	4HG — Bell

This clever play on calls, names and words was published in the December 1927 issue of *QTC*. The writer's call sign is not listed in any official call book of the era, so it can be assumed he wished to remain anonymous — perhaps fearing the wrath of his fellows for fooling around with their call signs. Either that, or OA4PM is a misprint.

—Contributed by Alan Shawsmith VK4SS

ar

"Must go OM — Evening meal is ready."

—VK2COP

Electro-Magnetic Compatibility Report

Hans Ruckert VK2AOU
EMC REPORTER
25 Berrille Road, Beverly Hills, NSW. 2209

I am grateful to DL1BU for making the following paper available. This expert on EMC problems and field strength measuring methods and equipment describes the RF field we have to expect within a typical amateur radio station, our house and the neighbourhood. We see clearly the necessary immunity level appliances should have, so that for example television sets must be immune to direct RF pick-up by the chassis. The electronic entertainment industry has had more than 30 years to undertake voluntarily the necessary design steps. When about 10 years ago EMC standards in the form of Test-Cell ("Jacky") field strength values for equipment chassis were discussed, 10 V/m was requested by the FTZ (DOC) and the DARC. Some companies achieved well over 30 V/m (EMC Report No 4), but others agreed only to 1 V/m, so a compromise value of 3 V/m was adopted in West Germany. The 3 V/m is much better than the milli-volt performance found earlier, but this field strength requirement is too low in many cases. The problem is worst when there are multi-story home units with wideband antenna preamplifiers (illegal in West Germany, must have television bandpass filters), which are as high as the transmitter antenna. Increased distance from the neighbour's television set at ground floor level, a directive beam transmitter antenna over 15 metres high, aluminium foil under the tiled roof, metal fly-screens, earthing of the television antenna coaxial braid and a television set with better than 3 V/m immunity should make compatibility possible in most cases. Input high-pass filter and mains-line filter may then help also.

SENSITIVITY OF TELEVISION VIDEO RECORDERS TO RADIO FREQUENCY FIELDS

By Gunter Schwarzbeck DL1BU for EMC Symposium Wroclaw, Poland, August 1984**

Summary
Television Video Recorders are quickly becoming popular. Millions are in use in densely populated areas.

The sensitivity to harmonics of nearby transmitters will be reduced with low-pass filtering at the transmitter output. Any overload effects at the VHF-UHF-tuners must be reduced by inserting isolating transformers at the antenna input. In some countries specifications exist for this sort of immunity.

Unfortunately, the severe problem is direct field penetration into the video section which is sensitive to all frequencies from 1 MHz to almost 10 MHz.

(See "EMC Standards for VCRs in West Germany: Amateur Radio, August 1986, Page 17")

1 Susceptibility Measurement
Video recorders contain VHF-UHF tuners that have to be checked for active and passive behaviour. This means that the radiation power of the oscillators for the fundamental and the harmonics must be reduced to certain values (in Germany to 31 dB above one pico-watt (VDE 0872)). On the other hand, radio frequency currents flowing into coaxial or normal inputs/outputs must not cause interference up to defined values. The severe problem, however, is the influence of electro-magnetic fields in the HF range 1 MHz to 10 MHz, because within this frequency range is the video band for the reproduction of the stored television picture and the accompanying sound. While is some countries the intensity of an electro-magnetic field that may not influence the perfect operation of entertainment equipment or professional devices is legally defined (in Germany three volts/metre for all frequencies from 150 kHz to 150 MHz, except for the tuned receiving frequencies or intermediate frequencies), no limit has been set so far (1984) for the field strength that video recorders have to stand. A specification can be expected for 1985, and it is hoped that also 3 V/m will be decided upon, as otherwise trouble has to be expected from many radio frequency sources in populated areas.

Measurement results with samples of the latest generation of video recorders (see Figure 3) show that this aim can be reached with simple shielding measures. It is state-of-the-art with standard video recorders of several manufacturers.

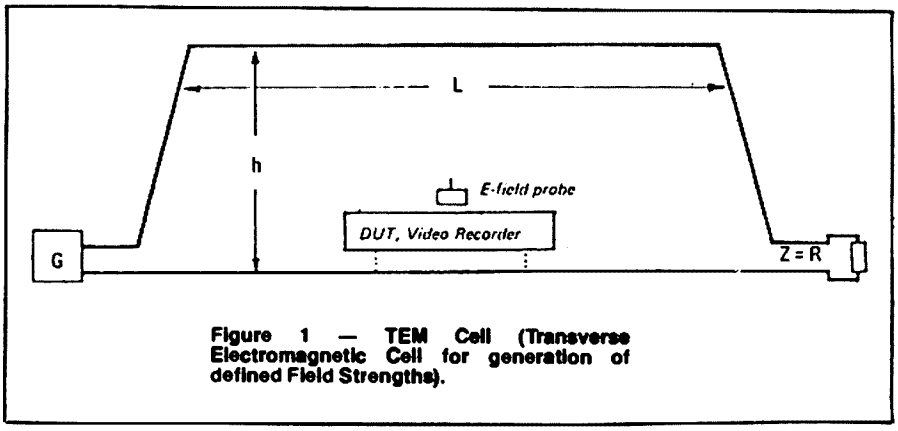


Figure 1 — TEM Cell (Transverse Electromagnetic Cell for generation of defined Field Strengths).

1.1 TEM Cell
The highest sensitivity is, with video recorders, at the moment of reproduction of a video tape. For testing the susceptibility (direct penetration of E-fields) a "TEM Cell" is generally used. There are different ways to build such a cell: Figure 1 shows a simple version consisting of two parallel line sections made of aluminium sheet.
The radio frequency generator (signal generator with up to 10 volts at 50 ohms) is connected to the input of the line while the output is terminated into a resistive load equal to the characteristic impedance of the conductor geometry. The length L should be three times the long dimension of the Device under Test (DUT), in this case the recorder. If corrections are to be avoided for the field strength disturbance by introducing the DUT, this should not be more than 1/6 of the conductor spacing h. Otherwise an E-field probe should be used to check the correct field intensity.

The field intensity in the gap between the sheet conductors will be

$$E_v = \frac{V\,cell}{h} \qquad (1)$$

From a certain frequency on there will be a VSWR (voltage standing wave ratio), usually starting at a few MHz that might require the measurement of the actual field intensity with a probe. There will be a maximum frequency, depending on the dimensions, called "cut-off/multi-mode frequency." Above this frequency, usually in the VHF range, fields must be generated with antennas. For the range in consideration here (1 MHz — 10 MHz) sufficient accuracy will be obtained with formula (1).

A better, but bulkier cell might be built be using three instead of two sheet conductors, thus approaching a coaxial line. The upper and the lower plates will be operated at ground potential and may be supplemented by a front and rear shield, while the centre conductor receives the RF voltage. In this way it is easier to approach 50 ohms characteristic impedance, and no radiation occurs that otherwise would have to be shielded and causes ripple of the voltage and field at higher frequencies. Only half of the total height can be used for the device, and only this dimension has to be considered for equ (1).

Modulation of Signal for Test
A certain modulation has to be agreed upon to obtain similar results. For other susceptibility tests on entertainment equipment, an amplitude modulated signal, 1000 Hz AM 80 percent is used and is also suggested for these tests. There are other proposals for 30 percent AM.

This AM signal will cause interfering lines on the television picture and will also be heard on the audio reproduction. It is not easy to define the point where the interference becomes objectionable. In these measurements described here, mainly the picture interference has been considered, and the first recognisable traces of a line structure have been used as a criterion.

It would of course be possible to define a certain "signal-to-interference ratio" to be measured in the picture and/or sound path, but the question would be disputed which ratio would be correct and if it can be used for any type of interference.

With a modulated signal, care has to be taken to specify the proper voltage. An RF meter which responds to the Average Value will not be influenced by the degree of AM.

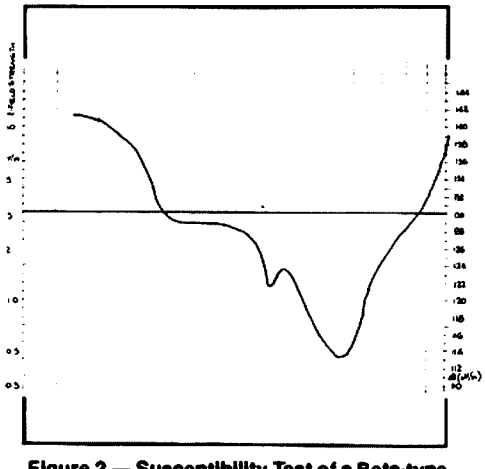


Figure 2 — Susceptibility Test of a Beta-type Video Recorder made in 1980. Cover material is plastic, no top screen. Measured in TEM Cell, 1 MHz-10 MHz. Horizontal line represents 3 V/m field strength that should at least be aimed at for compatibility with EM fields in populated areas. Dot-dash curve indicates field strength where the first traces of interference appears on a television screen. (AM, 80 percent).

An RMS meter will indicate a higher voltage with 80 percent AM (slightly more than 1 dB), and a peak-responding meter will go up by 5.1 dB.

The most often used diode detector RF voltmeter will transit from RMS response in the milli-volt ranges to almost peak in the volt range. The calibration is RMS sine wave, of course.

As such diode voltmeters are used quite often, the following table will show typical results:

10 mV range: 80 percent AM causes an increased indication over the carrier by	1 dB
30 mV range:	1.2 dB
0.1 V range:	2.6 dB
0.3 V range:	3.8 dB
1 Volt range:	4.4 dB
3 Volt range:	4.7 dB
10 Volt range:	4.8 dB

As only higher voltage ranges have been used (three volts range up), no corrections have been made here for the following measurements. Instead the true indication (that approaches the peak value) of a high-grade RF voltmeter has been used.

Figure 2 shows the curve of field strength, 1 MHz — 10 MHz, that caused the first traces of interference on one of the first commercially available video recorders of the "beta" system of 1980. The cover is made of plastic material, so only some internal shielding was effective. This recorder was very sensitive to signals with AM or SSB (single sideband) modulation from 3.7 MHz to 7.5 MHz. This might lead to severe trouble if shortwave transmitting stations are not too far from the recorder in the display mode. There is even some sensitivity to local broadcast stations. A broadcast transmitter using a quarter-wave vertical antenna with a power of 100 kW will cause a field intensity E vector of just 3.12 V/m in one kilometre, so coming close to the suggested immunity for video recorders of 3 V/m in the frequency range 1 MHz to 30 MHz.

Field intensity, caused by a quarter wave vertical:

$$E = \frac{312\sqrt{P}}{r} \quad \text{(mV/m, P = power in kW, r = distance in km)} \qquad (2)$$

or

$$E = 79.9 + 10 \log P - 20 \log r \ [\text{dB}\,\mu\text{V/m}] \qquad (3)$$

(P = power in W, r = distance in km)

A better shielding would not only be desirable to avoid unnecessary interference from shortwave transmitters (amateurs, police, embassy), but also from pulse interference of a broadband nature that exists in every house from switches and thermostats, etc. The philosophy often heard of that in a very few cases additional measures might be taken by the manufacturer of the recorder, is very dangerous, because it might just be impossible to cure the trouble by additional measures at the recorder. This method might be justified with television interference, where an isolating transformer at the VHF-UHF input might help. Should the embassy close their shortwave service or shall the user of an insufficiently shielded recorder buy a new model?

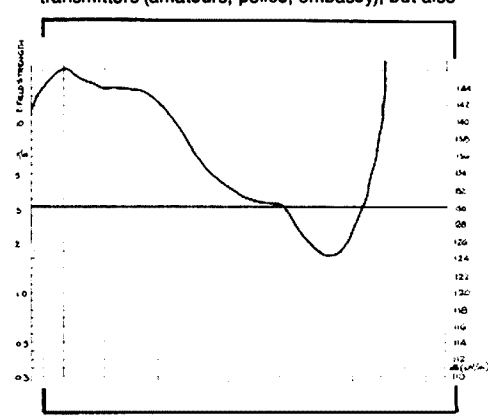


Figure 3 — Susceptibility Test of a VHS-type Video Recorder made in 1984. Cover material is metal with four screws. Measured in TEM Cell, 1 MHz-10 MHz. Horizontal line represents 3 V/m field strength that should at least be aimed at for compatibility with EM fields in populated areas. Dot-dash curve indicates field strength where the first traces of interference appears on a television screen. (AM, 80 percent).

Figure 3 shows a new recorder, manufactured 1983/84 of the VHS-type. The immunity is by far better than the 1980 model. The newer one uses metal shielding all around the set with four screws connecting the cover to the base. The curve in Figure 3 remains above the 3 V/m limit with only a small range being below from 4 MHz to 6.3 MHz. So the often used amateur bands near 3.7 and 7.1 MHz are much better rejected. In addition to the curve of Figure 3, a few discrete frequencies caused audio interference above 10 MHz: 10.4 MHz (19 V/m), 13.1 MHz (12.5 V/m), 14.1 MHz (8.3 V/m), 15.6 MHz (6.3 V/m), 21.15 MHz (3 V/m), 31.1 MHz (0.1 V/m), etc. The reason for this audio interference has not been checked further as with the exception of 31.1 MHz all other field strengths for just audible interference were ≥ 3 V/m.

The sensitive parts in the video recorder are the magnetic head and the video-frequency amplifier. In this better model, some screening around this head was used. With proper EMC checks and only little more shielding, all of the field-strength curve of Figure 3 might be moved up to 3 V/m or more.

The frequency spectrum used in a video amplifier is shown on the screen photograph of Figure 4.

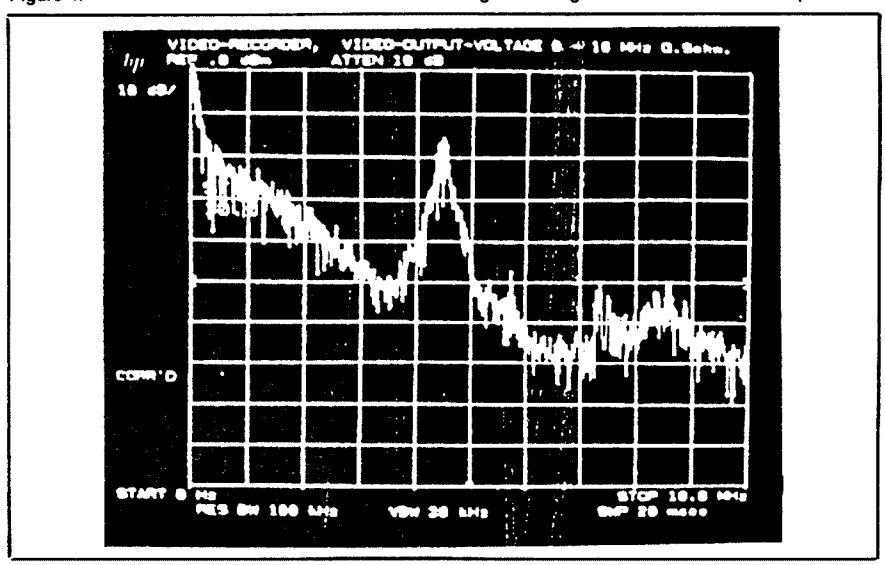


Figure 4 — Spectral Frequency Output of a Video Recorder (VHS- type, 1984), 0-10 MHz (1 MHz/div), (10 dB/div), normal picture.

2. Measures to Reduce Interference

For the severe problem of direct penetration of radiation into the video section, the usual shielding measures have to be followed. Also filtering of DC leads or signal path might help.

Figure 5 shows how conducted interference currents from a well shielded input wire or cable can reach internal boxes. Everything is completely shielded, but nevertheless the RF voltage drop across the ground wire of box C inside box B will reach box D and cause interference. The problem is at the feed-through A where the braid of the shielded cable is not connected to the outer shielding box B. If this connection is perfect (coaxial grounding), all RF currents would remain on the outer surface of box B and would not do any harm to the sensitive inner boxes with amplifiers, etc.

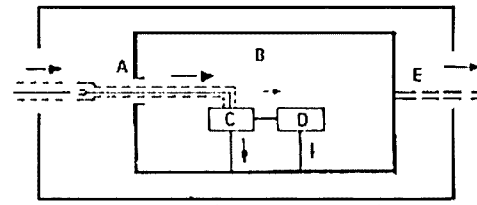


Figure 5 — Shielded Box B with input coaxial cable penetrating at A (insulated), grounded at lower side of sub-box C with RF current reaching box D.

2.1 Avoiding RF Currents on Connecting Cables

A VHF-UHF antenna with a long coaxial cable down-lead connected to the VHF-UHF tuner input, together with the power line cord of the recorder, also the connecting cable from the recorder to the television set and its power line cable represent a very efficient shortwave antenna system, similar to a dipole of considerable length or a grounded antenna. This means that high RF currents at the centre of this "dipole" might flow into the recorder or television set. To avoid these currents that might do similar harm as the fields, an isolating VHF-UHF toroidal ferrite transformer should be used at the tuner input.

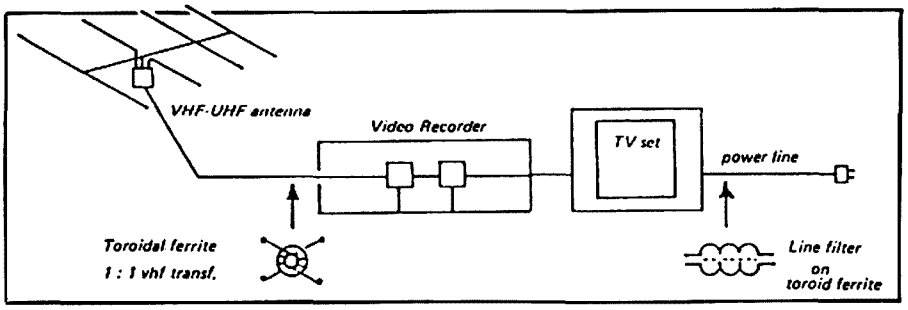
Figure 6 shows the point where such a small ferrite bead with three bifilar turns of enamel copper wire should be inserted (if not already built into the antenna Input of the recorder). Only the small capacity of the two windings bring RF currents of shortwave frequencies into the recorder. Furthermore, such a transformer with low inductance windings acts as a high- pass filter with low attenuation for the wanted VHF-UHF signal and high attenuation for lower frequencies.

Also currents through the power line cord (common-mode RF) should be avoided by inserting a somewhat larger toroid with two parallel wires (right-hand side of Figure 6).

Of course — if the coupling of a transmitting antenna with the television system is too tight, there will be no solution for the interference problems. For that reason, also the transmitter needs an effective power line filter, a coaxial cable with no RF current on the outer shielding and sufficient distance of the radiating antenna from the television system.

The order of field intensity generated by shortwave transmitting antennas, fed with power of 10 watts and 400 watts may be seen in Figures 7 to 11. If 100 watts are used instead of 400, the field strength will be half the figure shown.

All the values shown are measured, mostly 1.5 metres above ground. Both ground effects and the near-field effects cause different fields to exist compared with calculations. It is obvious from



these magnitudes of field intensities that severe problems could arise if shielding and filtering are insufficient in any type of equipment. The case of the video recorder is only one of innumerable other examples of EMC, and it is good advice to start solving these problems as early as possible. Otherwise millions of "cases" will have to be solved individually.

Figure 6 — VHF-UHF antenna and cable acting as a dipole antenna for HF fields together with power line conductor. RF current will flow into the video recorder unless cable shield is concentrically connected to outer shield. The dipole should be "broken" at the antenna side by an isolating transformer. Also use line filter.

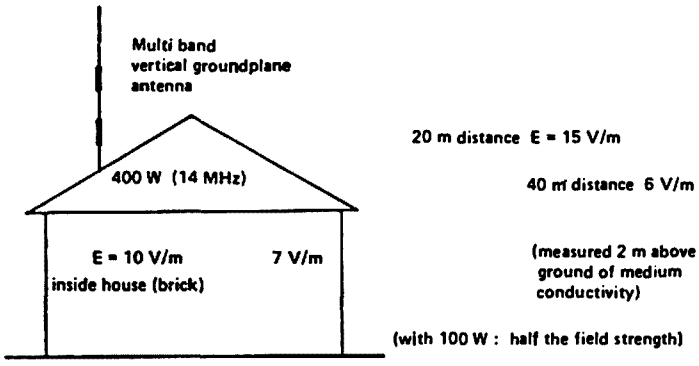
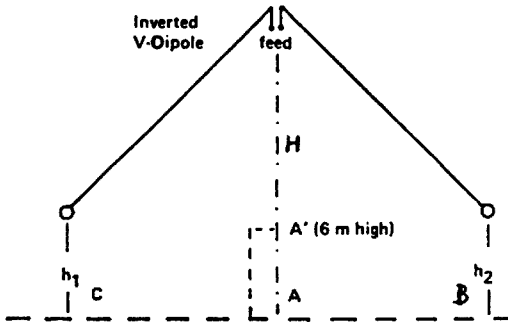


Figure 7 — Field Strength underneath a transmitting station with a vertical ground plane antenna with radials, also in 20 and 40 metre distances.

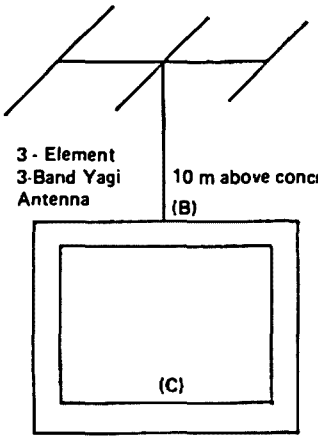


Case a: 7 MHz, 400 W, two legs 10 m each, H = 16 m, $h_1 = h_2 = 10$m
Field at A: 20 V/m, at B : 30 V/m in 20 m distance, 60° outside antenna plane: 6 V/m

Case b: 3.5 MHz, 400 W, 2 legs 20 m each, height 29 m, h_1=15 m, h_2 = 10 m
E-Field Strength
at A: 4 V/m
at B: 36 V/m
at A' : 30 V/m
at C : 20 V/m

Case C: 3.5 MHz, 400 W, 2 legs 20 m each, H=16 m, $h_1 = h_2$ =4.5 m
Field at A: 24 V/m, at B and C 180 V/m(!)
Case d: 1.8 MHz, 10 Watts, H=29 m
h_2 = 3,5 m, Field at A 1 V/m, at B 30 V/m

Figure 8 — Field Strength underneath an inverted Vee dipole antenna, fed with 400 watts (10 watts) at different locations in the near-field-zone (measured at two metres above ground).



In 40 m distance (main beam) 2 V/m
(14 MHz, 400 W)
in 20 m distance 4 V/m

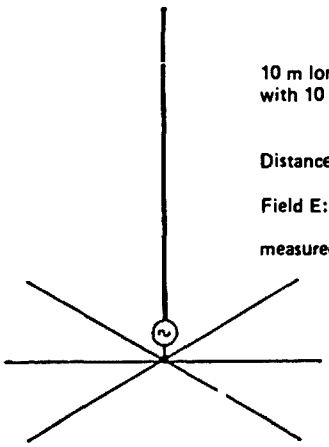
Field Intensity at mast base, 10 m below Yagi antenna at (B): 18 V/m (400 W)

Field Intensity inside the room (at C) with 30 cm concrete walls, steel reinforced:

1 V/m (14 MHz, 400 W)

(estimated value for wooden roof: 10 V/m).

Figure 9 — Field Strength of 400 watts at 14 MHz in front of and underneath a three element Yagi antenna.



10 m long ground mounted vertical quarter wave antenna with 10 radials buried 5 cm into ground, 7 MHz, 400 W:

Distance	2m	4 m	8 m	16 m
Field E:	72 V/m	40 V/m	30 V/m	18V/m

measured in 1.5 m height, vertically polarized, non-homogenous ground

Theoretical Field Intensity in far-field zone

$$E = \frac{10\sqrt{P}}{r}$$ mV/m, P = power in watts, r = distance in km

(measured values in near-field and transition zone)

Figure 10 — Field Strength of 400 watts at 7 MHz into a ground-mounted quarter-wave antenna.

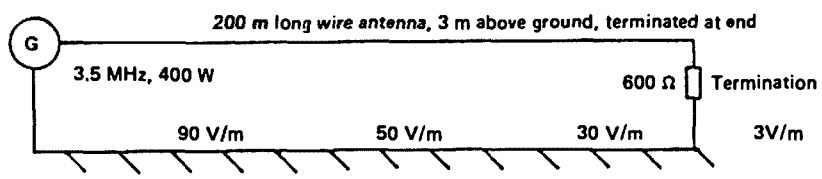


Figure 11 — E-field 1.5 metres above ground underneath a 200 metre long wire antenna.

**Dipl Ing Gunter Schwarzbeck
D-6901 *Schoeneu-Altneudorf* (West Germany, Federal Republic)
Development of EMC equipment, measurements,
Also consultant for DARC Radio Amateur Club — Honorary Technical Officer**

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THOUGHT FOR THE MONTH

The more things change the more they are the same.

WHY AN AMATEUR IS CALLED A "HAM"

Have you ever wondered why radio operators are called "Hams"? Well, it goes like this — the word Ham was applied in 1908 and was the call letters of one of the first amateur wireless stations, operated by some members of the Harvard Radio Club. The operators were Elbert S Hyman, Bob Almy and Peggy Murry. At first they called their station Hyman-Almy-Murry. Tapping out such a long name in code soon called for a revision and they changed it to HY-AL-MU using the first two letters of each name.

Early in 1909, some confusion resulted between signals from amateur wireless HYALMU and a Mexican ship named HYALMO, so they decided to use only the first letter of each name and the call became HAM.

In the early pioneer unregulated days of radio, amateur operators picked their own frequency and call letters. Then, as now, some amateurs had better signals than some commercial stations. The resulting interference finally came to the attention of congressional committees in Washington and they gave much time to proposed legislation, designed to critically limit amateur activity.

In 1911, Albert Hyman chose the very controversial Wireless Regulations Bill as the topic for his thesis at Harvard. His instructor insisted that a copy be sent to Senator David I Walsh, a member of one of the committees hearing the bill. The Senator was so impressed he sent for Hyman to appear before the committee. He was put on the stand and described how the little amateur station was built and he almost cried when he told the crowded committee room that if the Bill went through, they would have to close the station as they could not afford the licence fees and all other requirements which were in the Bill.

The debate started and the little station, HAM, became a symbol of all the little amateur stations in the country crying out to be saved from menace and greed of the big commercial stations who did not want them around.

Finally, the Bill got to the floor of congress and every speaker talked about the poor little station HAM.

That is how is started. The whole story may be found in the Congressional Record. Nationwide publicity associated station HAM with amateurs and from that time to possibly the end of time in radio, an amateur is a "Ham."

—From *Westlakes Amateur Radio Club Monthly Newsletter*, September 1986

LIGHT ACROSS THE NULLABOR

○ Telecom has begun route selection work on an optical fibre link across the Nullarbor between Perth and Adelaide.

Telecom's national optical fibre program to connect all Australian mainland capital cities by 1992 will cost $300 million.

A Melbourne central business district optical fibre loop became operational in November this year. The $3 million pilot program provides a street network which passes about 50 identified major business houses.

The loop will initially provide a test bed for Telecom's development of both commercial approaches and technical methods. It also offers opportunities to Australian industry for development of a range of new equipment and systems.

A similar street system is being considered for Sydney's central business district.

—From *electronics news*, September 1986

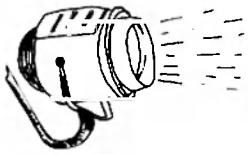
PHONE CAPACITY QUADRUPLED

○ A new speech coding algorithm that can quadruple the voice-channel capacity of standard telephone systems has been developed.

Subjective listening tests have demonstrated that the developed algorithm, which encodes speech signals at a rate of 16 Kbps, produces voice quality nearly distinguishable from that of the current industry-standard rate of 64 Kbps.

Substitution of the algorithm for the standard algorithm makes available four times as many telephone channels for use in either cable or radio communication systems.

—From *electronics news*, September 1986



Spotlight on SWLing

Robin Harwood VK7RH
52 Connaught Crescent, West Launceston, Tas. 7250

Well, another year has commenced — 1987 is here, which reminds us that the 21st Century is only 14 years away! That is truly a sobering thought. I am not going to be a prophet and make any predictions of what may transpire during the next 12 months. I will just sit back and observe what happens.

As one gets older, time literally does fly. The same is true in relation to happenings on the shortwave bands. Although it may give the impression that nothing is changing, yet the reverse is the case, for there is always something new or unusual observed. With the proliferation of new modes and special technology, it is difficult to keep abreast of the changing scene. It is different today from what the state-of-the-art was in 1972, some 15 years ago.

Some of the old timers wistfully remember the days when senders were restricted to lower power levels and the bands were less congested. Or they remember the exotic stations from distant colonial outposts, when station personnel were much more friendly and approachable. Nowadays, some of the larger, as well as the smaller, broadcasting organisations do not pay much attention to their audience and concentrate on airing reams of useless information and propaganda, ignoring listeners comments and feedback. They are puzzled why their research indicates that their audience-share is dropping.

As I have been listening to shortwave for 30 years now, I have recently been evaluating the alterations that have happened over the years. I think the programs that really brought the listeners and broadcasters together were the letterbox segments, such as on Radio Australia with Keith Glover, Earle Fisher on Radio Canada International and Margaret Howard on the BBC World Service. When these segments were discontinued, the listeners lost a personal contact with the station, which was subsequently apparent in the station's impersonal attitude from that time.

Also, there is a lack of glamour or fascination about international and shortwave stations today. This is not surprising as the growth of television has taken away the allure and excitement of listening to the news direct from the source, when they can see it happening almost instantaneously on the "box."

Yet, I am still interested and fascinated by what I hear, tuning across the bands. It may be a *Mayday* call from a vessel in the Pacific or copying a RTTY broadcast from a Middle Eastern newsagency. Or listening to the variety of different ethnic music that is available, compared with the drab staple that is churned out from our domestic stations.

If I am disenchanted with anything on HF, it is the average amateur QSO. We no longer have the intimate camaraderie that we had with OSOs 15 to 20 years ago, or even longer. Now it is hello OM, you are 20 over nine here and is my audio okay, etc. And please QSL this QSO for the Worked All signals award or something similar. Personally, I think that there are too many awards and that their criteria is too easy. To me, an award has to be earned the hard way. It is a sense of achievement. 30 to 50 years ago, it was a comparative rarity for an amateur to notch up 100 countries and to get the required number did take time. Nowadays, there are operators who have achieved that milestone in six weeks. I know of one DX operator who amassed 300 or so countries in two years and is only operational when one of the rarer prefixes are about.

When these rare DXpeditions are about the bad manners and sloppy operating procedures adopted by the average amateur is certainly no endorsement of the hobby. And some of the locations for these forays is also open to question. To mount a DXpedition to an outcrop of rock, which is only out of the water at low tide, at tremendous expense, even human lives being put at risk, all for the dubious honour of giving an amateur a piece of cardboard to help him get a worthless certificate, which proves little or nothing to the average man-in-the-street.

Perhaps that is why I am somewhat disillusioned with the present state of the hobby, combined with the fragmentation of the hobby into many specialist areas and groups that increasingly concentrate on their narrow interests.

I hope that I have not sounded too pessimistic about the amateur radio scene, but truthfully that is how I perceive the hobby at present. That is why I do derive more pleasure in tuning around the entire HF spectrum instead of being confined to one allocation. One does have to take in the wider perspective, the overview of things.

I think it is very appropriate to voice these comments at this stage, with New Year Resolutions fresh in our minds. We should have a goal to work towards and when we get close to it, we get a sense of achievement of having accomplished our goal. As a matter of fact, my goal this year is to be more consistent in dispatching reports to the various authorities that have requested help with their signals. What goals do you have in 1987?

73 de VK7RH.

Club Corner

TWIN CITIES RADIO AND ELECTRONICS CLUB

The Twin Cities Radio and Electronics Club, VK2EWC, announce the following office bearers following the recent AGM.

President: Rod Adams VK3CBO
Vice-President: Kevin Hartnett VK2FUO
Treasurer: Greg Sargeant VK2EXA

Business meetings of the Club are held on the second Monday of the month at 07.30 pm, and two workshop nights are held each month, the third and fourth Mondays at 07.30 pm, 644 Elm Street, Albury.

Net nights are conducted on Mondays, 28.490 MHz USB, 0930 UTC.

Further information about the Club may be obtained from PO Box 396, Albury, NSW. 2641.

—Contributed by Peter Presutti VK2CIM, Secretary

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BALLARAT AMATEUR RADIO GROUP

The Ballarat Amateur Radio Group held their annual Hamvention on Sunday November 2, 1986.

More than 300 amateurs and their families packed into the venue to see an outstanding display of equipment and activities. One of the displays was the AUSSAT Dish and equipment which gave an excellent picture on the downlink. Packet radio was also very popular and a huge range of pre-loved components and equipment provided a temptation for many. The Icom trade stand displayed a huge range of new gear at very special prices, just for the day.

Fox hunts and scrambles were again popular with many amateurs. The winner of the events trophy was VK3CGH. Clarry VK3DMK, won the high-speed CW event and the best home-brew equipment prize went to VK3CGG. The winner of the VZ300 computer raffle was Tom VK5EE, whilst Jim VK3NK won the ladies hamper.

From the glowing reports heard on air, it was the amateur event of the year with visitors from C21, VK2, 3, 5, and 7. It was great to see 12 members of the Disabled Radio Group amongst their fellow amateurs.

The BARG ladies turned on another top-line lunch and free tea and coffee flowed all day.

If you missed this great days outing you missed seeing the great spirit of amateur radio at its best. See you at Hamvention-1987!

Contributed by Kevin Hughes VK3WN, Hamvention Convener

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SYDNEY AMATEUR DIGITAL COMMUNICATIONS GROUP

The Sydney Amateur Digital Communications Group has announced the release of their SADCG Digital Repeater software, version 2.1, for amateur packet radio. This release features full implementation of AX25 digipeating, making it the first 'multi-protocol' packet repeater.

The first amateur packet repeater in Australia used the original version 1.3, developed and supplied by John Vandenberg VE3DVV, which, at that stage, only supported Vancouver V1 protocol and provided functions for V1 users. The DR software progressed to version 1.5, where it was superseded by version 2.0, to coincide with the release of Vancouver V2 protocol.

With version 2.1, it is now possible for both Vancouver and AX25 users to operate on the same channel simultaneously without interference. The explanation behind this is that with Vancouver protocol, all frames are repeated by the DR unless the user supplies a LOGOFF command, which allows the user to send packets without going via the DR.

The concept with AX25 protocol is the reverse. The AX25 user is not repeated via the DR unless the AX25 user specifically puts the DR's call sign into the user's AX25 address field. This means a SADCG DR can be installed as part of an AX25 digipeating chain.

The SADCG DR does provide user commanded functions, which can be called by Vancouver protocol users, while in the unconnected mode, (that is; when a packet node is not connected/linked with anyone) the functions include: Time, Status, Log, Logon, Logoff, Clear, Save, Dump and Help.

Other features provided for Vancouver protocol users are automatic DR identification messages, which display Time, Call Sign, and Location. This occurs every five minutes while the DR is in use, otherwise the DR is in quiescent mode when there is no channel activity.

These DR command functions are not provided to AX25 protocol users, as none of these features are used in TAPR AX25 digipeating. The figure shown is a file capture on packet which I have edited and included comments.

The SADCG DR software is only supplied to amateur radio groups who operate, or intend operating a licenced packet Digital Repeater and is presently only available for use on VADCG (Vancouver) Terminal Node Controllers (TNC).

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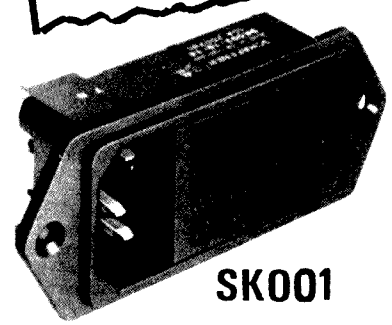
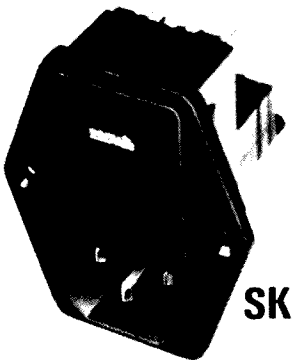
Figure 1.

```
'(this is a file capture of Digital Packet Repeater VK2RMB, on 144.800 MHz on
July 5th, 1986 by VK2KFJ using Vancouver V2 protocol.)

TIME                                                        (user invoked command)

TIME :13 37 41
Repeater node: VK2RMB  at Terrey Hills. Sydney.

HELP                                                        (user invoked command)
Command Summary.
TIME      display time
LOG       shows log status
LOGON     station repeat enable                    (Digital Repeater commands
LOGOFF    station repeat disable                    available to users. Each
STATUS :  show repeater status                      command is followed by a
CLEAR :   clear tx/rx buffer                        CR or CR/LF.)
SAVE :    save tx/rx buffer
DUMP :    dump buffer (256 byte blocks)

LOG                                 (user invoked command)   (E5B0 represents the
Node E5B0 logged on                                           2 byte node address
                                                              for VK2KFJ, derived
LOGOFF                              (user invoked command)    by using a poly-
Node E5B0 logged off                                          nomial equation in
                                                              Vancouver protocol.)
LOG                                 (user invoked command)
Node E5B0 logged off

LOGON                                                       (user invoked command)
Node E5B0 logged on

STATUS :                                                    (user invoked command)
TIME :13 38 32  DAY :195  DATE :Jul 05, 86
Repeater      : VK2RMB
Status        : enabled
Last failure  : N/A                                          (status of the
Failure day   : N/A                                           Digital Repeater.)
Error code    : X
Error log     : 00 00 00 00 00

VK2KFJ                              (automatic identification provided by my TNC.)
SAVE :                                                      (user invoked command)
Environment saved, use "DUMP :" to display.

DUMP :                                                      (user invoked command)
7000:00800000 0D140000 0080E5B0 00000000  7000:................
7010:1E521153 22530000 25531053 11530000  7010:.R.S"S..%S.S.S..
7020:02C0FA00 000004C8 1400FFFF 00000000  7020:................
7030:00000000 00000000 00000000 00000000  7030:................
7040:03000506 03000506 03000300 70FCFA05  7040:............p...
7050:B0031D00 01000400 05060100 05066B08  7050:..............k.
7060:70FC1D00 6B080000 45070000 29090201  7060:p...k...E...)...
7070:20737461 74757300 0A4800FF FF65B003  7070: status..H...e..          (HEX/
7080:01004C4F 474F4E20 20202020 73746174  7080:..LOGON      stat          ASCII
7090:696F6E20 72657065 61742065 6E61626C  7090:ion repeat enabl          dump.)
70A0:650D0A4C 4F474F46 46202020 20737461  70A0:e..LOGOFF    sta
70B0:74696F6E 20726570 65617420 64697361  70B0:tion repeat disa
70C0:626C650D 0A4300FF FF65B003 01005354  70C0:ble..C...e....ST
7000:41545553 203A2020 73686F77 20726570  70D0:ATUS :  show rep
70E0:65617465 72207374 61747573 0D0A434C  70E0:eater status..CL
70F0:45415220 3A202020 636C6561 72207478  70F0:EAR :   clear tx
******   end of dump  ( repeater node : VK2RMB  )   ******

TIME :13 40 00                                              (automatic 5 minute I.D.)
Repeater node: VK2RMB  at Terrey Hills. Sydney.
```

AR Showcase



SK001



SK070

SK080

POWER ENTRY MODULES

Westinghouse Systems have extended their range of Schaffner Power Line Filters, Suppression Chokes, Pulse Transformers, etc, with a new product; Power Entry Modules.

The SK070, is complete with a IEC320 C14 plug, fuses and voltage selector, nominal 6 amps current.

SK080 connectors have an IEC320 C14 plug, fuses and one or two pole power supply switch. Nominal currents are four and six amps.

SK001 — SK004 connectors have IEC320 C14 plug, fuses, nominal current 10 amps.

All connectors can be equipped with one or two fuses (5 x 20 or 6.3 x 32).

For further information contact Westinghouse Systems, 80-86 Douglas Parade, Williamstown, Vic. 3016. Telephone (03) 397 1033.

HEATHKITS

If there is one name known the world over for quality in electronics it is *Heathkit.*

For more than 50 years, the Heath Company of Benton Harbour, Michigan, has given hobbyists and enthusiasts build-it-yourself kits which are at least as good — and sometimes much better than — commercially available models.

More than that, and possibly what has given Heathkits their name, is the highly detailed, step-by-step construction manuals that Heath meticulously prepare for each kit.

Add to this the huge range of kits — everything from AM transistor radios through all types of test equipment, right up to the amazing Hero Robot. Kits for the home, the car, for education, amateur radio . . . you name it, there is one in the Heathkit range.

Until now, Heathkits have been readily available through most of the western world — except Australia

Dick Smith Electronics has recently been appointed Heathkit Distributor for Australia and New Zealand.

Initially, some 20 kits have been selected as "off-the-shelf" lines in major Dick Smith Electronics stores (some stores may have to order for you).

Of the other hundreds of products in the Heathkit catalogue, Dick Smith Electronics will order (on an indent basis, against a firm deposit) direct from the USA. Some kits are obviously not suitable for Australia (such as NTSC colour televisions, etc), and other kits are not available for licensing reasons (such as computers).

Heathkits are not cheap, but then nothing of top quality ever is! When you buy a Heathkit, you are buying the best kit available — a kit of which you will be proud to say "I built it myself!"

For further information contact Wendy Giles, Public Relations Manager, Dick Smith Electronics Pty Ltd, PO Box 321, North Ryde, NSW. 2113. Telephone: (02) 888 3200.

Intruder Watch

Bill Martin VK2COP
FEDERAL INTRUDER WATCH CO-ORDINATOR
33 Somerville Road, Hornsby Heights, NSW. 2077

Well, here we are in a brand new year, and if we are positive thinkers, we see the coming 12 months as "a whole new ball-game" in which we can try and omit some of the mistakes of the previous 12 months. We can try and achieve some of those objectives that we have, in previous years, put off until next year! As I am a kind of "semi-positive thinker," I reserve the right to still make a few mistakes in 1987. Irrespective of which category you belong to, I wish you all a very happy and satisfying new year.

At the time of writing, the DX seems to be improving a little. By the time the column is published, it may well be apparent that the new solar cycle is heading up. I hope so. Wouldn't it be nice if the DX got better, and the number of intruders diminished? Speaking of intruders, the reports for September 1986, broke-down as follows: Those using A3E mode — 334; CW intruders — 149; Non-amateur RTTY — 54; Intruders using other modes — 48; and 18 had the gall to send their call sign. The following people were a great help to the IW for that month: VK2s AEV, BAG, DEJ, EHQ, G Bradford; VK3XB; VK4s AKX, BG, BHJ, BTW, KGE, KHZ; VK5s AJK, GZ, NTT, TL; VK6s JQ, RO, XV; VK7RH and VK8s JF and HA. Thanks a lot fellers, and hope you can help again this year.

SARTS (Singapore Amateur Radio Transmitting Society) has agreed to join with the WIA, JARL and NZART in monitoring Intruders in IARU Region 3. This is a step in the right direction and we hope for their continuing support.

Col VK4AKX, observes that the main intruders are still Voice of the Straits (VoS) from China on 3.535 MHz; Urumqui from China on 7.050 MHz; Radio Tirana from Albania on 7.065, 7.080 and 7.090 MHz; Radio Beijing (China) on 7.095 MHz, and RRI (Indonesia) on 7.098 MHz. China and Albania continue to vie for the IW Wooden Spoon Award. I think we may have a tie there.

Look for the IW Net on/or about 3.595 MHz on Wednesday evenings at 1000 UTC. (Half-an-hour earlier in daylight saving time).

Our VK7 Intruder Watch Co-ordinator, Robin VK7RH, has a new QTH — 52 Connaught Crescent, West Launceston, Tas. 7250, or see the top of his *Spotlight on SWLing* column.

Good news re the Asian transmissions on the lower end of 28 MHz comes to me from Hong Kong. In August 1986, a meeting took place in Hong Kong, which resulted in the news being passed to me that the Hong Kong Amateur Radio Transmitting Society (HARTS) and the Hong Kong Administration are co- operating in their efforts to minimise the interference to amateur operators on the 10 metre band. Although the problem is extensive, hopefully the concerted efforts of HARTS and the Hong Kong Authorities may be able to help us.

Ivor VK3XB, has been reporting signals, which he describes as "the blowfly" on 1.802.5, 3.530, 3.645, and 7.054 MHz. Ivor describes it as sounding like a spark transmission, with a single two-second dash, tone- seven, with a CW modulation of didahdidahdidahdidah. *Anyone know anything about this one?*

Let me know if you have heard it. So that is about all for this month. . .see you in February, take care and enjoy the hobby!

VK2 Mini-Bulletin

Tim Mills VK2ZTM
VK2 MINI BULLETIN EDITOR
Box 1066, Parramatta, NSW 2150

Happy New Year to all amateurs and may it bring you better DX in the coming 12 months.

A new year for the Division means preparation for the Annual General Meeting. Although it is four months down the track as these notes were being prepared, we have to start thinking about it. First, those on annual billing will have received their renewal notices which become due on January 1. Please process it as soon as practical.

To those groups and office bearers who have to complete any financial notifications to the treasurer, please submit your paperwork now as the year closed on December 31 and the books are now being prepared. Next, those who have reports to submit for the annual report should have these in by mid- January. Nominations for Council for the next term will be called during February. Nomination forms are available from the Divisional Office.

The Council consists of seven members. The Annual General Meeting will be held at the end of March, most likely on the 28th.

Further details will appear in next month's notes.

It is also the time of the year to consider and submit to Divisional Council, matters which may be suitable for raising at the Federal Convention, which will be held in Melbourne, in early May. Sufficient lead time needs to be given to allow discussion by all interested parties.

EXAMINATION DATES

A reminder that the February examination applications close on January 8.

PUBLICATIONS

A reminder that when the Office reopens in January, there is, as always, a range of amateur publications available. There are still stocks of the *Australian Call Book*.

During the month, limited stocks are expected of the mifInternational and *USA Call Books*, together with the *1987 ARRL Handbooks*. A new list of surplus items available may be obtained from the Office in person or by sending in a stamped self addressed envelope.

NEW MEMBERS

A welcome is extended to the following who were in the November intake:

S Anderson Assoc, Cabramatta; A Brett VK2KBA, Garden Suburb; F W Brown VK2KFW, Albion Park; T J Burkart VK2YGQ, Point Clare; T I Clarke VK2YCB, Taree; G A Collins Assoc, East Maitland; D C J Croxford Assoc, Faulconbridge; C N Davis VK2KNN, Charlestown; B L Dyne VK2MLD, Gorokan; P D Harris Assoc, Lavington; R K Harris Assoc, Lavington; D E Henry VK2MAP, Wauchope; L T Noonan VK2LEE, Scone; J M Ried Assoc, Evans Head; R R Ross- Wilson Assoc, Leichardt; J A Suleau VK2VSJ, Marsfield; A J Walter VK2ZJW, Tamworth; Z R Yacoub VK2KCZ, Dundas; M J Yorkston Assoc, Padstow.

INSTRUCTION CLASSES FOR 1987

Would the various clubs and groups who will be conducting classes during 1987, please advise the Divisional Office with the details.

The Division is often the first point of contact for prospective new amateurs who are looking for a local class that they can attend. The Division's Correspondence Course may be undertaken at anytime, anywhere. Details from the Office.

Gladesville ARC, who conduct their classes at Lane Cove, advise that they will be commencing a novice theory, leading into the full AOCP level from January 29, 1987 and a computer course for basics from February 10, 1987. Details from Ken VK2LT, phone (02) 516 1271.

BROADCASTS/OFFICE HOLIDAY BREAK

The last broadcast for 1986 was held on December 21. The first broadcast for 1987 will be on Sunday, January 11. During this period, any major happening will be announced on the Divisional telephone News Report — (02) 651 1489.

The Office closed at 2 pm on Friday, December 19 and will reopen on Monday January 11. During this period, the mail will be attended to and should be sent to the address at the top of this column.

FEES

The VK2 fees for 1987 are:
Full Member — $34.50
Associate Member — $32.50
Pensioner — $27.50
Student and Family Rates on application to the Office.

Note — there is no joining fee, despite what appeared on page seven of the current Call Book.

A reminder that the *Gosford Field Day* will be held on Sunday, February 22. ** Morse Machine, VK2RCW, changed two metre frequency late in 1986 to 144.950 MHz. The 80 metre transmission is on 3.699 MHz. It is a continuous service. ** Liverpool and District ARC Repeater, VK2RLD 7375, suffered a problem early in November when the guy wires on its host tower were interfered with resulting with a tower collapse. ** The communications division of SES Headquarters has been carrying out coverage trials from Dural on UHF Should these trials provide the desired coverage, a commercial arrangement will be entered into between the Division and the SES.

TRASH AND TREASURE SALE

The next event is being considered for the end of this month. The Broadcast will provide details — a Sunday afternoon in the carpark at Parramatta.

DIVISIONAL LIBRARY

The Library is starting to build up a range of original and copies of equipment handbooks and service manuals. If you can assist with either the donation or the loan of these publications, we would like to hear from you.

A list of publications we already have will appear in the next issue. In the meantime, you might like to contact Aub Topp VK2AXT, the Librarian, at the Office any Tuesday. Telephone (02) 689 2417.

We are interested in any handbook for anything — WWII, early or current commercial units, etc. Any loans will be copied and returned to you. Thanks.

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Contests

Ian Hunt VK5QX
FEDERAL CONTEST MANAGER
Box 1234, GPO, Adelaide, SA. 5001

CONTEST CALENDAR

JANUARY	
1	UBA SWL Competition (Continues to December 31, 1987)
5	Ross Hull Memorial VHF Contest concludes
23-25	CQ WW 160 metre CW Contest
31	YL ISSB CW Contest
FEBRUARY	
1	YL ISSB CW Contest (concludes)
7- 8	QCWA CW QSO Party
14-16	YLRL YL-OM Phone Contest
20-22	CQ WW 160 metre SSB Contest
21-22	ARRL DX CW Contest
21-22	YL ISSB Phone Contest
28	YLRL YL-OM CW Contest
MARCH	
2	YLRL YL-OM CW Contest
7- 8	ARRL DX Phone Contest
7- 8	QCWA Phone QSO Party
14-15	John Moyle Memorial Field Day Contest
28-29	CQ WW WPX SSB Contest

I would like to take this opportunity to wish all readers a very Happy New Year and may you have an enjoyable and successful contest year.

A reminder also, please remember to send in your logs for the Ross Hull Contest.

—73 de Ian VK5QX

HUNGARIAN DX CONTEST 1987

This contest is held on the third full weekend of January each year. In 1987, it will be held from 2200 UTC Saturday, January 17, to 2200 UTC, Sunday, January 18.

The contest's aims are to strengthen traditional radio amateur friendships, to prove technical and operating abilities and knowledge and to help participants to fulfill the conditions for various Hungarian diplomas. It is organised by the Hungarian Radio Amateur Society and is open to any licenced radio amateur.

Categories

Single operator, single band
Single operator, multi band
Multi operator, multi band (Club stations are only permitted to enter this section)

Frequencies 3.5, 7, 14, 21, and 28 MHz. Only one signal, on one band permitted at any time. This rule shall be strictly enforced. Disregarding this rule results in disqualification.

Mode CW only

Call CQ HA Test

Exchange Signal report and progressive serial number from 001. Hungarian stations will give an additional two-letter code/county as follows:

HA, HG1 — GY, VA, ZA; HA, HG2 — KO, VE; HA, HG3 — SO, TO, BA; HA, HG4 — FE; HA, HG5 — BP; HA, HG6 — NO, HE; HA, HG7 — PE, SZ; HA, HG8 — BN, BE, CS; HA, HG9 — BO; HA, HG0 — HA, SA.

Score HA, HG stations — 6 points; DX stations — 3 points; Own Continent — 0 points

Multipliers Number of Hungarian counties, per band.

Total Score Sum of points multiplied by the sum of the total multipliers.

Logs Separate logs per band, plus a summary sheet with a signed declaration should be sent to the Contest Bureau, H-1581 Budapest, Box 86, Hungary, within six weeks of the contest.

AWARDS The top three entrants in each country, continent and category will be awarded certificates. The absolute winners of the categories SOMB and MOMB will also receive a plaque. The winner of the SOSB category will receive an memorial award.

Diplomas Foreign participants may also apply for the following awards: WHD, Savaria, Pannonia, Dunakanyar/DD, Balaton/BD, Budapest/BPA.

THOUGHT FOR THE MONTH

Yes and no are the oldest and simplest words, but they require the most thought.

VK3 WIA Notes

Jim Linton VK3PC
IMMEDIATE PAST-PRESIDENT
WIA VICTORIAN DIVISION
412 Brunswick Street, Fitzroy, Vic. 3065

A master-plan to upgrade the network of VHF and UHF repeaters in Victoria was drawn up after the Ash Wednesday Bushfire Disaster.

More than three years later, with a plenty of behind-the-scenes work, about 90 percent of the plan has been achieved.

The fine network of repeaters should be able to handle amateur traffic requirements to the year 2000.

The WIA Victorian Division sponsors most of the repeaters — and there is three portable repeaters for WICEN which can be used anywhere in the State. The WIA involvement in repeaters reflects the unique nature of Victoria having six WIA zones — these co-ordinate local activity.

Unlike most other States where activity is purely club based — and the clubs install and run repeaters — the WIA Victorian Division Zones look after the repeaters in their area and some raise funds to help with their upkeep.

There is not too many radio amateurs in Victoria who do not have access to the repeater network.

Three groups of two-metre repeaters are to be linked — one reason for linking is to enable a community of radio amateurs in sparsely populated areas to communicate.

Victoria's repeaters will be one of the first in Australia to be linked with duplex UHF links — this means access one of the repeaters in the chain and your signal is re-transmitted on all three repeaters. The links can be isolated if need be — for example, to handle heavy local emergency traffic.

The first trio of linked repeaters will be in north-east Victoria — VK3RNE Wodonga, VK3RPB Bright and VK3RNC Corryong.

The WIA North-East Zone cannot be covered by a single mountain-top repeater and the linked system will give zone members a medium to communicate. The heavily timbered and bushfire prone alpine area now also has the necessary repeater facilities in place for WICEN use.

Similarly, the East Gippsland repeaters VK3RGO Omeo, VK3REG Cann River, and VK3REB Nowa Nowa, will be linked and operational in the same manner as those in the North-East Zone.

In the North-Western Zone, VK3RON Ouyen, VK3RMA Mildura and VK3RVL Robinvale are to be a future link-up.

The same comments about linking apply to the three sets of links — they will help bring together radio amateurs in sparsely populated areas, increase repeater use, and be ideal for emergency communications.

For the WIA's Sunday Morning Broadcast, a different form of linking will be used to transmit Institute news and information to members. From the new Lyndhurst broadcast site, the VK3BWI signal will be linked into East Gippsland and to the North-East.

Investigations are being made into how the North-Western Zone Repeaters can take a feed from VK3BWI.

The broadcast links have been approved by the Department of Communications as one-way and not available for general use by radio amateurs.

The main Melbourne repeater VK3RML is undergoing the final touches of a complete upgrading. A spasmodic and troublesome frequency mix from commercial transmitters at Mount Dandenong should be remedied.

Two new repeaters are still in the planning stages — VK3RMK 147.250 Charlton and VK3RWA 147.100 Ararat — these will fill in holes in the repeater network coverage.

A distinct strategy has been used in planning the location of repeaters to ensure sufficient coverage from the best possible sites. In recognition that UHF works better in and among city buildings when compared with VHF — Melbourne is served by six 70 cm repeaters. Those with UHF in their cars and shacks are finding it an ideal medium for the metropolitan area — an increase in the number of UHF users can be expected in the next decade.

The use of UHF for Melbourne has also released two-metre channels for country areas. In anticipation of a packet radio boom, the Melbourne digipeater, VK3RPK 147.600 has been operating for about two years.

But the most exciting prospect is the Australian East Coast Packet Highway, which will link Brisbane, Sydney, Canberra, Melbourne and Hobart. Victoria's leg of the Highway has packet repeaters VK3RPN Wodonga, VK3RPW Shepparton, and VK3RPL Mount Saint Leonard, north-east of Melbourne. These digipeaters will all be on the national packet frequency of 147.575 MHz.

Over the past three years, the Victorian Division has spent about $20 000 on repeaters and it is the Divisional Council's intention to capitalise the repeaters on the 1986 Balance Sheet. This action is being taken because repeater expenditure has taken a large percentage of member's fees and it is desirable the valuable asset of repeaters be clearly shown.

In 1987, repeater expenditure will be drastically reduced with a $2000 budget. This will go to new repeater works and basically for digipeaters.

In line with WICEN's status in Appendix AJ of the State Disaster Plan representations will be made for State Government funding for WICEN repeater installations.

The Divisional Council's number one priority in 1986 and 1987 has been the VK3BWI Broadcast. After a decade of being located at the Science Museum in Melbourne, the studio had been relocated to Lyndhurst, south-east of the city. Expenditure on the broadcast has been set at a budget of $9 500 for a tower, antennas, cabling, new UHF equipment and a VHF transmitter and console. Modifications and fittings to the building have also been necessary, but the ultimate goal is to give members a weekly broadcast which can (with links already mentioned) be heard throughout the State.

NEW MEMBERS

Members, Council and Executive of the VK3 Division would like to extend a warm welcome to the following members who joined during the month of October 1986.

Julian Beaumont VK3YRL, A Chappelow VK3PMO, Colac Amateur Radio Club VK3CRC, Daryl Cunningham, C T Evans, J Knowles VK3PMT, Adam Maurer VK3YWV, Douglas Paton VK3SF, John Rankine VBE650, Frank Singleton VK3PKX, Abet Suhaian LF0057, A Swarbrick VK3XJW, W Swarbrick VK3XJX, Z Swarbrick VK3XTC, Peter Van Houten VK3XRQ, Herbert Varney and Gregory Anderson VK3NGE.

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Five-Eighth Wave

Jennifer Warrington VK5ANW
59 Albert Street, Clarence Gardens, SA. 5039

A very happy New Year to you all. I hope that the Christmas season was a happy one at your QTH and that Santa Claus brought you the right piece of gear (or test equipment, soldering iron, text book, etc).

Around the end of last year the Division received two very nice photographs of historical significance, donated to us by John Allan VK5UL, whose nephew, Bob VK5BJA, is one of our current Council members (this is not John's only claim to fame, as you will read later!).

The photographs are of the Mount Gambier High School Radio Club, which was active from 1928 to 1932, and show —
(Standing) Mr John S Walker BSc, Science Master and Radio Club Leader. Club members (seated LtoR) Arthur Simms, Noel Fredericks, Glen O'Shaughnessy, Rex Sullivan, Michael O'Neil, (hidden person unknown), Ken Crafter, Bob Krummel, Lloyd Orchard, John Heaver and Gilbert Saville.

I wonder if any of these young men gained their licenses and where they are now? (John Heaver is VK3XEH, and had a photograph published of the same class in *Amateur Radio*, May 1985, page 12. —Ed).

HISTORY

The Mount Gambier High School Radio Club was established by John S Walker in 1926. It was disbanded in 1932 when Mr Walker transferred to Adelaide High School.

The Club operated initially from Mrs Olsen's Boarding House, in Helen Street, Mount Gambier, where Mr Walker resided. It was later transferred to the High School.

The station was affiliated with the South Australian Division of the WIA and operated on the 40 metre band. Music and local topics were broadcast on Sunday nights in the 215 metre band. (The class used the call sign OA5GH on 200 metres). Programs were published in the *Border Watch* newspaper.

Technical Details

RECEIVER — originally three tubes, comprising TRF, regenerative detector, audio. An additional choke coupled audio stage was added later.
TRANSMITTER — UX201A master oscillator in a split Hartley circuit driving a UX210 power amplifier. Input power 25 watts. Modulation was Heising type, all filaments battery powered.
ANTENNA — inverted L-Cage with four counterpoise three metres above the ground.

Notes

OA5GH was the first country high school radio club in South Australia.

John S Walker retired as Director-General of Education in South Australia in 1970. He died on a voyage home from Europe in 1971 and was buried at sea. Our thanks to John VK5UL, not only for the photographs which he has donated, but also for these notes which I have copied.

As I said before, having a nephew on Council is not John's greatest claim to fame in the amateur fraternity! Reading Marlene Austin's book *The First 60 Years*, I note that John's first mention was in May 1946, when he was interpreting Ionospheric Prediction Charts (for whom, it does not say). From June 1947 until May 1963, he was teaching AOCP theory classes, some of that time he was assisted by Bruce Busseschutt VK5OR, and some of the time he was paid for it!

In August 1963, he was asked to liaise with the Education Department to organise a youth radio training scheme in South Australia, and in May 1965 he was elected to Council as the Youth Radio Club Scheme representative. By May 1968, he was nominated as Vice-President, and from March 1970 to 1972 he was Divisional President as well as still being the YRCS Liaison Officer. Thank you John Allan, MIREE Chartered Electronics Engineer, VK5UL — a hard act to follow.

Speaking of electronic engineers — at the end of last year, Don McDonald VK5ADD and myself, attended an afternoon of 'Demonstrations of Design *Projects* by Final Year *Degree* Students' at the School of Electronic Engineering, the Levels Campus of the Institute of Technology. The reason that Don and I were invited was because one of those projects is being sponsored by the WIA. Two years ago, Steve Ireland VK5AOZ, asked Council if the WIA would be prepared to become involved in a scheme whereby firms, individuals or organisations sponsor a project for which they have a need and have it designed by the students (working alone or in pairs) and a prototype built. Steve persuaded us that a two-metre FM RTTY repeater was needed in the Adelaide-area, and we agreed (this was before the advent of VK5RSV).

However, Steve and his partner never completed the project, which was continued last year by John Tsimbinos VK5ALG and Paul Burns VK5APG. John and Paul have built the receiver and transmitter, respectively, and we were able to see it working on the test bench. So far it has only cost us a handful of parts from ESC, but we are aware that there will be a nominal cost for paperwork, etc. The device as it stands at the present does not have to become a RTTY repeater, but could be a two-metre repeater for use as a backup repeater or perhaps for WICEN purposes. It has not yet been decided what use we will put it to, nor if we will leave it at The Levels for another 12 months, so that it can become the project for another student/s to finish. However, I would like to thank John and Paul for the effort that they have put into it, and wish them all the best in what looks like two very promising careers in electronics.

The opening speaker for that afternoon was Mr Henry D'Assumpcao, Director, Electronics Research Laboratory, DRCS. I think Don and I were both relieved that he chose to speak about Project Jindalee and the Over-the-Horizon-Radar system, which we could both understand having had a speaker from DRCS explain it to us a couple of years ago, and Ian Hunt VK5QX, write an article on it for AR!

DIARY DATES

January 27 — Traditionally the first meeting *in the* New Year is a *Buy and Sell* night. The only difference between this meeting and our fifth Tuesday night meetings is that ESC, Publications and QSL facilities will be available beforehand, and there will be a short business meeting also. (Commences 7.45 pm).

February 24 — Topic not known at time of going to press. Commences at 7.45 pm. (Gates open from 7.00 pm both nights).

Photograph courtesy J P Rodgers VK5KJT

Peter VK5PRM (left) and John VK5JM at the September Buy and Sell.

J150 AWARD WINNERS

767	VK3VNQ	819	V85RM
768	VK4KGL	822	YB5NOF
769	VK4MAX	823	4Z4OX[9]
770	G4OYU	824	VK5ANW
781	YB6MF	825	N4OAQ
782	YC6QF	826	VK5NZ/W4
783	YB6ZES	831	9M2HB
784	YC5OBB	832	PA3CWJ[10]
785	G4UNH	834	VK4NDG
786	KA6NIT	835	VK5NGT
787	WB5WFW	839	VK4MKT
788	G0DXC	840	VK6ZY
789	G0CCA	841	G0DBE
790	G3CPT	842	VK2POA
791	GW4VBV[1]	843	VK2MAP
792	GW4TFX	844	VK7CV
793	G4WTL	845	VK5NXB/P
794	GM0FQV[2]	847	NN0F
795	G4VPC	848	VK2LEE
796	GM4KLO	849	VK2AZS
797	G4WWP	850	VK2NHH
798	G0ATB[3]	851	FK8AH[11]
799	G3WRD	852	(SWL) ZL1-287
800	GM0ARD	853	JA5LEX
801	(SWL) L40074	854	EA2TSA[12]
802	JR8AYI	855	YC0GVT
803	ZL2MO	856	YC5RO/8
804	ZL3FM	857	NE8E
805	JH9UTY	858	G0AOP
806	OK2BBI[4]	859	AP2SQ[13]
807	ZL1BNW	860	ZL2AKI
808	JE4LPH	861	G2CZO
809	5W1FT[5]	862	G0BNA
810	5W1FM[6]	863	EI6EW[14]
811	9H4E[7]	864	ZL1BXB
812	VK6ATS	865	N4LZH
813	VK6DD	866	VK5PJM
814	ZL1HJ	869	KI4M
815	OZ1LDN[8]	870	IK5FCD[15]
816	YB3CN	871	VK5PEM
817	9M2EE	872	KF5LM
818	V85DU		

1 First GW
2 First GM
3 First G YL
4 First OK
5 First 5W1
6 First 5W1 YL
7 First 9H
8 First OZ
9 First 4Z
10 First PA
11 First FK
12 First EA
13 First AP
14 First EI
15 First I

COMPUTERS

Users of the *Sinclair* range of computers — X81, Spectrum, or QL — may be interested to know of a group of radio amateurs who specialise in the application of amateur radio to this computer.

The Sinclair Amateur Radio Group publishes a newsletter four times a year containing programs and useful hints. It also makes available program tapes on a wide range of radio topics, including satellites.

Membership for non-UK amateurs, including airmail delivery of the newsletter, is £stg8 per annum (in Sterling only) payable to P Newman G4INP, SARUG, 3 Red House Lane, Leiston, Suffolk, IP16 4JZ, England.

—Contributed by Bob Arnold VK3ZBB

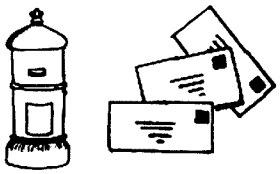
THEFTS UP

O Home computers and microwave ovens have replaced video equipment as a popular target for thieves and are one of the most marketable items on the crime scene.

The Insurance Council of Australia says there is a glut of videos and burglars raiding homes and schools are looking particularly for computers.

THOUGHT FOR THE MONTH

O What we see depends mainly on what we look for!



Over to You!

Any opinion expressed under this heading is the individual opinion of the writer and does not necessarily coincide with that of the publisher.

TECHNICAL MAILBOX

I am sorry to be so long in replying to your request for more information on my problem with my power supply. I have had so many amateurs anxious to help me after reading the October AR, that I need bother you no further.

It was as you suggested — inadequate earthing and the fact I used a picofarad capacitor instead of a microfarad!

Also, regarding the ATU, this was explained to me and I would like to thank you and your column for your help.

I feel sure the Technical Mailbox will fill a need for all amateurs.

Yours sincerely,

Albert Davey VK6ARD,
12 Lillian Street,
Cottesloe, WA.
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IN AGREEMENT

I am in complete agreement with the comments by Sid Molen VK2SG, in his letter *Ego Boosting* in AR for October, concerning emergency communications and those who deliberately ignore past history and the achievements of experienced amateur operators.

I read the "hogwash" letter in July AR headed: *Emergency! Are we ready?* by Sam Voron VK2BVS, and decided that I would be wasting my time replying to such nonsense.

In the past I have adequately pointed out in these columns the immature shortcomings and incorrect approach to emergency communications exhibited by the Australian Traffic Net and the July letter fully confirms my previous statements.

Not only Sam, but also other "Ego Trippers" in the Institute have deliberately published incorrect statements concerning previous emergency operations which have had to be corrected by those who actually took part in them.

As Sid points out, there are plenty of "Old Timers" with a wealth of knowledge and experience in radio communications, particularly emergency communications, who are willing to help, advise and even train newcomers in this important facet of our hobby.

A better understanding of the basics of radio communications will make better amateur radio operators which, in turn, will make for more competence in handling emergency situations.

One way to achieve this is for more amateurs to become involved in WICEN.

73,

Ted Gabriel VK4YG,
PO Box 245,
Ravenshoe, Qld. 4872.
ar

HAPPY ROSH HASHANA

On the Labour long-weekend, Sam VK2BVS, decided to set up an amateur radio demonstration station in the heart of Kings Cross, New South Wales. The purpose of the station was originally to demonstrate two metre repeater operation and take messages for Third Party Traffic to USA, Canada and Israel.

The same week being Navy Week, also helped due to the foreign warships in port.

I heard Sam operating and asked if he needed some help and down I came. After being briefed on Third Party Traffic, we were in business together.

Many messages were taken and promptly started their journey the following afternoon. With Sam's station, many messages were sent direct.

You are still wondering what the title means? That same weekend was the Israeli New Year and a group of Israeli visitors took the opportunity to send greetings to their loved ones and families. One of them also sent a message to the Israeli Prime Minister.

This is one of the many ways the public can see amateur radio in action, if only in a small way. We were visited by a lady from New Zealand and a

The Israeli Group witness amateur radio.

Two visitors experience two-metre repeater operation demonstrated by Sam VK2BVS and Greville VK2JGR.

Tasmanian visiting the mainland. Many thanks to everyone who came up on the repeater to assist in making contacts.

This exercise was done purely as a hobby and messages were handled gratis. We were offered remuneration at several stages but politely refused and explained the regulations.

Greville Knight VK2JGR,
HMAS *Orion*,
International Mail Exchange,
Sydney, NSW.
ar

MARITIME MOBILE

Firstly, thanks for an excellent and most interesting magazine, I look forward to every issue.

Two great interests of mine are, amateur radio (25 years) and 'being on the water.' I have operated Maritime Mobile for many years, mostly out in Bass Strait on a survey ship, running a variety of antennas, mostly long wires by necessity.

Now, being fed up with the sharks ashore, I've taken to the water again, this time on my own little yacht, a 25 feet (8 metre) sloop.

Naturally, one of the first pieces of equipment to go onboard was the amateur rig, so I would be interested to hear from other 'boaties' as to effective antennas.

The backstay is loaded up, but is not too good on some bands, especially 80 metres. I can't quite manage a three-element monobander atop the mast. Believe it or not, I saw one on a yacht in Canada!

Any information on maritime mobile nets and scheds would also be appreciated.

Something else of interest — do any of the old timers remember back in the 40s, there was a thermocouple generator available somewhere which ran off a kerosene lamp? Apparently it produced enough power to operate a small valve-type mantle radio.

Also, I believe, nowadays some of the commercial repeater stations in remote areas, use a thermocouple generator powered by propane gas.

I would appreciate any information on any of the above — power is short out on the water!

Cheers and 73,

Pete Robinson VK2DFR,
PO Box 290,
Milsons Point, NSW. 2061.
ar

FRIGHTENING

The editorial (reprinted below) appeared in *The Short Wave Magazine* September 1986.

It is frightening. It could just as well happen here with government policy changes, and political party changes, with pressure being applied by industry. The situation in the UK needs to be closely watched, along with ideas and attitudes of our own DOC.

Being employed in the electronics industry, the EMC situation is interesting. Many of my colleagues, with little or no radio knowledge, are ignorant — or worse, do not care about EMC. They think it is funny, and say "Bad luck, mate!" Some of the computer buffs think their computers are sacred and become abusive if RF gets into their beloved equipment.

It is interesting to note the number of amateurs who have become involved in computers and are heard less and less active on the air!

Yours faithfully,

Steve Mahony VK5AIM,
19 Kentish Road,
Elizabeth Downs, SA. 5113.

RIS PROBLEM

We have recently received from several quarters comments that indicate a changed attitude on the part of the Radio Interference Service staff; to lend credence to this we have just been sent a copy of a document entitled "Strategy for Dealing with the Problem when Amateur Radio Users Cause Interference to Neighbours" — without any covering letter. From the structure of this 'leaked' document we deduce it was formulated by the RIS management.

The result of full implementation of the ideas contained in this paper would be catastrophic, even to the point of spelling a virtual end to amateur radio activity as we know it today with VHF particularly badly affected. In the recent past RIS staff have intimated that in cases of intractable TVI they would request the DTI to vary the licence conditions to enable them to enforce reduced power to as low as three watts, or even enforce QRT. The document also makes it crystal clear that this change of attitude has been created by the anti-social attitude of a small number of amateur licensees. Couple this with the general notion that television is something akin to God only higher, and therefore cannot be questioned or taken to task for the interference *it* produces, and you can see that we have a real problem on our hands.

What now arises? First, let it be quite clear that the RSGB have spent, and are spending, hundreds of man-hours on fact-finding and negotiation with regard to this document. So please *don't* descend on RSGB Headquarters with queries demanding an answer, or you'll bring the entire organisation to a halt. Let them get on with their work for all of us, and give them every support you can. We *must* close ranks or we are lost.

Something which makes this threat so very dangerous is, of course, the idea of passing interference-solving activity to the radio/TV trade — an idea which is, and always was, ludicrous for the simple reason that Interference is something of a development engineer's problem, and this is an area in which, by definition, even competent servicing personnel lack know-how.

There was a proposed British Standard covering the question of immunity to interference in the pipeline, but this has gone by the board in favour of a CENELEC (ie EEC) standard which is in many ways better, though still not nearly good enough. The CENELEC standard lays down immunity of equipment to signals of approximately 1.8 volts/metre, and the intention seems to be to require amateurs to reduce power until that level is met and then continue operation using only that low power for ever after.

Clearly, that means that an amateur who lives in an urban area is at serious risk through TVI, because of the inadequacies of cheap-and-cheerful commercial entertainment products — although to be fair, the document does acknowledge that much domestic radio and electronic home entertainment and communications equipment is cheaply engineered with respect to immunity from unwanted radio signals. It also recognises that the amount of such equipment, which unless adequately shielded is sensitive to RFI, is growing rapidly. If we accept that the life of, say, a TV set is around 10 years, we can see the average UK radio amateur being reduced to QRP at best for the next decade at least.

All we can do at the moment is close ranks behind the RSGB and hope they can get a positive response out of the authorities. Of course if you know of an amateur who is behaving in an anti-social way over TVI and his neighbours, then bring the *strongest possible* pressure to bear on him to either close down or clear the TVI problem; throwing him out of the club is mild compared with all of us having to become QRP — or even QRT.

Looked at from a wider aspect for a moment, the powers-that-be would do well to understand that a 'national QRT' would be disastrous: much of the electronics industry's development work is done by the younger generation of engineers, and we know that many of these gained an initial interest through their early contact with amateur radio, even though they may have later given up their licence. Thus we stand to see sections of the electronics industry put at risk for want of new blood coming up through the amateur fraternity, who almost alone provide the know-how outside the ranks of the digital circuitry merchants.

Signed: G3KFE

—Editorial from *The Short Wave Magazine* September 1986

ar

IDENTIFYING QRM IN STEREO

Some types of "splatter," "mixed modulation," and "tone burst" interference are quite difficult to identify unless the source can be correlated with the result.

This can often be achieved using two receivers, one of which must be a general coverage type, while the other may be single band or fixed tuned to the interference. Take the single channel headphone output of each receiver to the L and R channels of a pair of stereo headphones, then tune the general coverage receiver down (usually) through the band.

When the source of interference is tuned, the modulation products "meet between the ears" to correlate the two, even though each is unintelligible in the normal sense!

For example, the "mixed modulation" from a third order product ($2 \times F1 \pm F2$) of two broadcast stations synchronises in musical beat or speech syllables although the interference is still hopelessly mixed up. The same applies for a foreign language, SSB "splatter" and even RTTY harmonics!

Bill McLeod VK3MI,
42 Capon Street,
Chadstone, Vic. 3148.

ar

CORRECTION

Unfortunately, in the article *Matching Impedance Formula* which appeared on page 3 of November AR, there was an extra 0 added to the last equation, six lines from the bottom of the page.

The equation should read:

$R_s = R_L$ (not $R_s = R_L = 0$).

Apologies to all readers and, most importantly, the author who may have had his maths doubted!

Silent Keys

It is with deep regret we record the passing of —

MR JIM CUNNINGHAM	VK3PHJ
MR L O OAKLEY	VK3BNH

Obituaries

CLAUDE VAUTIN VK4KDQ

It is with regret we record the passing of Claude Vautin VK4KDQ, aged 76. Claude suffered a stroke and died peacefully just over three weeks later, on October 16, 1986.

At the age of 70, Claude decided to study for his amateur licence and, having been employed at the local Electricity Board for all his working life, the theory was a breeze, but like many others, he had trouble with the 10 WPM CW and regretfully had not obtained his full call.

He spent many happy hours talking to his mates and was always very willing to help students with their theory.

Claude was a good club member, having held the position of Station Manager and participating in club meetings — his ready wit, infectious smile and helping hand will be sorely missed.

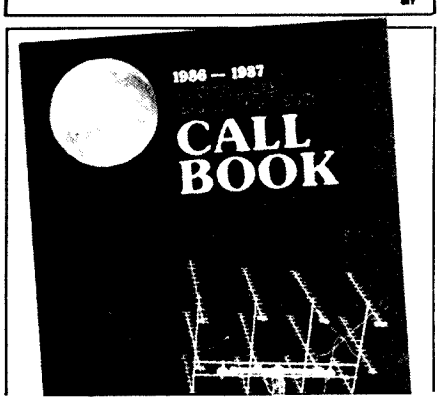
The people paying their last respects overflowed the large church and this is indicative of the high esteem in which Claude was held in the Cairns community.

The Cairns Amateur Radio Club members extend their sincere sympathy to his devoted wife, Ethel, his four daughters and their families.

Claude was truly a gentle man.

Anne Benson VK4FAB

ar



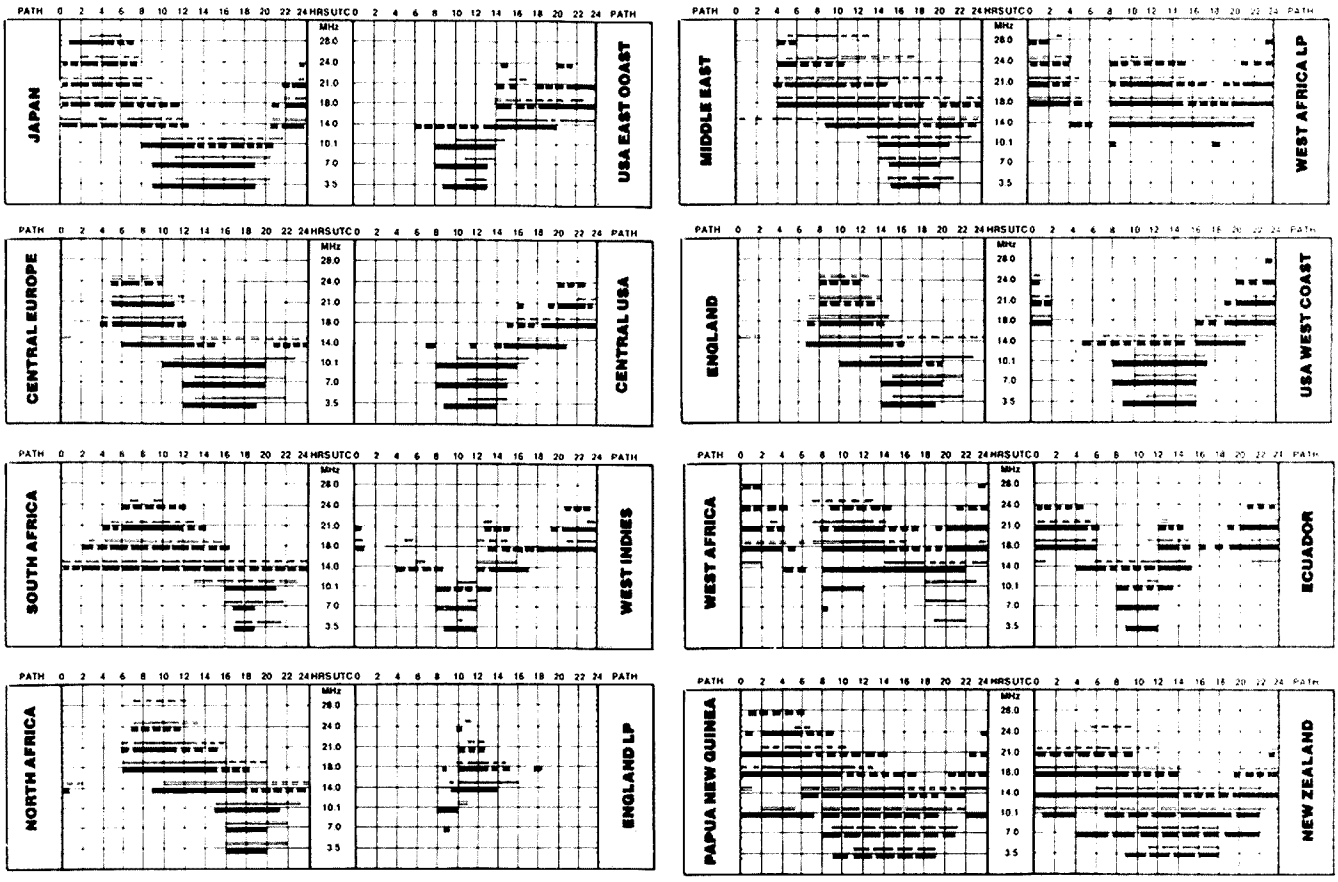
CHANGE OF CALL SIGN OR ADDRESS

Within days of the new Call Book being released, the Federal Office was receiving letters from amateurs that their details in the Call Book were incorrect. The WIA regularly receives updated information from the Department of Communications listing new call sign allocations and changes of call sign and address. The system works well — most of the time. Occasionally, there are delays or omissions.

All amateurs, whether they be members of the WIA or not, are requested to notify the Institute of changes of call sign or address to ensure that their entry in the Call Book is correct. When notifying the WIA of a change, please give both ***old details as well as new.*** If you are a member, please include a recent AR label if possible, to enable us to positively identify the record to be changed.

Ionospheric Predictions

Len Poynter VK3BYE
14 Esther Court, Fawkner, Vic. 3060



LEGEND
From Western Australia (Perth)
From Eastern Australia (Canberra)

Mixed mode dependent on angle of radiation (long broken lines).

Better than 50% of the month, but not every day (continuous lines)

All paths unless otherwise indicated; (ie LP = Long Path) are Short Path.

Less than 50% of the month (short broken lines).

Predictions are presented courtesy of the Department of Science, IPS Radio and Space Services, Sydney

Solar Geophysical Summary — SEPTEMBER

Solar activity was low in September with no energetic solar flares being observed. The sun was spotless except for 1-4, 6-9 and 29-30. During those periods there were small regions visible. The absence of spots is reflected in the very narrow range of the 10 cm solar flux.

The readings for the month were:
1=69, 2-4=68, 5=69, 6=68, 7=69, 8-13=68, 14=69, 15=71, 16=70, 17=69, 18-24=68, 25=69, 26=68, 27=69, 28=70, 29,30=71. Average was 68.7.

Sunspot number for the month was 3.9. The yearly average number was 13.1 centred on March 1986.

GEOMAGNETIC

It was a disturbed month with eight days on which the A-index equalled or exceeded 20. Those included the 12th and 23rd, on which the field was at major storm levels. There were also two extended periods of disturbed conditions — 11-15th and 23-27th.

September 2 The field became disturbed after 0300 UTC and remained that way until 1500 UTC. A=20.

September 11-14 The field became disturbed on 11 and a sudden jump in field around 1830 UTC. It was at major storm level from 2100 UTC until 1200 UTC on 12th and remained at active to storm levels until 0300 UTC on 14th. A=13, 49, 20, 13.

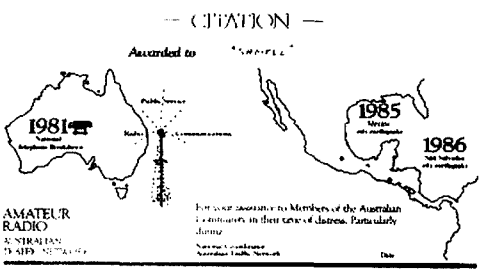
September 15 The field was disturbed in the early UTC day. A=15.

September 18-21 The field was generally disturbed with intervals of minor storm conditions. A=19, 17, 19, 12.

September 23-28 The field became disturbed after 0600 UTC on 23rd. It was at major storm levels for the remainder of the UTC day and at active to minor storm levels on 24-27 and gradually subsiding on the 28th. A=35, 23, 22, 21, 22, 15.

—From data supplied by the *Department of Science IPS Radio and Space Services*, September 1986
ar

RADIO COMMUNICATIONS



RADIOCOMMUNICATIONS CITATION

A radiocommunications citation will be awarded to amateur radio operators or anyone assisting those operators during the national Australian telephone breakdown of June 10-17, 1981, and/or the Mexico City Earthquake, September 21-25, 1985 and/or the San Salvador City Earthquake, October 11- 19, 1986 during which time, radio amateurs and their friends came to the service of distressed members of the Australian community.

Persons and Organisations qualifying for this Award — will have either originated, relayed or delivered messages on the air, over the telephone or by any other means, or provided updates to organisations, such as government departments or to national associations, or assisted as a net control or relay station or been available in some way; eg a non-licenced person helping an involved operator, or a CB operator assisting in delivery or message collecting in the local area or other members of the public whose special help is acknowledged.

Overseas amateurs or anyone who assisted them (as described earlier), in handling Australian third-party messages also qualify for this award. All Mexican radio amateurs involved in 1985 and all El Salvador amateurs involved in 1986 qualify. United States, Canadian and others who assisted Australian messages to flow in anyway also are eligible. This includes anyone who helped an overseas amateur; eg non-licenced person.

By now, citations will have been forwarded to persons and organisation known to have been involved. It is inevitable that, in efforts of such magnitude, participants may have been overlooked, be unknown, or changed address or call sign. Therefore, the citation is also being offered as a general award. Send details of your involvement, to: Sam Voron VK2BVS, 2 Griffith Avenue, Roseville, NSW. 2069.

THIRD-PARTY TRAFFIC

The State Visit to Australia by His Excellency, the President of Israel, Mr Chaim Hertzog, is one of the greatest manifestations of the good and friendly relations between our two countries. We are glad to note that the visit follows the entering into force a very few months ago of a Third-Party Traffic agreement between the governments of Australia and Israel. Though very little publicised outside AR circles, this agreement, we are sure, constitutes a welcome and important contribution to the advancement of co-operation and good relations between Australia and Israel and of human connections among the people of the world in general.

Signed: Y Lavie
Minister Councillor
Embassy of Israel, Canberra, ACT.

—WIA Third-Party Traffic, from VK2BVS to VK3CKK

TV WATCHES

O The term "watching the clock" could take on a whole new meaning when television watches become available.

A recent marketing seminar In Japan revealed the television watches about twice the size of a normal wrist watch developed for the American market could be in Australia within three years.

DEADLINE

DEADLINE

All copy for inclusion in the March 1987 issue of Amateur Radio, including regular columns and *Hamads*, must arrive at PO Box 300, Caulfield South, Vic. 3162, at the latest, by 9am, January 19, 1987.

Hamads

PLEASE NOTE: *If you are advertising items FOR SALE and WANTED please write each on a separate sheet of paper, and include all details; eg Name, Address, Telephone Number, on both sheets. Please write copy for your Hamad as clearly as possible. Please do not use scraps of paper.*

* Please remember your STD code with telephone numbers
* Eight lines free to all WIA members. $9.00 per 10 words minimum for non- members
* Copy in typescript, or block letters — double-spaced to Box 300, Caulfield South, Vic. 3162
* Repeats may be charged at full rates
* QTHR means address is correct as set out in the WIA current Call Book

Ordinary Hamads submitted from members who are deemed to be in the general electronics retail and wholesale distributive trades should be certified as referring only to private articles not being re-sold for merchandising purposes.

Conditions for commercial advertising are as follows:

$22.50 for four lines, plus $2.00 per line (or part thereof)

Minimum charge — $22.50 pre-payable

Copy is required by the Deadline as indicated below the indexes on page 1 of each issue.

TRADE ADS

AMIDON FERROMAGNETIC CORES: Large range for all receiver and Transmitting Applications. For data and price list send 105x 220mm SASE to: **RJ & US IMPORTS,** Box 157, Moridale, NSW. 2223. (No inquiries at office ... 11 Macken Street, Oakley). Agencies at: Geolf Wood Electronics, Lane Cove, NSW. Webb Electronics, Albury, NSW. Truscott Electronics, Croydon, Vic. Willis Trading Co, Perth, WA. Electronic Components, Fishwick, Plaza. ACT.

WANTED — NSW

DETAILS FROM CLUBS & GROUPS: about their formation & activities so they can be included in the Club Portrait series in AR magazine. Some brief details & contact name, plus phone number to Jim Linton VK3PC, QTHR.

FOR SPOT CASH: Kenwood 930S in good condition. Complete with ATU903 & CW filters. Al Davies-Rice VK2AXR. Ph: (02) 477 6275.

SERVICE MANUAL: for Kyokuto 2025A 2m rig. Purchase or loan for copying. Cash recompense. VK2IS, QTHR.

TRANSCEIVER: for 70 cm, amateur or commercial crystal controlled. Barry VK2AAB, QTHR. Ph: (02) 487 1428.

TWO METRE FM RECEIVER BOARD: out of IC22A or similar. John VK2DFC, QTHR. Ph: (069) 62 5547 AH.

YAESU RSL-3.5 MOBILE ANTENNA: for use with RSM-2 base and RSE-2A 2m stub. Brian VK2QP, QTHR. Ph: (02) 451 0818.

WANTED — VIC

CIRCUIT DIAGRAM: copy of circuit diagram &/or manual for AR8 wartime *receiver.* Will pay any costs involved. Ralph Birrell VK3BIP, QTHR. Ph: (054) 39 5428.

KENWOOD TS-130S or ICOM 730: Must be in good condition. Top price paid for good unit. VK3XV, QTHR. Ph: (03) 527 4029 after 5 pm. Reverse charges okay.

WANTED — OLD

DETAILS FROM CLUBS & GROUPS: about their formation & activities so they can be included in the Club Portrait series in AR magazine. Some brief details & contact name, plus phone number to Jim Linton VK3PC, QTHR.

INFORMATION ON SIEMENS FAX MACHINE: Borrow or buy. VK4PJ, QTHR. Ph: (07) 399 2881.

QST MAGAZINES: in good condition. VK4JZ, QTHR. Ph: (07) 398 2002.

TS-830S OR SIMILAR TRANSCEIVER: with WARC bands. Full details to VK4XA, QTHR. Ph: (07) 263 6812.

WANTED — WA

TRI-BAND ANTENNA: TH3 jnr or HQ1 or similar small beam. Arthur VK6SY, QTHR.

FOR SALE — NSW

KENWOOD 820: very good condition, manual and workshop manual. $450. Yaesu FT-101EE with all mods to bring to FT-101E, manual. Kenwood 7400A, 2m, $200. Deceased estate of OT VK2BRI. Hal VK2HW. Ph: (02) 810 1702.

YAESU AUTO ANTENNA TUNER: FC757 AT, for use with FC757GX or FT980/S or FT77/S. Very clean in original carton with manual & leads. $420. Bob VK2JZ, QTHR. Ph: (02) 44 7701.

FOR SALE — VIC

ICOM IC-22S: 2 metre FM tcvr, good performer with mic, mobile bracket, handbook. Ideal as a backup rig or for newcomer to investigate 2m without costing an arm or leg. $165. B Bathols VK3UV, QTHR. Ph: (03) 580 6424.

MICRONTA DIGITAL MULTIMETER: ohms 0.1 ohms to 20 meg, AC/DC mA 1uA to 200 mA, AC/DC volts 1 mV to 500/1000 volts. $50. Two Pearce Simpson Shuttlecock MX215 headset tcvrs on 55.035 MHz. New, $120 or best offer for pair. No licence required. Various miniature & octal valves, $1 to $5 plus post. About 200 all told. WWII ex-service army radio equipment suitable for museum. What offers? R Champness VK3UG, QTHR.

MOBILE 2 METRE XTAL CONTROLLED: Ch — RML, RMM, RGL, RBA, SHEP, Simplex — 40, 50, provision for 12 chs. $130. Good cond. Ashi gutter grip base & 5/8 Ashi whip. $30. VK3FT, QTHR. Ph: (03) 882 4853 after 5 pm & weekends.

FOR SALE — OLD

ICOM 740: workshop manual. $20. VK4PJ, QTHR. Ph: (07) 399 2881.

Advertiser's Index

SENSATIONAL OFFER!

2 METRE 5 WATT HAND HELD

Only $275

TH-205A
ILLUSTRATED

FEATURES	TH-205A	TH-215A
POWER OUT	5 WATT	5 WATT
FREQUENCY	144 MHz-148 MHz	144 MHz-148MHz
MEMORY CHANNELS	3	10
KEYBOARD ENTRY	NO	YES
UP/DOWN SCAN	YES	YES
FREQUENCY LOCK	YES	YES
EXT. SPEAKER/MIC.	YES (OPTION)	YES (OPTION)
12 VOLT CIGAR PLUG	YES (OPTION)	YES (OPTION)
WEIGHT	350 gms	350 gms
SIZE	70W X 180H X 40D	70W X 180H X 40D
SUPPLIED ACCESSORIES	AA BATTERY PACK AERIAL	AA BATTERY PACK AERIAL
	$275	$350
OPTIONS (See your dealer for prices)	NICAD PACK CHARGER	NICAD PACK CHARGER

KENWOOD ELECTRONICS AUSTRALIA PTY. LTD.

4E WOODCOCK PLACE, LANE COVE, SYDNEY, N.S.W. 2066. Ph. (02) 428 1455.

YOUR DEALER BELOW WILL GUARANTEE SATISFACTION

Further, beware of dealers not listed in this advertisement who are selling Kenwood communications equipment. All Kenwood products offered by them are not supplied by Kenwood Electronics Australia Pty. Ltd. and have no guarantee applicable.

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- EMTRONICS - 94 WENTWORTH AVENUE, SYDNEY (02)211 0988
- REG STOCKMAN COMMUNICATIONS - CNR. BANOCKBURN ROAD & SHIRLEY STREET, INVERELL (067) 72 1303
- WORMALO COMMUNICATIONS - 51 DENNISON STREET, HAMILTON, NEWCASTLE (049) 69 1999
- MACELEC PTY. LTD. - 99 KENNY STREET, WOLLONGONG (042) 29 1455
- E. & K. COMMUNICATIONS - 14 DUTTON STREET, DICKSON, A.C.T. (062) 49 6437
- DX ENGINEERING - 158 GRANITE STREET, PORT MACQUARIE (065) 84 9922
- FRANK BOUNDY - LISMORE (066) 86 2145

INTERSTATE

VIC.:
- PARAMETERS PTY. LTD. - 1064 CENTRE ROAD, SOUTH OAKLEY (03) 575 0222
- EMTRONICS - SHOP 5, 288-294 QUEEN STREET, MELBOURNE (03) 67 8131
- BRIAN STARES - 11 MALMSBURY STREET, BALLARAT (053) 39 2808
- SUMNER ELECTRONICS - 78 KING STREET, BENDIGO (054) 43 1977

TAS.:
- HOBBY ELECTRONICS - 477 NELSON ROAD, MT. NELSON (002) 23 6751
- WATSONS WIRELESS - 72 BRISBANE STREET, HOBART (002) 34 4303
- MARINE & COMMUNICATION - 19 CHARLES STREET, LAUNCESTON (003) 31 2711

QLD.:
- V.K. ELECTRONICS - 214 MOUNT STREET, BURNIE (004) 31 7733

S.A. & N.T.:
- MITCHELL RADIO CO. - 59 ALBION ROAD, ALBION (07) 57 6830

W.A.:
- INTERNATIONAL COMMUNICATIONS SYSTEMS PTY. LTD. - 8 NILE STREET, PORT ADELAIDE (06) 47 3688
- WILLIS ELECTRONICS - 165 ALBANY HIGHWAY, VICTORIA PARK (09) 470 1118
- BAY RADIO - 22 GRACE STREET, FERNDALE (09) 451 3561
- FORD ELECTRONICS - 209 HANCOCK STREET, DOUBLE VIEW (09) 446 4745

NEW RELEASE

The ham burger with the lot – IC-751A

LOUD & CLEAR

- **All HF Band Transceiver/General Coverage Receiver**
- **100% Duty Cycle Transmitter**
- **New Design**
- **105dB Dynamic Range**
- **12 Volt Operation**
- **All Modes Built-In USB, LSB, AM, FM, CW, RTTY**

The new IC-751A top-of-the-line HF base station transceiver is designed for the ham operator who demands high performance.
Whether entering contests or QSY'ing for pleasure, the 100 watt IC-751A incorporates the best features of the IC-751, and brings you to the forefront of technology with the following most-requested additions.
More CW Control. For the CW enthusiast, the new IC-751A includes an electronic keyer unit, QSK rated at up to 40WPM, standard FL-32A 9MHz/500Hz CW filter and CW sidetone to monitor your code in RX or TX modes ... great for practice!
All Amateur Band Coverage. Includes general coverage reception from 100kHz to 30MHz, and may be easily modified for MARS operation.

Improved Smooth Tuning. The IC-751A features a newly designed tuning control for velvet smooth tuning.
Added LED Annunciator. For easy identification if you're using the tuning speed, dial, or band switching functions.
32 Memories. Mode and frequency data may be stored in any of 32 memories ... all the memory capability that you'll ever need.
More Stable. Even in the receive mode, the IC-751A has a sophisticated thermal sensor to monitor the internal temperature. The sensor automatically activates the cooling fan which gives maximum stability ... critical for optimum performance during contests.
Newly Designed Features. The IC-751A boasts a number of newly designed features for better performance ... a new 9MHz notch filter that drastically reduces QRM, a new AGC system, a new compressor for better audio clarity, and a new AF gain control system that improves control of the CW sidetone volume.
Options Available. Options for the IC-751A include the IC-PS30 external AC system power supply, IC-PS35 internal AC power supply, IC-AT500 antenna tuner, IC-EX309 microprocessor interface connector, SM-8 or SM-10 desk mics, IC-2KL linear amplifier, RC-10 remote controller, SP-7 or SP-3 speakers, IC-EX310 voice synthesizer and GC-5 world clock.
Optional Filters. FL-52A CW 455kHz at 500Hz, FL-53A CW-N 455kHz at 250Hz, FL-63A CW-N 9.0106MHz at 250Hz, FL-33 AM 9.010MHz at 6000Hz, and CR-64 high stability 30.72MHz crystal filter.

Please send me details on:

☐ IC-751A ☐ ICOM's full range of communications equipment.

Senders details:

Name

Address

Postcode

Phone: (Business) (Home)

All stated specifications are approximate and subject to change without notice or obligation.
ICOM customers should be aware of equipment not purchased at authorized ICOM Australia Agents.
This equipment is not covered by our parts and labour warranty.

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3155

ICOM

The Frequency of Ideas.

WIA
STOP PRESS

A M A T E U R E X A M I N A T I O N S

W.I.A. POSITION?

The Department of Communications have notified the Institute that they would like to devolve Amateur Certificate of Proficiency examinations. They have, over recent years, handed over responsibility for conducting the major portion of Commercial Operator Certificate examinations to outside bodies. At present only examinations for Amateur and Restricted Radio Telephone Operator Certificates of proficiency (RROCP) are conducted by the Department.

In view of the reduced number of examinations and increasing pressure on resources, the manpower in the Department's examination area has undergone a considerable reduction. These aspects coupled with the Prime Minister's call for every Australian to examine how they can perform their work more efficiently, more effectively and more economically has prompted the Department to review its examination role.

Under the Radiocommunications Act 1983 provisions have been introduced which allow examinations conducted by external bodies to be accepted for the purpose of certificate issue. The Department has recently completed a draft RROCP accreditation package and one has also been developed for the Amateur certificate examinations.

The Department have circulated draft accreditation packages to Colleges, Institutions, other educational bodies and Clubs for comment. The Department stresses that no change in existing examination standards is contained in the Amateur accreditation package and that they will retain the overall responsibility for maintenance of standards.

In accordance with the consultation procedure outlined, the Department have invited the Institute to comment on the draft Amateur Certificate accreditation package. An indication of whether the Institute would be interested in accreditation is required by 1st March, 1987.

Extracts from Draft Accreditation Package.

AMATEUR OPERATORS CERTIFICATES OF PROFICIENCY ACCREDITATION REQUIREMENTS

1.0 INTRODUCTION

The Department, under section 31 of the Radiocommunications Act 1983, may for the purposes of issuing an operators certificate of proficiency approve examinations conducted by external bodies. Only examinations which are of equivalent or higher standard than that specified in the Radiocommunications (Certificate of Proficiency) Regulations will normally be accredited.

Where an examination is recognised, certificate applicants who present proof of a pass at that examination to the Department will be issued with an appropriate grade certificate.

Set out in this package are the requirements that must be met for accreditation in respect of the three classes of Amateur Operator Certificates of Proficiency, namely:

Amateur Operators Certificate of Proficiency (AOCP)
Required by radio operators of an Amateur Station (unrestricted)

Amateurs Operators Limited Certificate of Proficiency (AOLCP)
Required by radio operators of an Amateur Station (limited)

Novice Amateur Operators Certificate of Proficiency (NAOCP)
Required by radio operators of an Amateur Station (novice)

2.0 ORGANISATIONS THAT WILL BE ACCREDITED

Applications for examination accreditation in respect to all classes of Amateur certificaes will be considered from Colleges, Institutions, other like educational bodies and recognised amateur clubs.

3.0 METHOD OF ACCREDITATION

<u>Colleges, Institutions and Educational Bodies</u>

The Department will assess applications, submitted for accreditation against the:

- *content specified in the relevant syllabus set out in Appendix (A)*
- *examination question/test format outlined in Appendix (B)*
- *question standard in Appendix (C), and*
- *compliance with the requirements in 4.0 A - H.*

Amateur Clubs

In the case of amateur clubs, the Department will assess applications for accreditation taking in to account:

- *the reasons put forward by the club in support of the application*
- *comment provided by the Wireless Institute of Australia on the clubs suitability to conduct examinations;*
- *compliance with the requirements outlined in 4.0 A-D and F-I.*

Clubs which meet the accreditation requirements will be provided with the Departmental "question bank" from which to formulate examination papers. The examination format outlined in Appendix (B) must, however, be utilised.

4.0 REQUIREMENTS FOR ACCREDITATION

All applicants for accreditation must provide the Department with the following:

(A) Full name of the college, institution or club;

(B) The class of Amateur certifiate for which accreditation is required;

(C) The title of the exam (or course);

(D) An indication of the examination frequency;

(E) A sample of the examination proposed including:
- *theory questions*
- *morse code receiving test*

(F) A list of equipment available for the morse code receiving and sending tests;

(G) Details of the examiners and their qualifications;

(H) A sample of the form of advice that would be provided to successful candidates, including nomination of the person who would sign the form;

(I) In the case of Clubs, applicants should also provide:
- *reasons in support of the application.*
- *comment from the Wireless Institute of Australia.*

Should accreditation for more than one class of Amateur examination be proposed, applicants should provide the information in (B) - (H) for each examination.

5.0 EXAMINATION ASSESSMENT

Accredited organisations will be required on an annual basis, or where requested, to provide a sample examination to the Department.
In order to ensure standards are maintained, the Department reserves the right to have a representative present at any accredited examination.

6.0 EXAMINATION EXEMPTIONS

Accredited organisations:

- *may grant exemption from re-examination in any subject which a candidate has successfully passed. Where such an exemption is granted, a formal letter detailing the exemption shall be given to the candidate. This letter shall be under the signature of the nominated person responsible for issuing examination results.*

- *must recognise exemptions previously granted by the Department.*

- *should accept, for the purposed of exemptions, the qualifications specified in column 1 of Appendix (D) in respect to the subject listed in column 2 under the relevant examination heading.*

Executive are concerned at the broad devolution of the amateur operator examination and the varying standards that could result from such an action. They consider that it would be detrimental to the future developement of amateur radio in Australia.

It is considered possible, if the feeling of amateurs is strong enough, that the department may reconsider its position and continue to produce amateur operator examination papers with the possibility of the WIA and amateur radio clubs being involved with the conduct of examinations.

Executive are seeking members views on this matter and request that you write to your Division's Federal Councillor who will collate your responses and forward them to the Executive.

FEDERAL COUNCILLORS ARE:

VK1 Mr. George Brzostowski, VK1GB,
P.O. Box 600 G.P.O.,
Canberra A.C.T. 2601.

VK2 Dr. J. Pages, VK2BYY,
C/o P.O. Box 1066,
Parramatta, NSW 2150

VK3 Mr. A. Noble, VK3BBM,
19 Willow Avenue,
Glen Waverley VIC 3150.

VK4 Mr. R. Mutzelberg, VK4IY,
51 Spicer Street,
Laidley, QLD 4341.

VK5 Mr. R. Bruce, VK5OU,
33 Sunhaven Road,
Redwood Park, S.A. 5097

VK6 Mr. N.E. Penfold, VK6NE,
2 Moss Court,
Kingsley WA 6026

VK7 Mr. J. Gelston, VK7JG,
P.O. Box 1311,
Launceston, TAS 7250.

Amateur Radio

JOURNAL OF THE WIRELESS INSTITUTE OF AUSTRALIA
VOL 55, No 2, FEBRUARY 1987

- DOC MANAGER TALKS ON CHANGES AFFECTING THE ARS
- AMATEURS MAKE HISTORY
- MORSE INTERFACE
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- LEARN MORSE ON YOUR COCO2

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Amateur Radio

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Material should be sent direct to **PO Box 300, Caulfield South, Vic. 3162,** *by the 20th day of the second month preceding publication. Note: Some months are a few days earlier due to the way the days fall. Watch the space below the index for deadline dates.* **Phone: (03) 528 5962.**

HAMADS should be sent direct to the same address, by the same date.

Acknowledgment may not be made unless specifically requested. All important items should be sent by Certified Mail. The Editor reserves the right to edit all material, including Letters to the Editor and Hamads, and reserves the right to refuse acceptance of any material, without specifying a reason.

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It is impossible for us to ensure the advertisements submitted for publication comply with the Trade Practices Act 1974. Therefore advertisers and advertising agents will appreciate the absolute need for themselves to ensure that, the provisions of the Act are complied with strictly.

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All copy for inclusion in the April 1987 issue of Amateur Radio, including regular columns and Hamads, must arrive at PO Box 300, Caulfield South, Vic. 3162, at the latest, by 9am, February 20, 1987.

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Shozo JA1AN, accepts a Ceramic Plaque from David VK3ADW. See story page 4.

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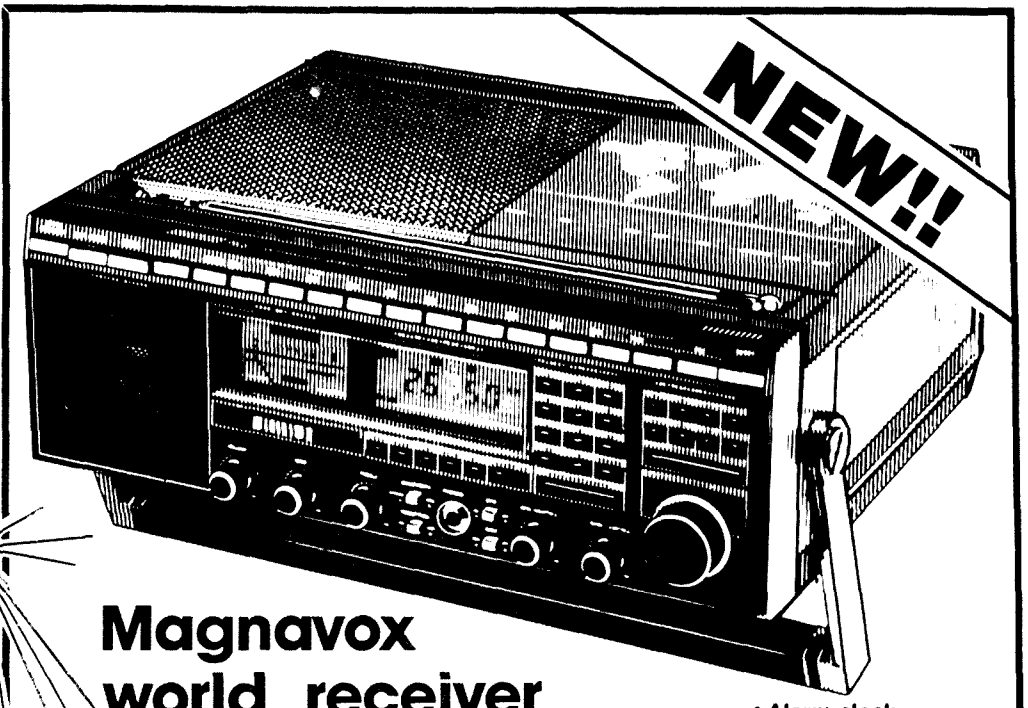

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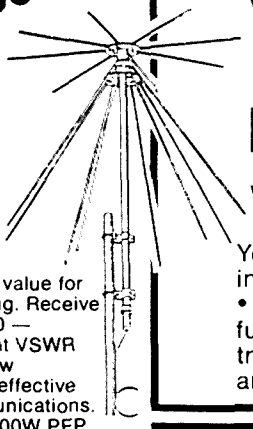

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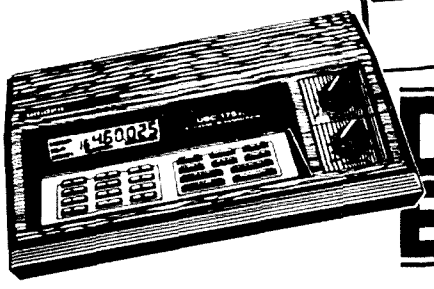

DICK SMITH ELECTRONICS

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Editor's Comment

WHAT DOES THE EDITOR ACTUALLY DO?

I write this on 30 December 1986, almost the last and certainly one of the hottest Melbourne days of the year (about 35 deg C). But we who put together your magazine are thinking ahead to the first week of February, when this issue will reach you. All the material has to be ready by 2 Jan, only about four instead of the usual six weeks ahead. February is unusual; due to the December holidays it usually has less up-to-the-minute material and is published a little late. In another 17 days we reach the March deadline, and come back to our usual six weeks lead time.

Being a holiday period, it seemed a good idea to go through the editorial file and extract from it the material which had been dealt with in 1986. Clean the slate, as it were, for 1987. I thought it might interest all of you to know what, in retrospect, had kept me busy during the year.

First, of course, there was the writing of 12 editorials. It only takes you a couple of minutes to read each one, but I can state firmly that it takes much longer to write! Inspiration is often a problem. A kick-start is usually needed. Sometimes this may be provided by a letter recently received, or an item of news from elsewhere. Sometimes it's a long hard struggle! I'm sure you, the reader, can tell the difference, but I hope all have been worth reading. Some have stirred up the odd hornets' nest, and perhaps that hasn't always been a bad thing!

Once a year, there's the report to the Federal Convention. It takes a little while to get all the details together, but generally this is less demanding than an editorial. Even so, it's a page or two.

The Publications Committee meets 11 times a year (we have a holiday in January). Guess who's in the chair? Preliminary organising, collecting and sorting material, and making up some kind of agenda usually takes more time than the three hours or so of the meeting. This is the main interface between the Technical Editors and the producers, at which everyone finds out what everyone else has been and is doing, and more to the point, what each is going to be attending to for the next four weeks. Usually there is a little something or other for the Editor to edit too!

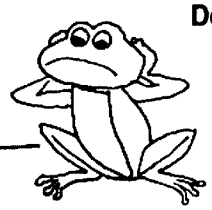
Then there are the letters from you, our readers. Many go straight into the "Over to You" pages with little or no editing being necessary. Some are not intended for publication. For various reasons, some are not appropriate to publish. Some seek information, or state viewpoints which are not of general interest. All of these must receive replies. They totalled 49 in 1986, with an all-time peak of 14 replied to in November alone. This is a job for the Editor and no-one else.

Altogether, I estimate that AR requires about 20 hours of my time in an average month; in some months, over 30. I have been asked from time to time how much I am paid for all this effort. The answer is, nothing! The job is purely honorary. The WIA cannot afford to pay all who might equally demand to be paid as well as the Editor. After all, we are an AMATEUR organisation in the true sense of the word. We do appreciate the kind words many say or write to us about this, your magazine. May we and our successors continue to serve you as long as there is a hobby of Amateur Radio!

Bill Rice VK3ABP
Editor

Department of Communications

Main QSP



AMATEUR REPEATER/BEACONS — CO-ORDINATION

Over recent months it has become apparent that some misunderstanding exists within the amateur community concerning the licensing/co-ordination of amateur repeaters and beacons. I therefore feel it important that I clarify the Department's position on this matter.

At the outset I would stress that the Department is the sole licensing authority. Any decision on licence conditions applied, frequencies allocated or in fact whether or not to issue a repeater/beacon licence rests with the Department

In order to assist the orderly development of the Amateur Service, the Department has adopted the Institute's allotment plan for the purpose of frequency allocation rather than apply its own. I am sure it is appreciated, some form of band plan is necessary to minimise interference between stations.

As you are aware, the Department had for sometime undertaken the role of co-ordinating applications for repeater/beacons with the Institute. This has proved a most time consuming process and contributed to delays in licence processing.

In light of these aspects, it is considered more appropriate for the co-ordination process to occur prior to submission of the licence application. Consequently, applicants for amateur repeater/beacons will in future be required to submit a letter from the Institute together with their application. The Department will then assess the application and comments provided by the Institute as part of the decision making process.

I would mention that the Institute's role in the co-ordination process should be restricted:

- advising the applicant on:
  - — inconsistencies with the band plans or existing amateur frequency allocations;
  - — technical matters relating to system configuration;
- acting as a conciliator between affiliated clubs where conflicts arise; and
- providing relevant comment to the Department.

Repeater/beacons can be a valuable asset to the amateur fraternity as a whole. It is important to recognise in this regard that repeaters are available for the use by all amateurs. Similarly, it should be recognised that some form of co-ordination process is necessary to ensure that optimum use is made of the spectrum available for amateur operations.

I thrust that this letter clarifies the situation in relation to repeater/beacon co-ordination and would appreciate if the Institute could disseminate the information outlined to the amateur community.

Yours sincerely

D Hunt
Manager Regulatory
Operations Branch
Radio Frequency Management Division
Canberra

10 December 1986

Cover Story —
60th Anniversary Celebrations

On special invitation by JARL, the Wireless Institute of Australia was represented at the 60th Anniversary Celebrations of JARL, by the WIA President, David Wardlaw VK3ADW.

The main celebrations were spread over a number of days commencing with a dinner hosted by Directors of the JARL.

At this dinner the President of the WIA presented the President of JARL, Shozo Hara JA1AN, with a ceramic plaque in the form of a kangaroo.

The plaque was in recognition of the JARL's 60th Anniversary. On Saturday, November 8, a ceremony commemorating the 60th Anniversary of JARL was held at the hotel *Okura*, at which Mr Shunjiro Karajawa, the Minister of Post and Telecommunications and Dick Baldwin W1RU, IARU President, who also attended the WIA 75th Anniversary Celebrations, addressed their messages of congratulations.

A film *The Record of the Amateur Satellite — Fuji* was shown. Fuji has created a great interest in amateur satellite communication in Japan. Also attending the celebrations were Terry Carrell ZL3QL, President of NZART and "Jumbo" Godfrey ZL1HV, a past-Director of the Region 3 Association, both of whom have attended WIA Federal Conventions.

Michael Owen VK3KI and Fred Johnson ZL2AMJ, represented the Region 3 Association.

The ARRL, DARC (Germany), RAST (Thailand), CRSA (The Peoples Republic of China), the Taiwan Society and RES (France) were represented.

A chance was given to visit two of the major manufacturers of amateur equipment and discussions took place on the problems of the value of the Yen and their attempts to combat its effect on their exports.

One afternoon was given over to a discussion of amateur radio activities throughout the world with various societies comparing their percentage level of membership. It seems that the larger the society, the less the percentage of total amateurs are members.

One notable exception is the DARC, which has a very high percentage. We also learned that the common licence is gaining ground in Europe. The need for very low cost equipment for amateurs in developing countries was emphasised.

Talks were held with the CRSA (The Chinese Radio Sports Association — Peoples Republic of China) concerning matters of joint CRSA/WIA co-operation on an educational project.

ar

TREASURER'S REPORT

I normally arrange for the publication of *audited* figures for Federal Income and Expenditure for the WIA to be placed in *Amateur Radio* well before now. It appeared early in 1985 that the Federal body could be liable for taxation as it was being argued as noted by various sections of "the act" we were a profit making concern and earning interest on our surplus funds during the year. The WIA may have faced a tax bill of $20000 to $30000 or more depending on how far the Taxation Commissioner was prepared to go back in time into our books and, more importantly, what fines he could have levied. After many months of skillful negotiations by our legal advisors, we received an exemption in writing from the Commissioner of Taxation.

Main audited income and expenditure for December 31, 1985, were:

BUDGET	ACTUAL	
$230 000	$232 000	(Income)
$129 000	$137 000	(Expenditure)
$100 000	$ 96 000	(AR Magazine)

We made a loss for this year of $1000.

At the Federal Convention in April 1986, I presented a six page report which goes into detail on the above figures.

I do not propose to go into detail on my report here, but any interested member may obtain it by writing to the Federal Office.

The charts accompanying this report give a breakdown of our financial affairs.

ABRIDGED BALANCE SHEET as at December 31, 1985

Deferred Asset	$ 6000	Debenture due February 1987
Current Assets	$153000	Deposits $134 000 remainder spread
Fixed Assets	$33000	Office Equipment, furniture (was $53 000, depreciated by $20 000) eg computer
	$192000	
Current Liabilities	$120000	Subscriptions in advance $77 000, Creditors $20 000, Amounts payable to State Divisions $15 000, remainder spread
Members Funds	$ 72000	
WORKING CAPITAL		
Current Assets	$153000	
less Current Liabilities	$120000	
	$33000	As our accounts for payment approximate $20/30 000 per month, this is a satisfactory figure.

Should any member be interested in a full breakdown of the Audited Balance Sheet it can also be made available upon written request to the Federal Office.

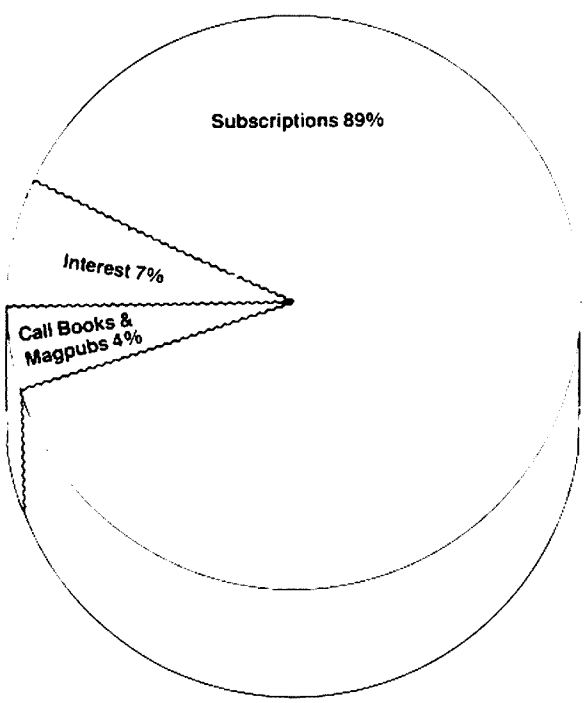
I believe a satisfactory financial position should occur for December 31, 1986, however, in 1987, I foresee the possibility of cost pressures further eroding into any surpluses that may accrue on our various incomes.

If our membership remains at approximately its present figure with increase in Federal Element of $2.50 per member, now in effect, we still may not be able to cut square for that year. Therefore, a very close watch on our finances for 1987 will be paramount, and if required, it may be necessary to reduce those services provided by the Federal Body — if membership drops and/or significant cost increases occur — eg further fall in $A, wages and general increase in inflation will also necessitate a review of present services. If the foregoing comes to fruition, the only other alternative to keeping up the status-quo on our services will be to increase subscriptions in order to come up with a balanced budget.

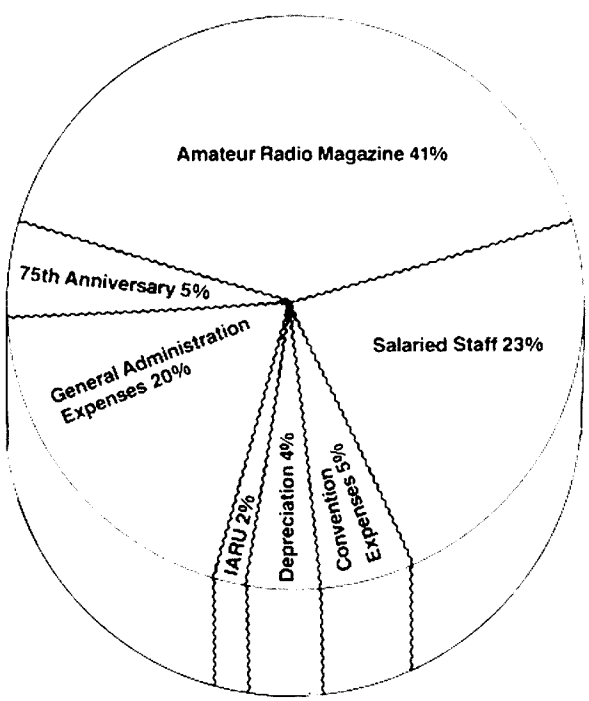
Best wishes to all.

73 Ross Burstal VK3CRB
Honorary Federal Treasurer

INCOME

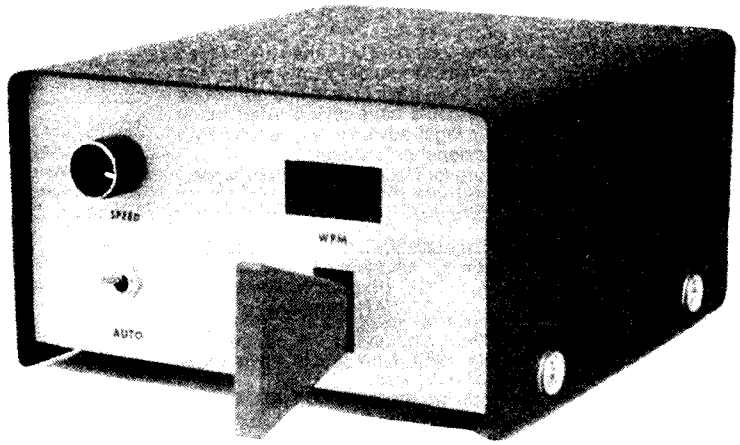


EXPENDITURE



Iambic Touch Keyer

Ivan Huser VK5QV
7 Bond Street, Mount Gambier, SA. 5290



This keyer may be constructed as a "stand-alone" unit or the touch section only built as an "add-on" to an existing keyer.

In either case, it will be a worthwhile addition to the CW operator's shack.

Some years ago, I constructed the *Electronics Australia* version[1] of the *Accu-Keyer*[2] to which was later added the touch facility[3]. More recently, the output circuitry was modified to enable either negative or positive voltages to be keyed.

The result is a keyer that is very light to the touch and a real dream to use. Having no moving parts, the keyer has no inertia and is absolutely mechanically silent. And, of course, there are no contacts to maintain either. On the negative side, the keyer may take a little getting used to — for instance, not resting the fingers on the paddle when sending.

CIRCUIT

The touch sensitive section of a square-wave oscillator running at around 100 kHz, the output of which is fed as a common mode signal to a pair of comparators via a sensitivity control. The comparators are slightly prejudiced with 10M resistors to maintain the desired quiescent state.

To enable the touch facility to operate properly, the paddle capacitance must be balanced out by two small trimmer capacitors. The adjustment of these is covered in detail under the heading *adjustment*.

Capacitive coupling to the operator's hand unbalances the inputs to the respective comparator and initiates the keying action. Cor-

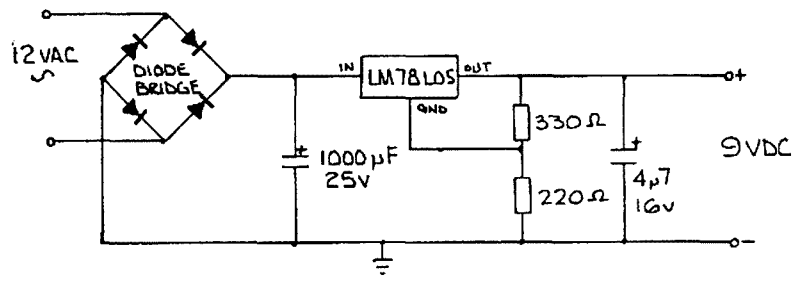


Figure 2 — Regulated Supply.

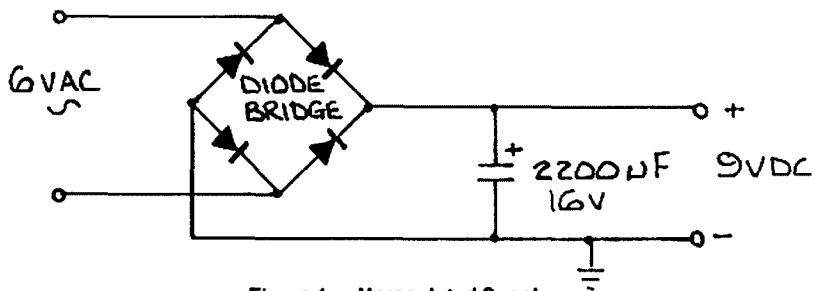
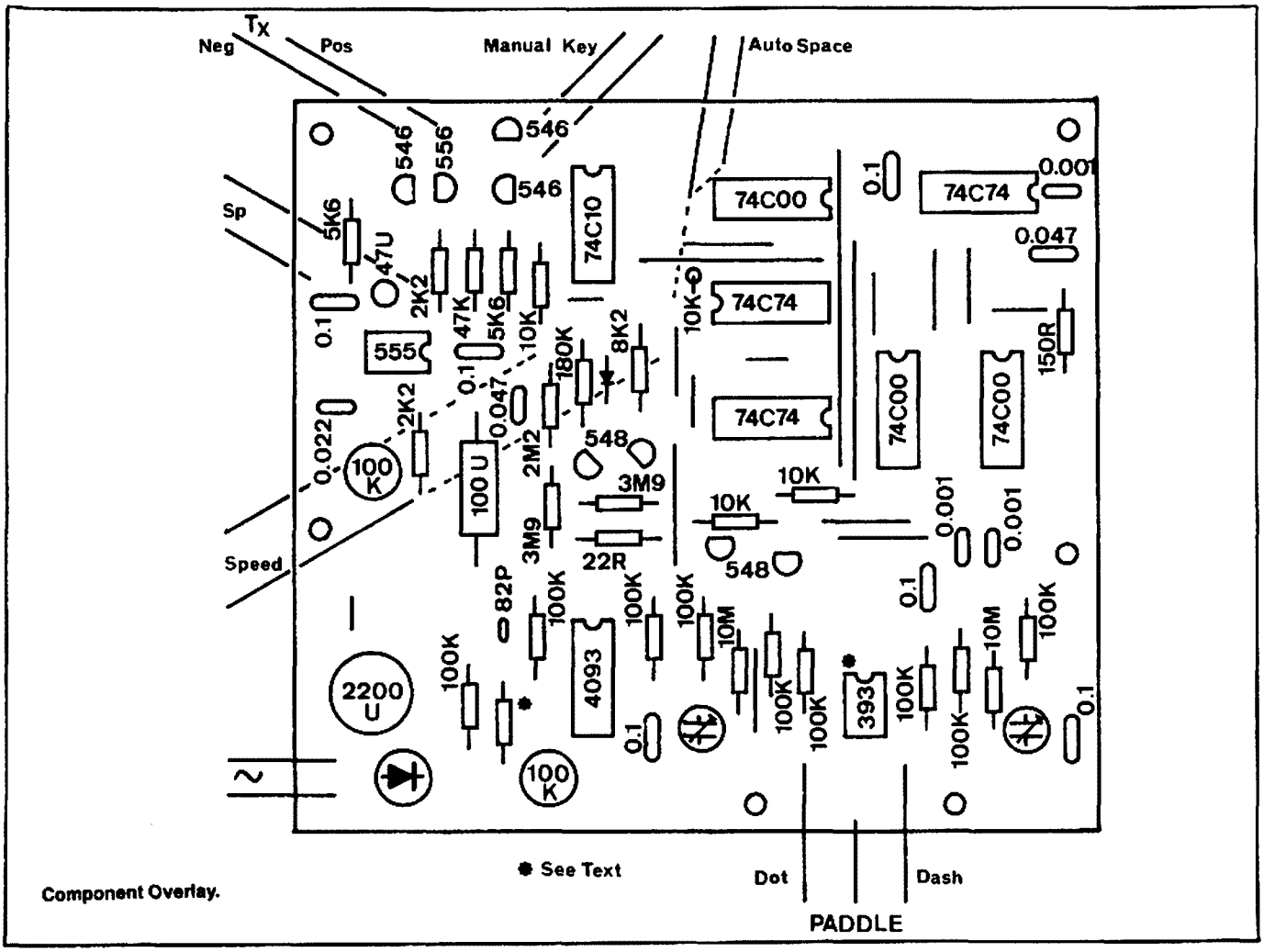


Figure 1 — Unregulated Supply.



Component Overlay.

rectly adjusted, the keyer is extremely sensitive. With the sensitivity control set at maximum, the keyer will operate with the fingers about 10 mm from the paddle. This, of course, is far too sensitive for normal operation.

The outputs from the comparators are cleaned up by Schmitt triggers ahead of the keyer logic to produce a positive switching action.

With the exception of the output keying stage, no changes have been made to the *Accu-Keyer* circuit and the same facilities such as automatic character spacing and side tone are still available as desired.

The modified keying stage will key either negative or positive voltages up to about 100 volts at a current of around 100 mA and should be compatible with most modern transceivers. The choice of negative or positive keying is made by selecting the appropriate pin on the printed circuit board.

The current drain is low and the whole thing can be powered from a small nine volt battery. However, provision has been made on the printed circuit board for either an unregulated or regulated mains powered supply. The regulated supply is recommended if a LED speed readout is permanently connected.

COMPONENTS

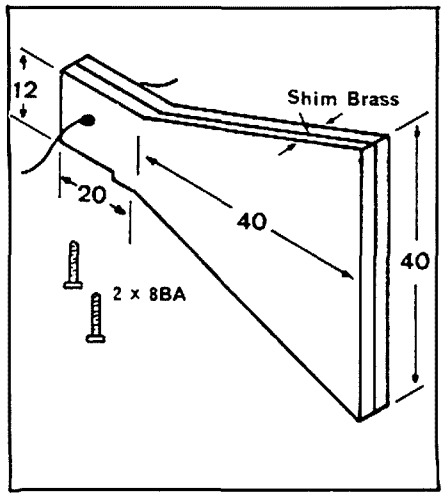
All components should be readily available with perhaps the exception of the LM393. The LM393 is a low offset dual comparator and if not available, a dual operational amplifier such as the LM358 or MC1458 may be substituted with some reduction in sensitivity and circuit performance.

Resistors are quarter-watt types and the tone and sensitivity controls (if mounted on the PCB) are horizontal cermet type trim pots.

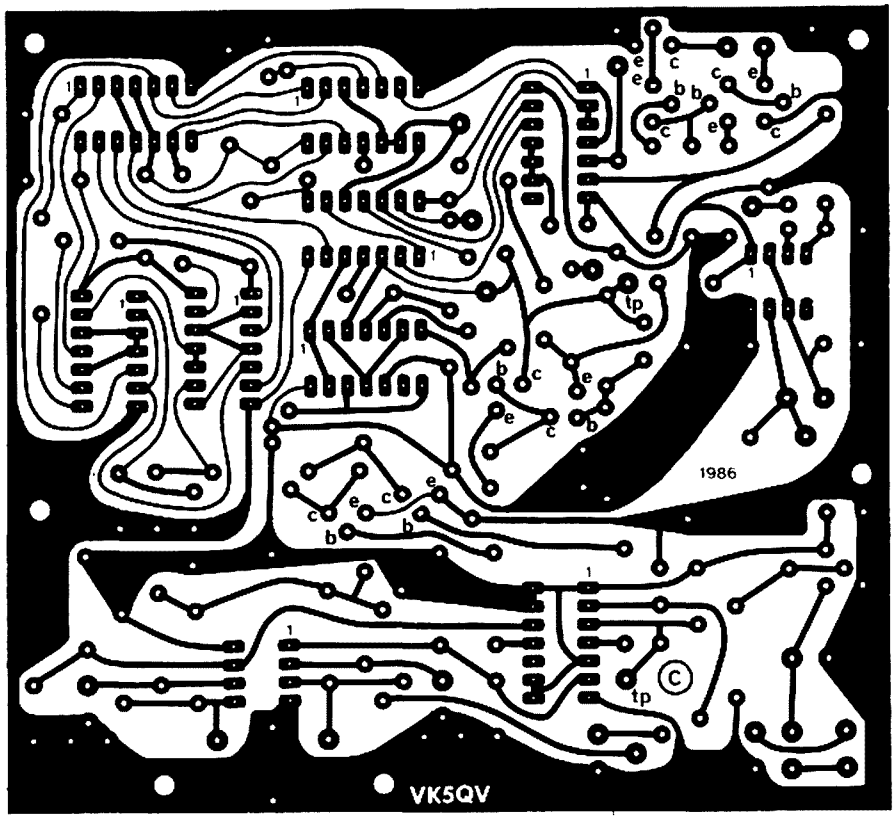
Capacitors up to and including the 0.1 μF may be disc ceramic or greencaps and the 47 μF an electrolytic or tantalum. The two balance trimmer capacitors should be of a type that is stable and easily adjusted. The printed circuit board will accommodate most currently available trimmers and no problems should be encountered here.

CONSTRUCTION

The touch sensitive section must be constructed so that it can be fully balanced and a PCB pattern and component overlay is given as an aid to construction. The board layout has been arranged such that the touch section only can be reproduced if so desired.



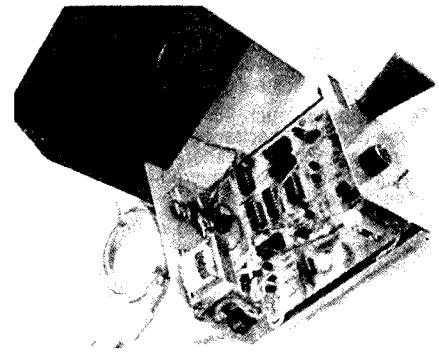
Paddle Details.



Printed Circuit Board. (Full size).

The size of the printed circuit board has been selected to allow the keyer to be housed in one of the popular metal utility boxes and a suggested front panel layout is given as a starting point. I opted to bring the speed control and automatic character space switch out to the front panel. The sensitivity and tone pots are mounted on the PCB. Other controls can be brought out to the rear panel. The window above the paddle cutout is for a future speed readout. Normal individual likes and dislikes will, of course, dictate the final layout.

The original paddle was constructed using three millimetre bakelite and 0.05 mm shim brass although perspex and tin plate could also be used. The paddle should be assembled using high quality contact adhesive and then dipped in a plastic such as ***Redskin*** to seal it from moisture and give it a near professional appearance.



ADJUSTMENT

Adjustment of the touch sensitive circuit is quite straight forward.

Slowly advance the sensitivity control until one side (dit or dah) operates spontaneously. Adjust the appropriate trimmer capacitor until the operation stops. Further advance the sensitivity control in steps and adjust the respective trimmer capacitor until the characteristic di-dah iambic output is spontaneously obtained.

Select the resistor marked with an asterisk on the circuit diagram and component overlay so that the spontaneous iambic operation occurs close to the point of maximum sensitivity. The value of resistance should finish up around 12k and in any case, would be a good starting point when making the initial adjustment.

For normal operation, the final setting of the sensitivity control should be such that the keyer operates just as the fingers touch the paddle but will depend to some extent on the "feel" of the operator.

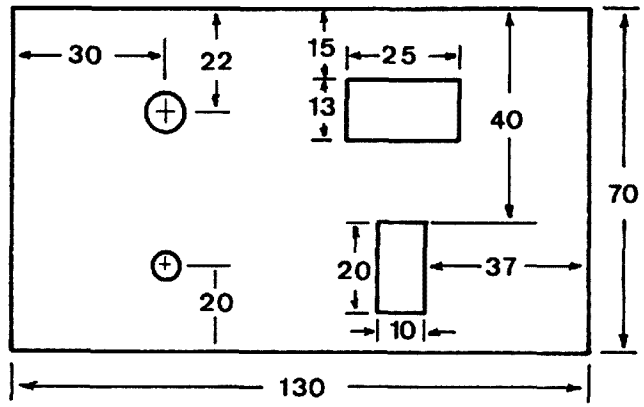
FINALE

I first constructed the touch section of the keyer on a breadboard using double sided PCB for the paddle and was so impressed with the result that I went ahead and built the complete keyer as described. My home-brew copy of a well-known and very expensive mechanical iambic paddle has now been retired in favour of the touch keyer.

Good luck with the project.

COMPONENT LIST

Resistors	*Semiconductors*
1 . . . 22R	1 . . . 4093
1 . . . 150R	1 . . . LM393*
2 . . . 2k2	1 . . . 7555 (555)
2 . . . 5k6	3 . . . 74C00
1 . . . 8k2	3 . . . 74C74
4 . . . 10k	1 . . . 74C10
1 . . . 12k*	3 . . . BC548
1 . . . 47k	1 . . . BC558



Recommended Front Panel Layout.

9 . . . 100k
1 . . . 180k
1 . . . 2M2
2 . . . 3M9
2 . . . 10M

Variable Resistors*
1 . . . 1k lin
2 . . . 100k lin
1 . . . 1M lin

Capacitors
1 . . . 82p ceramic
3 . . . 0.001 greencap
1 . . . 0.022 greencap
1 . . . 0.047 greencap
6 . . . 0.1 ceramic
1 . . . 47μ tantalum

3 . . . BC546
1 . . . BC556
1 . . . 1N914

Sundries
Printed Circuit Board, Speaker, Switches, Utility Box, etc.

Variable Capacitors
2 . . . 10-40 pF trimmers

****See text.***

NOTES
1 Electronic Morse Code Keyer, *Electronics Australia*, March 1978.
2 The Accu-Keyer, *ARRL Handbook*.
3 An Ash Proof Keyer Paddle, *QST*, Date unknown.

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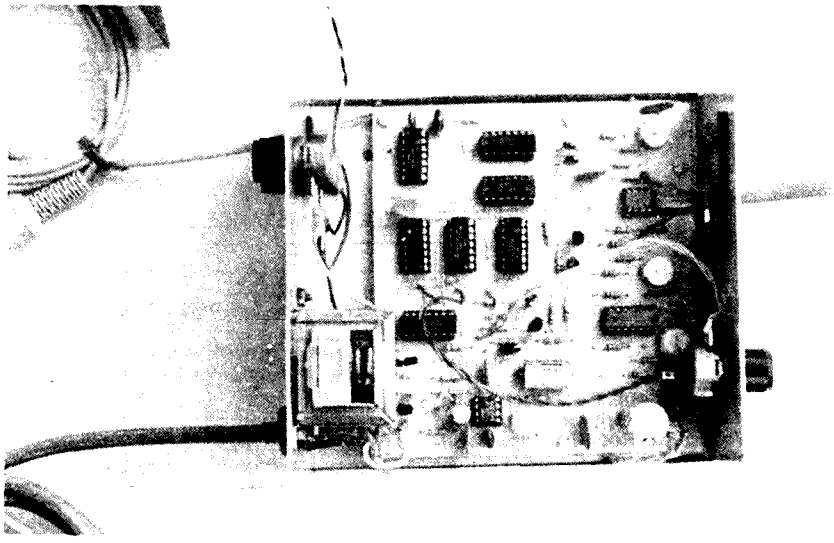


G.I.G.
AUSTRALIA

SINCERE APPRECIATION

On behalf of the Girl Guides Association of Australia, I would like to convey to members of the Wireless Institute of Australia, our sincere appreciation for members assistance at the 29th Jamboree on the Air.

In their reports, leaders expressed their thanks for the wonderful way in which their operators helped to make the weekend a success.

Yours sincerely,

June Retallack
National Guide JOTA Liaison

Power Supplies using Series Regulator Packages

Lloyd Butler VK5BR
18 Ottawa Avenue, Panorama, SA. 5041

A design procedure is outlined for low voltage supplies with loads up to 10 amps.

Because complete voltage regulator packages are readily available in current ratings up to 10 amps, the assembly of a low voltage supply for load currents in this range is a relatively easy task. Notwithstanding this, before proceeding with the task, a number of important circuit details must be worked out so that suitable components can be selected to work in conjunction with the regulator package. Such details include the following:

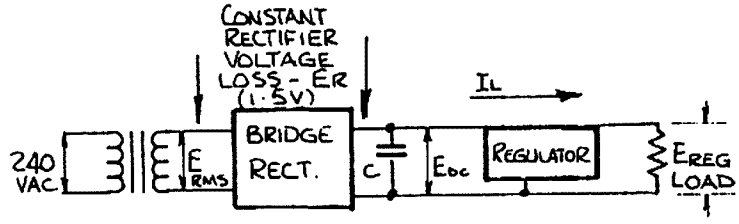
- The transformer secondary voltage and load current rating
- The size of the reservoir capacitor
- The maximum power dissipation in the regulator and rectifier units
- The size of the heat sinks
- Surge current into the rectifier unit

Other considerations include the careful placement of bypass capacitors to prevent instability of the regulator or RF getting back into the regulator from a transmitter load and the need for protection diodes to protect the regulator in the event of a short circuit.

The intention of this article is to discuss the general aspects of the regulated power supply design. However, to assist in the discussion, the development of a sample power supply to deliver 13 volts at a maximum load of 10 amps will be considered. A suitable voltage regulator for this purpose is the LM396, which can regulate for an output voltage range of 1.25 volts to 15 volts at a load current up to 10 amps and dissipate power up to 70 watts. A power supply envisaged is illustrated in Figure 1.

CIRCUIT R-C CONSTANTS

The DC power supply can be resolved into three components as shown in Figure 2, the source resistance (R_s), the filter capacitance (C), and the load resistance (R_L).



Basic Rect-Filter-Regulator Circuit.

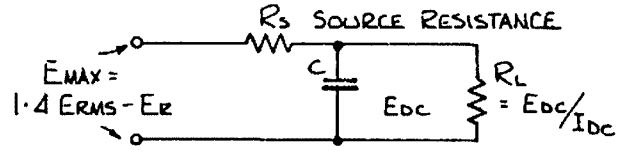


Figure 2 — Equivalent R-C Circuit, the Constants of which determine the ratio of DC Output Voltage to Rectified Input Voltage and Ripple Level across C.

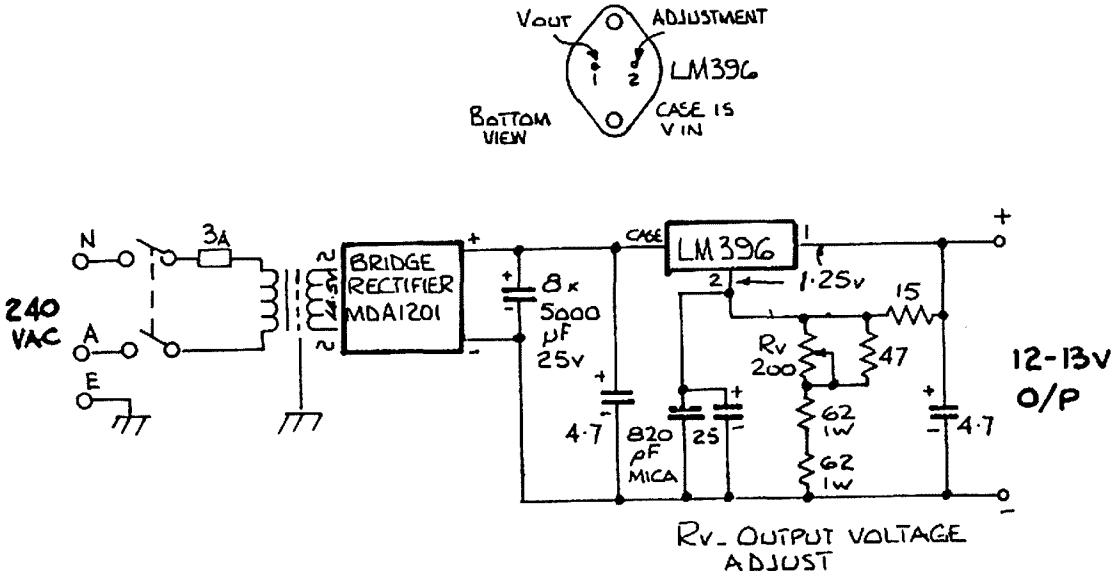


Figure 1 — 12-13 volt, 10 amp Power Supply.

The source resistance (R_S) includes rectifier resistance and transformer loss resistance. However, voltage loss in a silicon rectifier is substantially constant over most of its load range and hence the source resistance is essentially that resistance caused by the transformer core and winding losses. For the silicon bridge rectifier, two diodes conduct in series during each half cycle and voltage loss is about 1.5 volts. To calculate the effective source peak DC voltage (E_{MAX}), we simply subtract 1.5 volts from the transformer secondary peak AC voltage.

Load resistance (R_L) is the average DC voltage (E_{DC}) developed across capacitance (C) divided by the maximum DC load current (I_L).

The DC voltage developed across C is a function of the charge time constant R_SC and the discharge time constant CR_L and as illustrated in Figure 3, includes a ripple component caused by the charging and discharging process. The voltage regulator which follows acts as a second stage ripple filter and if it is to work correctly, the voltage trough (E_{MIN}), caused by the ripple, must not be less than the sum of the regulated output voltage and the regulated drop-out voltage.

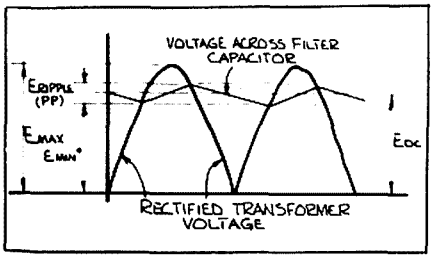


Figure 3 — Charge and Discharge of Filter Capacitor from Source and into Load Respectively.
*** E_{MIN} must be greater than the sum of the regulated load voltage and the regulator drop out voltage.**

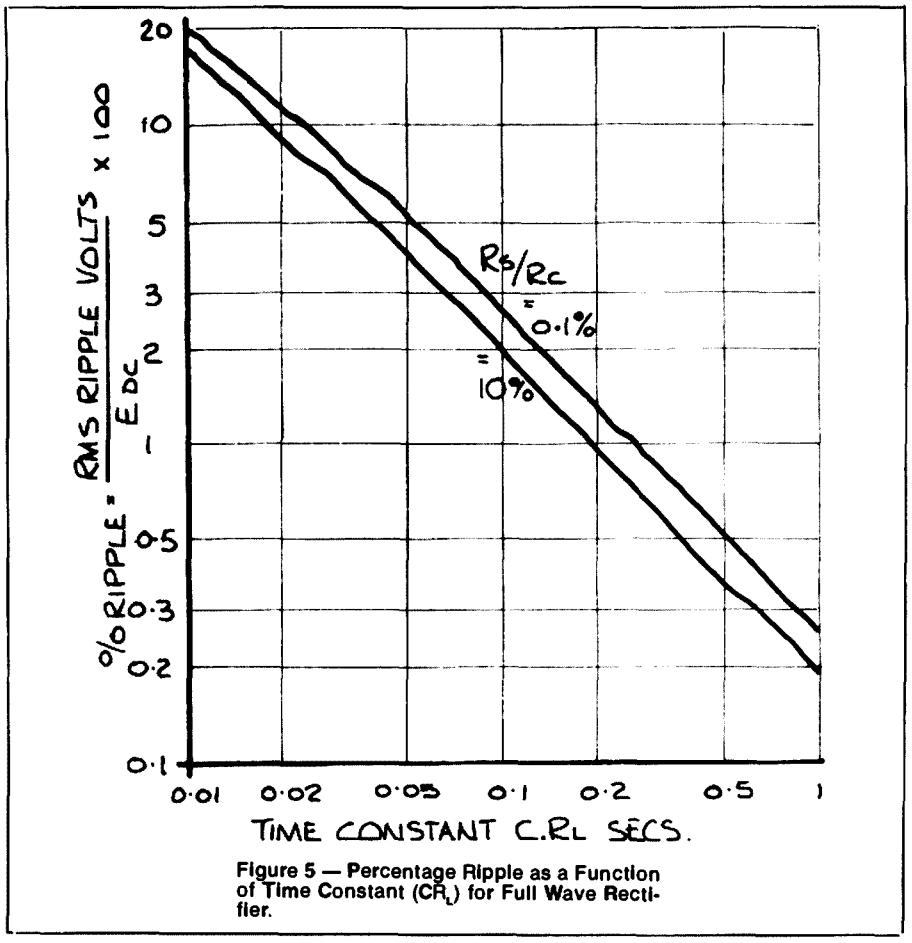


Figure 5 — Percentage Ripple as a Function of Time Constant (CR_L) for Full Wave Rectifier.

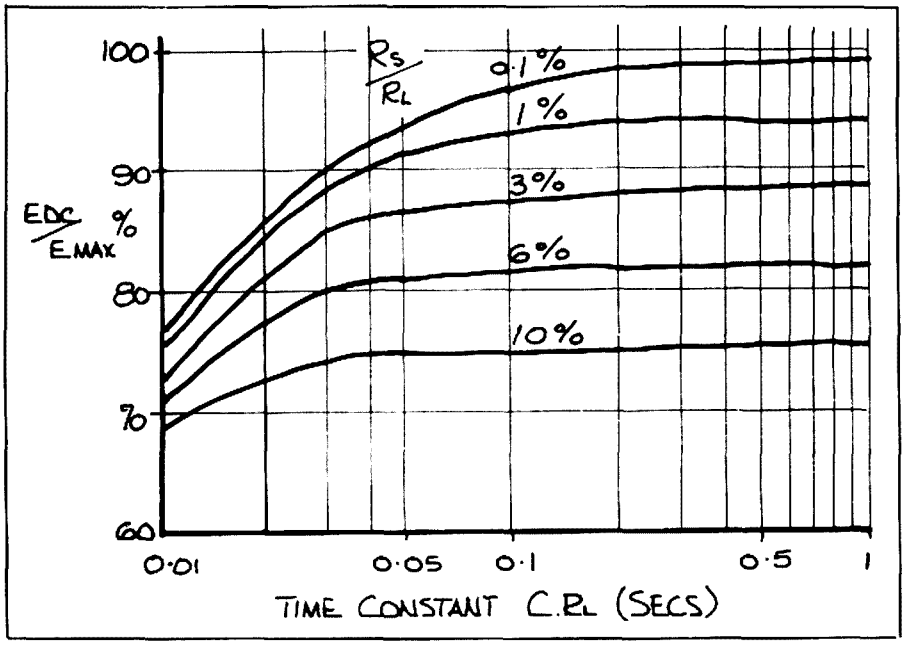


Figure 4 — Ratio of Average DC Voltage across C to Peak Rectified Voltage as a Function of Time Constant CR_L for Full Wave Rectifier.

Figure 4 shows the ratio E_{DC} to E_{MAX} as a function of time constant CR_L for various ratios of R_S to R_L. These curves have been derived from more comprehensive curves originally developed by Shade, Proc IRE Vol 31, 1943 and republished in a number of other reference sources. From the curves, it can be seen that to obtain high developed voltage, R_S must be as low as possible and time constant CR_L must be not less than 0.05 second. We now examine a second set of curves, Figure 5, which plot ripple percent as a function of time constant CR_L for a range of ratios R_S/R_L. We see that R_S affects the ripple a minor amount and that for time constants (CR_L) of 0.05 to 0.1 second, ripple percent is around 2 to 4 percent, hence trough (E_{MIN}) is very close to E_{DC}. From the two diagrams, we can also see that there is little to be gained by using time constants above 0.1 second.

A time constant CR_L lower than 0.05 second can be used but more transformer secondary voltage would be required to obtain a value of E_{MIN} necessary to prevent regulator cut-off. Another disadvantage is that, with the higher ripple level and a greater ratio of E_{DC} to E_{MIN}, the voltage differential across the regulator must be higher and hence a higher regulator power dissipation. In essence, what is saved in filter capacitance is lost in the need for a larger heat sink.

A time constant CR_L = 0.07 second seems to be a good choice for the average case.

REGULATOR INPUT VOLTAGE

On the basis of our previous discussions and allowing five percent for mains voltage variation and the ripple trough, we can set the value of E_{DC} as follows:

$E_{DC} = 1.05 (E_L + E_{DO})$

where E_L is the load voltage

and E_{DO} is the regulator drop-out voltage.

Considering our load sample of 13 volts at 10 amps and our LM396 regulator, we can work out E_{DC} for that case. The drop out voltage of the LM396 is given as a typical 2.1 volts, but could be as high as 2.75 volts. Using the 2.75 volts, we get:

$E_{DC} = 1.05(13 + 2.75) = 16.5$ volts.

Unless you are worried about the mains voltage falling further, there is little point in allowing more margin as this means more power which must be dissipated in the regulator.

CAPACITANCE (C)

From our previous discussion on the time constant of CR_L, let us decide to use a time constant of 0.07 second. Our ripple voltage will be about three percent and our average voltage across C (E_{DC}) will be within 1.5 percent of E_{MIN}. Load resistance is calculated as follows:

$$R_L = \frac{E_{DC}}{I_L} = \frac{16.5}{10} = 1.65 \text{ ohms}$$

Capacitance C is then calculated from:

$$C = \frac{T}{R_L} = \frac{0.07 \times 10^6}{1.65} \text{ microfarads}$$

where T = time constant CR_L

ie, C = 42 400 mfd (say 40 000 mfd).

This is a large capacitance which can be built up, if necessary, from paralleled smaller values. Voltage rating must be not less than 1.4 x E_{RMS} (The transformer secondary voltage to be calculated later).

RECTIFIER RATING

To proceed further with selecting the transformer secondary voltage based on the curves of Figure 4, we need to know the value of R_S. However, before looking at this, we must examine the rectifier bridge and how it is also affected by the value of R_S.

Rectifier ratings which must be considered are as follows:

1 The maximum average current rating (I_O) to be not less than the maximum load current (I_L).
2 The peak inverse voltage rating (V_{RRM}) to be not less than 2.8 E_{RMS} (twice the peak secondary voltage) plus a safety margin up to 50 percent higher to allow for line transients.
3 The surge current rating (I_{FSM}) in relation to source resistance (R_S) — to be discussed further.

The maximum instantaneous surge current, on switch on, is equal to (1.4 E_{RMS} - 1.5) /R_S and this flows to charge C. The peak voltage is reduced by 1.5 because of the voltage loss in the bridge itself.

Suppose we select rectifier bridge type MDA1201 for our sample supply. This has a maximum average current rating of 12 amps and a peak inverse voltage rating of 100 volts, more than sufficient for our 13 volts, 10 amps power supply. The I_{FSM} rating of the bridge is 400 amps.

Referring back to Figure 4, we can expect the average DC voltage (E_{DC}) to be as low as 85 percent of the peak value, hence the rectifier surge current sourced from the transformer primary, could be as high as E_{DC} /0.85 R_S. Transposing the formula we could say, that to safeguard the rectifier bridge, R_S must be not less than E_{DC} /0.85 I_{FSM}. Applying this to our power supply, minimum source resistance (R_{SM}) is calculated as follows:

$$R_{SM} = \frac{E_{DC}}{0.85\, I_{FSM}} = \frac{16.5}{0.85 \times 400} = 0.05 \text{ ohm}$$

Now R_L was calculated previously as 1.65 ohms, hence the lowest ratio of R_S/R_L possible is 0.05/1.65 = 3 percent which we will refer to later.

Another requirement of the I_{FSM} rating is that the surge should not be sustained and the time constant R_SC should not be greater than one half AC cycle (often quoted as 8.3 msec for a 60 Hz supply). In the case of our supply, R_SC = 0.05 x 40 000/1000 msec = 2 msec and no problem.

THE TRANSFORMER

The problem with the transformer is that until it is obtained, its source resistance (R_S) is an unknown factor, which in turn, affects the choice of its secondary voltage. At this stage we might assume that it has the minimum source resistance required to limit the rectifier surge current, as previously calculated, and therefore has the ratio R_S/R_L = 3 percent. Referring back to Figure 4, for a time constant CR_L = 0.07 second and R_S/R_L = 3 percent, ratio E_{DC}/E_{MAX} = 87 percent. We can now calculate our first estimate of secondary RMS voltage as follows:

$$E_{RMS} = 0.7\,(E_{DC}/0.87 + 1.5)$$
$$= 0.7\,(16.5/0.87 + 1.5)$$
$$= 14.3 \text{ volts.}$$

Secondary current rating is equal to 1.4 I_L and for our sample supply, 14 amps. Power rating of the transformer is E_{RMS} I_{RMS}, which is 14.3 x 14 = 200 watts.

At this stage, a few words might be said about the cost of the transformer. A 200 watt transformer can be an expensive item and if the building of such a large supply is contemplated, a search for a transformer from some old equipment is well worthwhile. Transformers from old black and white television sets can be put to good use. These transformers are usually rated about 200 watts and would be good for higher powers in amateur radio intermittent load applications. Heater windings on these transformers have heavy gauge wire and it is possible to achieve enough voltage for a 13 volt DC supply by series connection of some of these windings. The writer was able to obtain sufficient voltage on a similar supply by series connection of two 6.3 volt windings and tapping down the mains primary connection.

If the secondary has to be rewound, carefully remove the old outer windings and count the turns to obtain the number of turns per volt used. As a guide to winding wire selection, 1000 circular mils-per-amp is a conservative rating, but the ARRL Handbook suggests 700 circular mils-per-amp as common for amateur intermittent service. On this basis, suggested wire gauges are as follows:

1 amp	22 SWG
2 amp	20 SWG
3 amp	18 SWG
6 amp	16 SWG
9 amp	14 SWG
12 amp	13 SWG
16 amp	12 SWG

If you are using the power supply to operate a single sideband transmitter, you might be able to get away with an even smaller gauge than these. Whilst the voltage regulator must be rated for maximum current swing, the transformer heating is dependent on average current through its windings. You should check your transmitter average load current under speech conditions as you might find you can down-grade the power rating of the transformer considerably.

Having obtained a transformer, or rewound one, or whatever, we are still in the position where we are guessing about the value of source resistance (R_S). What we can do is to measure its value as shown in Figure 6. Here the difference is measured between the secondary voltage unloaded and the secondary voltage loaded with a large current. Some form of dummy load, such as a network of high wattage resistors, is needed for this test.

Source Resistance (R_S) =

$$\frac{(\text{Vnoload} - \text{Vload})\,\text{Rload}}{\text{Vload}}$$

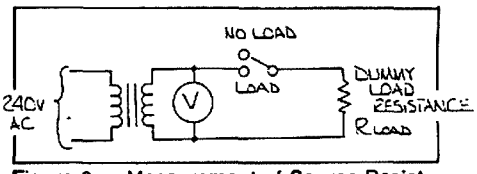


Figure 6 — Measurement of Source Resistance (R_S).

Source Resistance (R_S) =

$$\frac{(\text{Vnoload} - \text{Vload})\,\text{Rload}}{\text{Vload}}$$

If R_S turns out to be less than that required to protect the rectifier, resistance should be added in series with the secondary winding or the rectifier bridge output to build up R_S to the protection value. If this is the case, the initial calculation for the transformer secondary RMS voltage is correct. If R_S is more than this value, ratio R_S/R_L is recalculated, a new ratio of E_{DC}/E_{MAX} percent is read from Figure 4 and a new value of RMS secondary voltage is calculated as follows:

$$E_{RMS} = 0.7\,(E_{DC}/R_D + 1.5)$$

where $R_D = E_{DC}/100\,E_{MAX}$

This, of course means a probable addition of more turns to the secondary winding.

A less harassing procedure might be to make the transformer secondary with a little higher voltage to start with and if E_{DC} turns out to be higher than required, add resistance in series with the secondary, or the rectifier, so that R_S is increased to lower E_{DC} to the desired value. Again, it is emphasised that if E_{DC} is higher than necessary, there is unnecessary heat dissipation in the voltage regulator.

HEAT SINKING

To control the junction temperature of the voltage regulator within its rated specification, an effective heat sink is required. Where large currents are involved, the rectifier bridge also requires heat sinking.

To choose the heat sink, the following data is needed:

- Maximum power dissipation in the device (P_m)
- Maximum rated temperature of the device junction (T_j)
- Thermal resistance of the device junction to device case (R_{JC})
- Thermal resistance of the device case to heat sink (R_{cs}); ie the device insulating washer
- Maximum ambient temperature in which the device and heat sink must operate (T_a)

Thermal resistance between two points is the rise in the temperature per watt dissipated (°C/W).

Thermal resistance of the heat sink to air is R_{sa} and the total thermal resistance, junction to air (R_{Ja}) is the sum of the other resistances in the heat dissipating chain.

$$ie\ R_{Ja} = R_{Jc} + R_{cs} + R_{sa}$$

To find the required thermal resistance of the heat sink and subsequently to choose its size, its thermal resistance is calculated as follows:

$$R_{sa} = \frac{T_j - T_a}{P_m} - R_{cs} - R_{JC}$$

T_j and R_{JC} are obtained from the device data. The value of T_a is dependent on the environment of operation. In the comfort of the radio shack, 40 degrees Celsius could be adequate but this might have to be raised if the heat sink is located where there is restricted air flow or localised air heated by other equipment. In the boot of a motor vehicle on a hot day, ambient temperature could be as high as 65 to 70 degrees Celsius.

The importance of selecting a suitable insulating washer for the device is emphasised, particularly where high dissipation powers are involved (say over 10 watts). A colleague of the writer, who had some heat sink problems, carried out some tests to measure the thermal resistance of various TO3 type case insulating washers, which were at hand. The results were as follows:

No washer with silicone compound	0.062 °C/W
Beryllium Oxide	0.096 °C/W
Mica	0.16 °C/W
Silicone Rubber Fibreglass Composite	
(a) without silicone compound	0.58 °C/W
(b) with silicone compound	0.27 °C/W

For low dissipation power (say 10 watts), the type of washer is of little consequence, however if large powers were involved (say 70 watts), the silicone rubber composite, without silicone compound, would develop a temperature differential of 70 x 0.58 = 40.6 degrees compared to only 70 x 0.096 = 6.7 degrees for the Beryllium Oxide washer.

No insulating washer gives the lowest temperature differential, but this means the heat sink must be electrically above ground potential with possible hazardous consequences in the event of a short circuit to ground. Also, in this case, the heat sink is isolated from the chassis which means that the chassis itself cannot assist in dissipating the heat.

The best washers are Beryllium Oxide although there is often some hesitance to use these because if the material is machined, the fine dust from machining is toxic. In its solid state the material is apparently quite safe, but the moral is not to machine it.

Referring back to our sample power supply of 13 volts at 10 amps, the power dissipation in the regulator is calculated as follows:

$$P_m = (E_{DC} - E_L) I_L$$

where $(E_{DC} - E_L)$ represents the voltage loss across the voltage regulator and I_c is the load current.

ie $P_m = (16.5 - 13) \times 10$

$= 35$ watts

Allowing a margin of 10 percent, we will assume a maximum dissipation of 35 x 1.1 = 39 watts. The maximum junction temperature of the LM396 is given as 175 degrees Celsius and the maximum thermal resistance junction to case (R_{jc} is given as 1.2 °C/W.

Let us assume that a mica washer is used, as this might be easier to obtain than the Beryllium washer. Depending on the thickness, this could have a thermal resistance as high as 0.50 °C/W. The maximum ambient temperature (T_A) will be assumed to be 40 degrees Celsius.

From the preceding data, the maximum thermal resistance of the heat sink is then calculated as follows:

$$R_{Sa} = \frac{175 - 40}{39} - 0.5 - 1.2$$

$$= 1.76\ °C/W$$

A diagram of the heat gradient which results is shown in Figure 7. Note that the maximum temperature rise in the heat sink is 39 W x 1.76 °C/W = 69°.

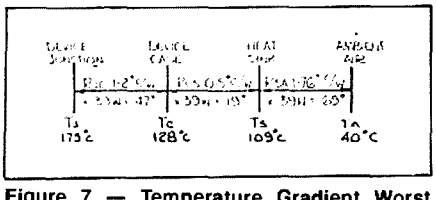


Figure 7 — Temperature Gradient Worst Conditions.

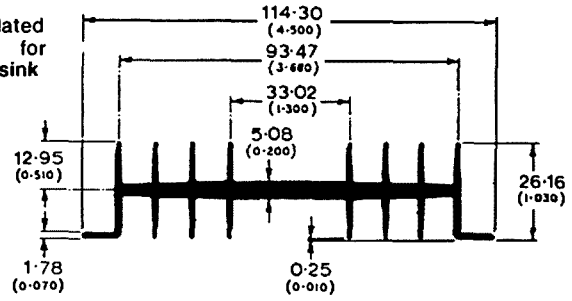
The next step is to examine some heat sink curves for commercial heat sink material which could be available. Typical curves for the Mullard 35D material is shown in Figure 8. Examination of these curves indicates that the minimum length of this material to limit the temperature rise to 69°, for a dissipation of 39 watts, is about five inches. Of course, we do not have to use this particular material and some other material might be available on the secondhand market from redundant equipment.

Whilst special heat sinks are necessary for large dissipation powers, lower powers (say 10 watts) can often be satisfactorily dissipated by mounting the device directly on the case of the equipment. Figure 9 gives a guide to the surface area of metal given a power dissipation and temperature differential above ambient value. As an example from the curves, 10 watts will raise the temperature of 50 square-inches to 45 degrees Celsius above ambient temperature. That is, it has a thermal resistance of 4.5 °C/W.

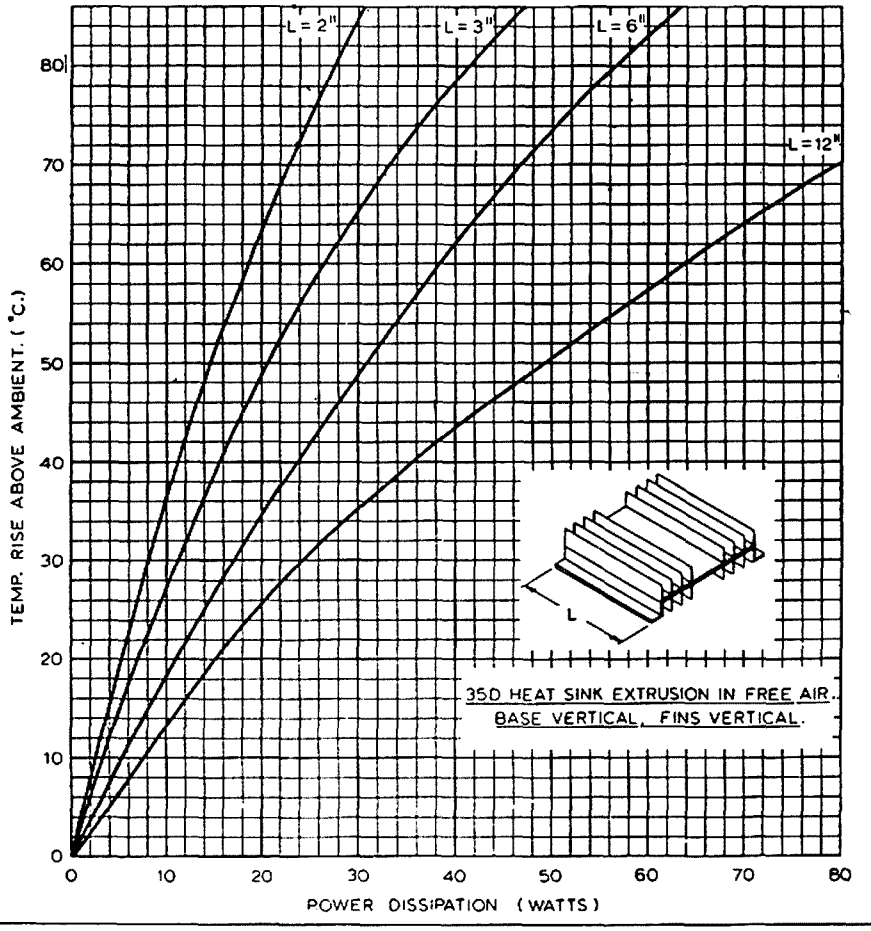
The performance of heat transfer can be checked by monitoring the device case and the heat sink with a temperature probe. This sort of test equipment is not generally found around the radio amateur's shack, but is very useful if one can be borrowed. A rough idea of the performance can be judged by hand. If the heat sink feels too hot, it probably is! If the device case is much hotter than the heat sink, a better insulating washer could be indicated.

The heat sink should be mounted in a place where air-flow is free and the fins of the heat sink should be positioned in the vertical plane to aid air- flow. A blackened heat sink radiates heat more effectively than an unblackened one. Heat dissipation from the heat sink can be made more effective by forced air cooling, that is, its effective thermal resistance is lowered.

Figure 8 — Power Dissipation Tabulated against Temperature Rise for Various Lengths of 35D Heat sink Extrusion.



Dimensions in mm.
Inch conversions in brockets. Scale 1:2



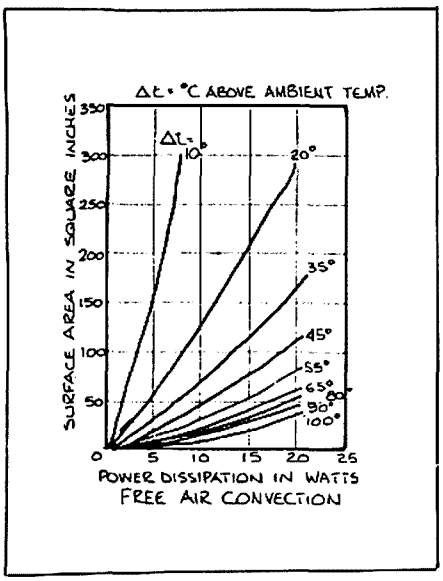


Figure 9 — Temperature Rise versus Power Dissipation for a Plane Heat sink.

THE RECTIFIER SINK

Whilst on the subject of heat sinks, we must not forget the rectifier bridge, which in the sample supply, must dissipate 1.5 volts at 10 amps = 15 watts.

The MDA1201 is rated at a maximum junction temperature of 175 degrees Celsius and a maximum case temperature of 100 degrees Celsius at its maximum current rating (I_o) of 12 amps. From this, we calculate junction to case thermal resistance as follows:

$$R_{jc} = \frac{T_J - T_C}{1.5 \times I_o}$$

$$= \frac{175 - 100}{1.5 \times 12} \qquad = 4.17\,°C/W$$

The rectifier bridge case does not have to be insulated so we give the case to sink thermal resistance (R_{cs}) a value of 0.1.

Using a previous formula for the thermal resistance of heat sink to air:

$$R_{sa} = \frac{T_J - T_a}{P_m} \qquad - R_{cs} - R_{jc}$$

$$= \frac{175 - 40}{15} \qquad -0.1 - 4.17$$

$$= 4.73\,°C/W$$

This means a temperature rise of 15 x 4.73 = 71° in the heat sink, as a maximum. Referring to Figure 9, we require a plane heat sink of not less than 30 square inches. Direct mounting of the rectifier bridge on the power supply chassis is usually sufficient to satisfy this requirement.

A few final remarks should be said about mounting semiconductor devices on the heat sink. Care should be taken to ensure that the mounting surface is flat and smooth, so that it makes good thermal contact. Make sure there are no drilling burrs to prevent complete surface contact and which could puncture the insulating washer and hence bridge the insulation. Use silicone grease or other heat sink compound on the joint to improve heat-transfer.

REFERENCE VOLTAGE

Voltage regulator packages are generally three terminal devices with an input, an output and a voltage reference terminal. In fixed voltage regulators, the reference pin is connected to the common power rail. In adjustable regulators, such as the LM396, a resistive voltage divider is required to divide the load voltage down to reference level (V_{REF}) as specified for the regulator. In the case of the LM396, the reference voltage is 1.25 volts and Figure 1 illustrates a divider network which allows an output voltage adjustment between 12 and 13 volts.

In selecting resistance values for the divider network, the bleed current through the network is made large compared to the input current of the reference pin (at least 10 times). Referring to Figure 10, a little exercise in ohms law gives us the following:

$$R_1 < \frac{E_{REF}}{10\,I_{REF}}$$

$$R_2 = \frac{(E_L - E_{REF})\,R_L}{E_{REF}}$$

The power in each resistor is also calculated so that the correct rated resistor can be selected:

$$\text{Power in } R_1 = \frac{(E_{REF})^2}{R_1}$$

$$\text{Power in } R_2 = \frac{(E_L - E_{REF})^2}{R_2}$$

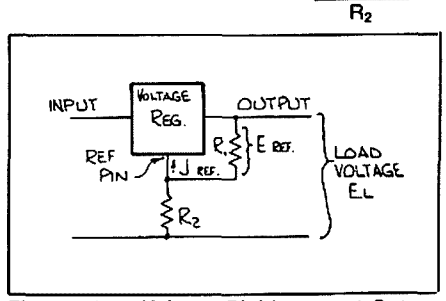


Figure 10 — Voltage Divider to set Output Voltage.

$$R1 < \frac{E_{REF}}{10I_{REF}}$$

$$R2 = \frac{(E_1 - E_{REF})\,R_L}{V_{REF}}$$

VARIABLE VOLTAGE SUPPLIES

Resistors R_1 and R_2 can be replaced with a variable resistance network including a control to vary the output voltage. Suppose in our sample supply we arranged for a control to give a variable supply from 11 to 15 volts. Input voltage E_{DC} is calculated on the basis of the maximum output volts (15V), however, heat sink requirements must be based on the lowest voltage (11V), when dissipation across the regulator is greatest.

Assuming the regulator is to supply a maximum of 10 amps over the whole output voltage range, we calculate the following:

$$E_{DC} = E_{LMAX} + 1.1\,E_{DO}$$

$$= 15 + 1.1 \times 2.75$$

$$= 18.03 \text{ volts.}$$

Maximum power dissipation is calculated as follows:

$$P_m = (E_{DC} - E_{LMIN})\,I_L$$

$$= (18.03 - 11) \times 10 = 70.3 \text{ watts.}$$

Now, this happens to be as far as we can go for the lowest voltage because the LM396 has a power limit of 70 watts. If we tried to go lower than 11 volts with the value of E_{DC} set to allow a maximum output of 15 volts, the dissipation in the LM396 would exceed its 70 watts rating.

Clearly, the maximum power dissipation is much greater in a variable voltage power supply than one set for a fixed voltage and as can be seen from the example, care must be taken in design to ensure that the regulator maximum ratings are not exceeded.

For the example, a low thermal resistance insulating washer, such as Beryllium Oxide is essential and, assuming a value of R_{CS} = 0.1 °C/W, we get the following:

$$R_{sa} = \frac{T_J - T_A}{P_m} \qquad - R_{CS} - R_{JC}$$

$$= \frac{175 - 40}{70} \qquad - 0.1 - 1.2$$

$$= 0.63\,°C/W \qquad \text{(ie 44° rise for 70W)}$$

For this application, quite a large heat sink is required. Referring to Figure 11, about nine inches of Mullard 50D heat sink would be required.

One way this high dissipation can be avoided, over a wide output voltage range, is to divide into several ranges with switching to change the transformer secondary taps with range change.

BYPASS CAPACITORS

Small bypass capacitors, from the reference pin to common and the output pin to common, are generally required to prevent instability in the regulator. Capacitors which have low impedance at high frequencies, such as tantalums, are necessary and these should be connected with short leads right at the pins of the regulator. If the regulator is used for powering a radio transmitter, the bypass capacitors also prevent RF signals from getting into the control pin of the regulator and being rectified. The writer had one experience with a UA78HGA regulator which supplied 12 volts to a two metre transceiver. On resistive dummy load, the regulator worked perfectly but dropped its voltage when powering the transmitter. The problem was fixed by bypass capacitors, but only after a good quality mica capacitor was selected for the reference pin.

PROTECTION DIODES

When capacitors are used in conjunction with IC regulators, it is sometimes necessary to add protection diodes to prevent the capacitors from discharging through the low current points in the regulator.

When a capacitor is connected across the output of the regulator and the input is short circuited, the output capacitance will discharge into the output of the regulator and, depending on circuit constants, can possibly damage the regulator.

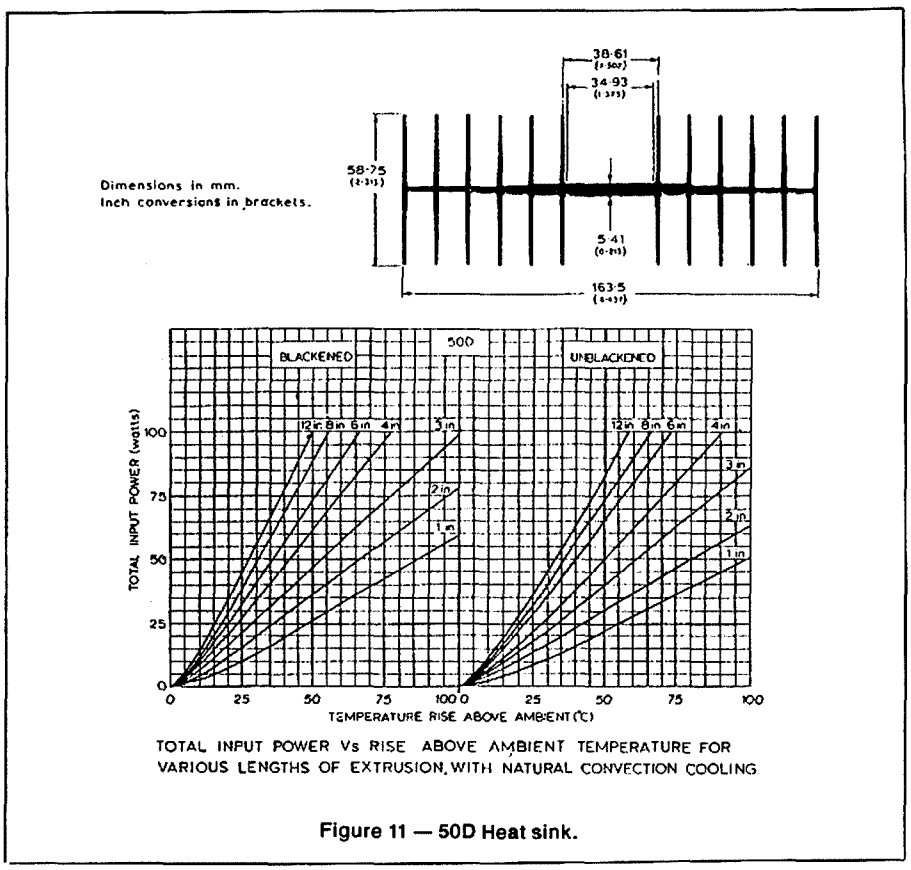
Another possibility is when a capacitor is connected at the reference or adjustment pin. In this case, a short circuit at either input or output pin can cause a discharge to a low current junction in the regulator. A diode connected between the reference pin and output can protect against this.

Whether these diodes are necessary depends on the type of regulator and its operating conditions and the designer must be guided by the manufacturers specifications. Regulator type LM117 requires this protection if used for output voltages above 25 volts. Figure 12 shows the protection diodes fitted to this regulator. As a general rule, if in doubt, put them in anyway; they cannot do any harm.

Protection diodes should be power types (say 1A) with sufficient surge rating to withstand the discharge surge.

THE SAMPLE SUPPLY

The sample supply, as shown in Figure 1, was actually built to power such loads as the 1675 transceiver (12.6V at 7A). Being adjustable down to 12 volts, maximum dissipation at the full load capacity of 10 amps, has to be calculated at 12 volts and this is as follows:



TOTAL INPUT POWER Vs RISE ABOVE AMBIENT TEMPERATURE FOR VARIOUS LENGTHS OF EXTRUSION, WITH NATURAL CONVECTION COOLING

Figure 11 — 50D Heat sink.

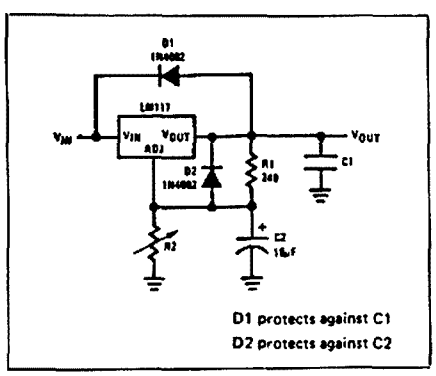


Figure 12 — LM117 Regulator with Protection Diodes.

$$P_m = (E_{DC} - E_{LMIN})I_L$$
$$= (16.5 - 12) \times 10$$
$$= 45W.$$

A Beryllium washer with a thermal resistance of 0.1 °C/W was used to insulate the regulator from the heat sink and heat sink thermal resistance (R_{sa}) has been calculated as follows:

$$R_{sa} = \frac{T_J - T_a}{P_m} - R_{CS} - R_{JC}$$
$$= \frac{175 - 40}{45} - 0.1 - 1.2$$
$$= 1.7\ °C/W$$

Using the Beryllium washer, the thermal resistance (R_{sa}) is very similar to that calculated previously for 13 volts using a higher resistance washer. As such, the heat sink examined before is suitable for this application.

SUMMARY OF DESIGN PROCEDURE

The following summarises the designs procedure as discussed in the previous paragraphs:

1. Select a suitable voltage regulator for the required output voltage (E_L) and maximum load current (I_L).
2. Calculate input voltage (E_{DC})

$$E_{DC} = 1.05 (E_L + E_{DO})$$

where E_{DO} is the regulated drop out voltage.

3. Calculate load resistance (R_L)

$$R_L = \frac{E_{DC}}{I_L}$$

4. Calculate filter capacitance (C)

$$C = \frac{T}{R_L} = \frac{0.07 \times 10^6}{R_L} \text{ microfarads}$$

where T = time constant set at 0.07 second.

5. Calculate transformer secondary voltage (first estimate) (E_{RMS})

$$E_{RMS} = 0.7 (E_{DC}/0.85 + 1.5)$$

6. Select Rectifier Bridge:
Peak Inverse Voltage at least 2.8 E_{RMS} plus a 50 percent safety margin.
Peak Current not less than I_L.

7. Calculate minimum source resistance (R_{SM})

$$R_{SM} = \frac{E_{DC}}{0.85 I_{FSM}}$$

where I_{FSM} is the surge current rating of the rectifier.

8. Check the source resistance (R_S) of the transformer

$$R_S = \frac{(Vnoload - Vload)\ Rload}{Vload}$$

If R_S is less than R_{SM}, add series resistance to make it equal to R_{SM}.

9. Calculate ratio R_S/R_L and find ratio E_{DC}/E_{MAX} percent from Figure 4 for time constant of 0.07 second.

Putting $R_o = \frac{E_{DC}}{E_{MAX}}$ %

Recalculate the R_{MS} secondary voltage

$$E_{RMS} = \frac{0.7(E_{DC} + 1.5)}{100R_o}$$

10. Calculate maximum secondary current (I_{RMS})

$$I_{RMS} = 1.4\ I_L$$

11. Calculate maximum power dissipation of the regulating device plus 10 percent margin (P_m)

$$P_m = 1.1 (E_{DC} - E_L) I_L$$

(Note: For a variable voltage supply $E_L = E_{LMIN}$)

12. Calculate maximum thermal resistance of device heat sink (T_{JA})

$$T_{JA} = \frac{T_J - T_a}{P_m} - R_{CS} - R_{JC}$$

where

T_J = Maximum Junction Temperature.
T_a = Maximum Ambient Temperature.
R_{CS} = Thermal Resistance Case to Sink.
R_{JC} = Thermal Resistance Junction to Case.

Select heat sink from published curves.

13. Repeat calculation (12) for the rectifier. In this case $P_m = 1.5\ I_L$

Ensure adequate heat sink on chassis or external to chassis.

14. If the regulator is an adjustable output voltage type, calculate voltage divider reference resistors:

$$R_1 < \frac{E_{REF}}{10\ I_{REF}}$$

$$R_2 = \frac{(E_L - E_{REF})\ R_1}{E_{REF}}$$

where E_{REF} = Regulator Reference Pin Voltage

and I_{REF} = Reference Pin Load Current

15. Include RF bypass capacitors and protection diodes as may be required.

ar

PACKET NEWS

The Department of Trade and Industry allowed a majority of packet radio to air on November 22, last year, for a period of one year on 146.650 MHz, before moving to the UHF and microwave amateur allocations.

Operation of the repeaters must be in accordance with the AX-25 Version 2 protocol. Bulletin Board, unattended operation and for non-repeater licensees, digipeating is not yet permitted.

* * *

Nearly 400 amateurs, have provided communication facilities for the New York City Marathon over the last 11 years. The recent event attracted over 20 000 starters and is classified as the world's largest marathon. Packet Radio communication was christened by the use of two stations.

Packet was dedicated to assisting in reporting some of the drop-out traffic as a back-up to the 21 traditional voice stations. The two stations handled about 35 percent of the 1090 competitors who did not finish.

Next time, 25 000 runners are anticipated to compete. Packet will be there and it is anticipated if two stations can create a fine record, four or five will be better.

—Adapted from *Gateway*, Vol 3 No 8, December 5, 1986

MORSE INTERFACE

Arthur Forster VK2DKF
5 Hersey Street, Blaxland, NSW. 2774

This Morse interface circuit can clean up noisy Morse signals copied from a HF receiver.

It provides a "clean" processed output signal at TTL level, or a constant tone for feeding to cassette or the cassette input of a personal computer.

Many amateurs and SWLs have software programs that enable them to copy Morse from a communications receiver and display it on their personal computer. There are many hardware interface circuits for RTTY available to constructors, but very few interfaces to copy Morse. The writer has found that the simplest interfaces are not satisfactory when trying to copy Morse on a computer from the HF bands. Any noise spikes present on the signal are usually interpreted by the computer as dots and the print-out contains mostly garbage.

When training, the human ear can copy Morse code which is partly masked by noise, interference from adjacent signals and fading. The computer however, has not this level of intelligence. One other area where the human ear is superior to the computer is in the spacing of the dots and dashes. If the correct spacing is not maintained by a hand keyer the computer will not be able to copy properly, irrespective of this interface.

In principle, the function of this circuit is to provide a sharp narrow band filter, followed by an audio tone decoder. Although the filter will provide good selectivity to interfering signals, it is not sufficient for pulse-type noise which has a relatively large bandwidth. Hence the signal is further processed by applying it to a tone decoder, integrator and comparator.

CIRCUIT DESCRIPTION

This interface consists of two parts:

1 A sharp audio filter centred on approximately 800 Hz.
2 A tone decoder and processor circuit.

The audio filter is composed of an input buffer stage IC1, followed by a four stage active filter, IC2, IC3. This filter gives very sharp rejection to any signals either side of its centre frequency. It is very useful when decoding a signal very close to unwanted signals.

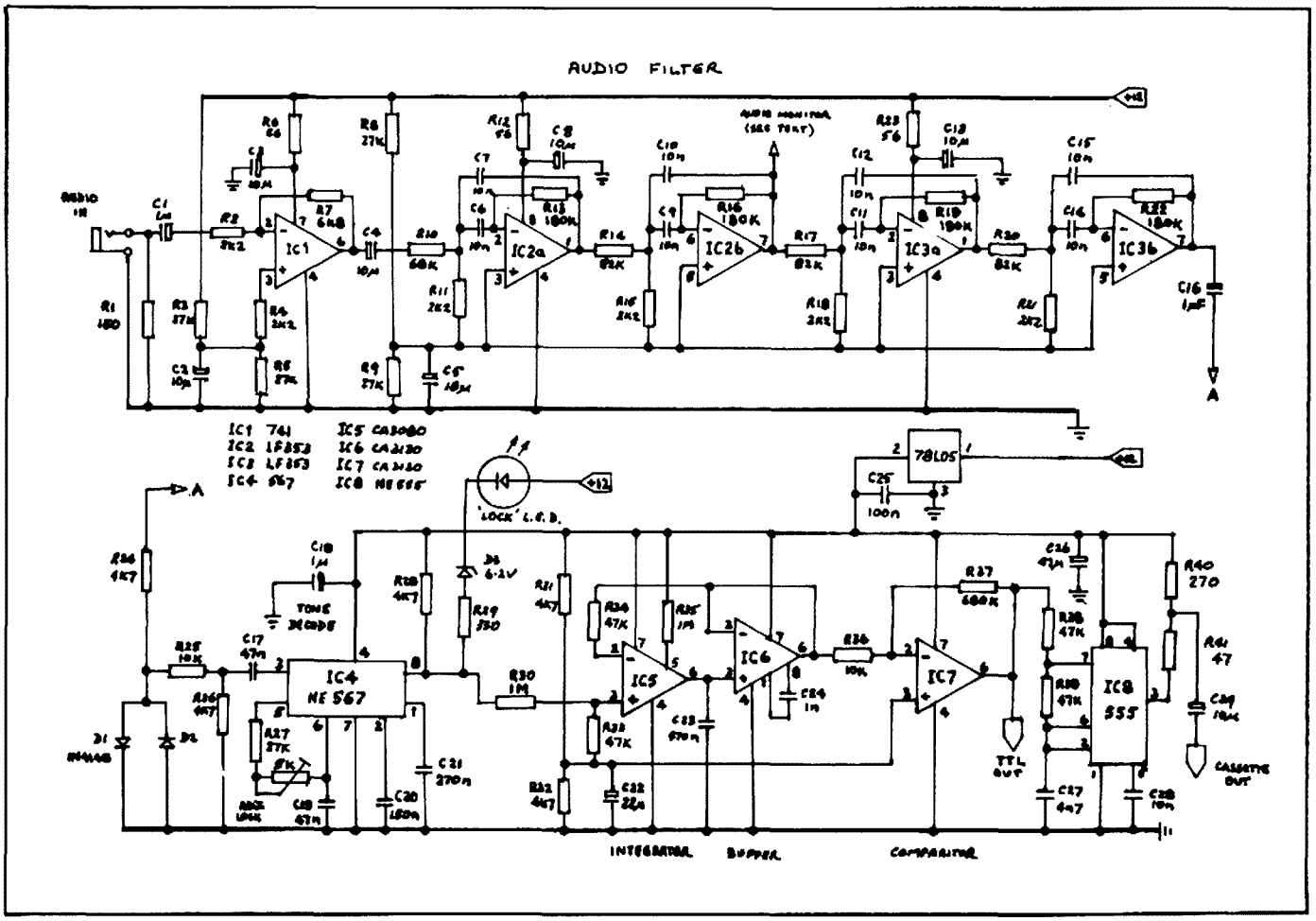
The output of the filter is then fed via a resistive attenuator network to the input of the Tone Decoder, IC4, on the second board. The back-to-back diodes ensure that the input signal level is limited to 600 mV peak-to- peak.

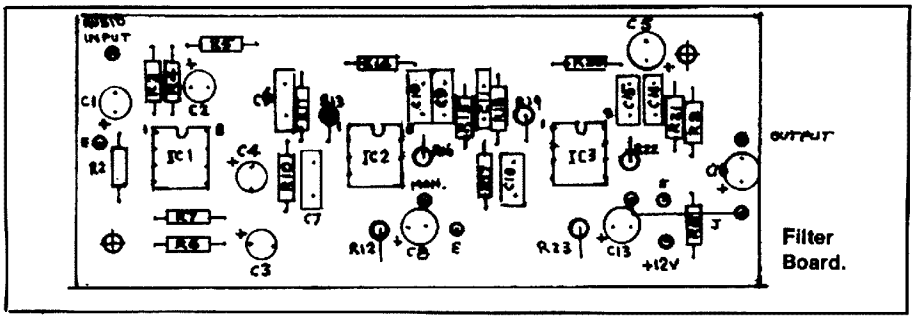
The frequency of the Tone Decoder IC4, is set precisely to the filter centre frequency by R27, C19 and preset potentiometer. The output of IC4 at pin 8, goes to logic 0 as soon as a 800 Hz signal is applied to its input, causing the lock LED to light. However, the Tone Decoder also responds to short interfering noise spikes that pass through the earlier filter. These pulses are eliminated by the following circuit consisting of IC5, IC6, IC7.

IC5 is configured as an integrator whose time constant is determined by the control current flowing via R35 into pin 7 and by capacitor C23. This has the effect of eliminating short pulses. IC6 is a voltage follower to prevent loading on Integrating capacitor C23. IC7 is configured as a comparator with a threshold voltage of 2.5 volts.

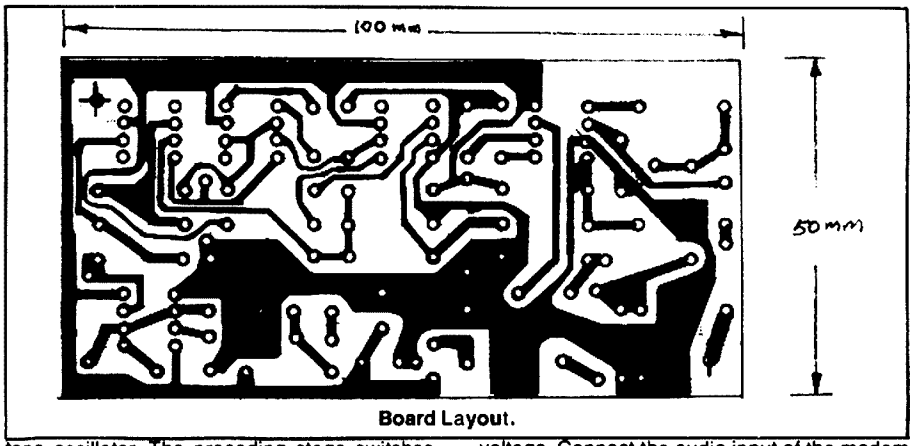
The output from pin 6 of IC7 will be at TTL level, going between 0 volts and +5 volts, depending on whether a tone (dot, dash) is present or not. This output can be used to interface with the input port of a computer that requires a TTL input.

The writer designed this interface for use with a software program for the VZ200/300 that requires an audio tone input to the cassette input of the computer. Therefore, IC8, an NE555 timer, is configured as a square-wave

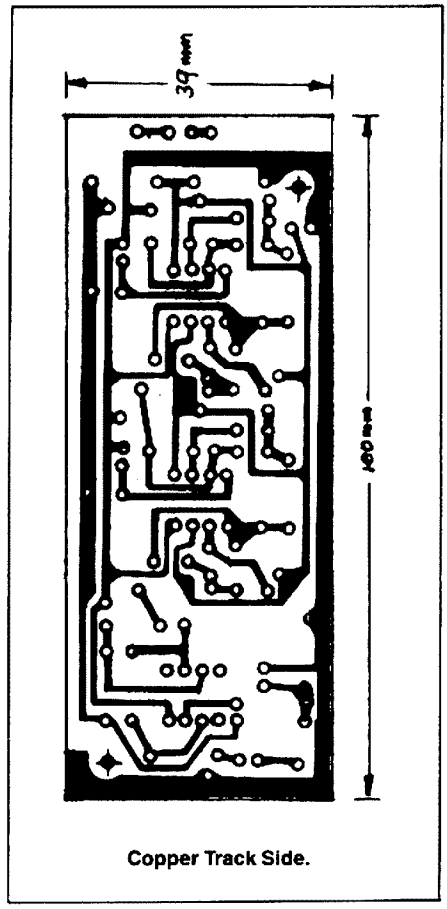




Filter Board.



Board Layout.



Copper Track Side.

tone oscillator. The preceding stage switches the tone on and off by switching the voltage on pin 7 of the IC. The output level at pin 3 is adjusted by R40, 41 to give the correct level into the cassette input of the computer.

If an audio monitor point is required, it could be taken from the output of IC8 but a better point would be from pin 7 of IC2 in the CW filter. The monitor signal could be buffered by a simple IC audio amplifier as per Figure 3 and brought out to a socket to drive a speaker or headphones. The circuit is supplied from an external 12 volt source that could be a DC plug-pack. The +5 volts rail is derived from the +12 volts rail very simply by using a 78L05 low power regulator transistor.

CONSTRUCTION

The circuit was laid out on two separate printed circuit boards to ensure as much flexibility as possible. The nature of the case housing the circuitry is left to the discretion of the constructor. The writer was able to mount the boards in the same case that contains a RTTY interface and thus obtain a single compact modem that can be used for CW as well as RTTY. Audio input and computer output connection are by way of miniature 3.5 mm jack sockets.

It is important to use close tolerance resistors and capacitors in the feedback circuits around IC2, IC3 of the CW filter. Preferably the capacitors could be checked using a capacitance bridge. Signal leads between the boards and the output sockets should be wired in shielded cable.

As some of the ICs are FET devices, the usual precautions against static damage should be observed. They were mounted directly on the printed board without sockets in the prototype, with the usual precaution of soldering the earth and supply pins first, using a properly earthed soldering iron.

ALIGNMENT AND USE

There is only one adjustment to be made after the unit has been constructed and the supply voltages checked to see that it is functioning correctly.

First check that the voltage on the input bias pins of the ICs is approximately half the rail voltage. Connect the audio input of the modem to the headphone output socket of a HF receiver and tune in a CW signal accurately so that the "Lock" LED lights in sympathy with the incoming CW signal. Reduce the receiver's audio volume control to a level where the LED just lights and adjust the preset "Lock" potentiometer for the minimum level of audio from the receiver that still keeps the circuit in lock. This will be the point where the tone decoder's frequency is adjusted to the centre point of the CW filter.

Check that a tone of approximately 1 kHz is being switched on and off at the output of IC8.

In use, it will be found that the circuit is quite sensitive and the audio input should be kept reasonably low so long as the decoder still stays in lock, indicated by the lock LED lighting at full intensity.

In operation, the circuit makes a surprising difference when listening to noisy signals. It could be used without a computer for monitoring off-air signals under difficult reception conditions.

MORSE SOFTWARE PROGRAM

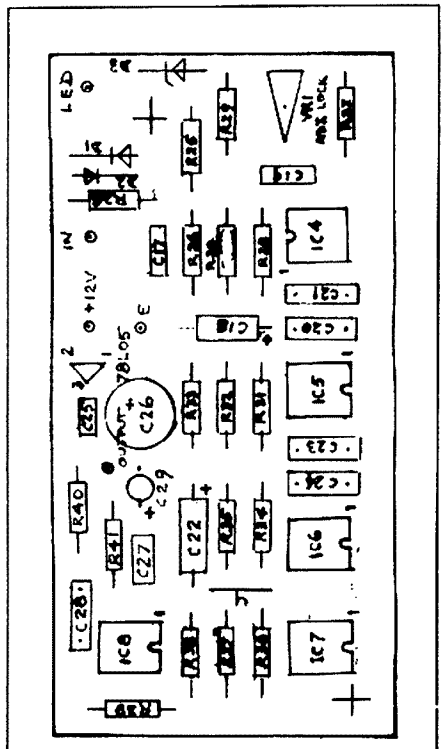
The writer is using a machine code Morse program written by Ross ZL1BNV, for the VZ200/300 computer.

This program has such features as sending and receiving with a speed rage of 1 to 99 WPM and split screen display. Input and output is via the computer's cassette I/O port.

PARTS LIST

RESISTORS: ½ watt 5 percent

R1	150 ohm
R2, 4, 11, 15, 18, 21	2k2 ohm
R3, 5, 8, 9, 27	27k ohm
R6, 12, 23	56 ohm
R7	6k8 ohm
R10	68k ohm
R13, 16, 19, 22	(2 percent) 180k ohm
R14, 17, 20	(2 percent) 82k ohm
R24, 26, 28, 31, 32, 33, 34, 38, 39	4k7 ohm
R29	330 ohm
R30, 35	1M ohm
R25, 36	10k ohm
R37	680k ohm
R40	270 ohm
R41	47 ohm
R42	(preset pot) 5k ohm



Processor Board.

CAPACITORS

C1, 16, 18	(electro) 1 μF
C2, 3, 4, 5, 8, 13, 29	(tantelum) 10 μF
C6, 7, 9, 10, 11, 12, 14, 15	(greencap 5 percent) 10 nF
C17, 19	(greencap 100V) 47 nF
C20	(greencap 100V) 150 nF
C21	(greencap 100V) 270 nF
C22	(electro) 22 μF
C23	(greencap 100V) 470 nF
C24	(greencap) 1 nF
C26	(electro) 47 μF
C27	(greencap) 4n7
C25	(disc ceramic) 100 nF
C28	(disc ceramic) 10 nF

INTEGRATED CIRCUITS

IC1	741
IC2, 3	LF353
IC4	NE567
IC5	CA3080
IC6,7	CA3130
IC8	NE555
IC9	78L05
D1, 2	IN4148
D3	6.2 volt zener

ar

QSP

ELECTRO-MAGNETIC PULSE PETITION

A petition has been presented to the FCC seeking a Notice of Inquiry on the subject of mandated EMP protective measures for telecommunications equipment under the Commission's jurisdiction. It is felt that the nation's economy is extremely vulnerable to severe disruption by high altitude nuclear explosions that might occur as a result of a variety of scenarios short of a general nuclear strike.

—From *Tha ARRL Letter* September 2, 1986

PICTURES BY AMATEUR RADIO

At the Kingston Amateur Radio Club meeting held on November 4, 1986, members of the Belleville TELIPAK Group, led by Syd Horne VE3EGO, demonstrated TELIPAK — a system which provides the capability for amateurs to exchange high-resolution, error-free, digital colour images, text speech and graphics.

The novel aspect of the lecture and demonstrations was that the pictures used for the talk were transmitted by packet radio from Belleville to Kingston using digipeaters, VE3TPK and VE3NFW. Barry VE3CJC, transmitted the pictures from Belleville and they were received by Syd VE3EGO, In the meeting hall at Kingston.

It is believed that this is the first time that digital colour pictures have been transmitted for a talk using packet radio techniques.

Does any Australian challenge the Kingston Club's claim?

—Written by Bob Boyd VE3SV, Program Chairman, Kingston Amateur Radio Club, Kingston, Ontario. Contributed courtesy The Editor, *The Canadian Radio Amateur*

THOUGHT FOR THE MONTH

He who throws mud loses ground!

DEFAUSSAT

Australia is committed to using its domestic satellites for military communications and will begin using a 12 watt AUSSAT transponder before 1990.

The Defence Department is planning to use 10 unmanned earth stations and two portable dishes to supplement an existing defence network of HF radio, microwave radio and cable systems.

The second generation of AUSSAT, now on the drawing board, could also include cross-band frequencies 7/8 GHz, which are reserved for defence- related satellite services.

ANDREWS COMMUNICATIONS SYSTEMS

NOW OPEN SATURDAYS 9-12 DUE TO POPULAR DEMAND

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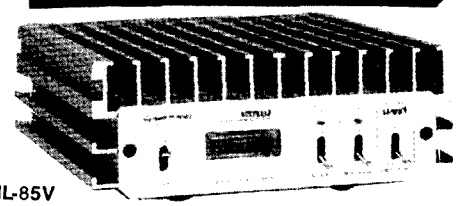

HL-85V

FACTORY-SUBSIDISED T.H.P. RF LINEAR AMPLIFIERS

- HL-66V 10-60W, GaAsFET, 6m $229
- HL-35V 3-30W, GaAsFET, 2m $149
- HL-62V 10-60W, GaAsFET, 2m $249
- HL-85V 10-85W, GaAsFET, 2m $329
- HL-110V 3/10-120W, MOSFET, 2m ... $429
- HL-160V 3/10-160W, MOSFET, 2m .. $599
- HL-160V 25A 25-160W, FET, 2m $399
- HL-60U 10-60W, GaAsFET, UHF $349
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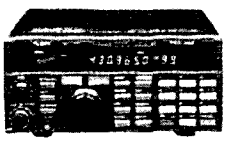

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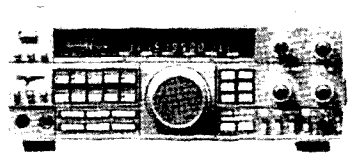

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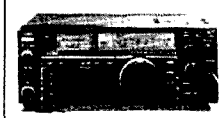

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HF 100W transceiver, features superb receive characteristics, 12ch memory, 0.1-30 MHz rx.

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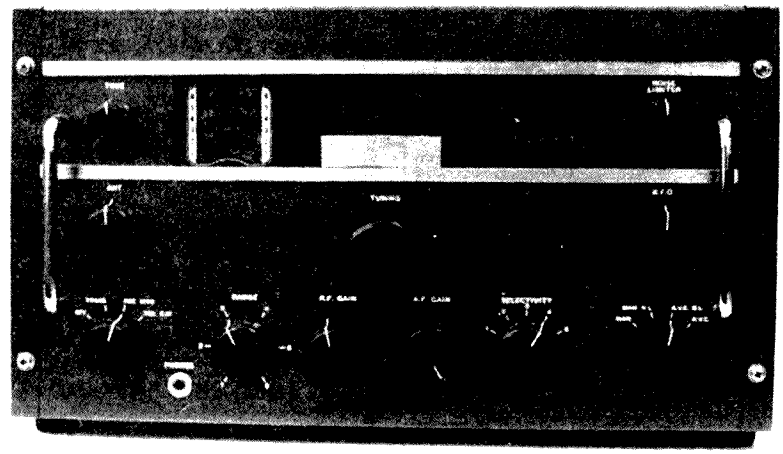
CLASSIC COMMUNICATIONS EQUIPMENT

THE AR-88 COMMUNICATIONS RECEIVER

Colin MacKinnon VK2DYM
52 Mills Road, Glenhaven, NSW. 2154

The AR-88 was a general purpose receiver covering 535 kHz to 32 MHz in six bands.



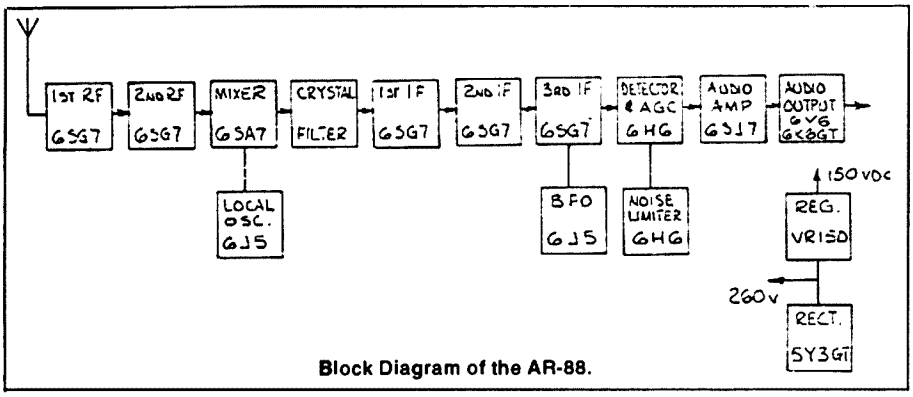
The Front View of the RCA AR-88 LF. Panel lettering is engraved and paint filled. Note the handles and end trims to improve the appearance.

The AR-88 communications receiver was originally designed by the RCA Amateur Radio Section in 1939-40, as a successor to their AR-77 for the USA amateur and commercial market. It was a general purpose receiver covering 535 kHz to 32 MHz in six bands and with deluxe features such as switchable selectivity, a noise limiter, and tone control.

However, before the AR-88 reached the market, England became embroiled in World War Two and had a tremendous need for modern communications gear. (The pathetic state of their radio preparedness in 1940 is another story!). Such was the demand for the AR-88 that four factories in the USA and Canada worked flat-out on UK and later US requirements.

The original AR-88 for the amateur market had an S-meter but few of the sets made actually were fitted with one because of wartime shortages. The AR-88D is the most common model and has an additional audio output at an impedance of 600 ohms to suit balanced lines, as well a the standard 2.5 ohm speaker output. The AR-88LF version covers the LF range in lieu of the broadcast band and has a higher IF frequency. The RAF made certain modifications to their sets and called them the R1556, 1556A, and 1556B. The sets were also used in Russia during the latter part of the war.

There are minor differences in construction techniques over the production span of the sets; for instance, the front panels were originally engraved, but later ones were simply stencilled. It was available free-standing or for rack-mounting, and a separate matching speaker, code MI-8303D, could be supplied.



Block Diagram of the AR-88.

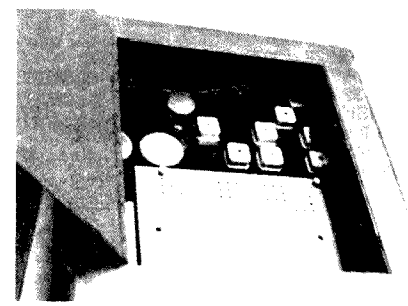
As can be seen in the Block Diagram, the electrical arrangement is conventional for the time, but includes comprehensive features. It is of course valve operated and has a total of 14 glass or metal 6.3 volt filament valves. The antenna input caters for single wire or balanced input at 200 ohms impedance. There are two RF amplifiers to aid image rejection, followed by a mixer which is fed by a separate local oscillator. There are then three IF stages with switchable coupling (five positions) to achieve different bandpass characteristics. The IF frequency is 455 kHz (735 kHz for the AR-88LF) and there is also a simple crystal filter at 455 kHz (735 kHz) which comes into circuit in the third, fourth and fifth selectivity positions. A separate BFO oscillator provides a signal into the second IF stage. After the IFs, a double diode circuit detects the audio and provides AVC. Another double diode acts as a noise limiter. Two stages of audio amplification then provide 2.5 watts of audio to the 2.5 ohm terminals, and 10 milliwatts to high impedance headphones.

The normal power supply has a tapped mains transformer to allow input voltages from 100 volts to 260 volts with a 5Y3GT rectifier and a VR150/30 voltage regulator. A vibrator power supply unit, code MI-8319, was available and the set could also be run off six volts "A" and 250 to 300 volts "B" batteries.

Mechanically, the set is built on a heavy gauge steel chassis, with the four gang tuning capacitor and front end tuning coils enclosed under a shielded cover. The front panel is also heavy gauge steel. A hinged lid on the case allows access to the internals and the case slides off for major maintenance.

The control layout across the front of the set is as follows:

Top Left: a variable tone control, followed by the main tuning dial with the six bands marked on a rotating disc. Then comes the 0 to 100 vernier dial, a nameplate where the S-meter was intended, and the variable noise limiter control. The main tuning dial and the vernier dial are coupled together by a gear drive so only one tuning knob is needed.
Middle: the antenna peaking capacitor knob is to the left of the main tuning knob which is very smooth in operation but slightly highly geared for



The View through the Top Cover of the AR-88 LF. The power transformer is at the top-left, IF and audio stages at the top-right. RF and tuning components are under the cover marked with an X.

easy SSB tuning. Directly below this tuning knob is a lock screw to hold the tuning setting. On the right is the variable BFO control.

Bottom: on the left is the mains switch with positions of OFF, TRANS (transmit mute), REC, MOD (receive phone) and REC CW positions. The six position band switch is next, followed by RF and AF variable gain controls. Next again is the five position selectivity switch and then a switch for MAN (no AVC), MAN N L (ie no AVC, but noise limiter on), AVC N L, and AVC.

Some sets had a separate ON/OFF switch below the bottom left control switch, which was then only a three position switch. A headphone jack is fitted between this switch and the band switch.

The back panel has screw terminals for antenna, audio out, and T/R switching, as well as a voltage change plug.

The basic specifications are:

FREQUENCY RANGE of the AR-88 and AR-88D

Band 1	.535 to 1.600 MHz
Band 2	1.570 to 4.550 MHz
Band 3	4.450 to 12.150 MHz
Band 4	11.900 to 16.600 MHz
Band 5	16.100 to 22.700 MHz
Band 6	22.000 to 32.000 MHz

FREQUENCY RANGE of the AR-88LF

Band 1	73 to 205 kHz
Band 2	195 to 555 kHz
Band 3	1.480 to 4.400 MHz
Band 4	4.250 to 12.150 MHz
Band 5	11.900 to 19.500 MHz
Band 6	19.000 to 30.500 MHz

Sensitivity was about 1.5 microvolts for 6 dB signal-noise ratio across all bands.

Selectivity (at 20 dB points) is 16 kHz bandwidth in position 1 to less than 1 kHz in the sharpest position. The crystal filter phasing could be set to narrow the passband.

Dimensions: Approximately 489 x 279 x 489 mm (WHD).

Weight: I saved this figure until last! The darned thing weighs 45 kilograms, or 100 pounds — not exactly portable!

For its era, the AR-88 was a top-class, solid (boy is it solid), stable receiver with advanced features. It performed valuable service during WWII alongside HRO and Hallicrafters receivers and was still in use in commercial services until at least 1980.

I am indebted to VK2ZJF, VK2KGB and Stewart Griffiths for donations of equipment and for information for this article.

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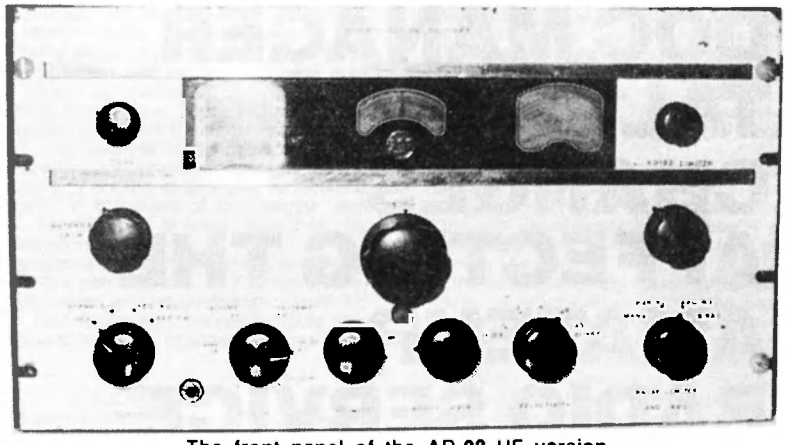
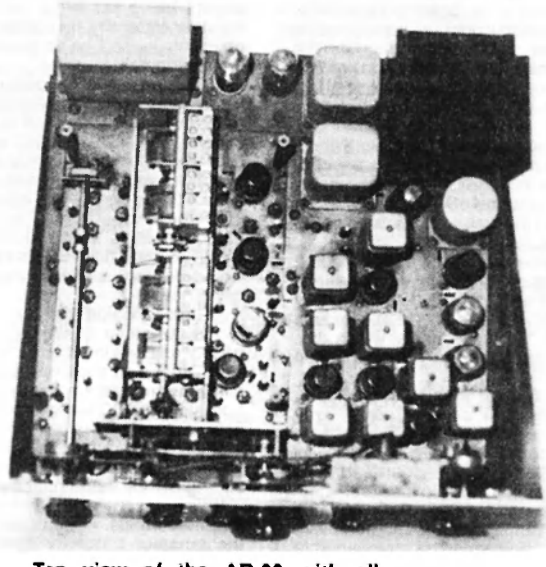


The front panel of the AR-88 HF version. Panel lettering is stencilled on.



Top view of the AR-88 with all covers removed.

DOC MANAGER TALKS ON CHANGES AFFECTING THE AMATEUR RADIO SERVICE

Jim Linton VK3PC
4 Ansett Crescent, Forest Hill, Vic. 3131

We live in times of great change and amateur radio is experiencing pressures which are reshaping it. In an interview for Amateur Radio magazine, DOC's Manager Regulatory, Operations Branch, Radio Frequency Management Division, David Hunt, outlines developments and trends affecting the Amateur Radio Service. He discusses a number of key issues, including DOC examination development plans, new transmission modes and techniques being accommodated in licence operating conditions, the era of deregulation, an explanation on licence fees and the future.

EXAMINATIONS

The process of examination development (DOC having outside bodies to conduct exams) would have to be the most significant change to the amateur service since the introduction of the Novice Licence. That was how Mr Hunt assessed this proposal which had yet to pass the draft and consultation stage.

He said the object was to allow amateur theory, regulations and Morse examinations to be conducted by education colleges and the amateur radio fraternity. And, in areas of need, DOC would like to encourage individual radio amateurs to conduct examinations, Mr Hunt said.

"One of the fundamental advantages of doing that we see is allowing access to examinations which aren't available at the moment.

"The Department is constrained to run exams every three months, normally on a week day. We're unable to support examinations outside normal hours.

"I'm sure there's a lot of amateurs out there, particularly in remote and country areas, who want to get access to examinations — it's very restrictive at the moment."

He said DOC was particularly encouraged to do this because of the self- discipline and high esteem of the amateur service. And, by colleagues doing the examinations, DOC considers the standard of instruction would be maintained or even increased.

"I'm not saying that the radio amateurs themselves, through the clubs and the WIA aren't doing a very good job — they're doing a terrific job," Mr Hunt said.

"But, colleagues, by their whole background and tradition are more experienced.

"I think you'll get a far more professional coaching and tuition from a college than what some of the amateur services are able to do — obviously there are a lot of very good educators in the WIA and we recognise that."

DOC had released a draft accreditation package for its proposed examination involvement and set a four month consultation period (November 1986-March 1987) for comments and responses.

Mr Hunt said: "Our objective is to make it work. We're aiming to have it working by January 1, 1988."

DOC wanted to, not only have outside bodies conduct exams, but also set the examination papers and Morse receiving test tapes.

Mr Hunt said: "What we intend at the moment is for our question bank, developed in consultation over the years with the WIA, to be given to the Institute (note: this had not been formally agreed to by either DOC or the WIA), to set the exam papers for use by those in the amateur service conducting exams.

"The colleges, it was assumed, would set their own examinations from their own courses.

"We would arrange to assess, from time to time, examination papers used by the colleges — that's how we would maintain the exam standard level."

Asked if this could lead to differing standards of papers being set — by various colleges and the amateur fraternity, he replied: "I think time will tell obviously — we'll be very conscious of those sorts of developments.

Mr Hunt also pointed out that the Radiocommunications Act provided for any candidates to be re-examined to assess their qualifications. While this option *would not be actively promoted* it was an avenue available to check if a standard was being maintained, and would be used if found necessary, he said.

"I would hope that, when the question bank is made available to the Amateur Service, at least within the service, the standard of examination would be very similar to the sort of exams we're using now.

"There shouldn't be any significant difference — it's the same questions — different groups of questions used in different examinations."

Mr Hunt said the experience of colleges should allow them to set exams by following the syllabus and typical DOC sample paper contained in their accreditation package.

"We would like to see the colleges use that (syllabus and sample paper) as a guide *for* the setting of their examination papers," he said.

It was unknown whether colleges wanted to do the Morse tests. In that case, perhaps the WIA or the amateur fraternity itself could do them, Mr Hunt suggested.

It would be the responsibility of those holding the exams to set whatever fees they wanted to charge.

The exam fee, until August 1985, was $2, and refundable as a credit for a subsequent exam if the candidate did not sit. With the introduction of the Radiocommunications Act the fees were increased in line with the Federal Government's user-pays policy. They now reflect the administrative and clerical costs of exams, which includes hiring venues. Current DOC exam fees are: Theory $10, Regulations $5, Telegraphy Receive $10, Telegraphy Send $5, or a total of $30.

REGULATIONS EXAMS

The public release of the entire question bank for the regulations exam might occur after the revised Amateur Operators Handbook is released this year. The logic of this was that the regulations exam could be likened to learning the laws of the road for a driver's licence, which were freely available.

Mr Hunt said: "I would like to see that — it's something we will be examining with a view to implementation.

"There's a good scope to introduce that sort of system with the regulations exam."

The failure rate in the regulations exam could be partly attributed to the difficulty in studying caused by the contents and format of the current handbook. Having the question bank available, a candidate could fully study the laws and regulations applying to the Amateur Radio Service.

SPECIAL EXAMS

With devolvement of exams, those candidates who require special exams due to a disability would be catered for under the new arrangements.

Mr Hunt said because there were so few of those exams, it was currently thought the Department would continue them.

But this matter could not be finalised until consultation with the amateur fraternity on the devolvement of exams had been completed. He explained: "The examination method for disabled or handicapped persons is totally different to a normal exam environment.

"If that was divested, obviously we would be giving some guidance and instructions to people on how they ought to be conducting them — every case is different."

DEREGULATION

Mr Hunt saw deregulation as allowing the Amateur Service to achieve more by way of self-regulation.

"We are extremely fortunate in Australia to have an Amateur Radio Service which imposes upon itself, a very high degree of discipline," he said.

Mr Hunt noted there had been very few instances where regulatory action was needed against a radio amateur.

"A lot of moves we're making lately would not be possible without the self-discipline we see from the amateur service.

"It's one of the few services which runs by itself, develops its own initiatives and does extremely well — we want the service to develop in its own way without being restrictive."

He said it was important for the Department to recognise and try to encourage the achievements radio amateurs were making.

"What we wouldn't like to see is guidelines and regulations which need interpretation and are restrictive in the development of the amateur service.

"We would like to reduce guidelines, regulations and conditions to the least extent possible.

"Obviously, where radio amateurs use shared bands, there's a need to set parameters for the service to operate in such bands."

Mr Hunt said the Department's resources were limited and deregulation was aimed at using available resources effectively. This could not be

done by spending time producing guidelines and sets of conditions, and then having to administer them, he said.

Along with expanding technology, DOC's workload was growing with new categories of communications service developing each year, and it had to use its limited resources dealing with priority or problem areas.

REVISED HANDBOOK

A new Amateur Operators Handbook, to be released this year, will greatly reflect the era of deregulation and greater reliance on self- regulation which sees a freeing-up of controls on the Amateur Radio Service. It also addresses the impact of new technology and offers a greater flexibility to radio amateurs. The Handbook was in need of urgent revision because of the changes which had taken place since the last published revision in 1978, and the introduction of the Radiocommunications Act. The Handbook would be in an easier to follow format, with a logical sequence of chapter material on the technical operating conditions, regulations and licensing requirements.

It will be a must for every shack and intending exam candidate. Effectively, all licensees should refer to it for the conditions under which they operate.

A draft of the new Handbook suggests a relaxation on types of emission limitations above 30 MHz. This will be a radical change from the current situation where all permitted transmission modes are classified and defined in the regulations. The move reflects the role of amateur radio in radio communication technique experimentation — opening the way for experiments with any known transmission mode and, indeed any so far undefined techniques.

Mr Hunt said the Department believed some existing provisions were unnecessarily restrictive and may hamper the service's development.

A chapter on *Technical Requirements* was likely to include provision for unattended stations which may be automatically operated without the licensee being physically present to control the transmitter. It would also set out additional conditions to be met by unattended stations to avoid them causing interference. These include a timer to automatically shutdown the transmitter after 10 minutes of uninterrupted transmission, a fail-safe device to prevent the transmitter operating due to a malfunction, a means of promptly terminating transmissions in the event of interference, and adequate security to prevent operation by unauthorised persons.

This development was in response to emerging techniques like packet radio, RTTY mail boxes, and digitally stored and retrievable voice mail. Mr Hunt also said unattended operation could also equally apply to remotely operated stations using telephony.

LICENCE FEES

Amateur station licence fees rose last October by $3 to $26 — and DOC considers the fees are the lowest possible. Mr Hunt explained that government set the level of overall increase in radio communication licence fee revenue in context with its Federal Budget considerations. "In practical terms, as far as the amateur service fees are concerned, they do little more than just cover administrative costs."

The fees were the lowest possible when you look at the Department's resources applied to the amateur service and costs, he said.

Part of the considerations in setting fees is to look at those categories of service that need to be fostered.

"Obviously, with the amateur service, as one example, we wouldn't want to be seen producing a fee level that is going to discourage people participating in the service," Mr Hunt said.

THE FUTURE

What role does DOC see for the amateur service in the short term, the year 2000 and beyond?

Mr Hunt said the Department, or anyone else, could not easily predict what the future held with all sorts of technological developments occurring.

"I think importantly our responsibility is to allow it to happen — allow the amateur service to become part of the progress of technology change.

"We wouldn't want to impose any restrictions on the amateur service to not experiment and develop new techniques in communication.

"But, the Department likes to see it continue growing and doing all the good things it's doing right now," he said.

In the past, some very important developments in radio communication techniques have been pioneered by radio amateurs, Mr Hunt said.

For this reason, DOC saw the amateur service as a benefit to the nation and it was also aware of the on-going contributions made by WICEN and other community related activity groups. Mr Hunt said the Department wanted to encourage the community service and emergency communications activities. He said the hobby also provided an environment for people to get involved in committees and be part of the running of the amateur service.

Does he see any future restructuring of the licensing system? The amateur service itself would decide if it wanted any restructuring and let the Department know its views, Mr Hunt said.

"There's a lot of ideas which have been promoted (about restructure) and the encouraging thing is that it's generating a lot of thought and discussion.

"To date there's been no pressure on us to change the system or structure. We would always be wide open to those sorts of ideas — and if the amateur service felt there was need for change it's important DOC accommodate this in the best way it can," he said.

International News

NEWS FROM SINGAPORE

Amateurs in Singapore are permitted to use the 10.1, 18.1 and 24.9 MHz WARC bands as of January 1, 1987.

As elsewhere, amateurs are the Secondary Service and must not cause harmful interference to stations of the Primary Service operating in these bands. The 18.068-18.168 and 24.890-24.990 MHz bands will become a Primary Service allocation with to 9V1 amateurs after July 1, 1989, but in accordance with the ITU Regulations, the 10.100-10.150 MHz band will remain a Secondary Service allocation for the Amateur Service.

Singapore Telecoms announced the opening of the WARC bands on December 2, 1986.

The Singapore Amateur Radio Transmitting Society has announced that it is strongly recommended that all 9V1 amateurs should adhere to the IARU Region III Band Plans for these three new allocations.

INAUGURAL SYMPOSIUM

Richard Butler, Secretary General of the ITU, recently announced the ITU-COM 89 Inaugural World Broadcasting Symposium and Exposition will be held at the Convention and Exhibition Centre, Geneva, between October 3-9, 1989.

Geneva, headquarters of the ITU and other international organisations and the focal point for many high-level professional and policy summit conferences, offers the appropriate facilities including 72 000 square metres of available floor space to hold the symposium and exhibition.

Further details may be obtained by writing to ITU-COM 89, Place des Nations, CH-1211, Geneva 20, Switzerland.

REPUBLIC OF KIRIBATI

By its accession to the International Telecommunication Convention (Nairobi 1982), registered on November 3, 1986 by the General Secretariat of the International Telecommunication Union (ITU), the Republic of Kiribati has become the 161st member of the ITU.

Kiribati became an independent republic in 1979. It comprises 33 islands, with a total land area of 717.1 square-kilometres, spread over some five-million square kilometres in the south-west central Pacific Ocean. Its population (1985 census) is in the region of 63 800.

According to the *1986 International Call Book* there are 16 licensed radio amateurs on Kiribati.

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Ron Fisher VK3OM
3 Fairview Avenue, Glen Waverley, Vic. 3150

ICOM IC-28A TWO-METRE FM TRANSCEIVER

The Icom company has always been in the front ranks with their two metre equipment. If we look back over the years, there have been a few Icom transceivers that have, for the time, set new standards.

Certainly the IC-22 series must be included amongst these. The last of these, the 22S, must have been the best selling two metre FM transceiver of all time and, even today, are still sought after on the secondhand market. In later years, the IC-25 and IC-27 series have proven popular. The new IC- 28 sets new standards for size and operating simplicity.

FEATURES

There is no doubt that the first impression of the 28A is the diminutive size. The depth is actually 50 mm less than the model it replaces, the IC-27A. Take a look at the photograph with my hand on it and you will get an idea of its size. Trying to fit a transceiver into a recent model car is often a matter of finding enough depth. A set would often fit under the dash-board if only that air-duct or whatever was not in the way. Here is the answer to the problem. In actual fact, the front panel size is slightly larger than the 27A — but let us look at the comparative sizes.

Note the compact size of the 28A. Try this with your two metre FM mobile.

The 27A is 38 x 140 x 191 mm (HWD), with the 28A 50 x 140 x 133 mm (HWD). Weight is only 0.95 kg against 1.2 kg for the older model.

Of course, size is not the only factor that comes into the choice of a new two metre transceiver, and, as we shall see later, the operation of this transceiver is also a delight.

At long last, Icom have developed a multi-function LCD display for the new rig, to replace the old LED readout. The old 25-A went from a red to green display and the 27-series continue with the green. However, while the green was better, it still suffered from a lack of readability under strong light conditions. The new display has overcome all these problems and, at the same time, gives the user a great variety of information. This includes: Frequency, Memory Selection and Memory Channel Selected, High or Low Output Power Selection, Memory Channel Skip Indication, Duplex Mode (±) Indicator, Offset and Tuning Step Memory Write Indicator.

Operation of the optional digital code squelch is also indicated, however this option was not supplied with our review transceiver.

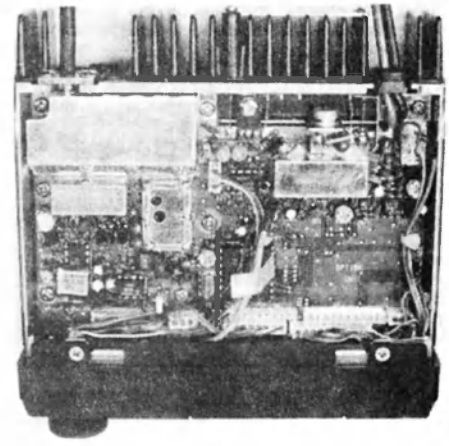
The IC-28A has 21 memories which can be programmed for frequency and repeater offset or simplex operation. A memory skip can be entered to eliminate non-required channels when in the memory scan function. Frequency and memory selection is via the 'tuning knob' on the left-side of the front panel or via the up/down buttons on the microphone. VFO or memory operation is selected by the adjacent rocker switch.

When in VFO mode, a variety of tuning steps can be selected. These are either five, 10, 15 or 25 kHz. For our Australian system, the 20 kHz stepping is ideal, with, perhaps, the five kHz steps as an option. The European version has the option of 12.5 kHz steps. When a band-scan is selected, the scanning rate follows the selected tuning rate. A priority or call channel facility is fitted which allows the selection of memory 21 with either VFO or memory operation in use. Unfortunately though, there is no priority alert, or sampling system, as there was with the old IC-27, or as provided with the recently reviewed Kenwood TM-2550A. With the 28A it is simply a method of selecting channel 21 without going through all the other memories to get there!

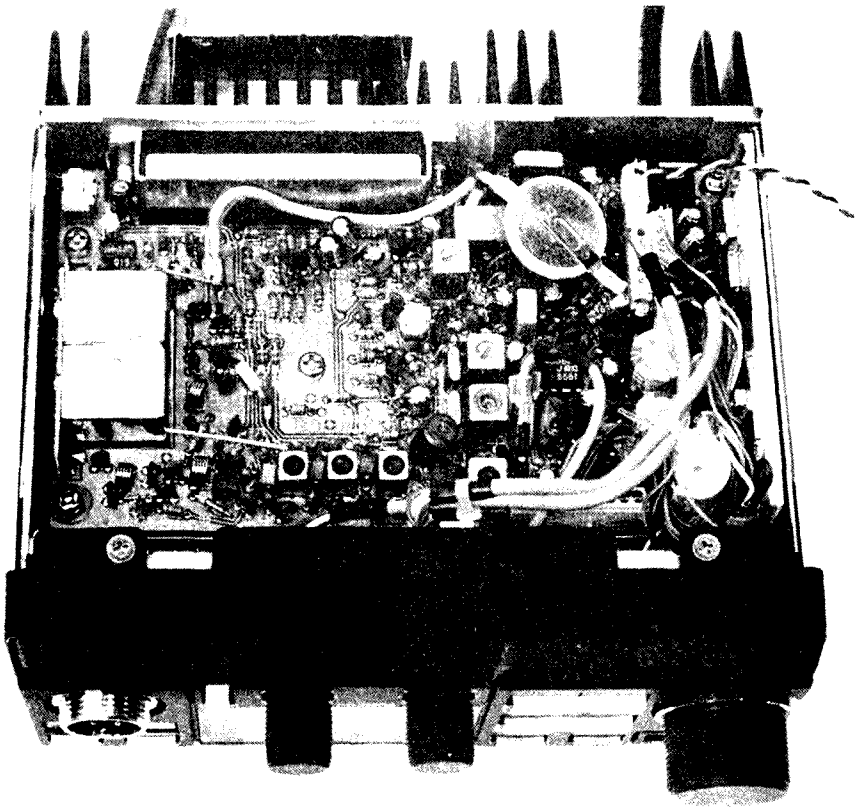
The transmitter output is a very useful 25 watts and, considering the compact size of the unit, this is quite remarkable. A 45 watt output version is also available, but we did not have an opportunity to test this. On both versions, a five watt low-power output is selectable. With repeater operation, a push of the squelch control gives a listen on input frequency facility. This does not lock on, so you cannot get yourself onto the wrong transmit frequency — a smart idea.

The internal construction is typically Icom. Most of the components are mounted on two large (relatively) circuit boards. These are separated by a central shielding plate which provides both good shielding and mechanical stability.

The circuit used appears to be fairly straightforward, but our details were obtained from the



Top View.



Bottom View. Note Lithium Battery In right-top corner.

block diagram only as circuit and printed board layouts are, for some unknown reason, not supplied. I am not sure whether a workshop manual is available. Icom have been running rather slow with their repair manuals of late.

The receive signal goes to the 2SC3355 RF amplifier via the transmitter lowpass filter, diode antenna switch and switchband pass filter. The first IF is at 17.2 MHz; second is 455 kHz and a MC3357P IC performs the second conversion, IF amplification, FM detection and noise amplification for the squelch circuit. Transmitter output employs a module which is attached to the rather small heatsink at the rear of the cabinet.

Memory retention is powered by a lithium battery. As can be seen from the internal photographs, the battery is very accessible. However do not be tempted to play around with it. The manual suggests that battery replacement should be entrusted to your Icom service centre. It appears that the usual Icom back-up system is used. That is when the battery life is expired, the system has to be re-programmed by the service centre. Although, as Icom have been saying in their advertisements in American magazines, the battery life could well be in excess of the users life, time will tell!

Both the antenna and DC power connections are via flying leads. The antenna lead is terminated in an SO-239 line socket while the DC uses a locking two- pin plastic connector and a fuse in both the positive and negative leads. Unfortunately, the DC connector is a new type and not compatible with any of the previously used Icom DC connectors.

ON-THE-AIR

I used the 28-A over a period of two months, both mobile and as a base station. During that period, in excess of 7000 kilometres were covered over all sorts of roads, both good and bad, and with temperatures up to the mid-30s in the northern Flinders Ranges, South Australia. This was one of the hardest tests that I have subjected a review transceiver to and it came through with first-class results.

On the original installation, one lesson was quickly learned. *Don't* try to run the transceiver from the car cigarette lighter socket. I found in two cases that the 28-A does funny things when it does not have a good earth to the car body. At the time, I was also using a magnetic base antenna which did not actually make any electrical connection to the car. I must be fair and say that the Icom Instruction Book states that a direct connection to the car battery is required. So be warned — do the job properly.

With the 21 programmable memories, the IC-28A is about the easiest two metre FM transceiver to use that I have ever seen. It is certainly more straight-forward to use than the old IC-22S. I found that once the required channels had been programmed into the memory, I used the memory mode all the time. The VFO can be used to scan the band in your preferred selectable steps, either via the 'tuning' knob or from the up/down buttons on the microphone. The up/down button on the front panel does not produce the same effect as the microphone buttons. In the VFO mode, they give a one MHz up- down step, while with memory mode selected, it will step up or down to the next memory, but will not initiate a scan situation, which the microphone buttons will. It is therefore more convenient to use the microphone for either scanning or memory selection.

The microphone also has a small scan-inhibit switch on the back. Transmit audio reports were always very good. It seems that the overall audio gain has been carefully selected as almost no mobile noise is audible on the transmitted signal. Quality is sharp and crisp with just a very slight trace of sibilant distortion.

On receive, the audio output was only just adequate under average mobile conditions. If yours is a noisy car, you will certainly need an external extension speaker and, in even a quiet car, it would be recommended. The actual received audio from the tiny internal speaker is surprisingly good, but it was unable to take the full output of the receiver without considerable distortion.

There are several nice features on the transceiver that make operating a pleasure. The push-on, push-off power switch on the volume control and the push to select repeater reverse operation on the squelch control are two that come to mind.

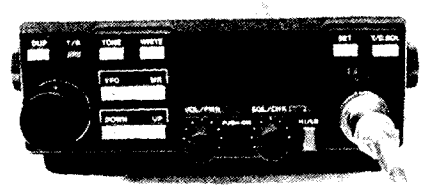
The memory scan is a very useful system. As each busy channel is encountered, the scan pauses for about 10 seconds before the scan resumes. If you want to stop on that channel, it is only necessary to quickly push either the PTT button or one of the up/down buttons.

Should any memory channel require skipping, this can be selected with a push of the 'step' button. The word *Skip* will now appear in the bottom righthand corner of the LCD display and those channels will be passed-over during the scan operation.

The receiver seemed to be very free from cross-modulation from nearby commercial and strong amateur signals. It was possible to leave the receiver scanning without the annoyance of unwanted spurious signals stopping the scan. The actual receiver circuit is very simple and straightforward. The RF stage, which is a 2SC3355, is fed from a two-stage input filter. The first mixer, a 2SK125 FET, converts to the first IF at 17 MHz. The second IF is at 455 kHz. Two filters, one two-section crystal filter at 17 MHz and a ceramic filter at 455 kHz, take care of selectivity. The general coverage receiver's performance was excellent with the only point of criticism being a small degree of ignition noise break-through. This appeared on both strong and weak signals at about the same level. Perhaps this indicates a slight lack of limiting in the 455 kHz IF section. In actual practice, it did not prove to be too annoying.

Several options are available for the IC-28A. These include a base station AC power supply, the PS-45. This is a compact switch mode supply that can deliver eight amps output at 13.8 volts. Two different base station microphones are compatible with the IC-28, the SM-10 and the SM-8. In actual fact, the older Icom SM-5 and 6 microphones work very well with the transceiver, but they lack up/down scanning buttons which are essential for the actual scanning operation.

Three mobile microphones are available in addition to the standard HM-12. These are the HS-15, which is a flexible type microphone and can be fixed to a convenient point in the car. The IC-HM16 and 17 are speaker microphone units. The 17 has a tone-burst unit built-in for European repeater operation. Digital code squelch and tone squelch units are also available. I wonder when these will be built in as standard. When this does eventually happen, and so long as all of the Japanese manufacturers produce compatible units, these systems might become popular. Time will tell. None of the above options were supplied with our review transceiver and so therefore were not tested for this review.



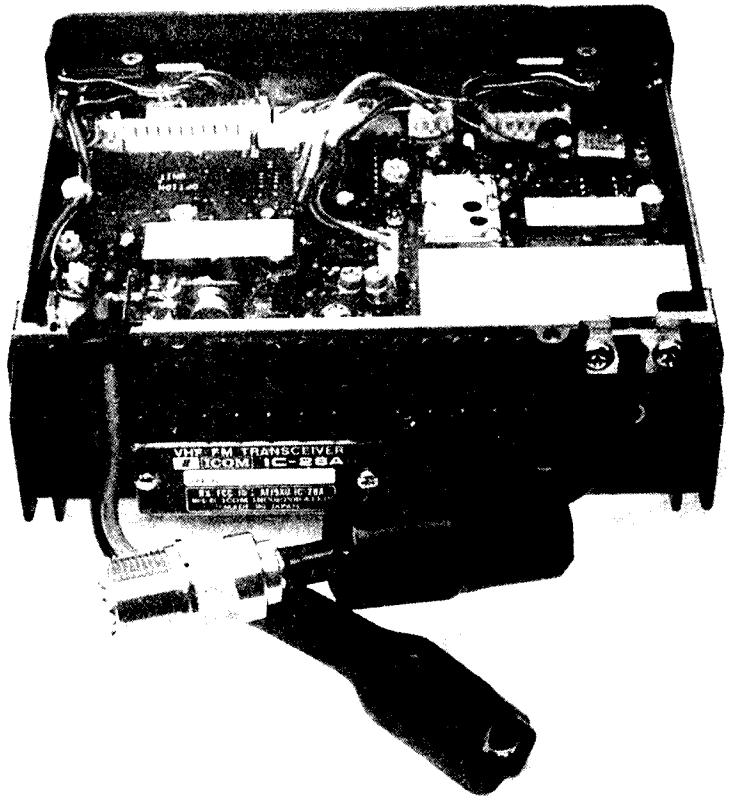
Front view.

ON-TEST

The following test equipment was used to produce the figures obtained during our tests. Yaesu YP-150 and Marconi TF-957/1 terminating RF watt meters; Marconi TF-995A/5 signal generator; AWA F242A noise and distortion meter and a Davern audio power output meter. All tests were carried out with a regulated 13.8 volts applied to the transceiver, unless otherwise stated, and all tests were carried out at 146 MHz.

Transmit Power Output

With high power selected, the output was constant right across the entire band at 30.5 watts. With low power selected, it was exactly on five watts, gain right across the band. As a test, the supply voltage was reduced to 11 volts. Operation of the transceiver was still quite satisfactory and the high power output was 22 watts.



Rear view showing Flying Lead Connections for Antenna and DC Power.

Current consumption at 13.8 volts and high power output was 5.2 amps, with 2.5 amps in the low power position. It is possible that the low power output setting is adjustable as it was with Icom's previous models, but no mention is made of this in the instructions.

Receiver Tests

The S-meter calibration was checked first. The LCD bargraph display has nine divisions up to S9 and five divisions above this for S9+. The following results were obtained:

S1	1.00 uV	
		2 dB
S3	1.25 uV	
		2 dB
S5	1.600 uV	
		2 dB
S7	2.00 uV	
		2 dB
S9	2.50 uV	
		2 dB
S9+	3.10 uV	End of Scale

This works out at just one dB per S-point. I often hear amateurs on two metres giving reports to other stations on the basis of six dB per S-point, but as we have seen over the last few reviews, this is just not so. The most that can be said for the IC-28 S-meter is, that it will sometimes tell you if you are receiving a signal, but as may usable signals are below one uV, this will not always be true.

Receiver sensitivity was checked. With the signal generator set at three kHz, deviation with a one kHz steady tone modulation, the 12 dB SINAD came up at 0.2 uV. The squelch sensitivity at the point of threshold was just a whisker under 0.1 uV and with the squelch right off, signals were audible down to an estimated 0.01 uV.

The extension speaker output was terminated with the power meter set at eight ohms. Power output of 2.2 watts produced 10 percent distortion and 2.5 watts, 20 percent. Somewhat more power is obtainable with a four ohm speaker connected. Up to about 3.5 watts with 10 percent distortion. Some comparative tests with an external speaker compared to the in-built speaker showed that it little over one watt of audio power, confirming my earlier remarks for the need of an external speaker.

The overall frequency accuracy was checked as better than 50 Hz, which is the limit of proven accuracy of my counter.

The receiver audio response was checked with the -6 dB points occurring at 250 Hz and 3.5 kHz. The curve between these points was very smooth.

I was unable to do an accurate check on the receiver selectivity due to synthesiser noise upsetting measurements, but it would appear that the specified 12.5 and 25 kHz at -6 and -60 dB would be easily met. Certainly for our 25 kHz channel-spacing there would be no problems at all.

Finally, the receiver current drain was checked. This was 320 mA with the receiver squelched and 600 mA with full audio output of 1 kHz tone. It was noted during these tests, that the receiver performed quite well right down to 9.5 volts, although the audio power output was rather restricted at this low voltage.

The overall performance of the IC-28A is very good with the power output of the transmitter and the receiver sensitivity very well matched.

INSTRUCTION BOOK

The 28 page Instruction Manual is very well printed and presented. Nine sections cover the following:

Specifications, Features, Control Functions, Installation, Operation, Inside Views, Maintenance, Block Diagram and Options.

Section 10 is a schematic diagram which was, in fact, not supplied with the review transceiver. All the operating instructions are clear and easy to follow. There are many drawings showing the sequence of LCD readout displays for the setting-up of the various programming requirements.

With so many good points, it is a pity that Icom did not see fit to include a little technical information. At the time of writing, not even a workshop manual was available and *Icom Australia* do not know when it will be available.

CONCLUSION

Although the IC-28A is priced somewhat higher than many other current two metre FM transceivers, it does have many advantages, particularly in the very simplified operation. The other important aspect is the very compact size. The general on-air performance is very good indeed, and probably the only point of criticism is the very small loud speaker, however, considering the overall size of the transceiver, it would be almost impossible to fit a larger one in. I was so impressed with the little rig that the review model is now a permanent part of my shack.

Our thanks to *Icom Australia* for the IC-28A used for this review and inquiries regarding price and availability should be directed to them or to one of their authorised agents throughout Australia.

EVALUATION AND ON-AIR TEST AT A GLANCE of the Icom IC-28A . . . Serial No 001284

APPEARANCE

Packaging
** Strong well presented carton with foam insert.

Weight and Size
**** One of the most compact 25 watt, two metre FM rigs yet seen.

External Finish
*** A real black-box, but neatly finished.

Construction Quality
*** Well put together with good looking circuit boards and wiring.

FRONT PANEL

Location of Controls
*** A very simplified panel layout. Easy to follow.

Size of Controls
*** Tuning, volume and squelch are very accessible. Push buttons are small but well located.

Labelling
** Very good under well lit conditions, not so good in the dark.

RECEIVER OPERATION

Memories
**** With 21 memories that include offsets, one of the best.

S-meter
** Shows if you are receiving signal. (See test section).

Spurious Responses
*** In most locations it is very clean. A few strange signals when operated in the city centre.

Sensitivity
*** Very good. See Test Section.

Received Audio
** Internal speaker is rather small and limited in a internal speaker is rather small and limited in audio output. With better external speaker it is quite reasonable.

TRANSMIT OPERATION

Power Output
Power Output
**** Excellent for size of transceiver. See test section.

Transmit Audio
*** Sharp clear quality. Deviation well set-up.

Cooling
*** Ran moderately cool for power output.

Metering
** LCD power output indication and on-air light.

Status Indicators
*** Plenty of information in the LCD readout.

Manual
Owners Book
** Excellent operating instructions. Poor technical information. No circuits or parts layout.

OVERALL RATING
**** With its excellent operating ergonomics, compact size, and good power output, it is one of the best available for mobile use.

RATING CODE
* Poor, ** Satisfactory, *** Very Good, **** Excellent

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RPH GOING IN-BAND

Radio for the Print Handicapped stations in Brisbane, Canberra, Hobart, Melbourne, and Sydney will be allocated frequencies on the AM broadcast band. (They currently operate on either 1.620 or 1.629 MHz — just above the AM band which ends at 1.606.5).

This decision follows a review of RPH by the Department of Communications. Discussions will be held with RPH licensees to devise a time for the change.

Learn Morse on your COCO2

Kevin Bond VK3CKB
57 Thomas Street, South Morang, Vic. 3752

A small follow-up article to convert September's program to the TRS80 Colour Computer.

Within a few days of the September *Amateur Radio* being published, I received an interstate phone call asking how to adapt the Morse training program to suit the popular TRS80 Colour Computer 2 (COCO2). The program differences are due to the COCO2 serial output address being 65312 (decimal) instead of 03 for the MC10. The connection of the external oscillator may be tested by typing POKE 65312,0 to turn the tone on, and POKE 65312,2 to turn the tone off. (Press ENTER after each command). This was previously POKE 3,0 and POKE 3,1 for the MC10. Note that the serial output is on Pin 4 and ground is on Pin 3 of the serial I/O connector. Another minor difference is due to the COCO2 having a 6809 processor instead of a 6803 in the MC10. Some instructions are different; eg NOP (no operation) is a decimal 18 instead of 1.

The machine language subroutine is longer by four instructions because the serial output address is a two-Byte number instead of a single Byte and is called up four times, once each at the beginning and ending of the dot and dash. Also, because with the COCO2, machine language subroutines are usually placed to start at hex address 3F00 (decimal 16128), the address of the delay subroutine is now hex 3F24 (decimal 16164) which converts to the two-Byte number 63,36 in decimal. Otherwise the subroutine is the same as before and not worth reprinting.

Line 8 of the listing clears 50 Bytes of memory starting at address 16128 to reserve space for the machine language subroutine. Line 9 again defines the starting address for the POKE statements. Lines 10 to 41 inclusive are the actual dot and dash subroutines. Some shuffling of the instructions has been done to avoid the printout spilling over the end of the line which may have caused confusion.

Line 160 tells the computer to output a dot, and Line 161 a dash at the new addresses. Lines 190, 200, 280 and 735 have been adjusted to allow for the different execution times of the BASIC instructions of the COCO2. This provides the correct delays between dots and dashes, letters and words to correspond to the examination speed.

Lines 320 and 560 call up the CLEAR key instead of CONTROL-Q to return to the menu in options one and three. Finally, the number in line 2000 has been increased to provide space for longer messages to be typed in on option two. This is possible because the COCO2 has a greater memory capacity of 16k.

Fortunately, I was able to borrow a COCO2 to test and make adjustments to the program. The changes only to the original program are listed and all other lines remain unchanged.

In conclusion, it should be noted that the Morse examination is computer generated, so using a computer for training is very effective. ar

Figure 1 — Computer Program. This listing shows only the alterations for operation on the TRS80 Colour Computer 2. The original program was published in *Amateur Radio* September 1986 (page 13).

```
5 REM:COCO2 10WPM CW
8 CLEAR 50,16127
9 N=16128
10 POKE N,79:POKE N+1,183:POKE N+2,255:POKE N+3,32
15 POKE N+4,134:POKE N+5,65
20 POKE N+6,189:POKE N+7,63:POKE N+8,36:POKE N+9,74:POKE N+10,38
21 POKE N+11,250:POKE N+12,134:POKE N+13,2:POKE N+14,183
22 POKE N+15,255:POKE N+16,32:POKE N+17,57
25 POKE N+18,79:POKE N+19,183:POKE N+20,255:POKE N+21,32
30 POKE N+22,134:POKE N+23,159:POKE N+24,189
35 POKE N+25,63:POKE N+26,36:POKE N+27,74:POKE N+28,38:POKE N+29,250
36 POKE N+30,134:POKE N+31,2:POKE N+32,183:POKE N+33,255:POKE N+34,32
40 POKE N+35,57:POKE N+36,198:POKE N+37,255:POKE N+38,90:POKE N+39,18
41 POKE N+40,38:POKE N+41,252:POKE N+42,57
160 IF W$="." THEN EXEC 16128
161 IF W$="-" THEN EXEC 16146
190 FOR D=1 TO 40:NEXT
200 NEXT:FOR J=1 TO 65*T:NEXT
280 FOR J=1 TO 510:NEXT
320 W=ASC(R$):IF W=12 THEN 2100
560 IF ASC(T$)=12 THEN 2100
735 FOR J=1 TO 300:NEXT
2000 CLEAR 1000
```

BAND PLAN — 23 CM

Ron Henderson VK1RH
Peter Gamble, VK3YRP

BACKGROUND

The 23 cm Band Plan was devised in 1984/85 by the Federal Technical Advisory Committee (FTAC) in response to a previous Federal Convention motion. It was debated and adopted by the 1985 Federal Convention and published in *Amateur Radio* and in the *1985/86 Call Book*. Much effort was put into defining this plan to ensure that it took cognisance of the secondary status of the amateur service, the national and international amateur satellite service sub-band allocation and the need to guard air traffic control radar frequencies.

A review of the band planning process and the existing band plans appeared in several AR articles in January, February and April, 1986. These foreshadowed discussions at the 1986 Federal Convention. Two motions were put forward for discussion specifically referred to a review of the 23 cm band.

The VK5 motion simply noted that "The 1296 MHz plan ignores the restricted frequency availability of commercial repeater equipment." The VK5 Division advised prior to the Convention that they had difficulties with the band plan, but did not provide advice on specific problems.

The VK2 motion was more specific. It noted that the current band plan did not suit the current manufactured range of equipment. However, it recognised the difficulty of staying clear of the Amateur Satellite Service sub-band 1260-1270 MHz and providing a guard band on the radar equipment centred on 1275 MHz. The motion sought a recasting of the band plan to accommodate equipment that was currently in the country and had limited frequency coverage and a 20 MHz repeater split.

The matter was debated at length in committee, no alternative solution was found and when voted on, the existing one year old plan was adopted unchanged (except for two minor editorial changes).

THE ISSUES

In the AR Band Planning articles it was stated that good band planning should not be compromised by essentially commercial considerations, that is the existence of some equipment types of limited capabilities. It was also suggested that microprocessor control of modern equipment made for flexible operating frequencies and repeater offsets. In contrast to this broad outlook was the pressure of some equipment suppliers to press sales through offers of cheap or low cost repeaters not in accordance with the band plan.

Thus the pressure for change has come not from band planning first principles, but from commercial pressure.

THE ALTERNATIVES

Based on the comments received there appear to be three main alternatives:

a) Change the allocated frequencies to allow repeater operation with a 20 MHz split with repeater operation at 1260 + MHz and 1280 + MHz. This places one set of frequencies inside the international amateur satellite sub-band (shades of channel 40 on two metres) with the other frequencies outside the radar guard band but in the ATV allocation. Both the frequencies and the shift do not accord with the band plan. It is unlikely that the Department of Communications would regard this as responsible band planning and therefore concur with it.

b) Modify the band plan to allow repeater operation in the 1280-1295 MHz segment. Note that allowance has to be made for an internationally agreed EME segment at 1296-1297 MHz and a guard band from 1295-1300 MHz for the 1300 MHz radar. This would still require the modification of all of the existing non-standard repeater and transceiver equipment for a 12 MHz split. The result of this change would be to cram a well laid out 20 MHz segment in the current plan into a 15 MHz segment. Other segments affected by such a move include ATV, digital, packet and SSB modes. This alternative has not received any support.

c) Modify the repeater equipment to a 12 MHz split and the frequencies assigned in the band plan. Given that the majority of repeater equipment in use in Australia is either "homebrew" or adapted from various sources, this should not pose a major problem.

This would also require the modification of the existing transceiver equipment to cover the correct band segment. This will probably require the assistance of the Japanese manufacturers, not just the local agents.

The above alternatives lead to the conclusion that the present band plan is the preferred alternative. The inescapable mathematical conclusion is that given the segments to be avoided in the 1260-1300 MHz segment, 10 MHz for satellites and 15 MHz for radar guard bands, a 20 MHz repeater split just does not fit!

Noting that the Amateur Service is the secondary service in this band, it is essential that the band plan be constructed to avoid causing interference to the primary users.

Finally, commercial pressures and technology that has now been on the market for a couple of years should not dictate a band plan for the future.

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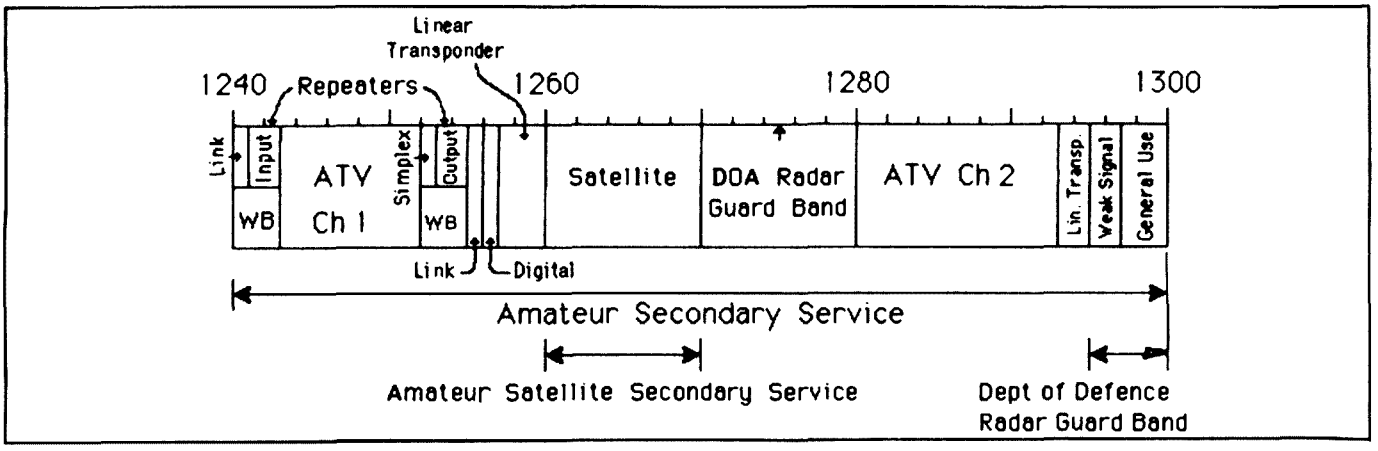


Intruder Watch

Bill Martin VK2COP
FEDERAL INTRUDER WATCH CO-ORDINATOR
33 Somerville Road, Hornsby Heights, NSW 2077

Welcome to the column. Ulrich Bihlmayer DK9KR, of the DARC Intruder Watch, reports that Radio Tirana (Albania) has vacated the frequency of 14.320 MHz. Transworld Radio (Monte Carlo) has vacated 7.100 MHz, but this station had not given us trouble here in IARU Region 3.

I am, at the moment, preparing the statistics of the Intruder Watch activities for 1986, and they should appear in this column in the April issue. Similarly, I should by then be able to report on who received the Intruder Watch Certificate of Merit for 1986.

Acknowledgments and thanks to the following who supported the IW in November 1986: VK1GD, VK2s CNS, DVW, G Bradford, VK3s AMD, DKE, XB, VK4s AFA, AKX, BG, BHJ, BTW, DA, KHQ, KHZ, VK5s GZ, TL, VK6s JQ, RO, XV, VK7RH, and VK8JF

There were 308 broadcast (A3E) intruders reported: 190 CW (A1A); 95 RTTY (F1B); 102 intruders were using other modes, and 50 intruders supplied our observers with their call signs. The Woodpecker was heard on the 7, 14, and 21 MHz bands.

Bob Knowles ZL1BAD, the IARU International Monitoring System Co-ordinator, writes that he may be in Sydney around April. Bob is also the NZART IW Co- ordinator, and I look forward to meeting him if he makes the trip. The only criticism I have of the hobby of amateur radio is that one so very rarely gets to meet those with whom one communicates, and it is always a great pleasure if we get the chance. (I would particularly like to meet those who say they will QSL and don't!).

A reminder that the only stations which can be considered to be intruders from 14.250 MHz to 14.350 MHz are broadcast stations, as this segment of the band is shared.

So we will keep it short this month, and wish you all 73. See you in March.

ar

Know your Second-hand Equipment

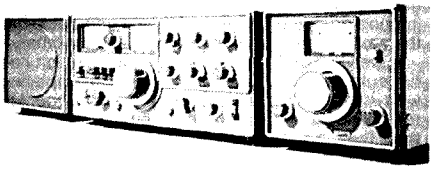
TRIO KENWOOD continued

Ron Fisher VK3OM
3 Fairview Avenue, Glen Waverley, Vic. 3150

This month, we will look at some of the better known Kenwood amateur equipment. Certainly the single piece of equipment that put the Kenwood name to the forefront must be the TS-520.

KENWOOD TS-520 HF TRANSCEIVER

Released about October 1974, the TS-520 was Kenwood's answer to the, then popular and well established, Yaesu FT-101 series. At this time, the 101B was "the rage." Up until this time, the Trio Kenwood line had not enjoyed a great reputation In Australia and it appeared that the TS-520 was an "all-out" effort to capture a fair share of the market. It did just that and Kenwood have gone on from success to success!.



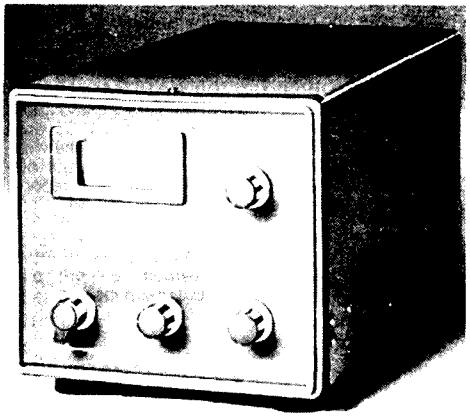
In concept the 520 closely imitated the 101 series — it had full coverage of the normal 80 to 10 metre amateur bands with a push-button selected, fixed tuned WWV position for calibration purposes.

The circuit was fully solid-state, except for the transmitter final stages which used a 12BY7 driver and two S2001/6146s in the final. A double conversion set-up was used with the first IF at 8.895 to 8.295 MHz. The second IF at 3.395 MHz employed a crystal filter for SSB, plus a position for an optional CW filter. All of the *extras* were included as standard, except the CW filter. These included a quiet cooling fan, a simple, but effective speech processor, crystal calibrator and VOX, and a 12 volt DC/240 volt AC power supply which was built in.

In terms of performance I have always considered that the 520 was better than the 101B. The 520 had a slight problem with the front end overload, but this was certainly not as bad as the blocking in the 101 series. Also, the audio quality on both transmit and receive was superior to the 101 series, with *much* less distortion *on* receive.

Transmit intermodulation distortion was less with the 520 due to the use of 6146-type final tubes. It is worth noting that, while the original S2001 final tubes can be replaced with 6146s, I have found that the S2001 will work much better with higher output on 15 and 10 metres. They are hard to find, but well worth the search.

A range of optional matching accessories were available which included an external VFO and speaker.



New price of the TS-520 transceiver was $550, in December 1974. Secondhand value for a 520 in a clean and unmodified condition today would be about $375.

The external VFO was priced at $99 and the external speaker was $26. Secondhand value today would be about $75 for the VFO and $20 for the speaker. A matching two-metre transverter was available somewhat later in the run. This had an output of 10 watts on SSB and a 1 uV/10 dB S/N ratio on receive. New price in 1976 was $240 — secondhand value would be about $120 today.

The TS-520 with DG-5 and VFO-520.

KENWOOD TS-520S

This updated version of the original 520 was released about September 1977. Appearance was very similar to the 520 with the dial area somewhat cleaned-up on the new 520S. Frequency coverage now included the 160 metre band and the WWV position was selected by the main bandswitch. The transmitter final tuning control was fitted with a vernier drive, but the DC power supply was an option and not included as standard as it was with the original 520.

The general receiver performance was much better, with very satisfactory front-end performance. An external digital frequency display, the DG-5, was an optional extra that could be plugged directly into the 520S. It should be mentioned that the DG-5 could be used with the original 520, but this required a modification kit for the 520 which is probably no longer available from Kenwood in Sydney.

The DG-5 could also be used as a 40 MHz frequency counter.

The 520S established itself as one of the most popular secondhand transceivers around and will provide excellent overall performance at a reasonable price.

New price of the TS-520S in September 1977 was $650. Secondhand value today would be about $425 for a clean unmodified unit.

The DG-5 is another story. The new price in November was $169, however, it proved to be a rather troublesome device. It seems that the soldering was rather suspect, but eventually most of the problems were sorted out and a good DG-5 is now very hard to find. (The DG-5 'Wanted-ads' are usually in excess of the DG-5 'For Sale-ads'. Secondhand value today would be about $150.

KENWOOD TS-820 & 820S TRANSCEIVERS

These were actually released prior to the 520S in January 1977, with the 820 being the Kenwood flagship. It was closely related to the TS- 900.

The 820 was a single conversion set-up with an 8.830 MHz IF The VFO, which operates at 5.000 to 5.500 MHz, fed a PLL controlled system to produce the required heterodyne frequencies.

This was one of the first transceivers to provide an IF shift facility. Although this did not actually alter the selectivity, it did enable interfering signals to be removed to outside the receiver bandpass — a very useful feature.

On the transmit side, an RF speech processor, which operated at 455 kHz, gave a useful increase in average output. The digital readout was not originally a standard feature. It was available as an option in the earlier models, but the later 820S came with the readout installed as a standard feature. It is unusual to actually find an 820 today without a digital readout.

The analogue dial scale was an excellent feature, a little like the old HRO or AR7 dial, where the first or 100-digit changed as the scale rotated. Special attention was paid to the transmitted signal quality. RF negative feedback applied from the final stage to the driver stage produced very low inter-modulation distortion. This was the first transceiver to use this feature since the Collins company *had* perfected it in their amateur equipment during the late-50s.

The final-stage employed a pair of S2001 tubes and the same remarks apply as for the 520 series.

All-in-all, the 820 is an excellent transceiver which Is capable of producing results on a par with the best available today. Perhaps the only point of criticism is the overall selectivity. The filter is a little on the wide side for the dedicated DXer.

Various modifications are available including upgraded filters, filters in tandem, etc — take your pick or leave alone and enjoy the smooth, normal performance.

In use the 820 has an excellent record of reliability. Initially a few problems came-to-light in the digital display, but generally a new pair of final tubes every few years is all that is needed.

In the servicing department the RF processor is liable to drift out of tune over a period of time but this is an easy thing to put right as the adjustments can be monitored by using the built-in transmit monitor facility.

The price of the TS-820, including the DG-1 Digital Display, when new in early 1977, was $980. Secondhand value for an 820 with digital display, or an 820S, would be about $575 today.

Next time, we shall look at some of the early Kenwood two-metre equipment.

If there is a particular piece of equipment you would like to see presented in this segment please write to the address at the head of the column. Also, if you need more detailed information on any of the pieces covered here, again please let me know — I may be able to help.

ar

COMPUTERISED BUSINESSES

The National Institute of Labour Studies says one in every six Australian businesses is computerised. And about one in 10 workers are expected to have computer skills. In 1960, there were only an estimated 34 computers in Australia.

Today, computers control our banking, shopping, education, and even fuel consumption.

The market for professional business computers is booming.

How's DX?

Ken McLachlan VK3AH
Box 39, Mooroolbark, Vic. 3138

TIME TO MEDITATE

After completing my notes for January 1987, in early November, I was fortunate not to become another road statistic shortly afterwards.

I was hit whilst driving my own vehicle in the middle of the day and later waking up in the Intensive Care Unit of a Melbourne hospital. Next day, on coming to my senses, I felt and looked like I had been subjected to a *mad* plumber, electrician and seamstress, with metres of tubes of varying diameters, thread, wires connecting high-technology equipment to my body.

Being unable to speak and having to print (due to my poor writing) my requests on paper, all was explained to me. Such things as arterial transfusions through the chest of blood, dextrose, analgesics, antibiotics, sedatives and nebulised oxygen, antibiotic and other drug lines from the respirator were passed through the nose and throat. All were electronically controlled on a calculated dosage to exacting tolerances, backed up by a myriad of wire sensors to a very elaborate computer-oscilloscope, so sensitive if one clenched their fist an alarm would be activated. One felt they were in a fish bowl, being the object of so many watchful eyes, backed- up by the constant attendance of a fully qualified ICU staff member.

The equipment was very sophisticated electronically, some bearing the logos of well-known amateur electronic equipment manufacturers. All units were fitted with battery back-up in case of power failure and heavily voltage stabilised against fluctuations, particularly those from the radiography department which was constantly in use. One wondered, after many days of this treatment, the effect of Radio Frequency Interference and its effects, if it got into the delicate equipment.

One of the staff pointed out that only certain televisions could be allowed in the hospital as some caused erratic behaviour in the systems. These devices generated QRM on the BC and FM bands, likened to the Woodpecker, on a "walkman" cassette/radio.

The ugly question reared it head; "What havoc to the equipment could an amateur or other RF transmission of within say a kilometre, cause?" As an uninvited guest, with no chance of leaving, I was concerned, and even more so when transferred to another hospital's ICU, which had more up-to-date, state-of-the-art technology and was located adjacent to the visitor's car park.

I know many members are involved in medicine and medical technology and perhaps they may be able to enlighten all readers on the subject with an article for the magazine.

I am happy to say that my prognosis over the next few months looks good, yet slow (by my standards!), and I have to look forward to many specialist appointments, the complete return of my voice and mannerisms to their vitriolic past and being a witness in pending police litigation.

Thanks must be extended to all who helped my wife during, what was a trying time for her, and to the many friends who volunteered help. It is when the "chips" are down one realises who their friends and true helpers are.

Briefly, sincere thanks to one and all for the multitude of cheery cards, numerous telephone calls both to home and the hospitals. All were greatly appreciated — the card with over 200 signatures was quite a talking point with hospital staff and did the rounds of many wards — brightening the dull and dreary weeks.

A compatriot of many years, Jim VK3YJ, whom I have unfortunately never met, has written some of this column to assist me. Your thoughts and your wife, Anne's, typing are much appreciated, Jim.

TECHNICAL INSTITUTE OF RADIO

At a meeting of members of TIR on October 1, 1986, Rasheed Jalal YK1AA, announced his resignation from the Presidency of TIP. Members acknowledged that Rasheed was the founder of amateur radio in Syria and was its first licensed operator in 1946. Rasheed has promoted amateur radio over the past 40 years and members accepted his resignation with great regret.

Members decided to ask Rasheed remain as an Honorary Chief of TIP. for life, and intend to celebrate his 40 years with TIP by a special call sign. The celebration will take place from December 25-31, 1987, and will take the form of four stations using special call signs as follows:
Rasheed 6C40TIR
Omar 6C40O
Michel 6C40M
Hikmat 6C40RJ

New Office Bearers are: President — Omar Shabsigh YK1AO; Vice-President — Michel Sioufi YK1AN; Secretary — Hikmat Zuhdi YK1AM.

New Headquarters and QSL Address: PO Box 245, Damascus, Syria.

Omar YK1AO, was born in 1936. He received a PhD in telecommunications in 1977 and a BScEE in 1985. He has a deep knowledge of all aspect of communications and until recently was a senior researcher before opening his own computer business. He has had several books published including one, in Arabic, about amateur radio.

—Contributed by Hikmat Zuhdi YK1AM and Omar Shabsigh YK1AO

FOOD FOR THOUGHT or how true?

On reading the *Papakura Radio Club Newsletter,* the astute Editor, Dave ZL1AMN, commences the December issue with some very pertinent comments, which I feel are worth reprinting to create a *Think Tank* amongst some of our amateurs.

"Why do so many people, who went through the work to obtain a licence, leave the ranks of this avocation?

"It does seem odd that people exposed to what amateur radio has to offer would let their licenses lapse when one of the most 'safety factor' items is a hand-held two metre rig under the car seat.

"Could it be that the newcomers meet coldness when they go to their first meting at an amateur Club? From a group of people who delight in talking about what a fine bunch of people amateurs are — what is the problem?"

How many of us, as SWLs, Novices or Full Call amateurs have visited a club and come away not meeting another person with the same interest or, in some cases, not meeting another person, even though they have sometimes been introduced as a newcomer? How many amateurs have tried to join a net only to be ignored? How many newcomers with a spanking new 'hours old' licence have been ignored or lectured at length as to the correct procedure to join a particular group? It happens in all hobby meetings, including ours, a hobby of communications. Ladies and gentlemen, be adventurous and welcome that new acquaintance as a friend. He or she has gone to the trouble of seeking your companionship, surely it is common courtesy to be reciprocal or they will not embarrass themselves by trying again.

SOUTH SHETLANDS

Listen for CX0XY, on all bands early this month. The exact date is dependent on the services of the Uruguay Air Force and weather conditions. The cards have been printed and the authorisation has been granted by the authorities, as copies were kindly sent to me by the Montevideo DX Group. QSL to CX2CS. Good luck to the group and those VKs that want King George Island.

DISAPPOINTMENT

Iris and Lloyd, the *Globetrotting Colvins,* were unable to obtain a 3B8 or 3B9 licence. Unfortunately, this couple, were subjected to unnecessary interrogation and foundless innuendoes. Not good for such a dedicated couple and our hobby. Even the authorities denied requests by 3B8DB to operate as 3B9DB.

NEPAL

It is on the cards that Nepal will be relaxing come of its stringent licensing conditions in the near future. Many amateurs are responsible for this change in attitude, but Father Moran 9N1MM, the crusader of the hobby in Nepal for decades, leads the list, by his attitude, assistance and dedication, to having our hobby being seriously recognised by the authorities.

PETER 1 ISLAND

Congratulations Bob KD7P. for your tenacity in getting permission to operate and the assistance of overseas publications, who spelled your problems out in words of one syllable. At the time of writing these notes, it is unknown if you made it. If you didn't, commiserations, if you did and only made even one contact, congratulations. Your integrity, in my opinion, is beyond reproach, in the way that you handled the whole project. Perhaps a few more amateurs could heed your methods and gain further considerations. Good luck on your impending operating and whatever you decide for the next season, whether that venue or another.

A well-known Norwegian DX club, of which I am honoured to be a Life Member, is contemplating, with others in that country, placing a contingent on the island early this month, or earlier. It is hoped that they do and, once officially activated, it becomes a DXCC Country. If successful, it is a shot-in-the-arm for DXing and, hopefully, the commencement of an upward trend in the Solar Cycle.

This will be a costly operation if it comes to fruition and it is anticipated that the operators will take no preferences in countries, call signs, nets or bands in a five or six day operation. So it will be a case of the best operators and not a case of *mate rates.* Is this not what the hobby is about, anyway?

HEARD ISLAND

Frank VK0DA, a Commonwealth of Australia Meteorological Observer, has done a sterling job from the area of Big Ben, a continuously active volcano and the highest peak on Australian owned soil, considering the other duties he has had before continuing further down into the colder regions. It is hoped to hear you later in the year Frank, time and energy permitting!

CHRISTMAS ISLAND

It appears Ron ZL1AMO, had a good time from the area and please QSL direct or via the Bureau to his home call. Ron, may have a surprise in store for those in need of another rare VK possession in the near future.

TEN & FIFTEEN — NOT HIBERNATING!

Do not overlook these two bands, they can create some surprises at very odd hours that never appear in the predictions. A CQ call at various intervals and frequencies can be very rewarding with S9, QRM free signals (for a short duration). If no one calls, no one is heard!

FRENCH ANTARCTIC ISLANDS

This year, if looks as if there will be active amateur operators on Crozet (FT8WA), Kerguelen (FT8XD) and Amsterdam Islands (FT8ZA) at the same time. Quite unusual, but not really unexpected.

DIPOLE & 100 WATTS

Jock VK1LF, has proved that persistence and good operating can break through the kilowatts and beams. Recently, he came across a dog-pile with Rick KH6JEB/KH7, underneath it. Jock got his contact and the card to prove it with a 5x3 report. The Q5, is the secret Jock!

HEARD ON THE BANDS

Joy VK2EBX and Steve VK2PS, considered November was an improvement on previous months. Some of the stations worked include:

15 metres — DJ, DK, DL, F6, GD, ON, PA, UL, UV and UX on the DK9KE Net.

20 metres — 5W1FM, A71BK, CE3CYM, CP5LE, FK8FA, G3HCQ, G4YLO, I5YBZ, KX6AZ, OK2BBI, OK3TMM, VE7YL, VE7CBK, and

ZL2YL. (All YL stations). Others were: 4L1WO, 4X6KA, 7J6AAA, BV2DA*, CO2LE, CP1BN, EA6WV, FK025AT, HA4KYN, HG4SEA/MM, HV1CN, IT9FTN, IT9JCB*, KA5NP, KA5RKI, KC6JC, KH6JEB/KH7, KN4BPL/KH2, N1BEX/KH2, OA3C, OA4AV, OA4ED, SP8CJR, SP8DJB, SP8HMK, SP8INK, SV1PL, T32BD, VK0SJ, VS6AHX, ZL8HV and ZP5JCY. Also numerous DL, EA, F, G, HB9, IK, PA, Y22 and YU contacts.
* denotes CW operation.

IMPORTANT — PLEASE NOTE

Please, under no circumstances, address any mail to Les Samson 7Q7LW, or his wife at their Call Book address. All mail to go to Mrs Helen Samson, 57 Milford Court, Brighton Road, Lancing, Sussex, BN15 8RN, England.

Les will be going QRT from Malawi, probably in May, after 23 years service with the government. Helen just loves collecting stamps, having a vast collection. Watch for Les on the ANZA Net before he leaves.

BITS FROM HERE AND THERE

JA is reissuing non-renewed call signs ** Vlad **J5WAD** is now home — please QSL to **UB5WAD** via the bureaus. **UA4PW** ran out of cards and apparently **W6CNA** hasn't got copies of the current logs. ** **Gerben PA0GAM** a consistent contributor to this column when he was editor of Veron's *DXPRESS* commences a one year assignment in Khartoum next month. The chance of receiving operating permission are still up-in-the-air and, I can imagine, he will be spending a lot of time at the QTH of Dr Sid **ST2SA.** ** **ZB40ANV** is being used to celebrate the 40th Anniversary of the hobby in Gibraltar. ** **KC6** and **KX6** became independent on January 1, this year. It is unlikely that they will be reclassified as new DX Countries or, even that their prefix allocation will change for awhile. ** **SSTV** operators will be pleased to hear that **9H** club stations can transmit this mode and all operators can transmit whilst mobile. Look out for a 9H. . ./M. ** **Peter Y23EO** will be signing **YN3EO** from Managua until the end of the year. QSLs to **Y32KE** via the bureaus are in order. ** **Kimsan XU1SS** still erratic in her operating behaviour and the information she divulges. ** It is believed 1981/82 cards from **Arthur G3JKI/5A** are good at the ARRL DXCC Desk, effective immediately. If so, it is one less that I have to scan the bands for, which is really a bonus with conditions and the problems in that area. Thanks must go to **Anne F6CYL** for her QSLing and efforts also Arthur's persistence with the Newington group. Whilst in that country, it may interest you to know that Herbert **5A0A** also **SP5RT** is a teacher at Benghazi University and he operates on CW for the purposes of *investigation into ionospheric radio-waves propagation*. There are various reports of him having very few takers and the reason could be his five watt output! If you make it, congratulations and remember it will be a very limited contact with no chit-chat. QSL to **SP6BZ.** ** **A4s XZF, XZI** and **XZJ** are now QRT. ** **T30AT** is QRT and is emigrating to **VK6.** Quite a discerning amateur. ** Patience! I have just received an SM card from a QSO in 1973. ** **Kevin ZD9CL** the Gough Island radio technician, though not a DXer (he will learn before he leaves in December!) is quite active. ** **Luis** is still quite active from Sao Tome. Listen between 14.160 and 14.170 MHz at around 2000 UTC. Unfortunately, the Europeans and Ws swamp him. Quite a number of VKs would like to get into the act, girls and guys. It would be great if you could advise him that VKs are also on the frequency. ** **ON7IP/ST2** is now QRT. ** **4K1A** is operating from the **USSR Molodezhnaya Base** and **4K1C** from the **Vostok Base.** Strangely, **KC4AAE** has been used from the Vostok Base on an exchange basis. Joe **KL7LF** will be signing **KL7LF/KH3** for the majority of this year on 10 through to 80 metres using SSB. QSL to **KL7VZ.** ** At least one VR8 card from Henderson Island in the Pitcairn group has been rejected by the ARRL. A declaration from the captain of the Sir Walter Raleigh may save the day. ** **ON** stations may now operate cn 160 metres with a maximum power of 10 watts. ** **Marlon Island** is now ZS8 to avoid confusion — when an operator is there and active! ** If you read last month's *Technical Mailbox* you probably had a smile about Saint Nicholas, but the OHs have an award for stations that have heard the 150-odd stations that are active in Santa Claus Land located in Finnish Lapland, Arctic Circle, and, wait for it, the points for the award are doubled in December! ** There may be changes in Bhutan's licensing system in the not-too-distant-future as they are seeking advice from other governments who permit and nurture the hobby. ** It is very unlikely that **TP2CE** will become a new DXCC Country. So folks, save your time, IRCs, stamps and cards for more valuable contacts. ** **4K0D** is a special call used by the **USSR Arctic Drifting Station UPOL-28** to commemorate 50 years since the first Polar expedition by Ivan Papanin. QSLs to **PO Box 88, Moscow,** marked **UA1MU.** ** Tom **VR6TC** has responded well to medical treatment and it will not be long before he is on the airways again. It will be good to chat again, Tom. ** The **6O**-prefix is outdated, but one gentleman still uses it! ! ! **Georgia T50DX** a legitimate call sign is quite active. If you are lucky QSL to **I2JSB.** Beware of the **6O** but perhaps no one has told him it is redundant. ** **JA** operators can now use 3.791 to 3.805 MHz. ** The **4U1VIC** issue, unfortunately is still brewing and could become a major issue in the near future, which will not benefit the hobby. ** Those who enjoy working YLs in other countries, and missed out on Soma 4S7YL (SK), may be able to work **Nanda DJ0CP** who will be visiting her home country with her husband, **Lorenz DK1ZN.** Lorenz will sign /4S7, and Nanda, the only 4S7 lady will use her own call, **4S7YLR.** ** Tonga cannot accept IRCs. ** **John Litten ZL1AAS** is the new **DX Editor** of *Break In*. John may be remembered for his Kermadec operations a few years back. Congratulations, commiserations and good luck, John. You have a hard act to follow in the footsteps of Ron **ZL1AMM**, who for the past five years, has presented an excellent column, frequently under extreme difficulties due to health problems. Sincere thanks and good future health and DXing, Ron. ** Try QSLing **Peter ZL8HV** at his home QTH, 2 Airport Drive, Hokitika, New Zealand. You will however miss out on the Kermadec franking of the envelope. ** Sad to relate, **Wally ZL1PN** a keen DXer and well-known to VK operators, became a Silent Key last year. ** **HV2VO** the **Vatican Observatory** station has been dismantled due to Brother Edmund's retirement, which is to be enjoyed in Arizona. A happy and long retirement Edmund, from all the friends you made with each contact. ** **Roly ZL1BQD** is posting **ZK3RR** QSL cards in the USA. The reason is probably economics and, at least, the cards are going out.

HOW'S DX with Jim VK3YJ

When Ken had his unfortunate accident, I was asked to fill in for him as it was unknown how long he would be out of action.

Percy VK3PA, the doyen of Australian DX net controllers, has been stricken by a painful complaint, Shingles, which has seen him absent from his usual place as Net Controller of the ANZA Net. We wish him a speedy recovery.

SWLing — the cost

Recently, it was brought home to me, quite strongly, that for those who transmit on the amateur bands, particularly the DX operator, the cost to maintain the hobby of shortwave listening is quite high. Having just received a batch of 60 QSL cards, via the bureau, of these, 17 were for contacts, 43 were SWLs and 32 SWLs were for USSR listeners. Knowing that a prerequisite for an amateur licence in Russia is proof of SWLing on air by receiving a predetermined number of QSL cards, and trying to do the right thing, I decided to buy some more cards only to find that the inexpensive card I normally use is no longer available and an equivalent replacement is around $100 per 1000.

By average of the above cards received, for every 1000 QSOs, it will cost me $250 for SWL cards over the same period. With the upturn in the sunspot cycle, it is not unreasonable to expect at least three contacts per day, or better (I have worked 30 Europeans per night on several occasions). This would equal a minimum of 1095 overseas contacts per year.

Therefore, over the next 10 years it will cost over $3000 just to subsidise SWLing by which time I will be retired on a low pension.

I am seriously considering the validity of a rubber stamp with *This Contact Confirmed* imprinted on their card, signing it and returning their own card. Or perhaps a photocopy of my QSL card!

I look forward to other amateur's comments on this approach — or problem.

QSL DIRECT

I have noticed, of late, a practice which seems to be growing — either QSL-direct or 'via my manager.' This, in some cases, is from countries that have better than twice the amount of amateurs than we have in Australia. The matter came to 'to a head' recently when I was asked to QSL direct by a UZ4 station to his VK QSL manager. Having around five shoe-boxes full of Russian cards, most of them SWLs, and informing him of this fact, he QSYed as if I had blown a fuse. Perhaps, if other amateurs explained to not- so-rare DX stations that are similarly acting in an egotistic and commercial nature, that is to the detriment of amateur radio, some of the newer amateurs will not be exploited by this practice, which is against all the qualities we respect in amateur radio, regarding QSLing.

DX WORKED AND HEARD

VK0DA — Frank should be clear of Heard Island by now. He is to be congratulated on a fine single-handed effort as he kept scheds regularly, worked many nets, plus handled the dog-piles from Europe with ease.

After this effort, plus previous expeditions, no one can say Australia's rarest DX location has not been activated enough to satisfy the keen DXer. Cards for VK0DA go to VK9NS.

FH/W6KG — Iris was heard from Mayotte, one of her many stopovers during the Colvin's latest DX tour. Cards for Iris go to the Yasme Foundation.

BY4AA — Gerd, a guest operator, was operating from Shanghai and was 5x9+ into VK on 14 MHz at 0900 UTC. QSL to DL5JP.

XX9XX — Yuki, operating from Macao was also a good signal into Australia. Cards for this operation go to JA5DQH.

DX NETS

With the amount of newer amateurs, both Full Call and Novice, on the air at present during the sunspot low, one of the best pieces of advice I can give is, to forget the purist's view that — to work rare DX stations on a net is like shooting a fish in a barrel! ! ! It may have been so 20 years ago when you could work them on low power and a piece of wet string, but it is not so today with QRM carriers and downright bad-manners that seem to spring up whenever a rare station comes on air. This is the reason that many rare and semi-rare stations will only come up on a well-controlled DX net.

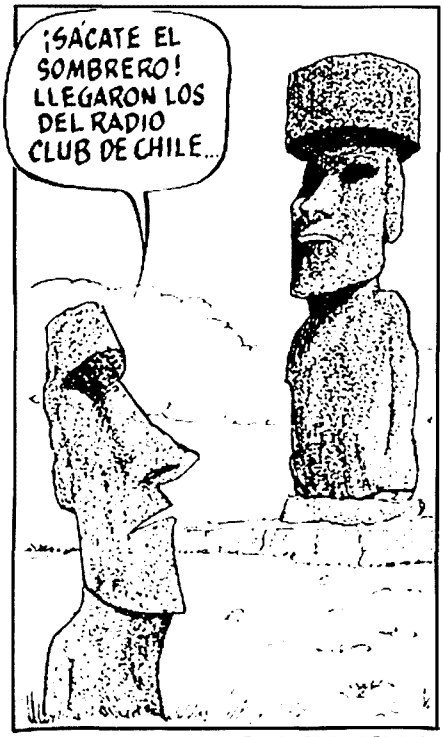
Several of the local DX nets give the newer Full Call amateur a good chance to work better than the DXCC in a short period, even with poor conditions. It should also give the Novice operator enough incentive to upgrade to get those special rare stations.

To prove a point, during the last sunspot high, Percy VK3PA, used to run the ANZA Net on 21.204 MHz, just out of the Novice band and over the years has had over 300 different countries on his net.

The Novices also used to run a net on 21.195 MHz, at the same time, with an ear always on the ANZA Net. Whenever a rare station appeared on the ANZA Net, Percy, always the gentleman, would run his list then ask the rare station if he could go down to the Novice section to work some stations. This proved beneficial in two ways — it gave the Novice a new country but, more importantly, gave those concerned in running the Novice Net, first hand experience in handling traffic as well as controlling a large number of both local and overseas stations on one frequency. Of these Novices, many have now upgraded due to poor propagation and are now well-known and respected members of the DX fraternity.

EASTER ISLAND

Easter Island was described to me by the late Father Dave CE0AE, whose premature death did



"Take your hats off! The Radio Club of Chile is coming . . .
Cartoon courtesy CE3IW. Translation courtesy Luis Diamante VK3ZLD

not allow him to finish an article about the island he was preparing for *Amateur Radio*. Dave had spent many years with the people and knew the history so well.

Dave and myself were both involved in two distress calls, the first of was a very expensive yacht missing with two local boys aboard, believed stolen, which was later found by the Chilean authorities in such a state of disrepair it would have turned the insurers gray overnight. The fate of the boys was never known, but their father was the Wharf Master.

The second was a Mayday message from a vessel, with a crew of 40, which was on fire, south of Honolulu. The operator was a YL with an accent familiar to both of us, but unknown. Dave kept the conversation going, trying different languages and dialects, whilst I relayed the details of questions I had asked, such as the vessel's name, registry, position, weather and destination, etc, to the Australian Coastwatch (now the Maritime Safety Division of the Commonwealth Department of Transport).

Their response was magnificent and within 10 minutes Honolulu Coastguard was on frequency and had scrambled an aircraft to search the location.

The whole incidence was recorded and in playing it back to the Australian Coastguard many times later that evening, it was noted that the weather conditions matched the area designated by the operator, but the vessel and registry could not be found when records were searched. Unfortunately, their fate will always remain a mystery.

Dave loved Easter Island. He was intrigued by its history and could speak several languages fluently, including the two used on the island — Spanish and Polynesian, both with a mixture of the Chilean dialect.

Easter Island, situated in the South Pacific, is a possession of Chile, located in a lonely area 390 kilometres from the mainland. It has a population in the vicinity of 2000 people, and is not marred by commercialism, night entertainment or *TV!*.

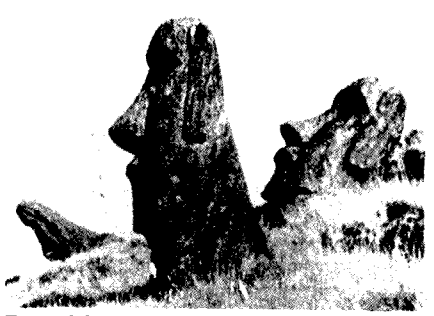
The island is renowned for its statues which are called moai. The moai, remains of village complexes, are scattered around the 60-odd kilometre coastline. They have been made from the material of an extinct volcano, Rano Raraku, but the weather has taken its toll and these many centuries old giant effigies of two factions (some with long ears, others with short) are thought to be of South American Indians and Polynesian origins. Unfortunately, no one knows exactly their origins but many theories abound, but cannot be proved as documentation, if any existed, has been lost down the years.

Dave believed that many of the present islanders were descendants of these forgotten people whose unique effigies still "guard" the island.

Dave's article would have been intriguing reading, and it is only my memory and notes made during numerous conversations with him that I am able to compile this short insight of Easter Island.

At one time Dave was the only amateur on this much sought after DX country, but now quite a number of amateurs are active. The island has an updated airstrip and a wharf which can accommodate a vessel with a reasonable draught.

If you hear a station signing Easter Island, ask them to tell you a little of the history. They may even be descendants of the guri era.



Two of Easter Island's moai guarding the coastline.

CW SWLing with Eric L30042/L5

1.8 MHz — VK3BEE, 3Q1, 7BC.
3.5 MHz — HK1ANW, JA1HQT, KH6CF SP9IKF/MM.
7 MHz — BY6LC, CO2HT, DK1HO, DL1YD, FK25DD, HL1IFD, I2LHE, KP2J, RT4UF, UBs 4MV, 4PJA, 5NGA, VE2FU, 2VN, VE3OQR, UW0CM, UZ0LJU, YB2BNJ, YUs 2LIX, 7GMN, Y43GO.
10 MHz — F3NB, G4OEC, G6HL, JA9JFO, K6JAJ/KH8, RC2CF, UA0FDD, W6VX, ZL4QO.
14 MHz — AH6GP, BY5RA, C21NI, CE2LZU/MM, CT4KO, DK9PD, FK0AV, 8FG, FO0BY, KA3DRR/DV2, F2YT, F9HR, FE6IJO, FK8FG, FK25DD, G3RGD, G3SEY, HB9AEC, HI8LC, HA5KF, HK1FYH, HK5BEG, HL9CW, I1RGF, NY6M/KH2, KH6BGE, KH9AC, LU1SH, NH6BH, OA4BR, OH6IU, OZ9DR, PY2SD, RL7JA, RA3GF, SL8KR/MM, SM6MCW, UA0JB, UB5MIF, UT5YZ, UW3TN/UF, UV6AM, UZ0LWC, VKs 4SWR/MM, 8AV, VS6DT, VS6UN, YB2IA, YO4WJ/MM, YT1W, YU2CRU, ZL6OR, ZS2FP, ZS6J, 4N7N, 4X6MP, 9M2CC/MM, 9V1VD.
21 MHz — DJ5XQ, HL1IE, JA9AA, KH6AQ, OH3ES, UB3IWA, UL7TCU, UW4HM, UZ4AXB, XE2SI, WH8AAP, YB0TK, YB1DVW, YC3ZAB, YC4GAP, YC6LD, YB3ATB, 7J1ACH.
28 MHz — JR2TZJ, JA7GBS, JR9RPU, VE7QO/KH8, VKs 2HU, 4VUA, ZLs 1AIM, 1AAT. Beacons VKs 2RSY, 3WI, 5WI, 6RTW.

QUIPS FROM KH6BZF

It appears that your quips are very popular Lee and I have taken the liberty of reproducing another couple for our readers.

"The life of a 'propagationist' has a superb cast . . . but, nobody can figure out the plot! ! !

"Ever noticed that a good hotel is one where you can take the clothes hangers . . . off the rod."

Lee, I am sure wrote this one for me — "Yes, slowly but surely . . . I am getting . . . nowhere." Oh, how true!

THANKS

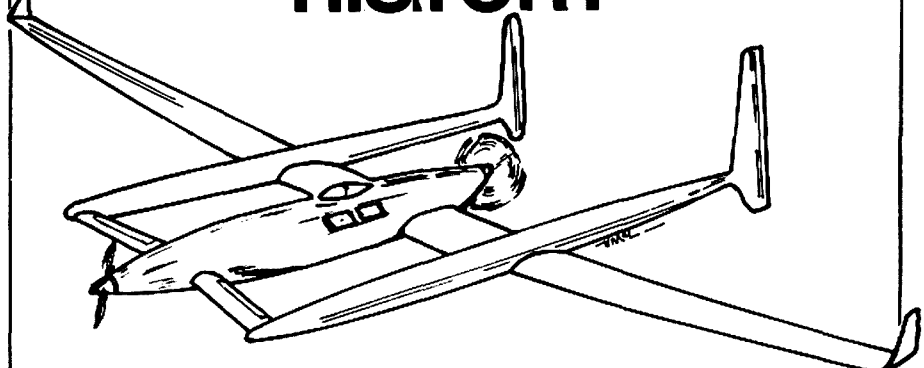
Sincere thanks to the Editors of weekly, bi-weekly and monthly publications such as: *ARRL Newsletter; BARG; CQ-QSO; The DX Family Foundation Newsletter; Inside DX; The W6GO/K6HHD QSL Manager List; KH6BZF Reports; Long Island DX Bulletin; Papakura Radio Club Bulletin; QRZ DX; RSGB DX News.*

Magazines including *Break In; cqDX; DX Post; JA CQ; JARL News; KARL News; QST; Police Life; RadCom; Veron; Weather News* and *Worldradio*, to mention but a few.

Individual contributors this month include VKs 1LF, 2EBX, 2PS, 3YJ, YL; L30042/VK5; CX2CS; YKs 1AM and 1AO. Sincere thanks to one and all and good DXing.

—73, Ken VK3AH

AMATEURS MAKE HISTORY



Another first for the amateur fraternity — Jeana Yeager KB6LQR and Richard Rutan KB6LQS, became household names as they encircled the world in the dramatic non-stop time of nine days, three minutes and 44 seconds, which was officially certified by the National Aeronautics Association, in their amazing aeroplane *Voyager*. The journey was carried out without re-fuelling in the plane designed by Richard's brother, Burt.

Richard, who is 49 years old and the veteran of 325 combat missions over Vietnam before mishap, and his younger companion of 34, emerged from a cockpit and living quarters no larger than a telephone box, to be greeted by a massive crowd estimated to be in the order of 50 000.

No amateur transmissions were made by the couple, all communications being made on commercial HF frequencies using the call sign, AFS6VO. A special event amateur station, K6OXI, in Los Angeles, ran regular updates on all the HF bands.

Both pilots and the designer of the *Voyager* were awarded the *Citizen's Medal*, one of America's highest honours and a personal gift from the President of the US, Ronald Reagan, for the historic flight that has been acclaimed by many nations as truly a first in aviation history.

I am sure all amateurs also congratulate this adventurous couple that braved extreme climatic conditions and other unforeseen occurrences from take-off, when a certain amount of damage was done to the wing tips, to landing with a minimal amount of usable fuel left. Reserve fuel was at hand but would have had to be siphoned, due to a fuel pump malfunction.

—Compiled courtesy Ken McLachlan VK3AH

VHF UHF — an expanding world

Eric Jamieson VK5LP
1 Quinns Road, Forreston, SA. 5233

All times are Universal Co-ordinated Time and indicated as UTC

AMATEUR BANDS BEACONS

FREQUENCY	CALL SIGN	LOCATION
50.010	JA2IGY	*Mie*
50.060	KH6EQI	*Honolulu*
50.075	VS6SIX	*Hong Kong*
50.109	JD1YAA	*Minami Tori-shima*
52.013	P29BPL	*Loloata Island*
52.020	FK8AB	*Noumea*
52.100	ZK2SIX	*Niue*
52.150	VK0SJ	*Macquarie Island (Keyer)*
52.200	VK8VF	*Darwin*
52.250	ZL2VHM	*Manawatu*
52.310	ZL3MHF	*Hornby*
52.320	VK6RTT	*Wickham*
52.325	VK2RHV	*Newcastle*
52.345	VK4ABP	*Rockhampton* [1]
52.350	VK6RTU	*Kalgoorlie*
52.370	VK7RST	*Hobart*
52.420	VK2RSY	*Sydney*
52.425	VK2RQB	*Gunnedah*
52.440	VK4RTL	*Townsville*
52.450	VK5VF	*Mount Lofty*
52.460	VK6RPH	*Perth*
52.465	VK6RTW	*Albany*
52.470	VK7RNT	*Launceston*
52.485	VK8RAS	*Alice Springs*
144.019	VK6RBS	*Busselton*
144.400	VK4RBB	*Mount Mowbullan*
144.410	VK1RCC	*Canberra*
144.420	VK2RSY	*Sydney*
144.430	VK3RTG	*Glen Waverley*
144.465	VK6RTW	*Albany*
144.470	VK7RMC	*Launceston* [2]
144.480	VK8VF	*Darwin*
144.485	VK8RAS	*Alice Springs*
144.550	VK5RSE	*Mount Gambier*
144.565	VK6RPB	*Port Hedland*
144.600	VK6RTT	*Wickham*
144.800	VK5VF	*Mount Lofty*
144.950	VK2RCW	*Sydney*
145.000	VK6RPH	*Perth*
432.057	VK6RBS	*Busselton*
432.160	VK6RPR	*Nedlands*
432.410	VK6RTT	*Wickham*
432.420	VK2RSY	*Sydney*
432.440	VK4RBB	*Brisbane*
432.450	VK3RAI	*MacLeod, Melbourne*
432.535	VK3RMB	*Mount Buninyong*
432.540	VK4RAR	*Rockhampton*
1296.171	VK6RBS	*Busselton*
1296.420	VK2RSY	*Sydney*
1296.480	VK6RPR	*Nedlands*
10300.000	VK6RVF	*Roleystone*

1. For some reason, VK4ABP has not been listed for a while. I was reminded of this during a six metre opening by Alan, the custodian, so is now included.
2. Advice via six metres has been received of a new beacon, VK7RMC, located in Launceston, which is currently going through its testing stages. By the time you read this it could be operational. It will be the first two metre beacon from Tasmania. Details later.

THE SUMMER Es SEASON

Where does one start? My predictions last year for another bumper Es season in 1986 have proved correct. It has so far (to 21/12) been nothing short of truly remarkable. Not only has it been marvellous on six metres, but the two metre coverage has been nothing short of fantastic and traditionally, the best period is yet to come being between Christmas Day and January 1. It is a little early to tell yet until reports come in, but it seems the two metre coverage of Australia may be even greater than last year and that would be saying something. I can see I shall have to draw another map for the March issue as I did last year!

SIX METRES

It doesn't seem necessary or required that I should give a blow-by-blow description of all that has happened, perhaps the highlights should be mentioned. No matter what I say there will be some important events I have missed. I will do the best I can.

The earliest recorded contacts at this QTH were on 10/10 to VK4ALM, and a number of others. Then during the next 21 days, until the end of October, the band was open on no less than 12 days, mostly to VK2 and VK4. As November progressed the contacts began to increase, with VK2, 3, 4, 5, 6, 7 and ZL being quite common. 18/11 was a particularly good day with VK2, 3, 4, 5 and 6. One good contact was to Jim VK3AZY, on backscatter at 5 x 5, but without the customary warble. Roy VK5AXV, from South End, was another good backscatter contact. VK4JH reported working VK8, ZL and two JAs. VK4ALM reported hearing FK8EM as a beacon on 50.500 sending FK8KAB/6 then a string of dots. ZK2AZ on 52.050 was heard in New Zealand around 2100 and was reported working ZL1TRM, ZL1AKW and ZL1AUR. FK1TZ also heard ZK2AZ. KH6 was heard by FK8EM and FK1TK, but no contact made. VK5ZBU heard VK0SJ beacon on 52.150 and VK8ZLX was observed calling VK0SJ. On 19/11, ZL2TZA worked ZK2AZ. After the big splash the band went a bit quiet and we had to be content with VK2 and VK4 contacts!

On 2/12, VK6KXW worked FK8EM and that's a long haul by any standards. 3/12, VK3AMK heard VK4 stations calling 5W1GA (Neville VK4ZNC, DXpedition), then on 4/12, the VK8 stations started getting into the act. VK8ZLX was heard at 0620 by VK5FT. At 0640, the VK8RAS beacon was S9, but no VK8s could be aroused! Then VK8GF worked VK3ATN/3 while using only a dipole. YJ8 and ZL were worked from Adelaide. So already the pattern was being set for something really big to occur.

And occur it did on 5/12. At 0140, VK5LP worked ZL2BKC (10 W) and ZL4TBN (15 W), and the latter reported having already worked VK2, 3, 4, 5 and 8, 0356 VK2ASZ worked 5W1GA who reported working six stations so far that day. VK2 stations reported the band open to practically all areas of VK and ZL, including two metres to some areas. On 6/12, VK5RO worked VK0SJ 5 x 9 at 1045. 8/12, open to VK7. 10/12, another good day with most Australian states available up and down the country.

12/12 was good. VK5RO heard 5W1GA and ZL1BHX contacted ZK2 and VK8. Lots of ZLs around today. VK5LP working VK6AOM at Esperance with signals S9 +40 dB when ZL2AQR broke in and had a 5 x 8 contact both ways with the 5LP beam still pointing west! It would have been interesting to have turned my beam to see how strong Dick was. VK6AOM also worked him. Dave VK6AOM, reported hearing FK25A at 0505, at 0545 VK2FMB worked FK25A at 5 x 3.

13/12 was a good VK6 day with lots of contacts. A report filtered through that a VK2 had worked into Indonesia as well as 5W1GA (I thought Indonesia had no normal six metre allocation). Band open from VK5 to VK1, 2, 3, 4, 5, 6, 8 and ZL1 and 2. 17/12 also a good day, with VK5RO working FK25A. 18/12 also a good day, it had to be as the VK8 beacon was S9 at 0005. At 0030, VK6ZKG/7 was 5 x 9. A little later it was over to the VK2s and 4s. At 0604, 3D2ER (Neville VK4ZNC) came through and worked by VK5LP at 5 x 3. 0911 VK5DK, from Mount Gambier, was 5 x 5 so promptly worked him on two metres at 5 x 9. At 0620 3D2ER was peaking S5/6 and could be heard working many VK1, 2 and 3 stations with strongest signals from the VK3s. Neville was also heard in VK6 at 160 km south of Perth which would be an even longer haul than the FK contact reported earlier. 3D2ER was around for a long time, Mick VK5ZDR worked him at 0427 and he was still audible, though weak, at 0700. 3D2GA also worked by VK7JG and others in Tasmania.

The band took a breather on 19/12 then, on 20/12, opened to VK6, VK8 and VK2. The stereo sideband from Channel 0 in Brisbane comes up nicely on 52.000 MHz and with the signal peaking to 60 dB over S9 provides plenty of monkey chatter up to 40 kHz into the six metre band. Quite a nice companion for us to have — still we were told it would not cause any harm to us! So much for that.

And now to 21/12. What a day! Open all day to VK8 as well as VK3, 4, 5, 6 and ZL1, 2, 3. The band looked as though it would be good because Neil VK8ZCU, at Tennant Creek, was 5 x 9 at 0129 and the band had already been open for hours. Contacts to VK5LP followed with VK8ZMA and VK8ZLX, which culminated in an all day long alertness and trials for two metre contacts. Dave VK6AOM, from Esperance, spent a lot of time at S9 from 0318, while Alan VK4ABP, at Rockhampton, pounded in. Sandwiched in amongst the strong VK8s I found VK3DUQ and VK3KK and worked them around 0657 at 5 x 9. Les VK3ZBJ, was also very strong but this appeared only to be a short duration opening as they were gone in a short time. The ZLs were very strong, well over S9 most of the time. Roger VK5NY, worked 3D2ER and 3D2MR around 0235, the latter being with American accent and on the same frequency as Nev 3D2ER. He may have been using Nev's gear or been activated by Nev's presence. Signals peaked to S9. ZL1AKW reported he had worked into FK and 3D2 today. ZL1TZA said he had worked all VK states except VK7. The signals from the ZLs were very strong around 0800 causing more tries for two metre contacts. The VK8s were still pounding in as late as 0900. Quite a few operators would be feeling exhausted from the continuing attempts at two metres with quite a degree of success, but you will need to read the two metre section which follows to learn what transpired!

TWO METRES

As I said earlier, two metres has been truly fantastic. Quite apart from the semi-regular contacts between VK5RO and VK5ZDR to VK3 stations, via tropo, Dave VK6AOM, set the ball rolling on 28/11 when he worked 10 stations in VK3 and six in VK5 on 144.1 tropo. Earlier, on 24/11, VK5NY had heard the VK1RCC beacon at 1509 on tropo for the first time. Roger VK5NY, also reports considerable success on 144.2 to Keith VK3AIH and Ray VK3LK, both at Portland, using aircraft enhancement around 2230. However, they have been unsuccessful using 70 cm.

There were a few spasmodic reports of Es two metre openings between VK3 and VK4 early in December. At 0917 on 10/12, VK4ZSH advised me that VK4 was working VK3 and VK5NC on two metres, which was probably one of the first substantial openings. Col VK5RO, reported copying ZL2TIC at 5x2/3 on 5/12. It was then on to 13/12 when Jim VK5ZMJ, had an opening to VK4 — Rockhampton and Mackay at 2340. There was a good Es opening to Perth at 0848 for half-an-hour when nine contacts were made by VK5RO with signals to S9. Also included was VK6AOM at Esperance. (VK5LP always seems to miss these openings — I have never yet worked a Perth station on two metres!)

Another important day was 18/12, when VK4 worked VK7 throughout the day while VK5ZMK opened his account by working five VK4s between 0630 and 0730. Several other VK5s were involved in these late afternoon contacts. VK4ABP worked VK3AQR, VK3CM, VK3ZBJ and others also late in the afternoon.

21/12 had to be a good two metre day. It started with early contacts to VK8 on six metres with signals S9 +40 dB much of the time. At 0140, VK8ZLX was heard calling VK3NM and both parties were picking up bits of the contact, but not enough to make it a two-way. At 0156, VK8ZLX

worked VK2DDC at Albert, a little place west of Narromine, in central NSW, at 5x9. Then Les VK3ZBJ, reported hearing the beacon VK8RAS and at 0257 plus 40 seconds VK8ZLX was heard in a three second burst on 144.080 by VK5LP. At 0358, VK5NY worked Neil VK8ZCU, in Tennant Creek, at 5x5. A little later the VK8s were kept busy around 0521 working a string of VK2s, including VK2DZV, VK2ZJK, VK2ASI, VK2ZAB and VK2ADY. A number of the stations worked were in the Tamworth area, but stretching down towards the Sydney metropolitan area outer limits. At 0630, VK2DDC was again worked by VK8 stations and when ZL1TZA flashed a report that he was hearing VK8 in ZL the VK8s wondered if it would ever stop.

The VK8s had been under constant pressure from several of the VK5s (VK5NY, VK5ZDR, VK5RO and VK5LP) to try and complete the path between the two States, but to no avail. Keyers were running, CW signals sent, SSB used, but to no avail. Apart from constant pings nothing else eventuated but VK5RO did work VK8ZCU. All the while VK8ZLX and VK8ZMA continued to pound in on six metres. In between the VK8s grabbed contacts into other States, but the VK5s generally were not given any real treats except the contact between VK5NY and VK8ZCU.

The bonus of course, which does come from this frenzy of activity, is that the whole country has been alerted to the possibilities of two metre contacts and all those with reasonable capability will have their two metre equipment at the ready, so the next week or so should see these contacts continue and possibly on an even greater scale. Did anyone ever need more proof that Es is best at the low part of the cycle and with this statement of best goes the increased chances of two metre contacts.

VK5LP will be operating portable again this year between Christmas and New Year from Meningie, which is south-east of Adelaide, from a small hilltop with a virtually clear horizon in all directions. The hill is about 16 km inland from the coast and has no power line hash, no vehicle ORM, no TVI, no close amateurs, nice level site, short feedlines to the antennas, what more does one want?

This is all leading me to the point that I think one should be sparing some time during peak two metre activity to examine 70 cm and see if there is any improvement in distances worked on that band. Such an examination would be impossible from my poor home location, but the immense improvement of the portable site would lend itself to some evaluation of the 70 cm scene. The biggest problem will be to find someone who, at the peak of two metre activity, and being called by so many stations, would be prepared to go and call on what could prove to be a dead band! I will try and give you a report.

LATE ITEMS

In the two metre summary, I forgot to mention I received a phone call from Peter VK8ZLX, on Saturday 20/12, in which he told me of the great two metre opening on Es to Perth from Alice Springs which commenced at 0525. Signals were mostly 5x9+ and the stations at the Alice Springs end were VK8ZLX, VK8TM, VK8GF, VK8TJ, VK8ATM and VK8ZMA. Peter worked VK6KRC, YU, WD, HK, UZ, ZKO, RO, XZ, ZRY, CX, YS and AKT. Peter also had a brief contact with VK6YS via the Perth Channel 2 repeater. At the time, six metres was good, but not extremely strong, Peter said. He also passed on a comment he heard, that someone in VK6 had worked a VK7 on two metres, but this could not be confirmed. In the light of these contacts is it any wonder the VK8s were on their toes the next day (21/12)?

A phone call from Wally VK6KZ, on 21/12, told me that the VK0SJ beacon, on Macquarie Island, was being heard there. VK6HK reported it at 0800 or earlier and through to 0936. This was confirmed by VK6WD. Unfortunately, I could not advise Wally of any way that Sojo on Macquarie could be alerted in time for the message to be worthwhile, so the opening had to pass without contact. Pity. The same situation exists with Mark VK0AQ, and the Mawson beacon, he has no way of knowing if the band is open and unless he is dedicated enough to sit there for hours on end listening to a dead band a contact will eventuate purely by chance. In the case of David VK0CK, he used to monitor the ZL TV stations and also listen for beacons, but not everyone is as dedicated as that!

50-54 MHZ DX STANDINGS

DXCC Countries based on information received up to December 15, 1986. Cross-band totals are those not duplicated by six metre two-way contacts. Credit has not been given for contacts made with stations when 50 MHz was not authorised.

Column 1: Six metres two-way confirmed
Column 2: Six metres two-way worked
Column 3: Cross-band (6 to 10) confirmed
Column 4: Cross-band (6 to 10) worked
Column 5: Countries heard on 50 MHz
Column 6: Countries heard on 52 MHz

CALL SIGN	1	2	3	4	5	6
VK8GB	42	42			13	
VK2BA	29	29				
VK4ZJB	28	28				4
VK2DDG	25	26		2	12	3
VK3OT	25	26			10	
VK2QF	25	25				
VK2VC	24	26				
VK3AWY	22	22				
VK2BNN	20	21				
VK5LP	20	22			6	3
VK3XQ	19	20			1	1
VK4ALM	19	19				
VK3AMK	17	17				
VK4TL	17	17				
VK9XT	17	21				
VK7JG	17	18			2	
VK3NM	16	17				
VK3AUI	16	17				
VK4ZSH	15	16				
VK4ZAL	14	14				
VK3ZZX	12	13				
VK9YT	12	14				
VK6OX	10	10	1	1		
VK6RO	9	9	3	3	2	3
VK4KHZ	8	10				
VK6HK	8	13		3	2	
					OVERSEAS	
JA2TTO	48	48			6	

The minimum number of countries confirmed for an operator to commence being listed is five, including VK.

The position on the list is determined by the number of confirmed contacts. Where two or more operators have the same total, those first date listed with that total can only be displaced by someone having a greater number of confirmed contacts.

The next list will appear in August 1987, and entries will need to be on my desk no later than June 15, 1987. Claimants are reminded that full details of all contacts are required; viz date of contact, time in UTC, call sign of station worked, country, mode, report sent and received, QSL sent and whether received, split frequency contacts should be indicated. Please add your own call sign and date of your claim.

I reserve the right to ask any claimant for QSL cards for perusal to support verification if considered necessary. Further entries are invited.

Steve VK3OT, has asked for his operations on Christmas Island, as VK9XT and Cocos Island, VK9YT, to be included and sent the appropriate applications, and these have been added in their appropriate positions in the table.

The stations worked from Christmas Island as VK9XT were:
Australia — VK4RO, VK4JH, VK4ZBJ, VK8GB, VK8VV, VK8GF, VK8ZBW, VK6OX; Christmas Island — VK9XI; Cocos Island — VK9ZYX; Thailand — HS1WR; Ogasawara — JA/JD1; Marcus Island — JD1BAT; Philippines — DU1GF, K9PNT/DU2; Hong Kong — VS6EG, VS6FX, VS6AB, VS6EZ and VS6SIX (beacon); Indonesia — YB1CS, YC1BMI; PNG — P29ZFS; Saipan — KH0AB; Guam — KG6DX, KG6JDX, KG6JKS, etc; Solomon Island — H44PT, H44DX; Japan — Japanese contacts approximately 6000; Korea — HL2JD; New Caledonia — FK8CR. Total 17 confirmed. 9N1BMK and 4S7DA heard in 1980; VE1ASJ beacon heard 1336 on 15.3.80; KX6BU beacon/kever heard 1415 on 18.3.80. Total of four not confirmed making a total of 21 countries.

On another occasion when space and time permits, I will include his listing for VK9YT and they are both very interesting, giving us some idea of call signs and the countries from which they originate.

The list submitted by JA2TTO, was published in the September 1986 issue of AR.

It may also be of interest to readers to know that the Australian Six Metre Standings are picked-up and included in the huge list prepared by Bill Tynan W3XO, in his *World Above 50 MHz* column of *QST*. There are 420 call signs on Bill's list and our top performer, Graham VK8GB, is number 116, VK2BA 225, VK2DDG 226, VK4ZJB 237, VK3OT 261, VK2QF 265, VK2VC 276, VK3AWY 292, VK2BNN 306, VK5LP 312, VK4ALM 320, VK3AMK 332, VK4TL 333, VK3NM 335, VK7JG 336, VK3AUI 337, VK4AYX 339 (not on the Australian list), VK4ZSH 344, VK3AQR 352 (not on the Australian list), VK4ZAL 356, VK6OX 372, VK3ZZX 378, VK4KHZ 379, VK6RD 382 (not on the Australian list), and neither is VK2ZDI at 399. Place number one is held by JA4MBM with 79 countries confirmed and 81 claimed. On this list also, are marked 154 stations who claim to have worked all continents on six metres. It would be interesting to know how many have actually worked Australia, which, after all, is the sixth continent — not Pacific islands or New Zealand!

The way the two metre band is shaping-up, it seems it may be worthwhile starting some form of listing for that band. Maybe this could be done using locator squares as we are unlikely to have masses of overseas contacts on that band due to our relative isolation. I am prepared to look at any suggestions which come from readers and will leave any decisions for a few months.

EME REPORT

Doug VK3UM filed the following report after managing to get back on the air after a major flame-out of his 4CX250B amplifier in the first half-hour of operating.

22/11: 1545 W7GBI 449 449; 1600 VE3CRU 549 449; 1625 K2UYH 449 439; 2135 DJ8MB 439 439; 2145 OK1KIR 339 339; 2200 DJ9BV 0 0; 2225 F2TU 0 0; 2240 FH1FHI 0 0. Doug was receiving 10 to 14 dB of echoes, however, even this does not necessarily mean conditions will be good to Europe and USA.

On 21/11, at 2145, Doug had a random contact with YU1AW 449 449, but the good results are possibly due to the station having a dish with polarisation rotation.

23/11: Very poor conditions. Libration fading, so unusual and vicious Faraday rotation making operation so difficult. There could be a burst of signal for a minute then nothing further for 20 minutes. At 1645, he worked K2UYH 449 449 then dropped out. Signals could be strong, but unintelligible. 1730 VK5MC M M. 2220 — 2345 tried with almost nil results, the only contact being F2TU. May December be better for you, Doug.

IC-551 NOISE BLANKER

The modifications to the noise blanker were given a good test today with the power leak S9 +20 dB with the blanker off and S0 or zero with the blanker on. So far I have found nothing objectionable from the modification. Sometimes, a very strong station nearby can get within the passband of the blanker and thus tend to turn it off a bit, but even this is preferable to a band full of noise.

I received one report that an operator had experienced loss of audio intelligibility after modifying. There has been no sign of this here! The operator had not included the 82 ohm resistor part of the modification because he could not see where 82 ohms, in series with 10k ohms, could make any difference. With this I had to agree, but I did put the resistor in and mine is okay. I am endeavouring to find out from overseas whether the 82 ohms is a misprint and it should be 820, 8.2k or even 82k, or as someone else suggested, are there other circuits around which we do not know about, where R86 could have an effect with 82 ohms in series.

Whatever the situation, I think I can safely say, those wanting to proceed can do so as I am very satisfied with the operation of my IC-551 under noisy conditions. The only noise the blanker will not remove is low level (S2-3) noise of a different

type from the usual power leak, but at that level it does not worry me too much, and I have yet to find the blanker which will remove it, anyway!

OVERSEAS

CQ ham radio from Japan (per Graham VK6RO), lists two AM stations on 50.610 MHz — BY-RADIO and UA-RADIO. It seems they must be vying for the position and perhaps even sitting in top of one another.

The November 1986 issue shows very little amateur activity through September, apart from stations in Korea and Hong Kong. VK6RTT, the beacon on 52.320 MHz was heard at 1725 on 12/9 and VK6YA on 52.050 at 1728, both reported by H8MQZ5 who could be a SWL. On 14/9, VK6ZKG/M4 was noted by JF2IWW at 1700. Also, on 12/9, VK4FXZ and VK4FXX were listed. The Malaysian television is heard regularly on 48.250 MHz and occasionally TVQ-0 on 51.750.

It was also interesting to note in the same publication the details of an antenna gain check on 50 MHz antennas. The highest gain of 14.42 dB (9.70 dB F/B) was obtained by a JF3GPS design on a 12.98 metre boom and having eight elements! Next was a 12 element Yagi on a boom 13.07 metres long with a gain of 14.19 dB (20.50 dB F/B) and of NBS design. All of the eight and nine element designs submitted scored very well in the forward gain area. One six-element on a 9.58 metre boom gave a gain of 12.48 dB (13.40 dB F/B) so there are some good antennas around. Maybe my pair of eights aren't too bad after all!

LATE NEWS

As these notes are being written, it is hard not to keep an ear on the VHF bands and 22/12 was certainly a day of rewards. Before 0000, VK8RAS on 52.485 was S9+, but the Alice Springs boys were obviously still in bed! First good signal was VK2YVU at 0008 5x9. Glen said he was using his 28 MHz beam! Then had quite a chat to John VK2BHO, and then VK4s started to appear. 0119 for a contact with Eddie VK1VP, then a brief exchange with VK2RS/3. Another chat with Lyn VK4ALM at 0137. At 0449, had a contact with Henri FK8EB, who was 5x6. He was clobbered by VK2 and 3 stations, but I still got him! Then more VK1 and 2s. Next the ZK2SIX beacon on 52.100 was noted about 0430 at S6. I tried calling ZK2, but to no avail. Then Bill VK5ZWP, kindly informed me ZK2RD was on 52.049. I gave Robert a call which he returned and we worked at 5x7 for a second new country for me this year, the other being 3D2ER. So it was well worth getting away from the typewriter for awhile!

Other news picked up on the band whilst sculling about — not necessarily in time order: ZL2TPY worked more than 30 VK stations on two metres during the evening of 21/12; ZL working regularly *into* VK4, *mainly* from the North Island, but two metres not getting as far as Christchurch. Steve VK4ZSH, working VK3 and then VK1 on two metres, then VK2RSY, the two metre beacon became S9+, then lengthened to VK7. All this started at 2200 and was still going at 0100. ZL1 and ZL2 had five hours of two metres to VK on 21/12, from 0310 to 0815. At 0036, VK2YDC worked P29BH on six metres.

VK1VP worked ZK2RD at 0603 on 21/12, while others also in VK2 *and* VK3 worked him. Also on 21/12 P29ZES was worked in Rockhampton. Same day VK5RO was rewarded by working VK8ZCU at Tennant Creek on two metres at 0400 while I had a cup of tea! Later told VK5ZDR worked him too, for the second year in a row. In a period of three hours on 21/12, VK1VP, VK1BUC and VK1BGG worked over 20 VK2s and VK4s on two metres.

Going further back, on 5/12, VK4ALM worked VK0SJ at 5x5 at *0850 and did* the same thing again two days later. VK0SJ was also worked in Townsville. On 14/12, VK8ZLX worked to Rockhampton on two metres. Should be a lot of this to report to you next month.

Double hop Es on two metres is not very common, but VK6AOM worked into VK2 on 22/12. ZL1BHX to VK8ZLX would also be double hop — I wonder if they made it? Have to stop now!

MACQUARIE ISLAND VHF OPERATION from Gil VK3AUI

During 1986, Sojo VK0SJ, operated from

Sojo VK0SJ.

Macquarie Island. Sojo had equipment for six and two metres, with a keyer to alert anyone hearing the signals.

Around 100 watts of RF was available on both two and six. The aerials were mounted on a tower, atop a hill — four elements on six and 14 elements for two metres.

Sojo took his own two metre equipment and various other items of equipment were loaned for the operation.

Operating from this harsh environment, Sojo was able to give many VHF operators a contact with Macquarie Island — including the first contacts with the Island on two metres made by Sporadic E propagation.

Macquarie had been activated previously on six metres, however, this was the first two metre operation.

The equipment is returning to Australia after a successful operation, but the aerials will remain to be used by anyone in the future. (Six metre operation will continue as one of the current years personnel has taken a rig to the Island). Many thanks to those who assisted at various times.

It is hoped that VHF operation will continue in the future. There are still a number of places to be worked on six. Two metres holds great promise, with a large number of possible contacts and propagation modes.

On UHF, a very interesting and rewarding operation would be possible. Tropospheric and Auroral propagation would be very interesting.

With the improvement of communication to Antarctic Bases, the possibility of quickly alerting operators to communication opportunities exists.

Many thanks are due to the operators from Macquarie Island over the last four years. They were VK0s AP, CK, YL and SJ.

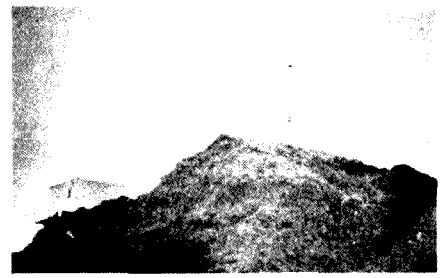
Also, thanks to those who assisted with material and support. They included VK3s GJ, IO, JH, NM, XQ, AUI, AUQ, BDL, YTB and Werner Wulf. Werner provided the six metre beam which has withstood the harsh environment so well — four years is a long time under those weather conditions.

Hopefully, operations will continue at Macquarie Island. Other bases are not without VHF and UHF possibilities. Who will make the first six, two and 432 MHz QSOs from Heard Island and the Antarctic continent? Now! There is a challenge if you are headed for the Antarctic.

CLOSURE

Closing with two thoughts for the month: *The measure of life is not its duration, but its donation* — and — *Smart is when you believe only half of what you hear. Brilliant is when you know which half to believe.* 73 *The Voice in the Hills.*

ar



Sojo's Macquarie Antenna.

MISSING PERSON

The NZART have forwarded correspondence they have received from the Salvation Army, who is trying to locate ***Andrew Vincent Kearney.*** Andrew was born in Melbourne on December 22, 1963.

Andrew once held the amateur call sign, VK3YTM, however this has not been renewed since his disappearance.

Should anyone know the whereabouts of Andrew Kearney would they please contact the Salvation Army Headquarters in their State and/or the Federal Office of the WIA at PO Box 300, Caulfield South, Vic. 3162.

Sojo's Equipment.

Electro-Magnetic Compatibility Report

FROM HEAR & THERE

Hans Ruckert VK2AOU
EMC REPORTER
25 Berrille Road, Beverly Hills, NSW. 2209

Earlier reports showed what had been done in West Germany with regard to EMC. The following cuttings from QST *indicate that we still have a long and frustrating way to go, before EMC is understood by all authorities and by the public in the necessary logical and technical manner. The lonely radio amateur is so far in a hopeless position in most countries.*

JACK RAVENSCROFT VE3SR: QRT

HR Bulletin 13 from CRRL, London, Ontario, 1986 April 09, to all radio amateurs BT.

Today, in what Canadian amateurs will likely regard as a flagrant miscarriage of justice, the judge hearing the case of Houghtby vs Ravenscroft, in which Timothy and Dale Houghtby of Kanata, Ontario, sued their neighbour, Jack Ravenscroft VE3SR, for damages arising from alleged interference to their furnace controls, microwave oven and home entertainment equipment, decided the case in favour of the Houghtbys and against Jack Ravenscroft. The judge granted a permanent injunction prohibiting Jack from transmitting radio signals, from his home or from his land, that would result in disruption of the operation of electrical or electronic equipment in the Houghtby's home. The judge also ordered Jack to pay $2558.60 in damages, all of the Houghby's legal costs, plus interest on monies the Houghtbys laid out during the course of the case. The unexpected outcome of this case is a severe blow to the Canadian Amateur Radio community and a potential threat to the operators of any licensed transmitter, even a transmitter in broadcast or *other commercial service*. Jack will decide whether or not to appeal the case in the next few days. His decision, in part, will be based on whether or not the Canadian Amateur Radio community appears willing to provide financial support. Even if Jack does not appeal, there is still a need for money. Jack's own legal casts plus what he has been ordered to pay will add up to as much as $40 000. To date, the Canadian Amateur Radio community has donated some $18 000. In fighting for all of us in this precedent-setting case, Jack could be $22 000 out of pocket. We hope this makes you feel like writing a sizable cheque. Please send it to the JRSD Fund, Box 8873, Ottawa, Ontario, K1G 3J2. AR.

Jack was convicted of being a nuisance. In his *Reasons for Judgment*, Judge Hollinger of the District Court of Ontario stated: "The (DOC) tests indicate that several devices in the Plaintiff's residence are affected by the operation of the Defendant's radio station." He added: "The tests did not involve any determination of the extent to which modifications of the Plaintiffs' electrical devices would reduce or eliminate the interference," and concluded, "On the evidence before me, it would be difficult and probably impossible to completely suppress the Plaintiffs' equipment (sic) from interference caused by the Defendant's radio station."

Judge Hollinger was not moved by a defence argument, put forth by Communications Minister Masse in the letter that appeared in last month's Canadian News Fronts column. The Minister stated that the malfunction of various devices was '. . .not the result of improper operation of the amateur radio station, but rather the inability of these devices to adequately reject the amateur's transmissions." Instead, Judge Hollinger took the Minister to task for not doing his duty. He quoted Section 64.4 of the General Radio Regulations, Part II: "Where interference to the reception of radiocommunications is caused by the operation of an amateur station, the Minister may require that such steps be taken as are necessary for the prevention of the interference, and the operator of the station shall comply immediately with any such requirement." He added: "In the case before me, the Minister took no such action. In fact the Plaintiffs got relief only by way of an interlocutory injunction granted after an action was commenced." Now, that injunction is permanent.

You can only take so much. Jack and his family have been "through the mill" on this case for two years. No one will blame Jack if he decides not to appeal. Of course, we all hope he will, for his sake and ours. As mentioned in the CRRL bulletin, a major factor in Jack's thinking will be whether he feels he has the backing of the amateur radio community. We feel that he has.

Only hours after Judge Hollinger's decision was announced, CRRL was flooded with calls from amateurs asking for details and how could they help. One of the most unexpected and perhaps the most meaningful was from a group in Cincinnati, Ohio. Their concern was a poignant reminder that amateur radio is still a fraternity, and when the going gets tough, borders be damned and amateurs stick together. Then there was the Durham Amateur Radio Fleamarket. CRRL people, I'm proud to say, set up a special booth to collect $500 for Jack. It quickly became a nonpartisan effort. At various times the booth was manned by a CARF Ontario Director, the CRRL President and representatives of RSO. In five hours they collected $2300.

At press time, there were indications that commercial radio organisations and possibly even DOC were preparing to support Jack. However, these may not come through — and it is our battle.

So, what about you? If you're like me, you're probably sitting in front of two or three thousand dollars' worth of pretty nice radio equipment. It's a sobering thought that we could be put off the air because we were creating a problem in someone's home and it was the same situation as *Houghtby vs Ravenscroft* and the precedent was set. Surely it's worth $10 or $100 or more to ensure that we can remain on the air. Let's get to writing those cheques. —*Harry MacLean VE3GRO.*

JACK RAVENSCROFT UPDATE

Jack Ravenscroft VE3SR, has decided to appeal the Ontario District Court decision that put him off the air and made him responsible for damages and costs arising from "interference" in a neighbour's home. The actual appeal was filed on May 6, 1986. Although no additional court appearances will be involved, *the* appeal will *take many* months and cost between $10 000 and $20 000. Most amateurs understand the danger of leaving the court decision unchallenged. Any one of us could be next. It is unfair to expect Jack, who has incurred financial obligations of about $40 000 to date, to carry the burden for all of us. If you have not yet made a donation, please make one now. If you have made a donation, please consider making another one. Send your cheques to the JRSD Fund, Box 8873, Ottawa, ON K1G 3J2.

One reason for the unfortunate outcome in the Jack Ravenscroft case is that Canada has no RF susceptibility standards for consumer electronic equipment. Bill Loucks VE3AR, CRRL representative at a recent meeting of RABC's EMI Committee, reported little enthusiasm for such standards among most RABC members. Nevertheless, the work goes on. CRRL has endorsed an initiative by the executive of Ottawa Valley Mobile Radio Club, who contacted the Minister of Communications and the Minister of Consumer and Corporate Affairs, calling for standards to protect radio users and users of consumer electronic equipment. In addition, CRRL people are now working on a document, similar to one prepared by ARRL for FCC, calling not only for standards but for labels on consumer equipment, warning of possible RF susceptibility.

ARRL has filed a petition for reconsideration concerning the dismissal of its petition by the FCC Chief Engineer to require the labelling of home electronic equipment relative to its susceptibility to RFI. The Chief Engineer had stated in his dismissal that the Petition was premature as necessitating mandatory RF rejection standards. The League's Petition for Reconsideration disputes this, stating that *the labelling is independent of RF-susceptibility standards,* and *it would encourage voluntary compliance* by manufacturers without adding any additional work burden on the Commission. The labelling requirement would also serve to educate the consumer by suggesting that the consumer should contact the manufacturer for assistance in case of interference.

—*The above is reprinted from QST,* June 1986

RFI

The FCC's three-year-old inquiry into the problem of radio frequency interference, or RFI, is heading in what could be a very dangerous direction for amateur radio and other long-time users of the radio spectrum.

For decades, the Commission's approach to resolving interference problems has been based on the sensible doctrine that interference should be eliminated by correcting the technical inadequacies in the equipment. If the transmitter is radiating harmonic energy that causes television interference (TVI), fix the transmitter; if the problem is inadequate selectivity or shielding in the TV receiver, fix the TV set. Under this doctrine, interference to stereo systems, smoke detectors and other devices not intended to intercept RF radiation clearly is the responsibility of the manufacturer of that equipment, *not* of the transmitter *operator who is* unlucky enough to be nearby. When the roof leaks you don't blame the clouds, nor is the solution to legislate against rain.

Over the past several decades, thousands of grateful US amateurs have had their right to operate defended by the agency that granted their licenses: the Federal Communications Commission. The Commission's engineers have a fine record of coming to the aid of amateurs wrongly accused of being the source of their neighbours' problems. While the growth of CB-related interference has made it impossible for the FCC to provide the individual attention it once did, the Commission's staff has continued its efforts to educate the public as to the true nature of RFI and the shortcomings of consumer-electronic devices. For example, more than 240 000 copies of the excellent FCC booklet, "How to Identify and Resolve Radio-TV Interference Problems," have been distributed since 1977. By contrast, the response of the industry responsible for the existence of the problem, the companies that reap millions of dollars in profits from the sale of RFI "time bombs" to unsuspecting consumers, has been to deny that a problem exists. Had the industry spent as much on engineers as it has on lawyers and lobbyists, that booklet would be much less in demand.

When it opened Docket 78-369 with a Notice of Inquiry in 1978 (see March 1979, *QST*), the FCC said it wanted to examine in detail every aspect of RFI. It posed a massive set of questions to which answers were sought, dealing with consumer issues, engineering issues, and the experience of other government agencies. Unfortunately, a whole category of potential questions somehow was overlooked: questions which might have sought information from the operators of Commission-licensed transmitters. Even so, the response was such that it took more than two years for the Commission to analyse it and issue a Further Notice of Inquiry (see "Happenings" September 1981, *QST*).

The Further Notice is encouraging on several counts. It is clear that the Commission does not buy industry arguments that a problem does not exist, and that it recognises the danger in the increasing presence of microprocessors in every-

day life — microprocessors that not only may be susceptible to RFI, but may even *generate* enough RF to cause interference. There is even some cause for optimism on the TVI front, according to the Commission, because the Electronic Industries Association (EIA) has published a bulletin which suggests procedures for testing the susceptibility of TV tuners to front-end overload and which contains a recommended level of performance. Unfortunately, the bulletin ". . .is not an EIA recommended standard and manufacturers are under no obligation to adopt its suggestions." Furthermore, it does not address the problem of interference that enters the TV set via a path other than the antenna terminals. Still, it is a start, and some television manufacturers are making a good-faith effort to comply with the EIA bulletin despite the fact that their cut-rate competition is not obliged to follow suit. Of course, this does nothing to solve other RFI problems, such as audio rectification.

What is troubling about the Further Notice is that in outlining its policy options, the Commission appears all too willing to sacrifice the mandate of the Communications Act, that the FCC is to ". . .generally encourage the larger and more effective use of radio in the public interest. . .", on the altar of short-term economic expediency. Some of the options apparently under consideration (otherwise, why publish them?) would place burdens on the operators of radio transmitters that are simply Indefensible on technical grounds, and the choice of options apparently is to be based on economic, not engineering, considerations.

The most offensive policy option would make operators of radio transmitters responsible for resolving interference problems, *regardless of technical fault.* The supporting rationale is that this would ". . .shift the responsibilit y for interference control from the government to the affected parties. . ." and would provide an ". . .incentive (to) those transmitting interfering signals to avoid interference." (Of course, where the transmitter is radiating spurious emissions that "incentive" already exists.) Elsewhere, the Commission's report provides an eloquent argument *against* this particular option:

The incentive of equipment manufacturers to redesign their equipment is weakened or eliminated if, as interference problems arise, the Commission moves to eliminate the interference in other ways, for example, by placing responsibility on the transmitter. . .Not only is the incentive to manufacturers reduced but such action may inhibit the fullest possible use of the spectrum.

The logic of this argument is unassailable, and if the Commission's deeds matched these words we would have little to worry about. However, in at least *three recent cases* the FCC has acted in violation of that logic. Paging services operating near 43 MHz are not being granted permanent authorisations to operate because of *poorly shielded IF stages in home television receivers.* Expansion of noncommercial FM service is being inhibited because of *inadequate adjacent band selectivity in TV sets* tuned to channel 6. Inland waterways operators adjacent to TV channel 13 will be fully responsible for TVI that results from the same cause.

It's time for the FCC to abandon this stop-gap, ill-advised approach that results in vast amounts of spectrum being held hostage to inadequate receiver design. It's time for the consumer-electronics manufacturers, who sell their equipment on the promise that it will give good performance to the purchaser, to accept responsibility if that performanc is not delivered. If the responsibility is not assumed voluntarily, it's time it was made a condition of doing business in the electronic marketplace. *—David Sumner K1ZZ.*

—The above is reprinted from QST, September 1981

MASSACHUSETTS ATTORNEY GENERAL AGREES WITH LEAGUE ON RFI

Earlier this year the Town of Andover, Massachusetts, began revising its local zoning ordinances. One of the proposed provisions provided certain "operating requirements" for "amateur communication antennae." This section was as follows:

"a. The operation of any device authorised by the Board shall not cause interference to neighbouring television and radio reception and, if such occurs anytime after installation, the applicant shall, in a timely manner and at his expense, correct the cause of the interference as determined by a qualified engineer/technician.

League Headquarters was made aware of this proposal by Ed Fleischer K1JRE, who attended hearings but tried in vain to reason with the members of the Andover Planning Board. Ed argued that amateurs in the community could not accept such conditions and that, in any event, the Board was pinning the blame for RFI on the wrong parties. Nevertheless, the Board passed the ordinance and submitted it to the Massachusetts Attorney General for approval.

Ed contacted Headquarters for help. It was fortunate that Massachusetts law requires that all new ordinances be approved by the State's Attorney General because this gave the League another opportunity to oppose the ordinance. The ordinance was not yet "water over the dam."

Chris Imlay N3AKD, of the ARRL General Counsel's staff, appealed to Assistance Attorney General Henry F O'Connell. According to Imlay, the Town of Andover did not have the legal authority to regulate matters of radio frequency interference. "In addition," Imlay wrote, "it places upon amateurs a burden over which they have absolutely no control. The problem of radio frequency interference results not from any fault or effect of amateur radio transmitters, but from the inability of home entertainment electronic devices to reject unwanted signals."

O'Connell and the State Attorney General, Francis X Belloti, agreed. In a letter dated September 8 and addressed to Elden R Salter, Town Clerk of Andover, the Assistant Attorney General stated:

"Paragraph 3(a) seeks to regulate amateur radio equipment and any interference resulting therefrom. The Federal Government has adopted a comprehensive scheme for the assignment of frequencies and the prevention of interference phenomena. (47 USC §§151 *et seq.*) (47 CFR 97.73, 97.131, 97.133). *See Schroeder v The Municipal Court of the Los Cerritos Judicial District,* 73 Cal App 3d 841, 141 Cal Rptr 85,87 (1977), appeal denied 435 US 990 (1978). A local community may not legislate in this area."

Attached to the letter was a statement signed by Attorney General Belloti declaring that the proposed insertion of paragraph 3(a) "is stricken and deleted therefrom."

VOLUNTARY TV/RFI STANDARDS

The Ad Hoc Committee on Public Law 97-259, sponsored by American National Standards Committee C-63, has produced its first voluntary standards for RFI immunity in TV sets and video recorders. These standards specify an immunity level guideline of one volt/metre to be used by manufacturers of TVs and VCRs. They are a tentative first step, and some committee members feel that it may not go far enough. Others worry that it will not be adopted by manufacturers. However, other participants think manufacturers have already begun to design the standards into the next wave of equipment. Among the participants in the Ad Hoc Committee were representatives of the Electronic Industries Association, the FCC and the Institute of Electrical and Electronic Engineers, and ARRL Atlantic Division Director Hugh Turnbull W3ABC.

—Above reprinted from QST, May 1986

MORE ON FCC PRE-EMPTION OF RFI

ARRL Counsel Chris Imlay N3AKD, wrote to the FCC for an option concerning a new ordinance enacted by the Township of Ewing, in Mercer County, New Jersey. The ordinance provides that it shall be unlawful for any person to transmit any radio signals that interfere with home electronic equipment in such a manner as to disturb the peace, enjoyment or general well-being of others. Imlay said in his letter that the question of interference is completely pre-empted by federal regulation and the Township's ordinance is invalid.

The Commission's reply, written by General Counsel Jack Smith, agreed completely with Imlay's assertions. The Commission stated that under the provisions of the Communications Act, the Commission has the authority to establish minimum performance standards for home-entertainment equipment. The Commission further noted that the rules in Part 97 "delineate the technical standards for operating amateur radio stations. State and local laws that either require amateurs to cease operation or pay fines when interference occurs conflict with our regulatory scheme. This is especially true when amateurs, who are fully complying with our rules, *must cease operation* or *operate at technical levels below* those established in our rules in order to avoid state or local sanctions." Copies of the Commission's letter are available from Headquarters upon receipt of an SASE. And what do the Township officials think of the FCC letter? Headquarters understands that the ordinance is in the process of being rescinded.

—Above reprinted from *QST,* June 1986

TV INTERFERENCE TRACKED DOWN

KADINA — For several months many Channel 10 viewers have been annoyed by reception problems, caused by a faulty antenna in the town.

Last week the source of the trouble was tracked down and rectified by a technician from O'Connel's Electronic Services, Jim Baker.

Jim, who is an amateur radio operator, has been suspected by neighbours of causing a nuisance and says he is tired of people knocking on his door at all hours of the night to complain.

O'Connel's also had numerous complaints from people who thought the fault was in their own television sets.

The store allowed Jim time to track down the offending antenna. This he did by attenuating antennae input to a portable TV set in his van, and driving round Kadina streets and lanes in a diminishing circle to find where the interference was strongest.

After approximately two hours Jim located the trouble at a home in Ewing Street, where the TV antenna wasn't connected correctly to the booster. It took him only a matter of minutes to adjust the antenna, free, as a service by O'Connel's to the community.

—Reprinted from *Amateur Radio*

RFI & EMI STUDIES

I am a professional engineer and consulting scientist mainly working with the government and military in electronic design and system engineering Some of my work involves RFI and EMI studies and the development of measures for the prevention of RFI and EMI.

Consumer electronic devices are designed as inexpensively as possible for the performance of their intended task without regard to RFI or EMI. For example, I have attempted to use my home computer in the amateur radio room without success because of interference to my receiver. Naturally, the computer wasn't intended to operate alongside a communications receiver. A related situation came about when we were performing a series of acceptance tests on a military VHF receiver. A hand-held calculator caused so much hash that we could not use it inside our screen room.

As time goes by we will see more and more consumer electronic devices coming into existence in the home and business, all of which will create pollution of the airwaves. Currently, one can fly over any urban area and note the almost overpowering RF pollution on a tunable HF or VHF receiver.

Keep up the good work, and press forward with the FCC for the establishment of stronger measures and responsibility regarding RFI and EMI enforcement and control. This should include every type of device. Special emphasis should be given to those that are powered from the 120-volt line, as they are usually the most serious offenders. *—Dick Schellenbach N1JF, Reading, Massachusetts.*

WHAT THE MINISTER SAID

Frustration. It's press time and the outcome of the Jack Ravenscroft case if still not known. Jack VE3SR, is the Ottawa-area amateur who was sued for $35 000 for allegedly interfering with a neighbour's furnace control, microwave oven and home-entertainment equipment. The following letter was presented as evidence at the trial. It was

written last summer, by the Minister of Communications, to the plaintiffs. At that time, the plaintiffs were applying pressure to have Jack's amateur radio licence suspended. We think the letter is instructive. It shows that DOC is willing to become involved in a case, even at the highest levels, and that DOC tries to be helpful and fair. Read on.

Under Section 4.(1)(d) of the Radio Act, I do have the discretion to suspend or revoke a radio licence when the operator has willfully failed to operate the station in accordance with the Radio Regulations or with the conditions of his licence.

The malfunction of various devices in your residence is not the result of the improper operation of the amateur radio station but rather the inability of these devices to adequately reject the amateur's transmissions. Manufacturers in Canada and abroad are aware of the need to design any item using solid state electronics to operate satisfactorily in the presence of radio waves, but often have chosen to modify affected units as a lower cost alternative to including the added protection in all units sold. It has been my staff's experience that problems, when they occur, can be resolved.

I understand that officials of my Department have assisted in the investigation of the problems with your furnace, electric organ and, to some extent, your microwave oven. Representatives of the manufacturers and retailers of these devices have been able to eliminate the interference to the electric organ. Unfortunately, tests with the microwave oven have proved inconclusive. I also understand that you wish no further tests, or modifications to your electrical devices, even though these are necessary to technically resolve the interference.

The regulations made under the Radio Act concerning interference are designed to provide protection to the reception of radio communications. All the electrical devices in your home investigated to date are not used for radiocommunications purposes, resulting in my Department's involvement being limited to that of a technical advisor to the manufacturers and their service agents.

As this matter is somewhat beyond my jurisdiction and with incomplete tests on the devices involved, I am sure you can appreciate why I cannot revoke your neighbour's radio licence.

I realise that you have elected to seek legal solution before the courts. I encourage you, however, to participate in further tests as proposed by my Ontario Regional Director. . .as the best means to achieve a satisfactory solution.

Yours sincerely,
Marcel Masse

—The above is reprinted from *QST*, May 1986

The ARRL has petitioned the FCC to *require the labelling of home equipment relative to its susceptibility to radio- frequency interference.* The petition requests that the Commission *require* that a tag or notice be attached to home electronics devices or their instruction manuals to indicate whether the device incorporates shielding, filtering or circuitry designed to reduce its susceptibility to nearby radio transmitters. The tag or label also would warn the owner that the device may be subject to radio-frequency interference.

—The above is reprinted from *QST*, June 1986

The following letter was received from David Brownsey VK4AFA, in reference to the November EMC column. It is a true story of one of David's experiences.

It was a Saturday afternoon, and as a secretary of a large radio club I was attempting to answer some unattended correspondence. Progress was hindered by a steady stream of unwelcome door-knockers reminding me that the roof of my house needed renewing, my soul was in dire need of repentance, a donation to a school raffle was required and I needed some home product to make my home smell beautiful!

I settled down once again, however this was short-lived by yet another knock on the door. At this stage of the afternoon I was about to inflict both verbal and bodily damage on the next caller. I dragged open the door and was met with the words: "You are causing interference on my television." He nodded his head towards my 10 metre quarter-wave vertical (homebrew) on the roof and the 80 metre long-wire attached to the toilet exhaust pipe. "You're an amateur, aren't you?" It was Fred (not his real name), a resident from one of the flats a few doors down the road.

I explained that I was not even transmitting, however Fred persisted that I was causing interference as I was an amateur.

By this time, after counting to 10 several times, I decided violence was not appropriate and a little public relations for amateur radio was needed. I inquired what symptoms Fred was experiencing — the picture was going up and down, and from left to right; intermittently disappearing then coming good. Also, there was sometimes a green band appearing across the screen. (I must remind readers that Fred was stone-cold sober).

I asked if he was receiving a picture that resembled looking through a Venetian blind, that was moving, and was there any distorted speech?

"No! Not at all," and Fred reiterated the symptoms as described previously.

From my experience of servicing televisions for nearly 20 years, and assisting fellow-amateurs with RFI and TVI problems for a shorter period, I was convinced Fred had television and aerial problems.

Diversion is a marvellous thing so I said that I had better go and check my television and see if I had similar problems. My television, a 28 cm portable, was rock-steady — a near perfect picture. I returned to the front door contemplating what to do next.

I told Fred that my television was okay and suggested that I come and have a look at his set taking my portable (an alignment tool, pliers, cutters and screwdriver were also included).

Both televisions were tuned to the same channel and it was not long before Fred's picture began losing the vertical and horizontal hold adjustments. I commented that the vertical and horizontal holds required adjustment and offered to adjust them for him.

The back was already off the set and I was looking for the adjustments when Fred immediately pointed them out to me. (I was beginning to get the impression that Fred had been there, done that before!). A small adjustment on both pots made the picture rock-steady on all channels. I settled back waiting for the picture to disappear in the next breeze. I didn't have to wait long.

A visit to the lead-in wire was in order — it was 300 ohm ribbon attached to the outdoor antenna with a stand-off insulator halfway down the side of the house, complete with three very badly corroded and twisted dry joints under the house. I showed Fred these bad connections and explained that the whole lead-in needed to be replaced. However, in the meantime, I would replace these joints to give him service.

We retired to the television sets again, waiting for any further faults to occur (especially the one giving the green band across the picture) — the colour crystal was off frequency but did not show itself in my presence.

Fred's wife came to the rescue with many cups of black coffee and biscuits whilst both sets remained rock-steady.

We *called it a day* and a very sheepish Fred showed me to the front door — promising to let me know if the green band reappeared.

Oh yes — the correspondence was completed the next day after the door bell was disconnected!

er

QSP

DATAFLASH OPERATIONAL

AUSSAT is now transmitting *Dataflash* for the Department of Aviation. *Dataflash* is a satellite communication system especially set-up for the Department to their design and development. It is used for the transmission of flight plan and meteorological data, making many manual telegraphic systems redundant.

This year, the Department of Aviation has allowed a budget of $8.97 million for rental payments to AUSSAT for the lease of four transponders.

Australian Ladies Amateur Radio Association

Joy Collis VK2EBX
PUBLICITY OFFICER, ALARA
Box 22, Yeoval, NSW. 2868

ALARA CONTEST

What a pleasure it was, in the 1986 ALARA Contest to catch up with some of our DX members and friends, many of whom we have had no contact with for a considerable time. One of the things that helped to make this contest even more enjoyable than the previous years.

Unfortunately, I was unable to be one of those well organised ladies (and there were some), who had their household chores done, meals pre-cooked, etc, and could devote their time to the contest without worrying about such mundane matters! However, as the OM was reasonably understanding, I was able to keep work to an absolute minimum and spend a fair amount of the 24-hours in the radio shack.

As always, the contest was well run, and friendly, and most comments received have been very favourable. Each year, more and more OMs join us, and we would like to thank all those who did so this year for their support and participation, which did so much to make our contest a success.

The only adverse comment I have received came from an OM who stated that he had listened and called on the CW end of the Novice bands at various times during the contest without receiving any response. While this was disappointing, i do feel that, largely as a result of coaching and encouragement from Mavis VK3KS, over several months, more YLs felt confident enough to attempt CW contacts than in previous years. We all owe Mavis a big vote of thanks for her efforts.

Our Contest Manager, Marlene VK2KFQ, has received more logs than last year, coming from every Australian State, ZL, G, VE, W and FK8. This year, also, there is a winner for the Florence McKenzie Memorial Trophy. We hope to have the results in next month's AR.

OUTSTANDING SERVICE PLAQUES

Three ALARA ladies have recently been awarded a plaque for *Outstanding Service to ALARA*. They are Marlene VK5QO, Valda VK3DVT and Helene VK7HD. Congratulations to all of you on a well-deserved award.

GET-TOGETHER

An ALARA Get-Together is planned for 1987 — September 25-27. The venue will be Adelaide.

Our first Get-Together in September 1984 was very successful. We are sure our second will be just an enjoyable.

The following letter has been received from Ian Hunt VK5QX.

"There has been some comment regarding the Federal Contest Manager's column in *Amateur Radio* magazine for June 1986.

"to ensure that the record is set straight, I wish to provide the following information.

"My column stated that — 'I am most supportive of those ladies who do so much to assist us mere OMs, particularly when it comes to such things as social functions, providing food for us on field days, etc.'

"I stand by my comment regarding this aspect of matters. The ladies referred to do a great deal for us OMs. My wife has always encouraged me in my hobby. In fact, if it was not for her I would not have the top class amateur radio station that I do have nor the excellent shack accommodation with carpet and curtains in a completely separate building to our home.

"My wife always makes sure that I have enough food and drink to take with me on field days and provides me with a constant supply of same in the shack during other contests.

"Probably, nearly all our amateur radio social functions would be a complete flop if it was not for the support provided to such functions by the YLs and wives.

"In my column, I was writing about all the ladies, not just those who hold tickets. I do not *just appreciate* them, I *support* them in their efforts. My words were specifically chosen to indicate this.

"I also went on in my column in June *Amateur Radio* to comment on the matter of fitting amateur radio in with family life. This mention should surely indicate something. I believe that quite a lot of the OM operators should give this aspect of things a little more thought too. My feeling is that the YLs are usually far more sensitive to this matter. However, I digress somewhat.

"With regard to the YLs, you might note that there is around one and a quarter percent of YL operators amongst the WIA membership. On this basis the YLs are doing very well and certainly making their contribution.

"If there were an average of 10 members in each WIA Divisional Council (VK1-7) that would make 70 total. (There is not that many incidentally). Thus, one could expect, on a pro-rata basis, that there would be less than one YL involved overall. In fact, to my knowledge there are at least three currently as members of Divisional Councils, and only fairly recently, at least two others have been so involved. At Federal level, there is also Brenda VK3KT. There have been two YL Divisional presidents to date.

"I have also observed the fine work done by YL operators each year in connection with stations in the *Red Cross River Murray Canoe Marathon* and this, under very trying conditions at times too.

"So, just keep on with your good work ladies. The record is already there to be seen and you do not really have to prove your worth or anything to anybody.

"I might claim, though, that this FCM (whose words were recently described in an amateur radio magazine as condescending claptrap) has done as much, if not more, than any previous FCM to provide publicity and encouragement for the ALARA Contest.

"This same person was also responsible, in some measure, for encouraging our much loved and appreciated Divisional President, Jennifer VK5ANW, onto the VK5 Divisional Council. I have really enjoyed watching her develop her capabilities to become one of our best Divisional Presidents, ever.

"Incidentally, you might note that Joy VK2EBX, in her *ALARA Notes* in February 1986 *Amateur Radio* hinted at the sort of situation also alluded to me when she described what occurred after she emerged from the shack after the ALARA Contest as follows: 'I was greeted by the male members of the household with sighs of relief, and such remarks as "At last" and "What time's dinner?"

"Maybe a YL can make such comments and perhaps an OM should no do so! Even so, 'Vive la difference!"'

Well, Ian. We certainly did not mean to upset you with any remarks of ours, and quoting further from the ALARA column in February 1986 AR:

"We were most appreciative of the many menfolk who joined us in making this fifth contest the best yet, sparing no effort to give us valuable contacts, and those unsung heroes — the OMs (mine among them) who minded the children, cooked the meals, washed dishes, and made frequent cuppas so that we could participate to the fullest."

We all appreciate and acknowledge the support and assistance we have received from the majority of OMs (not forgetting yourself, Ian).

Undoubtedly, things have changed a great deal from the early days when, in 1919, the VK5 Division decided (in consultation with other States) "This Institute at present is unable to admit lady members." (*The First Sixty Years — 1919 to 1980* by Marlene Austin VK5QO, October 1985 AR).

Now, as you point out, the VK5 Divisional President is a woman — Jenny Warrington VK5ANW.

We are also most appreciative of the space given us in *Amateur Radio* each month, and the way in which our column is set out.

As you say, Ian — "Vive la difference."

ALARA AWARD

Certificates and Stickers issued since October 1986 are as follows. All endorsements for FK8FA are for 14 MHz SSB.

NO	DATE 1986	NAME & CALL	STICKERS
95	Oct 14	Robert A Park ZL2-259 (SWL)	1
121	Nov 20	Nev Cowgill VK2NEV	
122	Nov 21	Daryl Quirk L30444 (SWL)	2
123	Dec 10	Nathan Rosan W2-6893 (SWL)	
124	Dec 10	Aimee Tuband FK8FA	3

Until next month, Joy VK2EBX.

PUBLICATION AWARDS

Each year at their December meeting, the Publications Committee decides the prestigious awards for published articles in different categories that have appeared in *Amateur Radio* during the year.

Congratulations are extended to the following contributors.

TECHNICAL AWARD

Drew Diamond VK3XU, for his constructional articles — "A Four Watt CW Transmitter" and "A Direct Conversion Receiver."

The Committee recommended an honourable mention be made for Ken Kimberley's series on both the "A 10 MHz Frequency Reference" and "A Square Wave Generator."

AL SHAWSMITH JOURNALISTIC AWARD

"Field Days Can Be Fun" contributed by John Hampel VK5SJ.

HIGGINBOTHAM AWARD

Jointly by Jim Linton VK3PC and Roger Harrison VK2ZTB, for their discussion paper "Amateur Radio — Future Direction."

Congratulations are extended to all the recipients and *will your name be considered or appear* as a winner this year? Write that pet project, experience or item of interest now, so it may be shared by the readers of the magazine and maybe catch the eye of the Committee for the 1987 AR Awards.

Awards

Ken Hall VK5AKH
FEDERAL AWARDS MANAGER
St George's Rectory, Alberton, SA. 5014

RL 50 JUBILEE AWARD

The RL 50 Jubilee Award is an official diploma issued by the *Reseau Luxembourgeois des Amateurs d'Ondes Courtes* (RL), a member society of the IARU. The award is to commemorate its 50the anniversary in 1987.

The award is available to licensed radio amateurs and shortwave listeners. It is issued to those who have contacted or heard Luxembourg amateur radio stations between January 1, 1987 and December 31, 1987.

Non-European stations must attain five points to be eligible for the award. A contact with an LX station counts as one point. A contact with LX0RL or LX50RL (authorisation pending) counts as five points. An LX station may be counted only once per band.

There are no restrictions in band or mode.

Cost of the award is five IRCs, US$2, 100 Lux F or DM 5.

An application accompanied by an extract of the log, certified by the Awards Manager, a club official or two licensed amateurs, should be sent to: Reseau Luxembourgeois des Amateurs d'Ondes Courtes, Awards Manager, PO Box 1352, L-1013 Luxembourg, Luxembourg before July 31, 1988.

THE LUXEMBOURG AWARD

The LX Award has been issued since 1970 by the *Reseau Luxembourgeois des Amateurs d'Ondes Courtes, (RL),* in commemoration of 50 years of radio amateur activity in the Grand-Duchy of Luxembourg.

The Award is available to licensed amateurs and shortwave listeners.

All LX contacts made by radio amateurs since January 1, 1951 count for the LX Award.

The Award is issued in two sections:

The HF Award: Applicants must provide proof of having obtained the following number of points — Non-European stations 20 points. Each contact on 14, 18, 21, 24 and 28 MHz counts as one point. Each contact on 1.8, 3.5, 7 and 10 MHz counts as two points. If the same station has been worked on all HF bands, non-European stations may count 15 points.

The VHF Award (30 MHz and above): Applicants must provide proof of having obtained a total of 30 points. Contacts on 144 MHz count as three points. Contacts on 432 MHz and above count five points. Contacts via earthbound repeaters are not valid.

The same station may be worked once on each band in different modes. There are no restrictions on mode.

Applicants should submit a list showing the date, station worked or heard, time, band and mode, duly certified by two licensed radio amateurs or by the Awards Manager of their society.

Applicants to be sent to: Reseau Luxembourgeois des Amateurs d'Ondes Courtes, The Awards Manager, PO Box 1352, L-1013 Luxembourg.

Fee for the award is 10 IRCs, US$4 or 200 Lux F

Any dispute concerning the LX Award shall be settled definitely by the Board of the RL.

EUROPEAN COMMUNITY AWARD

The European Community Award is an official diploma by the Reseau Luxembourgeois des Amateurs d'Ondes Courtes, in order to commemorate the 25th anniversary of the European Community, and is available to all licensed amateurs and shortwave listeners.

Each contact made with a station from one of the member countries of the European Community, made on or after the day of the country's entry into the European Community, count as one point.

— each station may be counted only once.

— no more than 20 percent of the points may be obtained by contacts with one and the same member country.

— a contact with the special station LX0RL may replace a missing contact with any of the member countries.

— contacts made via active earthbound reflectors or repeaters may not be counted.

— there are no band or mode restrictions.

— non-European stations must amass 50 points; each member country must be worked at least once; three LX stations must also be worked.

Applicants shall submit a GCR-list confirmed by two licensed amateurs, or by one club official or by a notary. However, in case of doubt, the diploma manager may ask the applicant to submit QSL cards for checking purposes.

Application fee is 150 Lux F, 10 IRCs, US$4 or 7 DM.

Applications to be sent to the Diploma Manager, PO Box 1352, L-1013 Luxembourg.

The following list gives the names of member countries of the European Community and the date of their entry.

March 25, 1957
DL Federal Republic of Germany; I Italy (including IS and IT); ON Belgium; F France (including FC); LX Luxembourg and PA Netherlands.

January 1, 1973
EI Ireland; OZ Denmark and G United Kingdom (including GD, GJ, GM, GU and GW).

January 1, 1981
SV Greece.

January 1, 1986
EA Spain and CT Portugal.

RECENT JUBILEE 150 CERTIFICATES AWARDED as at December 26, 1986

873	VK1KRD	874	SM0DEN
875	4Z4VG	876	F6IFE[1]
877	VK2EDQ	878	JJ2TBO
879	VK4FLH	880	OA6DA[2]
881	YC0PHM	882	YC8VHS
883	YB8VM	884	YC3BXK/8
885	YC7DF	886	YB7ZXX
887	YB7BC	888	YC7CR
889	YC7DX	890	YC7ZAF
891	YC7BS	892	YC7ZAC
893	YB3CEV	894	VK5NAM
896	JR1KQW	897	JK3DGX
898	JA1WVK	899	JM3ADQ
900	YC0BOX	901	K8IRY
902	W3WYP/DU2[3]	903	ZL2BCX
904	N6DOC	905	JR1IAD
906	JG7BFJ	907	JA7BSD
908	YC8QY	909	YC8TR
910	YC8SP	911	VK5IV
912	YB3CDL	913	VK4AOH
914	G3KLL	915	A Thompson SWL
916	V85HG	917	WA3NGM
918	DG7GK	919	JL3PVU
921	VK2MAP	922	VK2KFW
927	VK6AKU[4]	928	VK5BAR
936	VK5KGS	939	G4WQW
940	V85IR	941	SM4JEV
942	KA5VZP	943	SM7MPM
944	G4VIO	947	VK3AUM
948	VK5NOT	951	G3ABI
952	YO4JQ[5]	953	VK2NEV
954	VK6DY	956	AP2DM
957	LA1JDA	958	DU9RG
959	4X4DK	960	W6PHF
961	IK6GPZ[6]	962	G4WFZ
963	G0BMU	964	SM6LIF
965	VK3DRC	966	VK2VZB
967	JA3EQO/2	968	ZL2AAI
969	JA1MS	970	VK6APM
971	ZL3ADC	972	ON6HR[7]
973	DV2EG	974	JA3UCO
975	LA2ZN	976	YB5QZ
977	JA5IOQ	978	JA2EQO/2
979	YC7NI	980	9N1MC
986	VK6ADU	987	ONL4003
988	YB2IDX	989	G3ZBA
990	OE1PPC[8]	991	HB9AIB[9]
992	DF7UB	993	ZL4LD
994	9M2GH	995	G0CAK
996	IK3FHP	997	G0AWF
998	KS2F	999	I2EOW
1001	G3CPT	1002	N0GXA
1003	KA8ESO/VE8	1004	4X6RA
1009	VK2DYS	1011	YC0SY
1012	YD0NII	1013	G4YJH
1014	FK025AT	1015	VK7KMR
1016	VK3CCB	1017	VK5NWM
1018	VK6NPH	1019	VK4BAJ
1020	VK2POI	1022	VK2PWS
1023	VK5AIL[10]	1026	VK4BMP
1028	VK5NAV	1029	VK4NMA
1030	VK2SJ	1040	VK2MIT
1044	VK5AGX	1045	VK8NHM
1046	GM4VMV	1047	GM4XLU
1048	VK5ADO	1049	VK5NBM
1052	VK2PUP	1055	P McMillan SWL
1056	4Z4IK	1057	YC9VDT
1058	VU2VVC[11]	1059	JH8QAI
1060	JA3JN	1061	JG2VIV
1062	JJ1KTI	1063	JA8BCE
1064	PA0XPQ[12]	1065	KA2CC[13]
1066	GM4LDU	1067	G4ZZK
1068	VK3PHP	1069	VK3PUA
1070	JA0EBV	1071	JR6FYS
1072	JH5CKV	1073	JE3SSL
1074	JN3HFR	1075	JH2UZR
1076	JR1CTA	1077	N6CGB
1078	VK4VIS	1079	VK3PMO
1080	VK2CWG	1081	BY1QH[14]
1062	Y36TG[15]	1083	ZL3JU
1084	ZL3OQ	1085	ZL2ANT
1086	ZL1AMR		

1 First France
2 First Peru
3 First Philippines
4 First Six metre band
5 First Rumania
6 First Italy
7 First Belgium
8 First Austria
9 First Sweden
10 First CW QRP
11 First India
12 First Holland
13 First US Forces in Japan
14 First China
15 First DDR

WIA 75 AWARD

Applications for this award will not be accepted after March 31, 1987. Claims continue to trickle in, but the time has come for this highly successful award to be closed.

FURTHER WIA 75 AWARD RECIPIENTS

682 H Loeqman YC3FNL
683 Sergi Amburger VK1NAS
684 Sjohor H Daud YC7CR
685 Sonny Soemarsono YB3WC
686 Mh Faried YC3ENT
687 T Nusrat Kusuma YC0KRC
688 Hildegard Djojoseputro YC3CA
689 Hendro Santoso YC3GE
690 Slamet Faisal YC3MRX
691 Awik Asnawi YC3CCM
692 Arman Mallolongan YC8CDK
693 I Ketut Yadnya (Jim) YC9BEL
694 Leopold Dunajewski SP3BYZ

—Contributed by Jim Linton VK3PC, WIA 75 Award Manager & Maxine Conheady

AMATEUR TELEVISION AWARD OF QUEENSLAND

This award is presented by the South East Queensland Amateur Television Group Inc, for sustained excellence at ATV. The award is available on reception of a completed log showing ATV activity on the 70 cm band and above, according to the rules. Assistance with tube postage is requested and $1, or equivalent, shall accompany the submitted log sheet.

The award shall be available for points accrued on, or after, January 1, 1987. No recognition of activity prior to this date for the purposes of this award shall be given.

Separate awards shall be available for the transmission and reception of ATV signals.

Points Score: Repeater contacts — one point (maximum of 50 points). Simplex contacts — a) up to 30 km: five points, b) over 30 km: 10 points, c) portable: 20 points. Minimum award points — 200.

RULES

1 Only one contact with a given station each day may count towards the score. However the same

station may be worked on that day using a different ATV frequency.
2 Points may be claimed for the positive identification of any ATV transmission.
3 The award operates on the "honour system" and no QSL cards, etc, are required. The log sheet requires that transmissions be acknowledged by the receiving station.
4 The awards shall be administered by the Awards Manager, who shall seek the support of the management committee in the event of a dispute.

All applications for this award shall be addressed to: The Awards Manager, SEQATV Group, PO Box 3, Chermside, Old. 4032.

—Contributed by Tom Ivins VK4ABA, Secretary, SEQATV Group Inc

GB2SDD CALLING THE WORLD

The Saint David's Day Special Event Station will again be operational on March 1, 1987, to celebrate the National Day of Wales.

The Special Event Station will be operational from midnight Saturday, February 28, to midnight, Sunday, March 1, 1987. Activity, conditions permitting, will be on all HF and VHF amateur bands.

A team of enthusiastic operators will be pleased to make contact with all- comers and, as always, will endeavour to send greetings t as many countries as possible world-wide. All are cordially invited to join the celebrations!

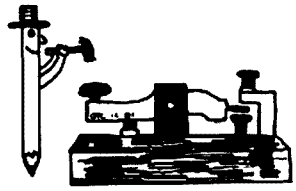
The Special Event OSL Card will be sent to all amateurs making contact with the Saint David's Day Station and replies will be sent to SWLs. IRCs would be appreciated if cards are required by return post.

All licenced amateurs operators interested in the attractive Saint David's Day Award should aim to meet the following requirements:

Contact should be made with the Special Event Station on Saint David's Day, March 1, 1987, and five other Welsh amateur station during the months of March, April and May 1987.

To claim the award, forward copies of your logged contacts together with 10 IRCs, to cover postage and packing, to: Event Co-Ordinator Mr R R Jones GW4HOQ, 'Bryn-Ynys', 13 Strawberry Place, Morriston, Swansea, West Glam. SA6 7AG.

ar



Pounding Brass

Gilbert Griffith VK3CGG
7 Church Street, Bright, Vic. 3741

Welcome to Pounding Brass *1987. DE VK3CGG, name Gil, QTH Bright in NE Victoria (near Porepunkah).*

I hope you will welcome me, and that my efforts bring you as much pleasure as my reading of this column have in the past. I will have to try to keep up to Marshall's standards, so let's hope that my being such a newcomer to the ranks of *Amateur Radio* will allow me to pass on a few of my learning experiences while they are still fresh in my mind.

Needless to say, I was very surprised when Bill Rice rang me with the news that Marshall was retiring and would I take over the *Pounding Brass* column. It really is a great honour to be selected and I hope I can live up to it.

So, where do I start?

I have been licensed for two years now, and about 90 percent of my operating is CW. VHF and UHF are not too successful here surrounded with the mountains, so about 10 percent of my time is on the local repeaters.

I will take the opportunity, as this is my first column, to thank a very few of the people who helped me get started as a *Knight of the Key.* Ron VK2DQR (VK2BWI), for his slow Morse, was the SCLLact/allfirst copied by me on September 6, 1984. Thanks to the VK2 and VK5 WIA Slow Morse Broadcasts, as I was able to pass both examinations in the November 1984 sitting. Then came the hard part — getting on air. For their example, patience and advice, I will thank Clive VK3CQL, Merv VK3GZ, Bill VK7NRV, Dennis VK2DET, Vic VK5AGX and the many other operators who slowed down and gave me encouragement through my mistakes when the key seemed to have a mind of its own. Thanks Ian VK5QX, the Federal Contest Manager, who has, through his column and personal letters, interested me in contesting.

Contesting is really *the* way to learn fast. Even though, while sitting for hours in a 'test I often say to myself that it is a lot of hard work and not much fun, especially when things are a little quiet, I think I get the enjoyment from meeting new people, sharpening up my ears, and (hopefully) increasing my skills. Most of the effort goes into the shack well before a contest in making sure that the station is in order. I have heard of stations suffering serious breakdowns during a contest, the prospect is so frightening I really hope it never happens to you.

Thanks to the hundreds of operators I have worked over the last two years. Especially those on the Friday night CW Net, Phil VK3CDU, Bill ZL4QY, David VK3DVW, Bob VK3AOX, Michael VK3AWX, Les VK3BPW, John VK3CAL, Mario VK3NI, Maurie VK3CWB, and others. Netting is not a great favourite of mine as I prefer a long ragchew, but there are friends to keep up with and skills to be learned, including plenty of gossip and receiving practice on a net. You must learn to keep on the controllers exact frequency, and to operate the RIT effectively so that you don't miss the callers who are off frequency a little. One day, I will attempt controlling a net, a fairly difficult job to do property, I would think!

Please feel free to write to me with your ideas, experiences, questions and answers. I think I will need all the help I can get. I will certainly answer all letters.

Back to business — I have been doing a lot of reading and going through plenty of old magazines for material, and, just to prove that no matter how enthusiastic one is, you will find that someone has probably said or done it before.

The following is from *QST,* August 1933, by N I Hall W8TI. It won the article contest prize for the month, too.

Gaining Code Speed

Who wants to increase his code speed? The answer is unanimous. All of us! The only reason we don't is that we hate to practice. But suppose we can increase it without practice. Sounds fine but how do we do it? Suppose that your operating speed is 10 WPM and that *all* of the other amateurs send 15 WPM or above. If you were even half an amateur, it wouldn't e long until you were doing 15 WPM with the rest of them. If you will grant me that, I'll prove to you that gaining code speed is fun and not a drudgery.

We are all looking for something to take the monotony out of the ordinary QSO. What could be better than improving both our sending and receiving speeds. Get your fist warmed up by calling and chewing the rag with operators faster than yourself. The next time you tune over the dial for a CQ to answer, wait until you hear one who is right up to the limit of your receiving ability or even a little above. Go back to him at just as near as his speed as you can send and still send code that sounds like English. Too many amateurs use the slogan that "Good 'slow' code is better than poor 'fast' code" when their slogan should be "Good 'fast' code is better than good 'slow' code."

If you are one of the fellows who can't send as fast as you can receive, buy yourself a good secondhand bug. It is a small price to pay compared to the satisfaction you will get out of it. Or for those who are mechanically minded, make your own bug. It is really easy. I made one myself, which proves it, hi. Receiving is every bit as easy as sending. Just make it a rule to talk to the operators who send fast enough to give you some real practice.

When you get a good operator, instead of giving a report on his signals and saying 73, get him chewing the rag about gaining code speed, his sending, how he holds the key, etc.

Let the other fellow tell you to slow down if you are sending too fast for him or for the receiving conditions. Remember the Q signal for send slower is QRS, not QRM or QRN. No one was ever called a lid because he sent too fast, if he sent good code.

That is it for this month, it is lunchtime right now on Christmas Eve so I had better see if I can get this to the post office before the deadline.

A belated Merry Crystals and a Happy New Gear to all!

W6EY & W2CA — SKs

Honorary ARRL Vice-President, J L (Mac) McCargar W6EY, passed away on October 26, 1986 at the age of 90. Mac was the Pacific Division Director from 1938-1946 and ARRL Vice-President from 1946-1950.

Harold P Westerman W2CA, passed away late last year. He was an early employee of the ARRL, joining in 1926 to conduct the Technical Information Service, and from 1928-9 was Assistant Technical Editor.

—From *The ARRL Letter,* November 11, 1986

DXAC TURNS THUMBS DOWN ON ARUBA

DX Advisory Committee Chairman, W4FRU, advises the the Committee's vote on separate DXCC country status for Aruba (P4) was a tiel According to DXAC rules, this defeats the motion. Thus, Aruba will continue to count for the Netherlands Antilles listing which includes Curacao and Bonaire.

—From *The ARRL Letter,* November 11, 1986

Contests

Ian Hunt VK5QX
FEDERAL CONTEST MANAGER
Box 1234, GPO, Adelaide, SA. 5001

CONTEST CALENDAR

FEBRUARY

1	YL ISSB CW Contest (concludes)
7- 8	RSGB 7 MHz Phone Contest (Rules this issue)
7- 8	QCWA CW QSO Party
14-15	Dutch "PACC" Contest
14-16	YLRL YL-OM Phone Contest
20-22	CQ WW 160 metre SSB Contest
21-22	ARRL DX CW Contest
28	RSGB 7 MHz CW Contest (commences) (Rules this issue)
28	French Phone Contest (commences) (Rules this issue)
28	YLRL YL-OM CW Contest (commences)

MARCH

1	RSGB 7 MHz CW Contest (concludes)
1	French Phone Contest (concludes)
2	YLRL YL-OM CW Contest (concludes)
7- 8	ARRL DX Phone Contest
7- 8	QCWA Phone QSO Party
14-15	John Moyle Memorial Field Day Contest (Rules this issue)
21-22	YL ISSB Phone Party (Rules this issue)
21-23	BARTG Spring RTTY Contest
28-29	CQ WW WPX SSB Contest

ARRL DX CONTESTS

I have not received a copy of the rules for these contests. It is unlikely though that rules will have been changed from last year. You can check last year's rules by referring to those which I published in the January 1986 issue of *Amateur Radio*.

Rules for other contests mentioned in the calendar are also not to hand as I am preparing these notes quite early. I would hope that early submission of my notes may be of help while some difficulty could perhaps be experienced without Ken VK3AH, immediately at hand to see to the production of the magazine. I have only just heard of his accident and trust that by the time you are reading this Ken will be back and pretty well mended. We do appreciate all the work you put into the production of a magazine well looked upon by people all over the world, Ken. I often receive comments from overseas stations whilst running my many regular scheds, particularly to the USA and they are always complimentary of *Amateur Radio*.

Should you need more details of rules for contests, it often pays to go back through back issues of the magazine, as most of the major overseas contests are fairly well established and their rules change very little from year to year. There seems to be a general reluctance on the part of many of the overseas contest organisers to send out, in advance, the details of their contests. The lead-time for publication is probably enough of a problem for them to overcome for their own publication purposes without them worrying about other magazines. It could also be that, when the contests are run by "commercial" amateur radio magazines, they do not wish to provide too much copy for others. Naturally, such magazines are really in competition with the various magazines published by the national amateur radio societies in the various countries.

I realise that it is only human nature that, if you can find what you want on one magazine you will not run out to buy the same thing again in another magazine.

These are just a few points you may care to bear in mind.

By now we *are well into* the New Year and I *hope* that I will have caught up on the preparation and distribution of all certificates for both 1985 and 1986, once again. The former have been made out for quite some time, however, for certain reasons they have all been delayed in being mailed out. So, if you are due for a certificate for any of the contests — do not give up hope! All is being attended to, albeit somewhat slowly.

In the December issue, I stated that I still had some further comments provided by entrants in the 1986 Remembrance Day Contest to publish. I now provide these additional comments for your interest.

Was pleased to get a cross-mode contact with you in snappy time. We did a little more operating this year, being on two bands at the same time where compatibility allowed, as Mavis could use the Ten-Tec while I used the old Collins (now 22 years old and with the band-switch wafers replaced). However, we took our full sleep time. Hi. —VK3XB

Some of my contacts have RST reports as well as serial numbers. If the rules are to be taken to the letter, then all contacts that would be acceptable as valid QSOs for awards; ie has a report, would be not allowed for the contest. . .Operation for this contest took place from Wemla in Central Victoria. . .Power source there is a Honda generator, which refused to start for about two hours and so it was dark before I even got an antenna up. —VK3AUQ

Bands were pretty lousy here. —VK7AL

Sorry about my poor effort, reason is that my QTH is in a deep valley with hills 200-300 feet all round and within half-a-mile of my shack. . .Most of my contacts had to be arranged through our local repeater (VK3RBA). —VK3XEX

a) A number of rough notes, one typical of early 1920s. b) An even greater number of stuttering electronic or bug keys operated by persons with glass arms. c) Several bouncing keying relays noted. d) No chirpy signals. e) Electronic keys with dots too fast and too light. f) One or two speed merchants over did it and floundered. HI. g) QSB on 14 MHz deep and rapid. h) Nothing on 21 MHz or 28 MHz. —VK4XW.

As usual a lot of fun this contest. Also, we had good conditions. HI — no thunderstorm this year. —VK4DD.

I have been on amateur radio since May 1984 and this is the third occasion I have submitted a log — always for CW operation only. —VK3DVW.

Just two small logs this year in what was again an enjoyable contest. —VK2TR.

Enjoyed the contest using 10 watts to a dipole and only working stations calling CQ. Surprised at the lack of Novice call signs, but I guess many have upgraded. —VK2AZR

I enjoyed the contest more this year having met the same call signs again in the RD. Although only a call sign — a familiar one is a friendly one. —VK2KL

I was a Full Time Net Controller in Royal Armoured Corps, 5th Reconnaissance Regt 1942-47 and have always had a leaning to radio and now have the time to enjoy it. . .I enjoyed the contest the second time since becoming licenced. —VK3NB

160 — heard some, worked none. 80 — band very crowded on the Saturday naught. 40 — band crowded at times, depending on time of day or night. 20 — few stations, but poor propagation throughout VK. 15 & 10 — no stations heard or worked. 2 — mainly operation on 146.500 FM, some on 146.550 MHz. Caused some pile-ups and time wastage when a new call sign appeared. —VK4ADC.

I thoroughly enjoyed the contest and was pleased to see good manners exhibited at all times. My only problem was a computer which let me down badly two-thirds of the way through. I hope that my log-keeping system will be more refined next year, but while it was running the computer really made easy work of detecting dupes. Of recent time in AR there seems to have been only one program included for contests. I wonder if you could use your influence to get a program included to cover the RD Contest and perhaps one that would run on the, now very popular, Commodore 128 format. —VK6YA (Any suggestions or contributions? ? ? —FCM)

So, I guess that pretty well wraps up the Remembrance Day Contest for 1986. There were a few other comments which I have not included in this column. I am grateful for the expressions of appreciation which many letters carried regarding the duties performed by myself as Federal Contest Manager and I thank those concerned for same. I would like to say that, whilst carrying the responsibility for this function may at times seem to have some minor drawbacks, the satisfaction derived from doing something which I believe allows me to try and put back into amateur radio a little of what I have derived from the hobby over the past 28 years, more than repays any effort involved. Likewise, I would encourage you too in any moves towards working for the benefit of our hobby from local club level through to accepting federal appointments in our national organisation, the Wireless Institute of Australia. What amateur radio becomes in the future in this country depends on what you, the individual amateur, makes it today.

One query which has arisen, pretty well a perennial one, is the question as to why points for CW operation in the RD Contest are not worth more than for Phone contacts. Once again I must explain that:

a) The Phone Section and CW Section are totally separated. In other words, entrants in any one section are competing in that section only.

b) More to the point perhaps, the method of scoring so as to determine the winning Division for the contest would become unbalanced should any particular mode be singled out for "loaded" points.

Yes, I can perhaps understand that there may be a certain amount of extra effort involved in making CW contacts as against phone contacts. It surely would not be a sensible thing to make each CW contact worth 100 times that of a phone contact, would it? So, if you think about it, even making the points for CW double that of Phone is also somewhat pointless. In other words, that approach would still be based on the same rationale. If you are competing in any section you are competing equally with all others, but only in that section.

I trust that you will enjoy your contesting activities during 1987.

—73 de Ian VK5QX

JOHN MOYLE MEMORIAL NATIONAL FIELD DAY CONTEST 1987

CONTEST PERIOD: From 0100 UTC, March 14 to 0700 UTC, March 15, 1987.

OBJECT: To encourage portable operation on the amateur bands by Australian operators. This form of activity is intended to help operators become familiar with portable operation and thus assist in training them for preparedness in emergency situations. Emphasis is placed on working between field day/local VK stations in a manner as might be expected in an emergency situation.

CALL AREA DEFINITION: a Within ones own call area. VK1 to VK1 etc.

b Outside ones call area. VK1 to VK2; VK1 to ZL etc.

RULES:

1. DIVISIONS: There will be TWO DIVISIONS — a) 24-hours and b) 6-hours. In each division the operating period must be continuous within the time period allocated for the contest.

2. SECTIONS: In each Division there will be separate SECTIONS as follows:

a) Portable Field Station, transmitting phone, single operator
b) Portable Field Station, transmitting CW, single operator
c) Portable Field Station, transmitting open, single operator
d) Portable Field Station, transmitting phone, multi-operator
e) Portable Field Station, transmitting CW, multi-operator
f) Portable Field Station, transmitting open, multi-operator
g) Portable Field Station, transmitting VHF
h) Home Transmitting Station, emergency powered
i) Home Transmitting Station, mains powered
j) Receiving Stations

3. STATION DEFINITION: A **Portable Field** Station is one which operates from a power supply which is independent of any permanent installation. The power source must be fully portable, ie batteries, solar panels, wind or motor generators, etc. A station located in an automobile and completely self-contained, apart from antennas, is classed as being portable, whether in motion or not.

A **Single Operator** Station is one where the work involved in setting up the station is carried out by one operator and where this operator is the one who makes all contest contacts from the station. This does not, however, preclude the operator from having minimal support such as a log keeper, provision of food and drink, etc. This definition debars such practices as entering a Club Station using a single operator with massive support, in

competition with stations which are set up and operated by an individual operator in the normal sense of the word.
It is considered that the terminology of Multi-operator Station is self explanatory.
4. INSTALLATION: No radio apparatus, including mast, antennas, feeder cables, etc, may be erected on the site more than 24-hours before the contestant/s begin/s operating.
5. BANDS: All amateur bands may be used with the exception of the 10, 18 and 24 MHz bands.
6. CONTACTS: Cross band contacts are not permitted. Cross mode contacts are permissible, however they will count only as phone contacts for scoring purposes.
7. THE SIZE of any portable field day station shall be restricted to approximately that of an 800 metre diameter circle.
8. MULTI-OPERATOR STATIONS: Such stations will provide a separate log for each band. Only one transmitter may be used on a given band at any one time, be it operating in a phone or CW mode. Only one call sign may be used from a multi-operator station.
9. NUMBER EXCHANGE: The exchange between stations will consist of a number/letter combination comprising the RS/T report as applicable, followed by a serial number commencing with 001 and increasing by one for every contact. Should the number 999 be reached, the series must then be re- commenced at 001. Following the serial number, a letter must be added indicating the Section (a) through (l) in which the station is competing. eg Number sent by a multi-operator station transmitting phone for the first contact would be 59001D. Both serial numbers sent and received must be recorded in the station log.
10. SCORING: For Portable Field Stations — CONTACTS WITHIN AUSTRALIA:
a) Portable/Mobile outside entrants call area — 20 points
b) Portable/Mobile within entrants call area — 15 points
c) Home Stations/Section H outside entrants call area — 10 points
d) Home Stations/Section H within entrants call area — five points
e) Home Stations/Section I outside entrants call area — two points
f) Home Stations/Section I within entrants call area — one point
— CONTACTS OUTSIDE AUSTRALIA:
g) Contacts with overseas stations, ie other than VK — two points
For Home Stations/Emergency Powered — CONTACTS WITHIN AUSTRALIA:
a) Portable/Mobile outside entrants call area — 15 points
b) Portable/Mobile within entrants call area — 10 points
c) Home Stations/Section H irrespective of call area — five points
d) Home Stations/Section I irrespective of call area — one point
NOTE: Home Stations/Emergency Powered must operate independently of mains power. Such a proviso serves to further the aims of the WIA to prepare operators for emergency situations.
For Home Stations/Mains Powered — CONTACTS WITHIN AUSTRALIA:
a) Portable/Mobile outside entrants call area — 10points
b) Portable/Mobile within entrants call area — five points
c) Home Stations/Section H irrespective of call area — one point

11. VHF/UHF MULTIPLIERS: For contacts made on frequencies from the 50MHz band and upwards, the QSO points score for each contact is multiplied as per the following table:

DISTANCE	MULTIPLIER
Under 50 kilometres	1
50 — 150 kilometres	5
150 — 300 kilometres	10
over 300 kilometres	20

12. BONUS POINTS: For any contact made using a NATURAL power source, a bonus score of 10 points may be added. A natural power source is regarded as one where power is derived from such as solar cells, wind, methane gas, etc, as well as from batteries which are completely charged by natural means. All power produced under this category must have been derived independently of commercial mains or the use of petroleum derivatives.
13. CW CONTACTS: CW to CW contacts earn double points. These points must be shown as claimed on the log sheet prior to the application of any multiplier or bonus points. *NOTE:* See below regarding CW Trophy under Rule 22.
14. REPEAT CONTACTS: Portable Field Stations and Home Stations under Section H may contact other stations within these categories (Section A to H) provided that a period of at least three hours has elapsed since the last contact with the station concerned. Home stations operating under Section I may be contacted provided that a period of at least six hours has elapsed. This applies for each band and mode. In the case of Portable Field Stations operating in the NZART Field Day Contest, repeat contacts are allowed provided a period of one hour has elapsed since the previous contact.
15. RECEIVING STATIONS: Stations in this section must record the serial number being sent by any of the stations operating in the contest within Sections A to G inclusive. QSO points scoring will be on the same basis as for Home Stations/ Section I as per Rule 10 above. VHF/UHF Multipliers and Bonus Points as indicated under Rules 11 and 12 also apply.
16. REPEATERS: Operation through any active earth repeaters is not allowed for contact purposes, however, the use of such is allowable for the purpose of making contact arrangements. Contacts made using orbiting satellites or EME as a medium are acceptable.
17. MODES OF OPERATION: AM, FM, and SSB all count as PHONE operation. RTTY and CW are both regarded as being CW. It would not be expected that more exotic modes, such as SSTV or Fast Scan television would be used in this contest.
18. LOG FORMAT: All logs shall be set out under the following headings and in the order shown:
Date; Time UTC; Call Sign; Band; Mode; RS/T Sent; RS/T Received; QSO Points; Multiplier; Bonus Points; Total Points Claimed.
NOTE: The last three columns need only be shown where applicable. Contacts must be listed in order of Time and Serial Number. Each log page must also carry a progressive Total Points Score Claimed at the bottom of each sheet.
Scores Claimed must be calculated by first multiplying the QSO Points Score as taken from Rule 10 by any applicable multiplier from Rule 11 and then adding any Bonus Points as per Rule 12.
19. SUMMARY SHEET: A Summary Sheet must be included which indicates the following details:
For each contact for which a multiplier is applicable, the Serial Number of the contact and also details of the respective stations locations which apply to the contact. Such details must include either latitude/longitude references for each station or some satisfactory proof by such as a map reference or distance calculation as to the distance over which the QSO was conducted. For Bonus Points to be claimed, suitable evidence must be provided as to the method of Natural Power Generation employed. Such evidence could take the form of a photograph of the generating equipment used or a signed statement by another amateur showing his call sign, declaring that he has inspected the generating equipment referred to.
20. FRONT SHEET: Each log must be accompanied by a Front Cover Sheet which provides the following information:
Name; Address; Call Sign; Division (six or 24 hour); Section (A to J); Number of Contacts; Claimed Score. This sheet must also indicate station location, equipment used, power generating system employed and in the case of Multi-operator Stations, a list of operators names and call signs, together with their signatures.
This Front Sheet must also carry a declaration signed by a licensed amateur as follows:
DECLARATION — I hereby certify that this station was operated in accordance with the rules and spirit of the contest. Signed. . . . . . Date. . . . . .
21. MULTIPLE STATION OPERATION: In the case of operators who have entered the contest in the six hour Single Operator Section it is allowable for them, upon their return to their Home Station, to make contacts with portable field stations. For this purpose they must submit a separate log which will be regarded as a Check Log only; ie they cannot enter into more than one section of the contest for competitive purposes. Operators who are interested in providing more field day activity are encourages to adopt this practice where possible. It should be noted however, that the practice of Multi-operator Station participants considering themselves to be portable stations and making contacts with the portable field contest station so as to bolster that station's score is deemed to be *not in the spirit of the contest,* and, as such, contravenes the intent of Rule 20.
22. CERTIFICATES AND TROPHY: Certificates will be awarded to the winner of each section in both the six and 24 hour Divisions of the contest. The six hour certificates cannot be won by the 24 hour entrants. The Contest Manager also reserves the right to award other certificates where the effort made by a particular station is of special worthiness.
The Highest CW Scorer outright in the contest, irrespective of the section of the contest entered, will receive a trophy in the form of the President's Cup to hold for a period of 12 months. This award is intended as an encouragement to operators to utilise the CW mode whenever possible.
23. DISQUALIFICATION: The general Contest Disqualification Criteria, as published on page 44 of *Amateur Radio* for August 1985, apply to this contest. It is again pointed out that you should read the above rules properly so as to understand them and ensure that your log does comply with the contest rules laid down.
24. LOG SUBMISSION: Logs should be forwarded to the Federal Contest Manager, Box 1234, GPO, Adelaide, SA. 5001. The front of the envelope should be endorsed John Moyle Memorial Field Day Contest. Closing date for entries is April 27, 1987.

I recently received a letter from an operator who intends to enter the Field Day Contest. Amongst his queries was one in regard to the rule concerning the use of *Natural Power* and whether it is permissible for entrants to arrive *with fully charged batteries and use the solar and/or wind devices to top them up during the contest.*

Well, I must admit that I have tried to steer clear of complicating the rules with too much detail, however, I had to address the query and feel that I have done so in a fair manner. So as to provide some guidance along such lines to others, I have decided to publish the relevant portion of my letter, as follows:

With regard to the matter of natural power sources, I can only put it to you in the following manner.

In any of the amateur radio contests that I know of, the organisers, and I am no exception, can only depend on the entrants themselves as far as "fair" behaviour is concerned.

To further explain this statement, one can have no real control over the actions of all who enter a contest. They could use higher power than is legal, set up QSOs where it is against rules, use unlicensed operators or do any manner of things along such lines.

The main idea of contests is to provide fun, challenge, experience, etc, and if people wish to do things which circumvent such an approach there is not much that can be done about it. About all that I can do, as Contest Manager, is to provide a reasonable set of rules, check logs as well as I can after entry and tabulate the results as I see them. (At the same time, trying not to make too many mistakes).

So, having said all the above, I realise that you still need some guidance.

I have purposely, until now, steered clear of providing too much in the way of definitions and spelling things out to the last degree where rules are concerned. I still would hope that I need not do so through the columns of *Amateur Radio.*

In the matter of prior charging of batteries, etc, the rules may be left open to interpretation. They do read, in part — "all power produced under this category must have been derived independently of commercial means or the use of petroleum derivatives."

If taken to the extreme, one could say that commercially made batteries are produced by use of petroleum sources, etc, and thus their use should not be allowed at all. However, I feel that to do so would be pedantic, to say the least.

I would prefer to leave the matter to each individual amateur to decide, based on his own fair interpretation; eg if you were running a station configuration which required an average 10 amps from the basic power source, such as a battery, and you had a nominal 100 amp-hour battery, you could expect around 10-hours of operation using same from a fully charged condition. If you attached a solar power source to the battery for charging purposes with a capability of one amp, you would be doing little to help your power supply problems.

Alternatively, if you provided a solar supply with a one amp capability to run a QRP rig of, say 500 milliwatts consumption, you would surely be achieving something.

Now, with respect to prior charging of the battery system, I would again leave it up to the individual.

In the first example quoted above, it would not improve the situation to any great degree unless you perhaps first of all flattened the battery completely prior to the contest and then spent the many hours charging it up using the solar source. Then you would, of course, use this battery with its slow trickle charge from your solar supply until such time as the whole system went flat. At this stage, you would go off the air as far as *Natural Power* was concerned. Possible, although perhaps a little unlikely! In the second case, even if you went out with a battery fully charged by normal means, you would obviously only be using power supplied by the solar source. In other words, the battery would be acting really as a component which provides a "filtering" function.

Thus you can see that there can be a wide range of possibilities which occur. The nature of the *Natural Power* rule is such as to encourage operators to devise new, interesting and useful alternatives for power sources.

So, I reiterate that one would expect those who participate in the Field Day Contest and wish to enter under the *Natural Power* proviso, to do so with a proper understanding of the rules and their aim and to conduct their entry in a fair and sportsmanlike manner.

I hope that this explanation will be of some help to you in making a decision as to how you plan your entry.

On further thought, I perhaps will publish a copy of this letter in my contest column as it may serve as a general guide to others as well as being of interest to many. In providing such comment I have followed my own self determined policy of trying to keep things as simple as possible, as well as retaining balance and fairness to all who may be concerned.

I trust that this year will see a successful start to the WIA sponsored and organised contests with the *John Moyle Memorial Field Day Contest* and that it will be a most enjoyable event for you. I certainly plan to be operating in the field day and I regard it as probably the best event of the year.

I will also be looking forward to receiving your comments and particularly any photographs you may send depicting your field day operations, along with your logs.

FRENCH DX CONTEST

CW: January 24-25. SSB: February 28-March 1.

Another case where I did not receive the rules in time for early publication. The rules for this contest have not changed from the format last year. It is still the rest of the world working the French Europeans, as well as the other French departments and territories all over the world. The French areas can usually be identified by the letter F in the prefix.

CLASSES: Single. operator and multi-operator. Multi-stations must stay on the same band for at least 15 minutes.

EXCHANGE: RS/T plus a three-figure number starting with 001. French stations will also include two figures or letters identifying their department.

POINTS: One point per contact between stations in the same continent, three points if with other continents.

MULTIPLIER: Each French European Department (95) and each overseas department and territory worked. Also DA1 and DA2 French Army, 2A and 2B Corsica and the Club Station F6REF

FINAL SCORE: Total QSO points from all five bands (3.5-28 MHz) times the sum of the multipliers *from each* band.

AWARDS: Certificates to the top scorers in each country. European single operators must make at least 100 QSOs; multi-operators 250 QSOs. All other areas 50 QSOs for single operator, 100 QSOs for multi-operator. Stations making over 250 contacts must include a dupe check sheet with their log. The usual disqualification rules for excessive duplicate contacts and other violations will be strictly enforced. All entries must be postmarked no later than March 5 for CW and April 5 for SSB.

LOGS TO: This year's logs go to the REF Contest Committee, Att: Lucien Aubry F8TM, 53 Rue Marceau, 91120 Palaiseau, France.

YL ISSB QSO PARTY

SSB: March 21-22, 0001 UTC Saturday, to 2359 UTC Sunday.

(The CW section of this contest was held from January 31 to February 1). The party is open to all, but emphasis is on membership participation.

CATEGORIES: Single operator, DX-US Partners and YL-OM Teams.

EXCHANGE: Call, RS/T, QTH (state, province, territory, district or country), Name, ISSB number, YL-OM team-mate, DX-US partner.

POINTS: One point for non-member contacts, three points for member contact on the same continent and six points if in a different continent.

MULTIPLIER: Only contacts with a member station count as a multiplier. There are 10 different categories. Get the list from WA9AEA.

FREQUENCIES: The *General* portions of the CW and Phone bands, 10 to 80 metres. Avoid 14.332 MHz used by the ISSB Net. Check 40 and 80 hourly.

AWARDS: Category and QTH area winners.

LOGS: Should be set out as outlined in the Exchange and should indicate at least two six-hour rest periods.

SUMMARY SHEET: Showing the scoring and other essential information would be helpful. Mailing for all entries is April 30 1987 and they should be mailed to: Bill Early WA9AEA, PO Box 401, McHenry, Il. USA. 60050-0401.

(Note: Rules and logging format are much too lengthy and complicated to list here. Strongly suggest that if you are interested you send a large SASE to WA9AEA for more details).

RSGB 7MHz SSB & CW CONTESTS 1987

All licenced amateurs are eligible to enter this contest.

TIMES — SSB: from 1200 UTC, February 2, to 0900 UTC February 8, 1987.

— CW: from 1200 UTC February 28, to 0900 UTC March 1, 1987.

BANDS — SSB: 7.040-7.100 MHz; CW: 7.000-7.030 MHz.

EXCHANGE — RS(T) plus serial number commencing at 001. When received, serial numbers from non-competing stations must be recorded.

SCORING — Non-European stations with British Isles stations 15 points per QSO. Note: contacts with aeronautical and maritime mobile stations will count five points per QSO, but not for multipliers.

MULTIPLIERS — Multipliers may be claimed for each British Isles prefix worked: G0, G2, G3, G4, G5, G6, G8, GD0, GD2, GD3, GD4, GD5, GD6, GD8, GI0, GI2, GI3, GI4, GI5, GI6, GI8, GJ0, GJ2, GJ3, GJ4, GJ5, GJ6, GJ8, GM0, GM2, GM3, GM4, GM5, GM6, GM8, GU0, GU2, GU3, GU4, GU5, GU6, GU8, GW0, GW2, GW3, GW4, GW5, GW6, GW8. In all a maximum of 49 can be claimed. Note the prefix GB cannot be claimed as a multiplier.

FINAL SCORE — QSO points multiplied by the number of multipliers claimed.

Logs — Log sheets should be headed date; time (UTC); call sign of station worked; RS(T) and serial number sent; RS(T) and serial number received; multiplier if claimed and QSO points. A separate sheet showing countries or prefixes claimed is also required. Unmarked duplicate contacts for which points have been claimed will be heavily penalised and logs containing more than five will normally be disqualified.

DECLARATION — Each log must be accompanied by the declaration: *"I declare that my station was operated in accordance with the rules of the contest and in accordance with my license."* The declaration must be signed and dated.

ENTRIES TO BE SENT TO — RSGB HF Contests Committee, PO Box 73, Lichfield, Staffs WS13 6UJ, England.

CLOSING DATE — SSB logs must be received by March 30, 1987. CW logs by April 27, 1987.

RECEIVING SECTION

Rules for the receiving section are the same as for above except as superseded below.

SCORING — Listeners should log only British Isles stations operating in the contest, and claim 15 points per QSO logged.

MULTIPLIERS — Are the same as for the transmitting section.

LOGS — Logs should be headed date; time (UTC); call sign of station heard; call station of the station being worked; report sent by station heard; multiplier if claimed and points. Note that in the column 'station worked' the same call sign may only appear once in every three contacts logged unless it is a new multiplier.

NOTE: VK3XB was listed as 14th in the 1986 Rest of the World CW Transmitting scores with a total of 660 points. The winner of the G6QB Trophy was Steve Taylor G4EDG. The SSB section winner was Keith Ginder G3NAS.

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NATIONAL SPRINT — 1986 RESULTS

Results of the inaugural National Sprint Contests, held on November 15 and 22, last year, have now been compiled. On behalf of the Adelaide Hills Amateur Radio Society and the VK5 Division of the WIA, congratulations are extended to the winners of the two trophies.

Overall winner of the 1986 National CW Sprint, and recipient of the trophy, was Ivor Stafford VK3XB, of Box Hill South. Ivor's log included no less than five DX contacts (three of them North America), which is an indication of what can be done with CW on 80 metres.

Overall winner of the 1986 National Phone Sprint, and recipient of the trophy, was John Hampel VI5SJ, of Glengowrie. John's log may, in part, be attributed to his almost constant presence on 80 metres in support of South Australia's J150 activities — and a lot of persistence.

The Sprints are regarded by the organisers as having been an outstanding success, and this feeling is echoed by many of the participants (see comments below). It is hoped that a suitable pair of weekends in July can be found for the 1987 event, on the basis that propagation may be better and the lack of Daylight Saving Time may persuade a few more VK6s to participate. Consideration is also being given to shortening the contest period to one hour.

As the entries show, there was a high level of participation by Novices, and many operators (not just the Novices) stated that it was the first contest they had ever entered. Amateurs in all call areas participated, though not all submitted logs. It was interesting to note the level of participation in the CW Sprint from VK4, which will take some beating next time.

Congratulations to all certificate winners, and thanks to all participating stations.

In the following list of logs received (printed in order of call sign and points claimed), an asterisk indicates the winners of certificate or trophies.

1986 NATIONAL CW SPRINT RESULTS

VK2CDG	7		
VK2ENX	10	VK4OL	23
VK2AIC	18	VK4VAD	25
VK2ZC *	32	VK4OD	25
		VK4APZ *	28
VK3AUQ	12		
VK3CGH	16	VK5TI	21
VK3JA	29	VK5ADX	31
VK3XB *	38	VK5ZN	37
		VK5FN *	37
VK4NCM	10		
VK4XX/MM	12	VK6AFW *	14
VK4BHR *	14		

VK4QY	20	VK7VV/QRP *	21
VK4SF/QRP	21		
VK4TT	22	VK8AV *	17
VK4BRZ	22		

VK4BHR, earned his certificate for perseverance and preparedness — main power supply was lost at the start and he continued on battery power.

Operators' comments (CW Sprint)

VK2CDG -- As a shift worker this concept may give me the opportunity to enter more contests.
VK2ZC -- Do hope in future events that more starters show up -- no doubt they will as the contest becomes known.
VK3AUQ -- Good points — not too long, simple rules, suits newcomers and contesters. Bad points — when I think of one I will let you know . . . hope you run it again in future.
VK3CGH -- A superb idea! I had a tot of fun taking part in my first CW contest . . . tried the CQ WW Test and got less contacts in 48 hours than I did in the 45 minutes of the Sprint.
VK3XB -- It was a good idea.
VK4NCM --. . . . first contest I've ever been in . . . An interesting exercise.
VK4BHR -- Never participated in a contest previously . . . the time had something to do with it . . . blew a fuse from the word go and operated from standby battery.
VK4QY -- It was most enjoyable, and everyone that I heard played the game fairly and squarely . . . Once a year not often enough -- how about every six months?
VK4SF/QRP --. . . great idea, and such a convenient time . . . haven't heard the band so alive with so many CW signals since the RD test. Hope you can have many more.
VK4BRZ -- Great idea! Hope to hear it is on next year, etc! etc!
VK4APZ --. . . . An event which I very much enjoyed . . . We all had lots of fun, and look forward to next year's contest.
VK5TI -- It was a great idea, CU NXT year.
VK5ZN -- It was a lot of fun and I sure look forward to the next one.
VK7VV/QRP --. . . certainly enjoyed it, something to be said for a short period scramble . . . Hope it grows each year.

1986 NATIONAL PHONE SPRINT RESULTS

VK2ENU	13		
VK2CJH	18	VK5KGS	22
VK2AIC	21	VK5FN	32
VK2ENX	27	VK5ADX	37
VK2LEE	29	VK5YX	40
VK2BQS	31	VK5QX	40
VK2CDG *	37	VK5AYD	44
		VK5SJ *	71
VK3JA	40		
VK3CRA *	40	VK6AFW	11
		VK6LD *	22
VK4OL	13		
VK4BIL	16	VK8AV *	24
VK4OD *	31		

Operator's Comments (Phone Sprint)

VK2BQS -- An interesting contest and very enjoyable perhaps the WIA should include the 'small ones' with (the register of contests) in the Call Book.
VK3CRA --. . . . two things going for it -- short time period and extremely simple rules/scoring . . . hope you persist with the event . . .
VK4BIL -- I'm not normally a contest man but I reckon the idea was great . . . thanks for a lot of fun.
VK4OD --. . . . thoroughly enjoyed them both, especially the CW. Perhaps it would be better to drop the signal report -- just a number exchange. All seem to give 599 even if they can just read you 439!
VK5QX -- Enjoyed the short, sharp contest for the first part . . . became somewhat boring towards the end. Maybe it could be reduced to about half an hour . . . eastern States should have an advantage . . . might receive more entrants during the winter months.
VK5AYD --. . . . enjoyed the spirit of the contest . . . Definitely a good thing, see you next year.

—Results supplied by Marshall Emm VK5FN, President, Adelaide Hills Amateur Society Inc

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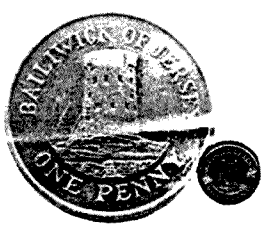


AMATEUR RADIO TOWER!

The following is a small article which appeared in the local press of Jersey. Channel Islands, Great Britain, received by Jock VK1LF from his niece, a resident of Jersey. Jock is an OT who held the call sign, GM4MV, in 1937 and still retains a call sign, GJ4MV, when he visits Jersey.

What, I hear you asking yourself, is he doing showing the obverse of a common-or-garden Jersey penny piece!

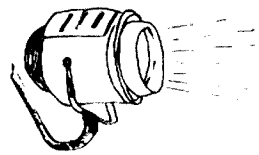
Well, in fact, this little coin is far from ordinary, for it is the only coin in the world that depicts an amateur radio station!

Le Hocq Tower is the headquarters and station for the Jersey Amateur Radio Society (JARS, as they are affectionately known), and it is here that they send and receive messages to and from all over the world.

Mr Ken Kirk-Bayley, is both a committee member and their PR man, and he is kept busy with the 70 or so overseas visitors which they get every year. The nice thing about amateurs is that, although one may be meeting an American, Japanese, Australian or whatever, for the first time, the stranger in the flesh may be a very old friend on the air. It is a hobby where there are no boundaries of country, race or creed.

One of the most amusing things about the Jersey penny is that Americans happily pay $1 for it in order to get it as a keepsake. JARS (call sign GJ3DVC), receive many letters asking for one of the little coins which include a dollar bill to cover postage.

So,when you dig into your pocket for change and see those small coins, don't cuss them and say how small and useless they are. To many, they are little works of art to be treasured as a picture of the amateur station in "old" Jersey.



Spotlight on SWLing

Robin Harwood VK7RH
52 Connaught Crescent, West Launceston, Tas. 7250

Christmas Eve 1986

Well, we are well into 1987 now. The Test Cricket has come and gone and the finals of the One Day series are about to be held. So too, has the Davis Cup. I cannot comment on the winners or losers, because as you can see, these are not known at deadline time. Radio Australia has been airing ball- by-ball descriptions live on 15.415 and 21.525 MHz. These come in handy for some of us, as the local television station decided to not telecast the Davis Cup, which certainly upset many locals.

This meant going back to the radio descriptions, which brought back a lot of memories of the good old days, when the whole country was riveted to Ted Schroeder's descriptions of the the exciting Davis Cup ties from Kooyong or White City. Why I sought the RA cricket descriptions was because the local ABC domestic networks were not broadcasting live commentaries, because of parliamentary commitments or public affairs programming.

I am one of those televiewers who prefer to hear the radio commentaries, rather than the comments of Grieg or Chappell. But I do not think that the ABC team is as good minus Alan McGilvray. Yet, I still prefer the audio to being constantly interrupted by extremely noisy commercials, in between overs. I also follow the descriptions of test matches in other countries, via shortwave. For instance, I was recently able to follow the tour of the Australians in India and the West Indies tour of Pakistan. There were some commentaries, but the commentators often broadcast in languages other than English. This winter, I expect that I shall be able to follow the test matches in England via the BBC World Service.

And whilst I am referring to the BBC World Service, I have received some advance information on their February programming. In January, they commenced a weekly program called "Computer World." Hosted by Hamish Robertson, this program aims to keep pace with the fast-changing world of information technology and other developments in micro-computers. Each program has been designed to keep the listener abreast of the latest developments, as well as assess the implications of the growing convergence of computers and information technology. You can hear the program at 2315, Mondays. It is repeated at 0145 and 0730 on Tuesdays. (Incidentally, all times quoted in this column are in UTC, unless otherwise stated).

Another program dealing with the wider field of technology for the 21st Century will be discussed by the BBC Science Unit from February 12, at 0145 or 0945.

The program "Assignment" will be reviewing the year of Cori Aquino's presidency of the Philippines during February. It can be heard at 2030 Wednesdays and repeated at 0230, 1130 and 1615. February 8, 1987, is the 400th Anniversary of the last queen of Scotland being beheaded. This was at the instigation of her cousin, Elizabeth I of England. This program traces the tragic story of her 44 years of life. You can hear it at 2330, Tuesday, February 10, or 0330, Thursday, February 12.

Incidentally, I do notice that the BBC are recommending some additional frequencies that can be tried for this area. 9.915 MHz, is available from 2200 until 0330 from a UK site. 7.325 MHz from 2300 until 0100 UTC.

By-the-way, I also noted that the BBC World Service is now regularly on 18.080 MHz from 0900 and comes in very well here. This sender formerly carried the BBC Asian Service and is located at Daventry. It certainly assists me to have what sites they are using, which I obtained from the International Listening Guide and not from the official BBC schedule.

Have you heard those weak stations with extremely bad audio down amongst the 7 MHz CW segment? Well, they have now been positively identified. The one that floats around 7.052 MHz is the clandestine *Voice of Malaysian Democracy* in Chinese and Bahasa Malay. It is unstable in frequency and is heard around 1130 UTC. The other station is further away in Sri Lanka, or in south-east India, near Madras and is on 7.010 MHz. It calls itself *The Voice of Tamil Eelam* and has been heard in Sydney, by Patrick McDonald, in English at around 1330.

I am also led to believe that they even have an address in Madras, yet the Malaysian clandestine does not have any, reportedly broadcasting from the Malaysian-Thai border.

Usually, my practice is to ignore pirate stations but I am interested in clandestine outlets. Remember a few years ago, I mentioned that I received the anti-Castro Cladestine *La Voz dell CID*, on 10 MHz and got a QSL card back in 18 months, after dispatching a report to their New York offices. The reply came from Costa Rica with no forwarding address. Lately, they are rarely heard because the US Government has an official anti-Castro clandestine voice — *Radio Marti* which is a part of the VOA operations.

I do recommend that you keep monitoring down around 6.2 MHz in our winter for some of the Central American clandestine outlets in Honduras, El Salvador and Costa Rica. The clandestine that is heard very well is on 4.120 MHz at 1200 UTC, is in Korean with the call sign of *The Voice of Reunification*. It claims to be in Seoul, South Korea, but is , in fact, in North Korea as intermodulation from another North Korean sender has been detected under the modulation. Also, programming is favourable to the north. The South Koreans have replied with a clandestine of their own — *Radio Echo*, on 6.348 MHz at 1000 UTC.

That is all for this month. Until next time, the very best of 73 and good listening! — Robin VK7RH.

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Education Notes

Brenda Edmonds VK3KT
Federal Education Officer
PO Box 883, Frankston, Vic. 3199

The insert in January AR notified members of DOC's proposal for devolvement of the Amateur Operator Examinations.

I think we must accept that the Department is unlikely to continue the present examinations system indefinitely unless fees are increased even more, to close the gap between examination costs and revenue. Figures quoted by DOC for the February 1986 examinations show a total cost of over $68 500, but receipt of less than $11 000 from fees. Although we may query the data used in arriving at this figure, it is apparent that the examinations have been a significant cost to the Department for many years.

The insert also noted the Executive's concern with the problems likely to arise if a large number of bodies are accredited as examiners. Some of these problems have been elaborated in a circular to divisions and clubs. Any members interested in this circular, but not having access to it, are welcome to request a copy from me.

Briefly, we are concerned that broad devolvement will lead to erosion of examination standards, and variation between standards established by different bodies; also that classes run by bodies with access to the Question Bank may be taught with reference only to the Bank and not to the whole syllabus. We are also concerned that the examinations may be seen as a source of revenue for individuals or institutions, so leading to high or uneven charges for them, and that the geographic spread of examining bodies may make things difficult for candidates in remote areas. Problems will also arise with CW examinations, and with maintenance and updating of the Question Bank if it is released.

We see it as vital that the examination system should be fair and equal for all candidates in both content and accessibility, and that the exams are available at reasonable frequency and cost.

I have previously raised the possibility of clubs or individuals being involved in the conduct of examinations set and marked by the Department. Most of the responses I received accepted this as a possibility, and several groups expressed willingness to assist. If DOC is prepared to continue to produce the papers, but allows the Institute to participate by arranging times, venues and supervisors, we would have the potential for exams by mutual agreement to suit a particular group or class, at weekends or in the evening. This is very nearly the 'exams on demand' for which we have been asking.

Other possible arrangements have been discussed at Executive meetings, including the American system of using registered Volunteer Examiners. Some of you may have seen the article on this system in *CQ* last November. This system might be less satisfactory here with only two grades of theory. We have also considered the idea that the Institute should accept the full responsibility for the whole examination system on a non-profit- making, but cost-recovery basis.

DOC has set a deadline of March 1, for submissions in response to their devolvement package. We would like to have as many replies as possible from members and groups by early February, so that opinions can be collated. Please give this matter your consideration and forward your views to your Federal Councillor, or to me, ASAP. Non-response will be assumed to mean that you will be satisfied with whatever action is taken by the Executive.

This is probably the most significant change to our hobby since the introduction of the Novice Licence. It is essential for the future of amateur radio that the Institute presents a logical, reasoned and reasonable submission that has been based on wide canvassing of members opinions.

I would like to thank all those who have already responded to my requests for opinions or offered comments on various educational issues. I am sorry that I do not always have time to reply individually, but your voices are being heard.

If you would like to discuss the above matters, the Education Net will be back on-air from February onwards — Thursday 1130 UTC, 3.680 MHz ±QRM. If writing, please note the new Post Office Box number above.

Best wishes to all sitting for the February exam. Remember — ***read the question***, and *all* the alternatives.

—73 Brenda VK3KT
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AMATEUR & NOVICE AMATEUR OPERATOR'S CERTIFICATE OF PROFICIENCY EXAMINATION RESULTS

August 19, 1986

CANDIDATES	NSW	ACT	VIC	QLD	SA/NT	WA	TAS	TOTAL
Section "M" (Theory) AOCP								
Sat	80	7	75	58	37	31	5	293
Passed	31	2	36	17	17	12	3	118
Section "O" (Theory) NAOCP								
Sat	44	1	60	34	16	17	8	180
Passed	20	0	28	22	7	9	6	92
Section "K" (Regulations) AOCP & NAOCP								
Sat	56	3	68	34	17	15	6	199
Passed	41	2	49	26	15	8	6	147
Section "LS" (Telegraphy — Sending) AOCP								
Sat	15	2	23	19	7	9	4	79
Passed	14	2	19	17	7	7	3	69
Section "LR" (Telegraphy — Receiving) AOCP								
Sat	32	5	49	28	12	15	5	146
Passed	11	1	16	13	6	3	1	51
Section "NS" (Telegraphy — Sending) NAOCP								
Sat	23	0	39	20	7	12	0	101
Passed	22	0	37	19	6	7	0	91
Section "NR" (Telegraphy — Receiving) NAOCP								
Sat	31	1	44	29	10	14	4	133
Passed	19	0	28	22	1	6	3	79

November 18, 1986

CANDIDATES	NSW	ACT	VIC	QLD	SA/NT	WA	TAS	TOTAL
Section "M" (Theory) AOCP								
Sat	86	8	90	62	41	38	6	331
Passed	40	2	28	23	14	13	1	121
Section "O" (Theory) NAOCP								
Sat	49	6	66	35	30	20	12	218
Passed	28	4	31	19	19	11	4	116
Section "K" (Regulations) AOCP & NAOCP								
Sat	45	4	76	34	28	27	13	227
Passed	30	2	60	19	26	20	7	164
Section "LS" (Telegraphy — Sending) AOCP								
Sat	26	4	25	14	8	9	4	90
Passed	17	2	19	10	7	5	4	64
Section "LR" (Telegraphy — Receiving) AOCP								
Sat	34	6	44	29	16	22	5	156
Passed	19	0	19	8	5	8	2	61
Section "NS" (Telegraphy — Sending) NAOCP								
Sat	24	5	26	13	15	14	0	97
Passed	18	4	23	10	11	6	0	72
Section "NR" (Telegraphy — Receiving) NAOCP								
Sat	33	5	41	17	18	28	0	142
Passed	18	4	27	9	10	14	0	82

LOUD SPEAKER — WORLD'S LARGEST
35 Foot Horn

—(From *Wireless Weekly* Special Correspondent)

"At Idora Park, a public amusement resort in California USA, wireless music is received and in order to make it audible over the whole park, a loudspeaker of rather startling proportions is used.

"The horn of this instrument is 35 feet long and the mouth is 12 feet square. This huge horn is in successful daily operation and the area over which it is heard has been computed as 29 square miles.

"Apart from its huge size, this loudspeaker, which is claimed to be the world's largest, is of absorbing interest, because of the facts that through the use of the electro-dynamic reproducer such true tones have been produced and there is practically no distortion."

Readers should note: The PA valve had only just come into common usage in 1922. They were inefficient by modern standards. A large number would have been needed to drive the above speaker.

—Published in *Wireless Weekly* November 17, 1922 and contributed by Alan Shawsmith VK4SS.

TECHNICAL MAILBOX

RETRACTION OF ADVICE!

Ted VK4AEM, VK2DCF and Ken VK2ATK, have all written regarding the "advice" given in the October 1986 *Mail Box* pertaining to breakers.

Unfortunately, it seems that the "advice" given was taken seriously! Perhaps we did err in this instance but it was hoped that the message would get across that to break into a conversation should not be treated lightly. It certainly was not the intent to point criticism towards another country. As one writer states we certainly "do not have a corner on arrogance in amateur operating". How true! ! ! If we did cause offence to any of our readers we apologise. It was hoped that the "advice" would have been seen as intended. . ."tongue in cheek".

PREVENTATIVE MAINTENANCE THAT WENT WRONG

VK4AFO, Malanda, Qld.

Aub, obviously mindful of the requirement for preventative maintenance on his TS-530S, has written detailing a "wild goose-chase fault" that overtook his rig unexpectedly.

Aub gives us a blow by blow description of how and why "the lights went out on his TS-530S."

For space considerations, here is his abbreviated story.

Inspection of the single fuse in the active mains lead following the failure revealed that it had expired rather violently. Replacing the fuse and trying again (tut tut!), served only to confirm he still had a problem! It was significant that the power switch (S9) had not been turned on. This observation narrowed the fault to the primary side of the transformer and indicated that the RF line filter capacitors or (shudder) the power transformer were faulty.

Aub then checked (with a multi-meter), from chassis to AC active lead and observed what appeared to initially be a *dead* short. This "short" however, was observed to increase in resistance indicating that a large filter capacitor was in fact being measured. This on the primary side of the transformer you may well ask! ! !

It turned out that, after cleaning the fan, Aub unfortunately allowed one leg of the 100 volt AC fan winding to come in contact with a 6146 plate cap. The insulation ultimately failed and thus a connection was made between the HT filter capacitor and was reflected in the "strange" multimeter reading. Fortunately, the fault was resolved with out any permanent damage to any component.

The moral surely is, when carrying out such necessary preventative maintenance, exercise all care. Do not keep feeding fuses into the rig but look for the fault in the dormant state. Finally, what appeared to be a strange multi-meter reading had a most logical conclusion. Thanks Aub.

BATTERY CHARGERS

VK3. . . Box Hill, Victoria

"Can I run my two-metre transceiver by using power from a 12 volt battery while the charger is connected? Are there any traps in doing this? I have heard some chargers can put out more than 12 volts. Is hum a problem?"

Well Ross, you probably have read in the *Technical Mailbox*, October 1986, of our *response* to a similar question which covers, in part, what you have asked.

It may be beneficial to enhance the point of employing a battery charger floating the battery whilst running the rig.

Having what could be typical of commonly available battery chargers, purchased from an Australia wide retail chain (a CW go ahead!), I decided to investigate further.

I disconnected the rigs and my 35 amp regulated supply and then connected the charger. I then fired up the CRO, checked the calibration and connected it across the battery. The charger leads were just over a metre in length and of wire that I would not have used for a five amp charger.

The picture that presented itself on the CRO was somewhat more dramatic than I anticipated.

Firstly, the ripple (noting that the battery is one sizable capacitor) was in the order of 2.5 volts peak-to-peak (as referenced to a DC voltage of 15.8 volts). The latter was a little difficult to ascertain due to the ripple content.

Not good! — but on closer inspection (by winding up the CRO intensity) spikes were evident. They were extremely narrow but their magnitude was alarmingly high. These spikes were in the order of +22.5 volts.

Ross, I think this provides you with the answer:

a the ripple will certainly enhance the possibility of hum appearing on your transmission,
b the spikes may just prevent your hum problem as the rig may have expired beforehand! ! !

Naturally, one cannot say that all rigs will be prone to such problems for power supply design (internal regulators), output transistors or RF/AF module characteristics, etc, all will have a bearing on their susceptibility to the ripple or spikes. However, it is clear that using a battery charger whilst operating the rig could be tempting fate.

My battery charger will ever remain as originally purchased — for the car alone, but this raises another point. . .What about all those ICs in the car electronics if you just happen to have the ignition turned on. . .?

As readers are now aware, we aim to include Technical Tips in this segment. If you have anything that would benefit us all please do not hesitate to drop us a line.

Following are a couple of tips from Gordon McDonald VK2ZAB, with our thanks.

FEEDING HELICALS

Text books tell us that standard, end-fire helical antennas have a feed impedance of about 138 ohms.

It is important to realise that this impedance is obtained at the periphery of the helix only and if the end near the back screen is bent in to the centre to meet with a coaxial connector mounted there, the feed impedance seen by the feeder will not be 138 ohms.

Furthermore, radiation from the bent section will interfere with radiation from the helix proper to the detriment of the pattern and overall performance of the antenna.

It is better practice to mount the coaxial connector in the back screen off centre so that the helical meets it without becoming non-helical. The impedance seen will then be about 138 ohms and any matching section required can be mounted at the rear of the screen without distorting the antenna pattern.

ANTENNA CONNECTOR SEALER

Denso tape is a loose weave fabric thickly impregnated with brown, sticky, waxy goo. It is waterproof, stays soft and waxy for years, even when exposed to the weather and is used in flashing applications by the building industry.

It seals connectors and joints in cables and on antennas; really well.

First wrap the connector and cable junction with ordinary paper masking tape and then apply a layer of *Denso* tape over the lot. Smooth the waxy goo into a fissure-free blob and that's it! (I wrap the blob with black insulation tape to prolong its life and improve the appearance — Tech Ed).

It not only works, it is cheap, easy to apply, easy to remove and no bird in its right mind will touch it! ! !

FLOPPY DISCS

Now a couple of pointers from your Technical Editor on Floppy Discs.

For those of you who regularly send discs through the mail, you will no doubt have experienced the problem of "folded discs." Mark your package *Do Not Fold* or whatever, seems only to exasperate the situation, regardless of the packing material used. Apart from using quarter steel plate, which would be slightly expensive on postage, one will eventually receive a disc folded in half! Generally, trying to straighten the disc is not too successful as it tends to bind within the envelope and thus slips on the drive hub, resulting *in read errors.*

Do not shudder, but as a final resort, carefully remove the envelope and even more carefully insert the disc into the drive. Ensure it is sitting centrally on the hub of the drive and then close the door. Copy the now "most floppy disc" onto another good disc. I have used this method many times and can assure you it does work!

Finally, avoid "storing" discs under a heavy object (like a book!) or posting between flat surfaces (aluminium sheet) or you may have to resort to recovery methods as detailed above. Corrugated cardboard boxes cut into squares provide a more satisfactory packing material.

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AMSAT Australia

Colin Hurst VK5HI
8 Arndell Road, Salisbury Park, SA. 5109

NATIONAL CO-ORDINATOR
Graham Ratcliff VK5AGR
INFORMATION NETS
AMSAT AUSTRALIA
Control: VK5AGR
Amateur Check-In: 0945 UTC Sunday
Bulletins Commence: 1000 UTC
Primary Frequency: 3.685 MHz
Secondary Frequency: 7.064 MHz
AMSAT SOUTH WEST PACIFIC
Control: John Browning W6SP
Bulletins Commence: 2200 UTC Saturday
Frequency: 14.282 MHz

Participating stations and listeners are able to obtain basic orbital data, including Keplerian Elements from the AMSAT Australia Net. *This information is also included in some WIA Divisional Broadcasts.*

ACKNOWLEDGMENTS

Contributions this month are from Bob VK3ZBB, and due to Colin VK5HI's absence in Japan on business, mainly UoSAT-OSCAR 11 Bulletins covering amateur satellite activities during December 1986. The reason for what must seem old news in this column is that copy has to be in Melbourne no later than January 2, 1987 for the February issue of *Amateur Radio*. This was the main reason for the introduction of the *AMSAT-Australia Newsletter,* namely to supply up-to-date information. An information received up to, and including the last Friday night of the month, can be included in the Newsletter, as it is printed in that night and posted the next morning at the Adelaide GPO. To subscribe to the monthly eight-page Newsletter, send $20 to: AMSAT-Australia, C/- Box 1234, GPO, Adelaide, SA. 5001.

QRP MEANS 100 WATTS EIRP OR LESS — Graham VK5AGR

Since the return of OSCAR 10's Mode B transponder to full time high power operation on December, AMSAT has asked that only QRP power be used on the uplink of OSCAR 10's Mode B transponder and that the transponder should ***not*** be used at all from MA 200 through perigee to MA 20 as the spacecraft will be in solar eclipse for at least 60 minutes per orbit during this period.

EIRP — is an acronym for Effective Isotropic Radiated Power and is basically equal to the 'power' being fed to an antenna multiplied by its 'gain.'

The major error most people make in calculating EIRP is that they just multiply the power to the antenna by the 'gain' of the antenna in dBi or dBd or dBc. This is only correct for one special case and that is when the antenna 'gain' is quoted at 10 dBi. In other words, 10 watts to a 10 dBi 'gain' antenna *does* equal 100 watts EIRP. However, 10 watts to a 13 dBi 'gain' antenna equals 200 watts EIRP, *not* 130 watts EIRP, because 13 dBi equates to a power ratio of 20, not 13. See the table below:

GAIN (in dB)	POWER RATIO
10.0	10
13.0	20
14.8	30
16.0	40
17.0	50
17.8	60
18.5	70
19.0	80
19.5	90
20.0	100

Therefore, a station running 10 watts to a KLM 18C is *not* running QRP; ie 100 watts EIRP or less) because the KLM 18C quotes a 'gain' of 12 dBd which is greater than 14 dBi or a power ratio of 25, which multiplied by 10 means at least 250 watts EIRP.

Please *check* your station's EIRP — 73 Graham VK5AGR.

UOSAT-OSCAR-11 Bulletin-065 November 27, 1986

CCD Experiments
Tests of the UoSAT-2 CCD are under way, with some encouraging results returned on Monday 241186. The *Diary* has been programmed to take CCD images when UO-11 is over the terminator (twilight line), and these images have been examined by experimenters at UoS. The UO-11 CCD camera is very sensitive, and overexposes quite easily. Until we have arrived at the correct exposure, combined with good satellite pointing and good ground weather (to give land/sea/cloud boundaries), we will not be sure how well the camera and the DSR systems are working. Listen on 435 MHz for test transmissions.

Digitalker
The published UO-11 schedule now includes *Digitalker* on Wednesdays, since UO-9 is no longer 'visible' during normal school hours. OBC programmer, Steve Holder, has been working on software to test the UO-11 *Digitalker* and eventually allow it to read out a stored message. The first stage of this test was carried out on 251186, when the *Digitalker* was turned on for an orbit and its vocabulary was tested. If all goes well, the *Digitalker* should be sending a meaningful message before long.

Battery Voltage WOD
Wednesday, November 26, saw the first of a special series of WOD surveys aimed at assessing the effect on the UO-11 batteries of having both the 70 cm and two metre beacons on. Both beacons were turned on from 0000 UTC, November 26, and run for 12 hours. The 10 hour WOD dump of channel 52 (battery voltage) clearly showed a discharging trend superimposed on the normal charge/discharge cycle caused by the satellite leaving/entering eclipse. The long-term discharge was not dangerous, and a longer period of operation with both beacons on will be attempted next week. Power budget is closely coupled with spacecraft attitude, and when UO-2 lost gravity lock last month, the dual-beacon operation discharged the batteries very deeply.

FO-12 Recharging
The JARL reports that FO-12 was turned off for six days, from November 22 to November 28, for battery recovery. No further information was included, but it is possible that extended operation of the JTD digital transmitter caused deep discharge of the FO-12 battery. FO-12 operates with a negative power budget (more power being consumed by the transponders than generated by the solar cells) in all but the most favourable configurations of orbit geometry and transponder loading.

AO-10 Recovery Effect
As reported in last week's bulletin, the AO-10 transponder is now available for limited QRP use. No schedule has been announced, as transponder operation is often interrupted by control station activities. ***It you use the transponder, use only low power*** and listen to the satellite nets and UO-11 Newsflashes for latest information.

There has been an interesting twist in the AO-10 recovery program. All efforts to this time have concentrated on using the first 512 bytes of the IHU memory, since this is the memory into which the 1802 computer will automatically load uplinked data. Through the unflagging efforts of the AO- 10 command stations (DB2OS, ZL1AOX and VK5AGR), the whole 14 kbytes of IHU memory were tested. Several blocks of the higher memory were in much better condition than the lower area. If programs can be loaded into this high memory, there is hope of bringing the satellite further under control.

UOSAT OSCAR-11 Bulletin-066 December 4, 1986

CCD/DSR
The CCD exposure tests carried out over the last week have resulted in some interesting data, but none conclusively showing a working imaging system. Part of the problem is in the display system used at UoS. The 127 Grey Levels available from the CCD camera have to be compressed into only four display colours. The addition of a new graphics board to the CCD display system should solve this problem shortly. Further tests will have to wait until then. In the meantime, the DSR will be used to downlink both high-resolution magnetometer data and ASCII text diagnostic reports during the upcoming de-libration tests.

Digitalker
The *Digitalker* will be turned on for Wednesday (UTC) 101286, sending a stored message. Should this test go well, the *Digitalker* will be on every Wednesday, primarily for classroom demonstrations of UoSAT-2.

Reports
We received a most interesting update of activities at the Sir William Turner's Sixth Form College (UK) who, you may remember, won the prize for the best educational use of UoSAT-1 in 1985. First and second year students are involved in tracking UoSAT-2 and receiving/decoding telemetry, Bulletins and WOD as part of a Liberal Studies Course — using a hand-steered five- element Yagi antenna. The UoSAT team would like to congratulate the students and staff at the college on their enthusiasm and example. We would be most interested to hear from other schools/colleges who are actively tracking UoSAT-1 or 2. Please enclose a short description of your station and activities with UoSAT — a photograph would be interesting too!

UOSAT-OSCAR-11 Bulletin-067 December 11, 1986

CCD
This week the UoSAT Unit received an "Extended Graphics Adapter" for the IBM-PC-Clone which displays UO-11 CCD images. Team member, Jacky Radbone, made the appropriate modifications to our display software and we were finally able to look at UO-11 CCD images in more than four colours! We are now analysing several interesting images taken automatically by the *Diary* over the terminator (twilight line) in North America. When the UO-11 CCD system is pronounced fully operational, details of receiving and decoding the images will be published. We will need a little more time before this can be done.

WOD Surveys
There were a couple of very interesting surveys this week. First, the magnetometer survey which was dumped on Saturday (061286), showed a unique event now under detailed study: Midway through the survey, the spacecraft spin period slows down, and "oscillations" begin on the magnetometer channels. There were no magnetorquer firings during this period. A special WOD survey was initiated Thursday (111286), to attempt to capture this type of event again, and to determine whether it is correlated with battery charging. Charge currents of several amps can flow when the satellite leaves eclipse, and these currents might have been able to "magnetorque" UoSAT-2! According to UoS Attitude Determination and Control expert, M S Hodgart, when the spacecraft is spinning slowly (as it was at the time of the survey), only small torques are needed to change the spin rate significantly.

The other important WOD survey this week was that collected and dumped on Wednesday (101286). This single-channel (# 52) survey was used to measure the effects on UoSAT-2 batteries of simultaneous operation of the 70 cm and the two metre beacons. Dual-beacon operation started at the beginning of the survey, and lasted for 18 hours (about three-quarters of the survey). A steady discharging trend can be seen during the whole of the 18 hour *on* period, with rapid recovery after the 70 cm beacon was turned off. This 18 hour test came close to bringing the batteries into the "danger zone," and as a result of this experiment, dual beacon operation will be limited to 12 hours from 0000 UTC to 1200 UTC on Wednesday.

25TH ANNIVERSARY OF OSCAR-1

OSCAR-1, the first amateur radio satellite, was launched at 2042 UTC on December 12, 1961 aboard *Discoverer-36* from Vandenberg Air Force Base, California. Built by members of the *OSCAR Association,* this small satellite was to prove the inspiration for a steady stream of amateur radio satellites produced and launched by nations around the world over the next 25 years. Weighing only 10 lbs, OSCAR-1 carried a 140 mW CW beacon transmitting "Hi Hi" on 145 MHz at a speed dependent on the internal satellite temperature and powered by a small battery. OSCAR-1 transmitted continuously for 22 days before burning up during re-entry into the Earth's atmosphere. More than 570 amateurs from 28 countries forwarded reception reports to Project OSCAR, providing information on trans-ionospheric radiowave propagation, and the satellite's orbit and thermal design.

The Amateur Satellite Service has come a long way since those early days — with highly sophisticated spacecraft in a variety of orbits today such as UoSAT-1 and 2, AO-10, FO-12 and the RS satellites providing a wide range of complex communication and experimental functions more advanced than the 'primary' payloads contemporary to OSCAR-1! We should, perhaps, pause and acknowledge with thanks the small body of enthusiasts world-wide that have devoted so much time and energy to the design, construction, test, launch and orbital operation of the 20 amateur radio satellites that have flown over the first 25 years of the Amateur Satellite Program. We should also not forget the many thousands of amateur experimenters who have stimulated the 'builders' with their enthusiasm and innovative ideas when confronted with the technical challenge associated with communications through or receiving data from these satellites.

With Phase-3C, RS-9 and 10 awaiting launch, and with UoSAT-C and Phase-4 on the drawingboard, let us look forward to another 25 years in the Amateur Satellite Service and hope we shall be able to continue the close international co-operation that has been established, and witness the growth of amateur satellites to support an ever wider community reflecting their diverse interests. (de G3YJO).

UOSAT-OSCAR-11 Bulletin-0688
December 27, 1986

AMSAT OSCAR-10

Through the diligent work of a small team of satellite controllers and engineers, additional communications service is now being provided by AO-10. The memory condition continues to deteriorate. Despite this, additional Mode B use may be possible under carefully controlled conditions. QRP use is essential. That means 100 watts ERP or less please. The satellite is currently experiencing eclipses of approximately one hour duration. Use of AO-10 is therefore limited to MA 21 through 199. Use between 200 and 020 is strongly to be discouraged.

FO-12

JARL and JAMSAT continue to experiment with the new satellite in preparation for its being declared fully operational. Once it is declared operational, it is assumed a regular transponder operating schedule will be established.

RS-5 and RS-7

According to PA0DLO, RS-5 and RS-7 have survived the long eclipse period but have sustained further degradation of their batteries. In particular, RS-5's battery appears incapable of holding a charge. When load on the power supply increases, the voltage quickly drops and the transponder shuts off. The intervention of a ground command station is then required to switch it back on. RS-7 will remain in continuous sunlight between December 6 and January 3. RS-5 will remain in continuous sunlight from December 10 to January 8. Both satellites should be in operation every day except Wednesday UTC. The long rumoured launch of RS-9 and 10 are now put in January 1987.

Thanks to ASR, PA0DLO and ZS6AKV for these reports.

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SATELLITE ACTIVITY FOR THE MONTH OF OCTOBER 1986

1. LAUNCHES

The following launching announcements have been received:

INTL NO —1986	SATELLITE	DATE	NATION	PERIOD min	APG km	PRG km	INCL deg
074A	Cosmos 1782	Sep 30	USSR	97.8	677	650	82.5
075A	Cosmos 1783	Oct 03	USSR	5hr59m	20045	813	65.8
076A	PRC 19	Oct 06	China				
077A	Cosmos 1784	Oct 06	USSR	89.3	305	203	64.8
078A	Cosmos 1785	Oct 15	USSR	11hr48m	39300	608	62.8
079A	Molniya 3-30	Oct 20	USSR				
080A	Cosmos 1786	Oct 22	USSR	113.3	2589	198	64.9
081A	Cosmos 1787	Oct 22	USSR	89.3	290	215	70.0
082A	Raduga 19	Oct 25	USSR	24hr39m		*	1.3
083A	Cosmos 1788	Oct 27	USSR	94.5	520	472	65.9
084A	Cosmos 1789	Oct 31	USSR	89.3	316	196	82.6

2. RETURNS

During the period 40 objects decayed including the following satellites:

1986-013A	Cosmos 1731	Oct 03
1986-064A	Cosmos 1773	Oct 21
1986-069A	USA 19	Sep 29
1986-072A	Cosmos 1781	Oct 01
1986-076A	PRC 19	Oct 23

3. NOTES

* Raduga 19 has been placed in a near-stationary circular orbit 36618 km from the surface of the earth. The satellite will be used for communications and television broadcasting.

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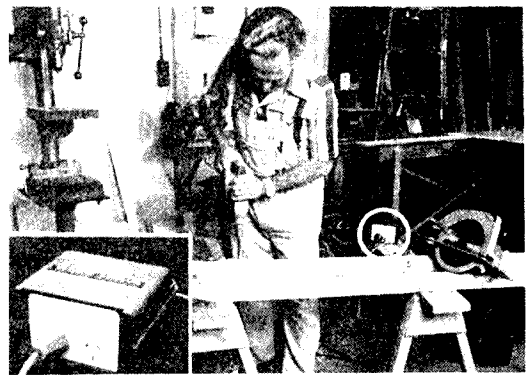

HIGH-TECH MONITOR OTC RACE

A state-of-the-art communications system has been developed by OTC. Australia's international communications carrier, to monitor yachts competing in the *OTC Southern Ocean Yachting Classic*, the longest blue water yacht race ever held in Australian waters.

Employing the latest technologies in radio, electronic messaging and computer analysis, this sophisticated system monitored and reported on yachts during the three race legs from Hobart to Fremantle.

All race contestants report their positions twice daily by radio-telephone to *Merindah Pearl*, the radio-relay vessel that follows the fleet. OTC radio operators on board transmit these reports to the Race Control Centre at the Royal South Australian Yacht Squadron (RSAYS), in Adelaide.

Merindah Pearl is fitted with both "Seatex", radio-telex, and INMARSAT, the international maritime satellite, which allows instantaneous communications between ship and shore.

OTC operators in Hobart, Melbourne, Adelaide, Esperance and Perth monitor the schedules and provide backup communications services when necessary.

At the RSAYS, race officials verify position reports and input data into a microcomputer. This computer performs a number of functions such as estimating arrival times of yachts, as well as calculating corrected positions of each yacht by class, handicap and 'off-the-stick.'

The computer also calculates the overall positions of each yacht based upon the results of the last leg.

having made these calculations, the computer then automatically establishes a telephone connection, via Austpac, to OTC's Electronic Mail system in Sydney and delivers the results to a mailbox.

Simultaneously, the current race positions are displayed at the Control Centre on a colour video screen which simulates the section of the coastline where the fleet is located.

This display lists the 'off-the-stick' and corrects the positions of each yacht in turn so that the entire fleet is described over a 10-15 minute period.

The OTC Southern Ocean Yachting Classic began last month and will finish in Perth days before the *America's Cup.*

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'SAFEGUARD' AGAINST ELECTROCUTION

Every tradesman, hobbyist, do-it-yourself enthusiast and engineer has, at some time, felt the jolt of the electrical mains. All accept electricity as part of everyday living, yet rarely respect it — it is a killer.

Today, all homes have portable appliances, but less than one percent have protection against accidental faults that can so easily occur when the appliance is damaged or misused.

The portable Scanelec Safeguard, is designed to protect the person using portable appliances such as electric drills, polishers, sanders, saws, hair dryers, etc.

It is technically described as a core-balance earth leakage circuit breaker. This means that if there is any leakage of electricity to earth, created by a fault in the appliance, the breaker will trip and provide protection against electrocution.

The portable Scanelec Safeguard is available in twin 10 or 15 amp outlets, is quite small in size and designed in a rugged polycarbonate case that can withstand many severe knocks and bumps.

Further details may be obtained from Scanelec Division of Utilux Pty Ltd, 14 Commercial Road, Kingsgrove, NSW, 2208. Telephone (02) 50 0155.

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THE MAN BEHIND ATN ANTENNAS

World-renowned moon-bounce pioneer, Ray Naughton VK3ATN, first became interested in electronics in 1935 at the age of eight, when he visited a radio amateur's shack. Ray kept up the interest through his teenage years and in 1943, when accepted for an engineering course at Melbourne University, had further exposure to amateur radio.

In May 1950, he gained his licence and almost immediately began experimenting with antennas.

Contesting saw him in the winners circle, including top scorer in the Remembrance Day Contest. VK3ATN gained the DXCC, WAC, WBE and WAZ, while operating from Melbourne's western suburbs.

In the summer of 1951, he moved to Birchip, in north-west Victoria, for three months work experience with Clyde Case (VK3ACE SK), who had an electrical retail business. He then learned he had missed out on a couple of second year engineering subjects and was faced with the prospect of repeating the whole year.

Not being in a financial position to do that, Ray decided to remain in Birchip. In June 1952, putting faith in his electrical service experience, he started an electrical business called *Birchip Sun Radio.*

The Naughton retailing empire grew to include shops in the main street of Birchip and the neighbouring towns of Sealake and Ouyen.

Ray states it took him until 1977 to accept that there was no money in retailing due to price-cutting and the weather-dependent fluctuating rural economy. He had been successfully making 16-element phased array television antennas and decided to concentrate on manufacturing.

The *ATN Antennas* company began in 1978, manufacturing HF, VHF and UHF antennas for commercial, amateur and CB radio.

Ray's personal achievements with antennas include:

- the first southern hemisphere-northern hemisphere two-way moon bounce contact with K2MWA/2 (main operator Dick Turrin W2IMU), the Crawford Hill VHF Group, November 1966
- international recognition for EME work when he became the only non-American to receive the ARRL's Technical Merit Award, November 1967
- construction of a 28 foot (8m) dish to receive signals from the Apollo 11 mission Lunar and Command modules, July 1969
- setting a world moon bounce record using a 16 foot (4m) dish to successfully conduct a 1296 MHz receiving test with W2NFA, Crawford Hill VHF Group, February 1973

The call sign, VK3ATN, will again be bounced off the moon using six-metres and upwards, hopefully later this year.

Ray said the project will enable Australian radio amateurs to become involved with EME by using decent gain Yagi beams as available from the ATN range of antennas.

ANTENNAS, TOWERS & RADIO ASTRONOMY KITS

In the last nine years, *ATN Antennas* have exported their products to 17 countries, including Japan and the United States, have been used on Heard Island and in the Antarctic, and were in demand in the Pacific Islands, New Guinea and New Zealand.

The exports were mainly log periodic HF antennas. A recent order was delivered to the Philippines Government for use at approximately nine of its embassies throughout the world. In Canberra, the embassy had a log periodic covering 11.5 MHz to 28 MHz for radio liaison back to Manila.

A large percentage of the 350 log periodics, which have been sold so far, were bought by radio amateurs. These antennas come in six and eight element models, covering 13 to 30 MHz continuously with a claimed VSWR of less than 1.5:1 — and two new models for 10 to 30 MHz and 7 to 30 MHz will be released this year.

ATN log periodics were supplied with a 2 kW PEP balun. Many modern amateur transceivers include a general coverage receiver — a log periodic is ideal for listening over the HF spectrum!

Ray Naughton has written testimonials from radio amateurs in praise of the very versatile antenna, and a report from a happy customer that, with an antenna coupler, the log periodic also works on 160, 80, 40 and six metres.

(The company stresses that the antenna has none of the bandwidth problems experienced with trapped beams).

"Why should people buy Japanese and American antennas if we can produce a quality product at about 60 percent of the price, and create local employment," Ray said.

ATN Antennas was moving heavily into the export of its products, including a new aluminium tower, to take advantage of the low exchange rate for the Australian dollar. Its range of VHF and UHF antennas are also very popular — ATN's 14 element beam for amateur television is in widespread use.

Featured on the cover of the *1986/87 WIA Australian Radio Amateur Call Book* were 16 bays of 16 element ATN beams. "The quality of the product is there — we use the best available materials — and the latest technology with help from a world leading antenna designer.

"They are all optimised — you cannot get any more gain on that given length boom." Ray said, commenting about the VHF and UHF antennas. The product range reflected the latest technology and was aimed at the Australian radio amateur.

This year, *ATN Antennas* will make beams for 7 and 3.5 MHz — and is willing to make any specialised antenna for hobby communications or commercial use.

The company hope to have a radio astronomy educational kit available late this year, for schools and other educational institutions.

The latest thrust for *ATN Antennas* is the manufacturing of a bolt- together, guyed, triangular aluminium tower. They come in 5.5 metre sections and are supplied with tools to put them together. The sections can be shipped anywhere in Australia for an additional $20, which includes insurance.

In one application for the tower, you bolt together two or more sections. Using a Hazer framework, which fits neatly around the tower, you mount the rotator, bearing and antenna while it sits just above ground level. The boom of the antenna could be about two metres off the ground and reached with a step-ladder.

With the aid of a winch, the Hazer is hauled up to the top of the tower — there are in-built safety features to prevent the Hazer from crashing down.

The *ATN Antennas* product, believed to be the only triangular aluminium tower made in Australia, also comes in a tilt-over version. Complete engineering standards and computations are available and the hardware supplied is stainless steel.

Ray said: "The features of this tower are so enormous — that is why interest has already been shown from governments for use on Pacific Islands."

The tower sections could also be used by an

experimenter as antenna booms for 7 or 3.5 MHz beams.

Inquiries about *ATN Antennas'* products should be directed to the company at PO Box 80, Birchip, Vic. 3485 or telephone (054) 92 2224.

—Contributed by Jim Linton VK3PC

BROAD FIELDS

The Australian Maritime College, located in Launceston, is not only restricted to electronic courses.

The college caters for numerous maritime orientated courses covering all facets of the profession, from short courses in revalidation of certificates to maritime engineering degrees, including a special Hydrographic Surveying Course. The college is believed to be only one of three non-governmental institutions in the world to offer this accredited course and interest has already been shown in Britain, the USA, and many other countries.

The staff are conscious of the advancement in technology and are updating the facilities available, as well as gaining first hand knowledge by being on board seeing some of the problems involved, in vessels entering Antarctic waters to those of patrol boats in the Pacific.

For those interested, further information may be obtained by writing to: Australian Maritime College, PO Box 986, Launceston, Tas. 7250.

NEW OUTLETS

Dow-Key Microwave, manufacturers of microwave switches and RF coaxial relays, have appointed Elmeasco Instruments Pty Ltd as exclusive agents of their products in Australia.

All inquiries should be directed to Elmeasco State Offices or their distributors.

* * *

Integrated Power Semiconductors, based in Scotland and specialising in power supply control, voltage regulators and similar type ICs have appointed Tronic Bits, 1/407 Highett Road, Highett, Vic. 3190, as their Australian representatives. Contact Tronic Bits for further information.

* * *

Hewlett Packard has opened a $5 million, 3700 square-metre sales facility in Canberra's Fern Hill Technology Park.

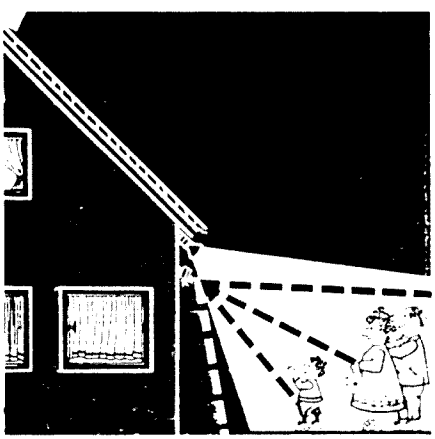
* * *

Skandia Electronics, the Melbourne based importer and distributor of a multitude of companies engaged in all phases of electronics, has expanded its operations by opening a New South Wales office located at 199 Parramatta Road, Flemington.

AUTOMATIC LIGHTING CONTROL

There are many passive infra-red devices in use for intrusion alarm systems, but few that can be used for directly switching lighting.

Utilux has recently introduced *Scanelite* which is suitable for both indoor and outdoor use and is capable of switching up to 2 kW (resistive) loads. The detection unit is small, about 75 mm square and has a range up to approximately 15 metres.



It functions by the detection of heat and movement. If a person moves into the detection zone, then the unit will operate and switch on the selected lights. After a preselected time (adjustable between 12 seconds and 12 minutes) providing no movement has been detected, the Scanelite switches off the lights automatically. An inbuilt photo cell is provided that can be adjusted to allow daylight walk tests or provide operation only at night.

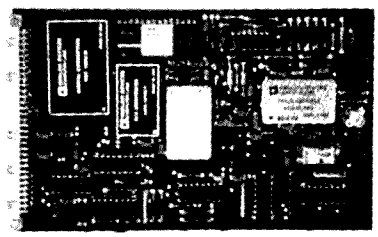
This unit is just not for detecting intruders, it can also be used to welcome your guests with automatic pathway lighting, or to light your driveway when you arrive home late.

Scanelite is available through your local electrical wholesaler. Full information is available by contacting your State Utilux Office or direct from the Scanelite Division of Utilux Pty Ltd, 14 Commercial Road, Kingsgrove, NSW. 2208.

THROUGHPUT ON A SINGLE-WIDTH EUROCARD BOARD

A new 12-bit analogue-to-digital converter has been introduced by Analog Devices Inc. The CAV-1205 features 5 MHz throughput and is designed on a small, single-width Eurocard board that includes a track-to- hold, an encoder section, output registers, and all of the necessary timing circuits to generate 12 bits of digital output data.

Applications for the CAV-1205 include radar systems, medical instruments, transient analysis and designs where high resolution, high speed and small size are required.



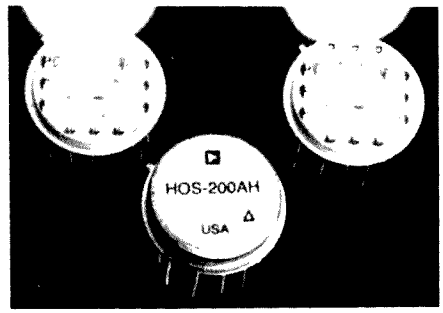
It specifies minimum in-band harmonics, generated at a 5 MHz encode rate, of 70 dB below full scale with a DC to 500 kHz input, and 62 dB below full scale with a 500 kHz to 2.5 MHz input. Minimum signal-to-noise ratio at 540 kHz input is 65 dB, and 62 dB at 2.3 MHz input frequency. With full-scale analogue input ranges of ±1.024 or ±2.048, the converter is guaranteed monotonic over temperature, 0 to +70° Celsius.

For further information contact Parameters Pty Ltd, Box 261, North Ryde, NSW. 2113 or Private Bag No 1, Oakleigh South, Vic. 3167.

BUFFER AMPLIFIER

A new hybrid buffer amplifier provides up to ±100 mA of continuous current drive, ±250 mA peak, at frequencies to 200 MHz. The HOS-200 is a high-speed buffer amplifier featuring a 1500 V/us slew rate, capability to drive 50 and 75 ohms cables, and operation with ±5V power supplies compared to ±15V supplies for competitive parts.

Applications for the HOS-200 include instrumentation, coaxial cable driving, high-speed line driving, A/D input buffering, and current boosting.



Low-voltage power requirements make the buffer well-suited for remote or portable equipment where low supply voltages are used, or for primarily digital systems where +5V (TTL) and -5.2V (ECL) power is available.

Additional key AC specifications include phase linearity of two degrees (at a bandwidth from 1 to 20 MHz) and distortion of less than 0.1 percent, key parameters for raster graphics and video-speed applications. Propagation delay and rise time are both typically 1.5 ns. DC specifications guarantee a minimum power supply rejection ratio (PSRR) of 40 dB and minimum output voltage swing of 4.0V.

Two grades of the HOS-200 are available, AH and SH, which guarantee operation over -25 to +85 degrees Celsius and -55 to +125 degrees Celsius temperature ranges, respectively. Maximum power dissipation is only 160 mW.

For further information contact Parameters Pty Ltd, Box 261, North Ryde, NSW. 2113 or Private Bag No 1, Oakleigh South, Vic. 3167.

GOOD NEWS FOR ICOM USERS

In this era of rapidly expanding technology and ever-increasing pressures on the radio spectrum, it's reassuring to know that one communications equipment manufacturer is taking positive steps to counter the trend toward "planned obsolescence" seen in so many modern consumer products.

In the Amateur Radio Service, one of the ever present problems for transceiver manufacturers is the different band segments allocated for amateur radio operation in different parts of the world.

There is also an increasing threat, in many countries, of major alterations to amateur allocations due to the changing needs of commercial and government spectrum users, and of the Amateur Radio Service itself.

Sometimes this results in extra allocations for radio amateurs; at other times it may mean significant changes in the upper and lower frequency limits of amateur allocations on various bands, particularly in the VHF and UHF regions.

Evidence of this trend toward spectrum restructuring has been seen recently in the United States and Canada where radio amateurs using the 70 centimetre band in the border regions between the two countries have been forced to seriously curtail their use of this allocation.

Amateurs in other parts of the world are, or may soon be, facing similar problems.

If an amateur allocation is significantly changed, some radio amateurs may be left with expensive transceivers which no longer provide coverage of the full amateur allocation.

If, for example, the "Two Metre" amateur band was 'relocated' to 150-154 MHz to make way for a special purpose television system, many transceivers could not be easily modified for the new allocation.

Icom equipment buyers, however, can rest easy in the knowledge that all 'new generation' Icom base station transceivers and receivers have been designed to sidestep 'operating range obsolescence.'

To achieve the flexibility needed to ensure continued compliance with amateur allocations in the future, broadband RF circuits and full microprocessor-controlled tuning systems are now employed in all new Icom base station transceivers and receivers.

But Icom hasn't stopped there.

The Icom engineering team has gone one step further in its development of 'third generation' PLL/VFO technology.

Most amateurs would know that Icom has achieved an unequalled reputation for frequency accuracy and stability in receiver and transceiver design.

So it should come as no surprise that Icom is also leading the way in the design of 'flexible' transceivers and receivers.

By clever use of the memory capacity inside the CPU (central processor unit) and the addition of external RAM (random access memory), Icom is now able to offer an 'update' service that ensures the future useability of these new generation Icom products.

Icom's frequency-controlling RAM is contained on a single plug-in PC board mounted near the CPU, which also houses a lithium cell designed to retain all the information stored in RAM even when no power is provided to the transceiver.

In the event that an amateur radio allocation is changed so that the transceiver no longer covers the required frequency allocation, the RAM board alone can be removed from the transceiver and returned to Icom's Australian head office in Melbourne for re-programming.

It is not necessary to return the complete transceiver. Cheap, convenient and simple!

This is only one example of Icom's commitment to provide the best possible customer service and to ensure that your Icom transceiver or receiver is the best that money can buy.

For those interested in experimenting, Icom Australia can also provide the original programming data stored in the RAM for use in a computer program to customise your Icom transceiver or receiver by computer control.

Because the lithium cell on the RAM board is essential to maintain the RAM data — the 'identity' of each unit — Icom has conducted extensive tests before selecting a lithium cell suitable for this purpose.

As lithium cells have only been manufactured in the last 10 years, real time performance is impossible to prove. In choosing the appropriate cell, Icom has intentionally 'over-designed' its cell specification to ensure reliability.

The Icom lithium cell is rated at 165 milliampere/hours capacity. In normal use, the cell is designed to retain at least 91 percent of this capacity after 10 years of use.

During pre-assembly tests at the Icom factory, each RAM board is placed in a special test jig where the total drain current is measured before the board is installed in the transceiver or receiver.

Measured current demands must not exceed 100 nanoamps (.0001 milliamps), so the minimum life of the lithium cell is not 10 years, but 180 years.

As if this is not enough, actual current values measured for Icom memory applications are normally between 10 and 30 nanoamps, yielding a cell life calculated to be 600 years.

Lithium cells of this type are installed on the RAM boards of the IC-0751A and IC-745 HF transceivers, the IC-271A VHF transceiver, IC-471A UHF transceiver, the IC-1271A 1.2 GHz transceiver, the IC-R71A HF general coverage receiver and the IC-R7000 VHF/UHF general coverage receiver.

In choosing to buy an Icom receiver or transceiver like those listed above, you might say that you are making a 'lifetime investment' in a rig designed to meet what ever tomorrow might bring.

For further information, contact Kyoshi Fukushima or Duncan Baxter at Icom Australia on (03) 51 2284.

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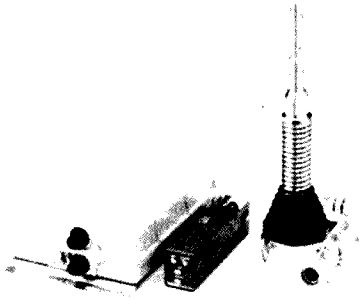

STATE-OF-THE-ART ANTENNA TUNER

One of the most frustrating aspects of mobile HF amateur operation, especially where more than one band is used, is the time- consuming and often inconvenient need to change antennas or re-tune every time you change bands. Below 40 metres, it's often necessary to re-tune every time you change frequency more than a few kilohertz.

The end of this frustration is now in sight with the release of Icom's sophisticated AH-2 Automatic Antenna Tuner.

This digital-microprocessor controlled automatic mobile antenna tuner is designed for use with the Icom IC-735 HF mobile transceiver on all HF bands from 80 to 10 metres, including WARC bands, using only the supplied AH-2b short stainless steel whip antenna. It can even operate on 160 metres with the addition of an extension whip antenna.

The brain behind the AH2 is an 8-bit microprocessor circuit inside the AH2a Controller Unit which obtains an optimum match from more than 260 000 possible LC combinations . . . and all in usually less than six seconds between 80 and 10 metres. Up to eight pre-programmed LC combinations can be stored by the Controller Unit for favourite frequencies, with recall and tuning usually in less than one second.

The compact AH2a controller attaches neatly to the side of the IC-735 transceiver and is operated by simply pressing the 'TUNE' button. Band data is obtained directly from the 'ACC 2' connector on the rear of the IC- 735.

The rugged AH2b bumper-mount whip supplied with the AH2a controller is only 271 mm long, yet it will present an SWR at the transmitter of less than 1.5:1 between 3.5 and 30 MHz.

The AH2a Tuner Unit, the third part of this combination tuner, is designed to be mounted in a convenient location away from the transceiver, usually in the boot of your car, in its own sturdy, weather-resistant case.

The AH2 Automatic Antenna Tuner can also be used with existing whip antennas or in other applications such as marine and limited space situations.

For more information on the AH-2 Automatic Antenna Tuner, contact your nearest authorised Icom dealer or Icom Australia on (03) 529 7582.

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MAKE THE MOVE TO 1296 MHz

The engineering department of Icom Japan has a valued reputation for being responsive to the needs of the radio amateur. As interest in the 1296 MHz band has grown — so has Icom's research and development into transceiver design for this "new frontier" of amateur experimentation. Icom can now offer the serious 1296 MHz user a serious 1296 MHz multi-mode base station transceiver.

The Icom IC-1271A was designed in response to the needs of amateurs world- wide who have expanded 1296 MHz usage, taking in satellite and amateur television operation as well as mode and antenna experimentation.

The IC-1271A is to 23 centimetres what the IC-271A is to two metres — the reference transceiver by which all other transceivers will be measured.

1296 MHz is an exciting new band and the IC-1271A is an exciting transceiver designed to make the most of what 1296 MHz has to offer.

Its features include FM, SSB and CW operation, dual VFOs, 32 fully programmable memory channels (each of which can be used as a separate VFO), storing frequency, mode and offset, variable frequency stepping down to 100 Hz per step, full scanning facilities and Icom's unique RAM-equipped flexible central microprocessor which allows for computer control and makes provision for any future alterations to frequency allocations in this band.

Exceptional receiver sensitivity has been achieved through use of state-of- the-art GaAsFET front end design. SSB and CW sensitivity is claimed at less than 0.16 microvolts for 10dB S+N/N. FM sensitivity is claimed at 0.22 microvolts for 12dB SINAD or 0.32 microvolts for 20 dB of noise quieting.

Superb receiver selectivity, achieved through the use of Icom-engineered internal filters, means more than 2.4 kHz SSB/CW selectivity at -6 dB (less than 4.8 kHz at -60 dB) and FM selectivity of more than 15kHz at -6 dB (less than 30 kHz at -20 dB).

Images and spurious signals are minimised by the use of triple conversion superheterodyne circuitry with a variable first IF of 133.8600-133.8699 MHz on SSB/CW (133.680-133.689 MHz on FM), a second IF at 10.750 MHz and a third IF at 455 kHz (FM only).

Power output from the IC-1271A transmitter PA is continuously variable from one to 10 watts.

Frequency stability is claimed within plus/minus 0.0003 percent (three parts per million) within the operating temperature range of 0-50 degrees Celsius.

For the ATV enthusiast, the IC-1271A can open the way to a very different and more technologically sophisticated ATV system employing the optional TV- 1200 ATV Adapter, designed for use with the IC-1271A.

The TV-1200 connects directly to the IC-1271A and outputs video and audio colour signals when used in conjunction with a video camera, video cassette recorder or other TV signal source.

1296 MHz operation may soon be enhanced in many areas of Australia with the release by Icom of its IC-RP1210 1296 MHz repeater system, with 196 DIP- switch controlled channels, high-stability PLL frequency synthesis, CTCSS tone encoding facility, three-digit DTMF function control, 10 watts of FM output and selectable "hang time."

For the 1296 MHz mobile user, the IC-120 mobile transceiver features six memory channels, scanning, sub-audible tone encoding and three frequency stepping rates. Used with the ML-12 optional amplifier, the IC-120 provides 10 watts of FM output. It can also be used in the shack in conjunction with the slim-line PS-45 power supply.

Portable operation on 1296 MHz is also a reality with the release of Icom's IC-12A hand-held transceiver, a 23 centimetre version of the popular IC-02A and IC-04A hand-helds for two metres and 70 centimetres.

Full-feature operation on the 23 centimetre band is now guaranteed.

For photos, a review unit or further information, contact Kyoshi Fukushima or Duncan Baxter at Icom Australia on (03) 529 7582.

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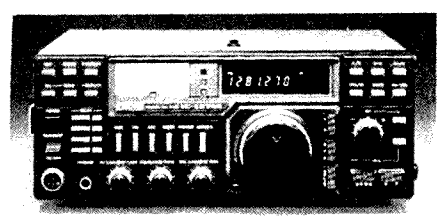
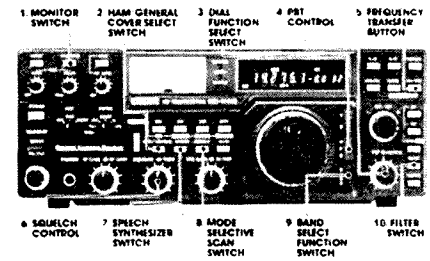


ICOM IC-751A

Icom's valued reputation as a manufacturer of quality amateur and commercial radio transceivers has been enhanced with the release of the IC-751A HF (high frequency) amateur transceiver.

Designed with the serious amateur operator in mind, the IC-751A is not to be confused with the earlier model IC-750 (or the IC-751 Japanese domestic model of the IC-750 which Icom did not import into Australia).

This, the 'flagship' of the Icom HF fleet, features coverage of all authorised amateur bands from 1.8 to 29.7 MHz plus a general coverage receiver with sensitive reception from 100 kHz to 30 MHz continuous.



Thirty-two memory channels store both frequency and mode. The memory capabilities of the IC-751A are enhanced by mode-selective scan, priority memory scan and scan lock-out.

In the receiver department, contesters and serious DXers will appreciate the improved noise-blanker circuitry with variable pulse level and width, the new AGC (automatic gain control) circuitry, an improved speech compression circuit for significantly better audio output quality, and a receiver dynamic range of 105 dB.

Receiver specifications include sensitivity figures of 0.15 microvolts for 10 dB S/N (1.6-30 MHz, SSB/CW/RTTY, preamp on), selectivity of 2.3 kHz at the -6 dB points (SSB/CW/RTTY), image rejection of better than 80 dB, and notch filter attenuation of more than 45 dB on interfering carriers.

The state-of-the-art receiver is a quadruple-conversion superheterodyne circuit using four intermediate frequencies (all modes except FM) at 70.4515 MHz, around 9.01 MHz, 455 kHz and around 9.01 MHz again.

CW enthusiasts will appreciate the in-built electronic keying circuit — plug in a paddle key and away you go — which is QSK rated at up to 40 words per minute. The standard 500 Hz CW filter (FL-32A) and variable-level CW sidetone control, which operates in both receive and transmit modes, will also be popular features of this new transceiver.

CW performance can be improved even further with the addition of the optional FL-52A (455 kHz at 500 Hz) filter, FL-53A (455 kHz at 250 Hz) narrow filter or the FL-63A (9.0106 MHz at 250 Hz) narrow filter.

General receiver performance is enhanced by the inclusion of variable pass- band tuning (PBT), a deep notch filter (45 dB), variable pulse-type noise blanker, 9.9 kHz XIT/RIT and a large, clear, multi-function meter.

A sophisticated thermal sensor in the IC-751A transmitter circuit continuously monitors the internal temperature of the transceiver and automatically controls the in-built cooling fan to ensure maximum output and frequency stability, especially during continuous operation (RTTY, contesting, etc) of the 100 percent duty cycle transmitter.

Options available for the IC-751A include a 2.8 kHz SSB filter (FL-70), 6 kHz AM filter (FL-33), IC-PS30 external power supply, IC-AT500 automatic antenna tuner, C-EX309 microprocessor interface connector, IC-10 remote controller, IC-SM8 or SM10 desk microphones, IC-2KL solid state linear amplifier, IC-SP3 or SP7 external speakers, CR-64 high stability 30.72 MHz reference crystal and the C-EX310 voice synthesiser.

For the serious amateur, inspection of the Icom IC-751A is a must. Now you can truly ask yourself 'Can I handle this much transceiver?'.

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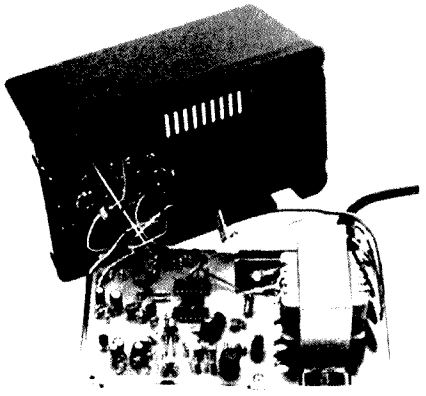
CHEAP CHARGERS MAY BE DANGEROUS

The appearance of cheap 'pirated' copies of the Icom BC-35 AC Battery Charger is cause for serious concern, Icom Australia director Kyoshi Fukushima said recently. Mr Fukushima warned that the illegally copied chargers, while almost identical in exterior design to the genuine unit, have not been certified safe by Australian electricity authorities and may cause serious, even fatal, injury to unsuspecting users.



Designed for use with the IC-BP3 Battery Pack, the BC-35 and BC-36 Battery Chargers are a common accessory for many Icom VHF and UHF hand-held transceivers.

"The power transformer in the genuine BC-35 is approved by the State Electricity Commission of Victoria," Mr Fukushima said, "but the transformer in the copy has not been SEC approved and appears unsafe for use with Australia's 240 volt mains power supply.

"The copy is hard to identify so most users would believe they had bought the genuine Icom product. The similarity is obviously intended to deceive intending buyers of the genuine product. In fact it was only when a unit was returned for repairs that we became aware of the problem.

"The circuit board, power transformer and other components are not of the standard used in the genuine BC-35. Icom's charger is designed for safety and reliability. It uses a high quality double-insulated power transformer for complete mains power isolation. The copy uses only a thin layer of plastic insulation between the primary and secondary windings of the transformer.

"It is not only unsafe and unreliable, it could also cause considerable damage to the BP-3 Battery Pack and the transceiver itself. But what we're most concerned about is the risk of serious injury."

Icom distributes only the BC-36 AC Battery Charger, the export model of the BC-35. Those who have purchased BC-36 chargers from authorised Icom dealers need not be concerned.

BC-35 owners with in-house technical staff can identify the pirated charger by removing the outer cover and inspecting the internal circuit board. The genuine BC-35 circuit board is marked with full component indentification and the power transformer is marked "240V" and "24V." The pirated unit has no circuit board or transformer markings. If in doubt, the BC-35 can be taken to the nearest authorised Icom dealer who will be able to confirm if the unit is a genuine Icom product.

For further information, contact Kyoshi Fukushima or Duncan Baxter at icom Australia, 7 Duke Street, Windsor, Vic 3181, or phone (03) 529 7582.

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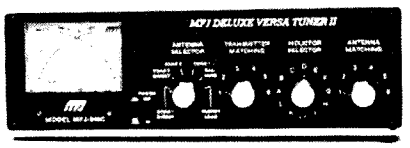
NEW CROSSED NEEDLE MFJ ANTENNA MATCHER

"One of the worlds finest 300 watt antenna tuners with features that only MFJ can offer" reads the headline in GFS Electronic Imports advertising brochure on their new MFJ-949C crossed needle antenna matcher.

It goes on to say "...dummy load, SWR, forward reflected power meter, antenna switch, balun. Matches everything from 1.8 to 30 MHz."

GFS claim that the MFJ-949C Deluxe Versa Tuner II will handle a transceiver with up to 300 watts RF output and match it to any feedline from 1.8 to 30 MHz regardless of whether coaxial cable, balanced line or random wire is used.

The MFJ-949C's crossed needle meter provides a simultaneous reading of forward power, reflected power and SWR in either a 30 or 300 watt range. No SWR sensitivity adjustment is needed so that you have a permanent watchdog on your final transistors.



A built-in 200 watt air cooled dummy load allows you to tune up your transceiver "off-air" minimising annoying interference to others. Dummy load selection is via a flexible six position coaxial switch which also provides access to either of two coaxial lines directly or via the tuner, as well as a random or balanced line.

At the heart of the MFJ-949C is a large efficient 75 mm diameter airwound inductor which provides more matching range and less loss for more watts out.

Its many other outstanding features include a built-in 4:1 balun, 1000 volt rated capacitors, SO-239 coaxial connectors and binding posts for balanced line, random wire and ground. The 949C measures 250 x 175 x 75 mm and is currently priced at $754 plus $18 P & P.

If you would like further information contact GFS Electronic Imports, 17 McKeon Road, Mitcham, Vic. 3132. Phone: (03) 873 3777.

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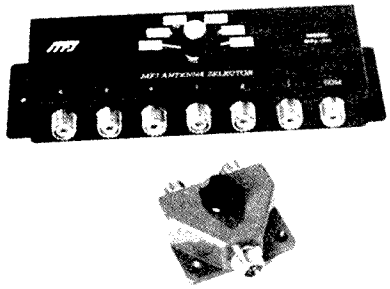
NEW MFJ COAXIAL RF SWITCHES

GFS Electronic Imports, announced recently the release of two new Coaxial RF Switches from MFJ Enterprises.

The first, MFJ-1701, is a six position switch which allows switching between six antennas without the need to unplug cables. It can be used on both 52 and 75 ohm systems. It will also handle 2000 watts SSB or 1000 watts CW. The MFJ-1701 is fitted with seven SO-239 connectors and exhibits negligible insertion loss on HF bands.



All unused inputs are automatically grounded for static, lightning and RF protection. Equipped with convenient mounting holes for desk or wall mounting it measures approximately 250 x 75 x 38 mm and is priced at $154 plus $12 P & P.

The second switch is the Model MFJ-1702, a two position switch designed for 50 ohm systems. It is capable of handling 2.5 kilowatts PEP and has an insertion loss of less than 0.2 dB. Isolation is better than 60 dB at 300 MHz and 50 dB at 450 MHz. VSWR is less than 1.2:1 plus the unused terminal is grounded for static, lightning and RF protection. The MFJ-1702 measures just 75 x 50 x 50 mm and is priced at $99 plus $10 P & P.

For more information contact: GFS Electronic Imports, 17 McKeon Road, Mitcham, Vic. 3132. Phone (03) 873 3777.

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SECURITY CONSCIOUS

More organisations are becoming security conscious of who has access to privileged information as keys, access codes, and magnetic impregnated cards can be defeated by thought and careless handling, generally unknown to the entrusted employee or, more importantly, their employer.

Recently released in Australia, by Access Control Systems, is the US system *EyeDentity* which revolutionises security management.

EyeDentity works on the principle that every person, even identical twins, have distinct, yet stable, retinal patterns that vary only under conditions of serious eye diseases.

The unit uses a low intensity infra-red light source, circularly scanning 320 readings of the intricate pattern at the back of the eye. All is accomplished, including releasing the locking system, within seven seconds and it is also claimed it has a capacity to hold information on 1200 "eye signatures."

Another method of defeating access to the unauthorised is the use of fibre optics instead of copper transmission cables. Though not foolproof, it is more time consuming and not as easy to access, due to its construction.

Club Corner

TOWNSVILLE AMATEUR RADIO CLUB

Advance notice is given that, the Townsville Amateur Radio Club will be holding the eighth Biennial North Queensland Convention over the weekend of Friday, September 4, to Sunday, September 6, 1987.

The venue is, once again, the beautiful setting of the Western Campus of the James Cook University.

On-site accommodation will be available.

Further details from the Convention Secretary, TARC, PO Box 964, Townsville, Qld. 4810, or telephone Bob Mann VK4WJ, on (077) 81 4450 BH or (077) 79 7869 AH.

TOWNSVILLE AMATEUR RADIO CLUB

The recent Annual General Meeting of the Townsville Amateur Radio Club saw a total of 33 positions filled for the coming year. This was an incredible result, and indicates the continuing support for the Club. It is worthy of note that the incoming President is Evelyn Bahr VK4EQ, who is the first female President. She is also one of the Life Members of the Club.

New office bearers for 1987 were elected as follows:

President	Evelyn Bahr VK4EQ
Vice-Presidents	Bob Mann VK4WJ
	Harry Verner VK4BBC
Secretary	John Stevens VK4AFS
Treasurer	Ian Sutton VK4ZT
Publicity Officer	Peter Renton VK4PV
Class Manager	Roger Cordukes VK4CD
Co-Editors	Iain Morrison VK4KIG
	Peter Renton VK4PV
Librarian	Felix Scerri VK4FUQ
Co-Station Managers	Roger Cordukes VK4CD
	David Henry VK4KDH
WICEN (Region 1A)	Ian Sutton VK4ZT
WICEN (Deputy)	Gary Kimber VK4KGK
WICEN (TARC)	Bob Mann VK4WJ
Intruder Watch	Ann Hayes
	Peter Vella VK4AAW
	Barrie Currie
Slow Morse Co-Ord	Bill Sebbens VK4XZ
Slow Morse Ops	Vern Crabb VK4FVC
	Charlie Bahr VK4BQ
	Noel Kohler VK4BDV
	Alan Stevenson VK4PS
	Neil Butterworth VK4AQD
	Col Hayes VK4FUV
Auditor	Peter Lindsay
QSL/Awards	Col Hayes VK4FUV
Disposals Officer	Bill Sebbens VK4XZ
Activities Officer	Col Hayes VK4FUV
Trustees	Charlie Bahr VK4BQ
	Alan Stevenson VK4PS
	Jim Sturges VK4DH

The outgoing President, Harry Verner VK4BBC, then read the President's Report.

—Contributed by Peter Renton VK4PV, Publicity Officer

WESTERN RADIO CLUB

In October 1958, Les Mitchell, whose amateur radio call sign was G3BHK in England, founded the concept of amateur radio operators making their radio shack equipment available to members of the scouting association, with the idea of allowing scouts to get-together on-the-air and speak with one another. This way, they could exchange ideas and, of course, it would introduce the scouts of all ages to amateur radio with all its thrills and mysteries, which perhaps up to this time, had only been known to the "radio weirdo" up the road. In keeping with scouting language, this yearly get-together became known as a *Jamboree* — in particular, *Jamboree on the Air.*

Waldis VK2DXV, assisted with the JOTA station at Blackheath.

Since 1958, two days of each year, the third full weekend in October, have been set aside for JOTA by both organisations.

Girl Guides also join in the activities and provide a very solid backing and lively aspect to the whole operation.

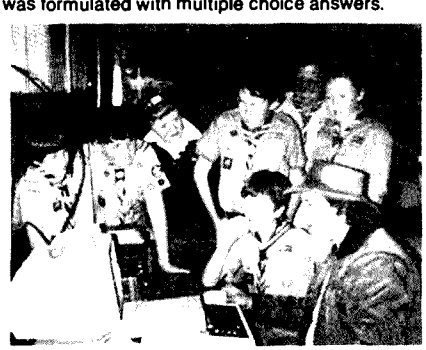
In 1985, scout stations operated from 103 different countries, with an estimated excess of 8000 stations operating.

The Western Radio Club members have been involved with JOTA since October 1984.

The Western Radio Club was founded in June 1982 by a group of radio enthusiasts in the western region of Sydney. The interests of club members range from amateur and CB radio to shortwave listening and utility scanning. Many members have special interests such as personal computers, RTTY, DX home-brewing, VHF/UHF communications and antenna design and construction. The real difference with this club is that it does not align itself with any particular aspect of radio.

Helping to run the JOTA station in 1985, with the Tartoola District Scouts, was more fun than the proverbial *barrel of monkeys.* As it was such a success a meeting was called and plenty of planning of events was organised for JOTA 1986. It was suggested to Steve Shaw, the Scout Leader for 1st Westmead, that as 1986 was the International Year of Peace, the club could incorporate the theme into JOTA — and idea which Steve agreed to.

A suggestion was also made that the Scouts and Guides from the Tartoola District participating in JOTA be given the opportunity to pass their Communications Badge over the weekend. Also, as well as speaking on the radio, the Guides and Scouts could build various kits under supervision and a simple question and answer examination was formulated with multiple choice answers.

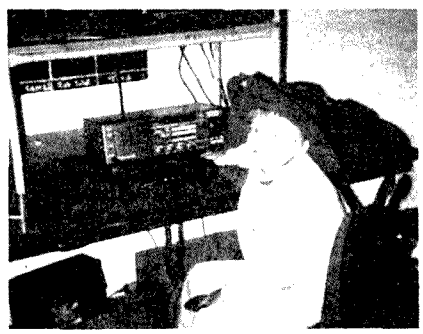


Andy Keir, has an attentive audience as he operates satellite equipment.

When the equipment was set up at Blackheath there was no shortages of Scouts and Guides at the microphone. A favourite contact for the Scouts was the half hour spent talking with 3D2ST, in Fiji, and exchanging information and badge details with the 1st Suva Troop.

On Saturday afternoon, contact was made with Murray ZL3TIM, via JAS 1. Other stations contacted were RA9JF, YB0S, JA6HUQ and UW0CT.

Western Radio Club member, Colin Thompson, shows some Scouts the finer points of kit-building.



Warren Upton enjoyed JOTA weekend.

Sunday saw the Scouts receive their Communications Badges, and the Scout whom the leaders felt had put in the most effort was presented with a kit.

The weekend was a great success with over 400 Scouts, Girl Guides and Cubs attending the Blackheath JOTA station, and who knows, maybe a few budding amateurs of the future may have participated in JOTA 86. At the conclusion of the weekend the club was presented with a Certificate of Appreciation by the District Commissioner, which was a welcome surprise.

Attendances are really looking up for the club with 22 attending the recent meeting to hear guest speaker, Peter VK7PF, from the Northern Branch.

Repeater 3 has been misbehaving lately (a fault has developed in it), by sending spurious noise when operators are transmitting. The RAD control unit has been improved and a one second pause is required to reset the repeater between overs.

It is easy to see that the bands have began to improve as there were 196 incoming QSL cards.

The Radio Room is still progressing well and donations are still being received, for which we thank the donors. Frank VK7ZFH, gave a black and white television set, two pieces of test equipment and some rolls of RTTY paper whilst John VK7KDR, gave a two metre high *rack on* castors to house some of the equipment.

The Club sadly farewells Frank VK7ZFH, and thanks him for all the work and time he has put into the Club as News Officer. Frank has moved to VK1.

One of the repeaters on Mount Duncan recently had a very *close shave* when a large tree fell barely missing the cable and guy wires. Fortunately, only the wires suffered slight strain.

The Clanger Award for the month was presented to John VK7KDR, for using the hand-held rig with an insulator on the battery pack, and for his donations to the club rooms.

Guest Speaker, Peter, explained where membership fees, recently increased to $35, go to. A lively discussion followed on pensioner concessions. Peter also discussed State Council

Policies and some policies are to be printed and given to each branch for easy reference by members. Peter then gave a talk on satellites and his trip around the world in 1984, illustrated with slides.

The Branch AGM, which was to be held in December, will now take place in February.

—Contributed by Max VK7KY and Greg VK7ZBT

SOUTHERN AMATEUR TELEVISION GROUP

A 23 cm repeater has been approved for the southern districts of Adelaide.

The 23 cm ATV repeater, with the call sign VK5RWH, is situated at Willunga Hill.

The repeater licence was applied for in November 1985, and granted in June 1986. The Southern Amateur Television Group was formed in late 1985 to investigate the possibility of a repeater to cover the area south of O'Halloren Hill, where VK5RTV is located.

Although VK5RTV is received well in a northerly direction, such is not the case in the southern viewing area, due to the geography of the location. Most viewers and transmitting members found it necessary to spend a considerable amount of money on antennas and preamplifiers in an attempt to receive a marginal picture.

The group were offered a site on Willunga Hill, which will service the southern area well.

At the end of last year, the transmitter and receiver were operational and the control circuitry, ident, etc were well under way.

Technical details of VK5RWH are as follows: Uplink Vision 444.250 MHz, Sound 449.750 MHz; Downlink Vision 1246.250 MHz, Sound 1251.250 MHz; Transmitting Antenna is an Alford Slot; Receiving a Collinear; Power Output — one watt average, to be increased later as funds permit. The transmitter consists of a TGL commercial modulator unit with an output at 851.250 MHz to a HP diode mixer. Oscillator chain injection frequency is 395 MHz to give an output of 1246.250 MHz. This is fed into six linear stages with an MRF511 transistor in the output.

Office bearers of the group are:
Chairman: Brian VK5KBU
Secretary/Treasurer: Mike VK5KMJ
Co-ordinator: Nick VK5NT
Technical Officers: Ray VK5ZEF and Lee VK5NK
Control circuitry: Ray VK5ZEF, Barry VK5KAU and Neville VK5ZHP

Barry VK5KAU, was actively engaged in the work on VK5RCN repeater in the mid-north, and this is proving very helpful to the VK5RWH project.

This is believed to be the first 23 cm ATV repeater in Australia and the group are looking forward to great things in the future.

The group would like to thank the ATV Group for donations to this project and the WIA SA Division for their help.

A new FM 23 cm repeater, VK5ROH, has been approved, but that is another story.

—Contributed by Brian Usher VK5KBU

NORTH-EAST RADIO GROUP

The North-East Radio Group will be conducting the 2nd Victorian Fox Hunting Championships on Saturday, February 28, 1987. It promises to be a busy, but enjoyable day for all participants.

Prizes will be awarded to the first three place-getters of each event. A pertetual trophy has been donated on which the overall winners call sign and/or name of the club will be engraved.

If you are missing equipment for any of the bands, NERG may be able to assist. Provided you can receive on the band of interest, the only other equipment needed is a directional antenna and step attenuator. For the cost of an SASE, NERG can provide photocopies of articles/information sheets for any of the following:

ESTIMATED COST TO BUILD

10m Loop	$5
80m Ferrite Rod	$3
2m Beam	$6
70 cm Beam	$6
Step Attenuator	$6

If you are really in trouble, both for time and equipment, several spare sets of DF antennas are available for loan ... contact the undersigned before the event.

The event will be fully catered in the usual NERG tradition. A barbeque lunch, refreshments and an evening meal will be provided for at an estimated cost of approximately $8 per head.

Program

TIME — EVENT

0900 — Registration and gear setup. Test signals available.
1000 — 2m Fox Hunt.
1100 — 70 cm Fox Hunt.
1145 — Sniffer Hunt.
1230 — BBQ Lunch.
1330 — 10 m Fox Hunt.
1410 — 80 m Fox Hunt.
1450 — Three-leg Fox Hunt.
1600 — Multi-leg Sniffer Hunt.
1630 — Talk-in Hunt.
1710 — Traditional NERG Fox-Hunting Supper.

Further inquiries to Geoff Hudson VK3CGH, 16 Fowler Street, Box Hill South, Vic. 3128, telephone (03) 288 6019 AH.

FRANKSTON & MORNINGTON PENINSULA AMATEUR RADIO CLUB INC

Last year was another successful year for FAMPARC, and it is hoped that this trend continues throughout 1987.

At the Club's Annual General Meeting on Friday, December 12, the following were elected for the 1987 committee:

President	Earl Russell VK3BER
Vice-President	Philip Pavey VK3BHN
Treasurer	Robin Brading VK3KRB
Secretary	Gordan Buchanan VK3BGB
Assistant Secretary	Jessie Buchanan VK3VAN
Committee Member	Frank Beer VK3DYE
Committee Member/ Social Secretary	Chris Chapman VK3BMG

With three newcomers and some 'younger amateurs' on the committee, 1987 looks like being an interesting year for FAMPARC.

Club events for February include a barbeque on the eighth at 11 am, to be held at the home of VK3VB, 6 Bayview Road, Tooradin. The 10th Anniversary Awards Weekend will be held at Mount Martha culminating in a meal at the Dava (February 28-March 1).

The 1987 Novice Classes begin on February 24, at 7 pm and usual meetings are held on the second and fourth Fridays of each month. The Club meets at the Brotherhood of St Lawrence, Frankston-Dandenong Road, Carrum Downs.

For more information on FAMPARC's activities, write to: the Secretary, PO Box 38, Frankston, Vic. 3199 or call in on the Club Net, Wednesday nights at 2000 local on 3.570 MHz ±QRM. Listen for the Club Call Sign, VK3BHU.

—Contributed by Philip Pavey VK3BHN, Vice-President FAMPARC

GLADSTONE AMATEUR RADIO CLUB

Awoonga Dam, south-west of Gladstone, was the venue for a tree- way social meeting between members of the CQ Division of the WIAQ, Rockhampton, the Biloela Amateur Radio Club and the Gladstone Amateur Radio Club, on November 9, 1986. The host club was Gladstone, with the day well organised by the club's Vice-President, Will VK4XP.

Members and their families relax and enjoy the surroundings at Awoonga Dam.

From left: Jeanette VK4BZL, Errol VK4ZHL and Will VK4XP.

The day's activities began at 11 am with a taped replay of the WIA News, followed by a barbeque lunch at 12 midday. A treasure hunt for the children was held at 1 pm, a fox-hunt on two and 10 metres was held at 2 pm, and a raft race for the children at 3 pm. Activities ceased at 4 pm.

The fox was pursued with great zest by one and all and the worthy winner was Gordon VK4AGM, representing the CQ Division.

Nigel VK4FPC (Gladstone President) presents the Fox-hunt Award to the winner, Gordan VK4AGM.

From left: Doug VK4ZDK, David Christmas, Lyle VK4ALD, Ivan VK4QO and Don VK4ZFB.

The day provided an excellent opportunity for amateurs in Central Queensland to establish "eyeball" QSOs, meet new friends, and gave them an opportunity to discuss planned projects in the area. Feedback from members of all clubs represented indicated the day was a great success and was a further step in bringing the radio clubs of central Queensland closer together.

Club members attending were:

CQ Division — Errol VK4ZHL; Lyle VK4ALD; Rob VK4TKA; Doug VK4ZDK; Clive VK4ACC; Ted VK4JTW; Gordon VK4AGM; John VK4AHB and David Christmas SWL.

Biloela ARC — Don VK4ZFB and Ivan VK4QO.

Gladstone ARC — Jeff VK4JTP; Paul VK4NCD; Doug VK4ZNT; Bob VK4NUU; Jeanette VK4BZL; Vic VK4KVM; Will VK4XP; Nev VK4NPN; Noel VK4FQW; Tom VK4BTN; Nigel VK4FPC; John Jones SWL; Charlie Corbett SWL and George Phipps SWL.

—Text and photographs courtesy Nigel Stack VK4FPC, President, Gladstone ARC

From left: Jenny VK5ANW, Gordon ex-VK5GR and Paul 3B8AD, holding the "breadboard" 20 metre transmitter, loaned for the evening by the Telecommunications Museum, Adelaide.

ADELAIDE HILLS AMATEUR RADIO SOCIETY — VK5BAR

The December meeting of the Society was held as a Social Night to conclude a very active year in 1986. A group of 36 visitors and members were honoured to welcome, as Guest Speaker, Mr Gordon Ragless, a foundation member of the original Blackwood Radio Club which was formed in 1923.

Mr Ragless held the call sign, VK5GR, for many years, and members were pleased to be able to arrange a loan for the evening from the Telecommunication Museum, in Adelaide, the 20 metre transmitter made and used by Mr Ragless in the early days. This transmitter created great interest and many questions were asked by those present concerning its construction and operation.

During the evening, Mr Ragless spoke of his amateur radio experiences and his activities in the manning of a 24-hour radio listening post in Adelaide, during the war-years, 1939-1945.

Among the welcome visitors to the meeting were Jenny Warrington VK5ANW, President of the WIA SA Division, Paul Caboche 3B8AD, President of the Mauritius Amateur Radio Society and Rob Gurr VK5RG, State Manager of the Department of Communications, Adelaide.

A very pleasant and informal evening was experienced, and the Society wishes to thank Mr Ragless for his most interesting talk and for his gift to the Society of the microphone case used by VK5BR (the call sign of the Blackwood Radio Club), in the early 1930s.

Members of the Adelaide Hills Amateur Radio Society are reminded that the Annual General Meeting will be held on Thursday, February 19, in the Blackwood Junior Primary School, and the election of Officer Bearers will take place to appoint the Management Committee for 1987. A full attendance is requested for this important meeting.

Inquiries concerning the activities of the Society can be made by telephoning 296 9278.

—Contributed by Gordon Welsh VK5KGS, Secretary AHARS

Forward Bias

Ken Ray VK1KEN
Box 710, Woden, ACT. 2606

ANNUAL GENERAL MEETING — 1987

The AGM for the VK1 Division will be held on Monday, February 23, in the Griffin Centre, Civic, commencing at 8 pm. As usual, elections will be held for all office bearers of the Division, and any member of the VK1 Division is eligible to nominate for any position.

Most amateurs are aware that, from time to time, the WIA comes in for criticism from members and non-members alike. For members, the best way that you ensure that the Institute is run to the best of its ability is to activity take part in the running of your own Division. While it may be easy to sit on the side and play "Devil's Advocate," or be one of the many self-styled "watchdogs," no organisation can survive without the positive, active assistance of its members. One major opportunity is at the Annual General Meeting of your Division. Don't just destructively criticise — put your money where your mouth is so to speak, and stand for a position on your Division's committee.

Alternatively, if you think something needs doing, why not speak to the committee? As well as criticism, offer solutions. Be prepared to do some work to back-up your suggestion. For example, if you think that your Division's weekly broadcast should be relayed on a band not covered at present, or re-transmitted at a different day or time, be prepared to help in relays or re-broadcasts. if you think that there is an area of amateur radio not being addressed by your Division, work out a plan to address the issue.

There is a misconception among the general amateur community that our privileges and extensions to the amateur service somehow happen magically, as a gift from the kind benefactor, the charity DOC. Some people are naive enough to believe that there is no need for any lobbying by amateurs to the Government, and that the conditions that amateurs have are an irrevocable right, akin to the constitution. The truth is far from this. There are currently around 16 000 amateur licensees on Issue in Australia, compared to over 600 000 total radio communications licenses in total. This is around two and a half percent. Many of the other users of the rapidly diminishing spectrum space that are highly justifiable. If we, as an amateur fraternity are to retain our existing privileges, we need to be equally efficient and effective in our dealings with DOC, as the other spectrum users are.

While that may seem to be off the topic of the VK1 AGM, when you consider that the WIA is the group recognised by DOC as representing the interests of Australian amateurs, the future of our hobby is in your hands. If the WIA becomes ineffective and incapable of acting for its members, then amateur radio, as a hobby, has a decidedly short future. If you think that your Division, your Institute can be better, stronger, then do something positive to achieve that — don't just complain.

Remember, it's your hobby — and your WIA.

WICEN News

Keith Scott VK3SS
34 Henry Street, Maffra, Vic. 3860

THE GREAT BIKE RIDE — 1986

The 1986 ride began in Bairnsdale on Saturday, November 29, after five long train loads, plus several buses deposited over 2500 people and bikes. Their kits, with clothes, tents and camping equipment were loaded onto two large semi-trailers then wave after wave of bicycles, ridden by young and old (and all in between), set out for the short ride to Eagle Point Camp, on the shores of the Gippsland Lakes.

At daybreak, on Monday morning, the tranquility of the Lakes was transformed when all packed up, breakfasted and set off, on their bicycles, along back roads en route to Sale.

These procedures were repeated each day along the route the bike ride would take, with overnight stopovers at Sale, Yarram, Foster (two-nights), Leongatha, Warragul, and Gembrook. The route was along quiet back roads through changing and very scenic country. A free day at Foster gave many riders the opportunity to ride to nearby Wilsons Promontory or into the scenic forrested hills.

WICEN was involved to assist the huge organisation. Fixed stations were set up daily at starting points, plus a net control at the finishing line. Up to eight check points were set up along the route to report progress and the whereabouts of the Police Motor-bike Patrols, Doctors and St John Ambulance First Aid vehicles.

WICEN operators accompanied the doctors and first aid vehicles to enable prompt notification of any requirements. The whole organisation was constantly aware of most requirements and progress via constant communications for up to 12 hours per day.

Most communications were on two-metres through repeaters which were constantly monitored and maintained by the WIA VTAC technicians, Col Pomroy and Peter Mill.

There were no breakdowns, a small amount of interference near the suburban area, but generally 99 percent co-operation by repeater users.

A pleasing number of local Gippsland amateurs and SWLs helped with communications. Experience on a controlled net, in some cases for the first time, gave useful experience which could have future value. Food was plentiful and good supplied by the organisers. Sleep was hard to find, but an excellent spirit of happiness ran through the 3000-odd riders and support personnel.

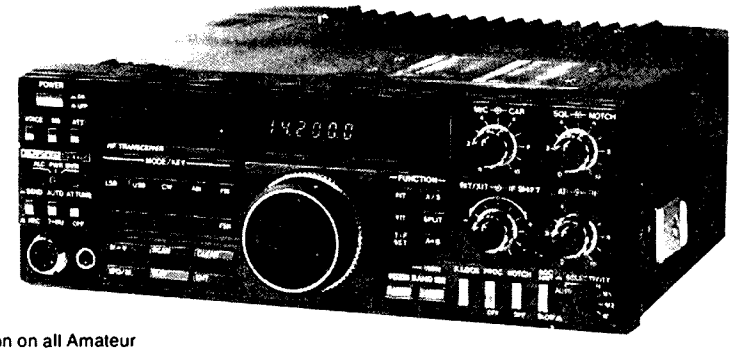
Dennis Furlong VK3XP, deserves a special commendation for his organisation of the whole WICEN operation for either the fourth or fifth year! His route maps, placing of fixed and mobile stations, arranging meals and pre-race organisation involved much time and detailed work.

Bob Hose VK3KAH, Co-ordinator of the Shepparton area, brought his caravan along for use as a Net Control Point. The caravan was equipped with all necessary communications, antennas, masts, etc which made the net control job easier and more efficient.

There were four Americans who had travelled from the US to ride in this years Bike Ride.

(From a family point of view, it was pleasing to see both my son and grandson involved in the ride. Son David VK3DY, was with WICEN and grandson Shannon was riding).

TS-440S
HF TRANSCEIVER



The TS-440S is an HF transceiver designed for SSB, CW, AM, FM and AFSK modes of operation on all Amateur bands including the new WARC bands. It is the ultimate in compact size with the automatic antenna tuner built-in and featuring a highly efficient final amplifier cooling system. It incorporates a 100 KHz to 30 MHz general coverage receiver having superior dynamic range. Advanced digital technology controls the various functions, including dual digital VFOs, 100 memory channels, keyboard frequency selection, memory and programmable band scan, and RIT plus XIT. Additional operating features include full break-in CW (switchable to semi break-in), built-in automatic antenna tuner, IF shift, notch filter, IF filter selection, RF attenuator, speech processor, and other features for ease of operation and added versatility.

TS-940S
HF TRANSCEIVER

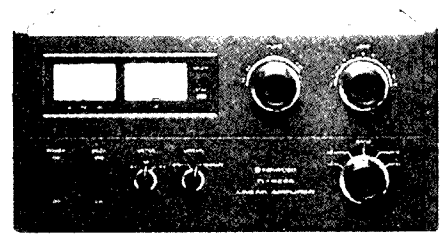
The TS-940S is a competition class HF transceiver having every conceivable feature, and is designed for SSB, CW, AM, FM and FSK modes of operation on all 160 through 10 meter Amateur bands, including the new WARC bands. It incorporates an outstanding 150 KHz to 30 MHz general coverage receiver having a superior dynamic range (102 dB typical on 20 meters, 50 kHz spacing, 500 Hz CW bandwidth).

Engineered with the serious DX'er/contest operator in mind, the TS-940S features a wide range of innovative interference rejection circuits, including SSB IF slope tuning, CW VBT (Variable bandwidth tuning), IF notch filter, AF tune circuit, Narrow/Wide filter selection, CW variable pitch control, dual-mode noise blanker, and RIT plus XIT.

TL-922
HF LINEAR AMPLIFIER

The TL-922 is a band linear amplifier designed to provide maximum legal performance, utilising two 3-500Z high performance transmitting tubes. Incorporates class AB_2 round-grid amplifier circuit. Excellent IMD (intermodulation distortion characteristics).

VALVES NOT INCLUDED



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4E WOODCOCK PLACE, LANE COVE, SYDNEY, N.S.W. 2066. Ph. (02) 428 1455.

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WATSONS WIRELESS - 72 BRISBANE STREET, HOBART (002) 34 4303
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V.K. ELECTRONICS - 214 MOUNT STREET, BURNIE (004) 31 7733

QLD: MITCHELL RADIO CO. - 59 ALBION ROAD, ALBION (07) 57 6830

S.A. & N.T.: INTERNATIONAL COMMUNICATIONS SYSTEMS PTY. LTD. - 8 NILE STREET, PORT ADELAIDE (08) 47 3688

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WILLIS ELECTRONICS - 165 ALBANY HIGHWAY, VICTORIA PARK (09) 470 1118
BAY RADIO - 22 GRACE STREET, FERNDALE (09) 451 3561
FORD ELECTRONICS - 209 HANCOCK STREET, DOUBLE VIEW (09) 446 4745

VK2 Mini-Bulletin

Tim Mills VK2ZTM
VK2 MINI BULLETIN EDITOR
Box 1066, Parramatta, NSW. 2150

Members of the NSW Division are advised that the Annual General Meeting will be held on Saturday, March 28, 1987. A separate posting will be made, of the Annual Reports, in early March. You are further advised of the following dates concerning the AGM:

—Items of business and nominations from members to serve on the Council for the forthcoming year must be received at the Divisional Office, 109 Wigram Street, Parramatta, by 9 pm on Wednesday, February 25, 1987. Nomination forms are available from the Divisional Office.

—Folding and enveloping of the Annual Report and other material will occur on the evening of Tuesday, March 3, 1987, at the Divisional Office. Help is required for this task.

The Divisional Council consists of seven Full Members elected annually at the Annual General Meeting, which is by ballot, if there are more than the required number. Duties of a councillor include attendance at the monthly council meeting. In addition, each councillor has a number of administrative duties to undertake during the month, which in most cases includes attending the Parramatta Office. A full run-down on duties of a councillor is included on the nomination form.

NEW MEMBERS

The following were admitted to membership of the Division at the Council meeting on December 12, 1986.

M D Beamish VK2PEH, Putney; J C Bray VK2DEC, Faulconbridge; S R Brown Assoc, Cherrybrook; B R Croker VK2DBA, Crookwell; R N Greenstreet Assoc, Lambton; G A Hill VK2DAA, Gosford; N S Johnston Assoc, Mullumbimby; (Mrs) J M Key VK2AKW, Guildford; R A Lalor Assoc, Cambridge Park; D A Page VK2GF, Merewether; G V Povey Assoc, Bredbo; R J Richardson VK2MAO, Kempsey; R H Simmons VK2NRS, Doonside; F Yangsun Assoc, Dulwich Hill and F Delia VK2GA, Blacktown.

A warm welcome is extended to all.

To all members — we would each of you to introduce a new member to the Institute during this year. If you would like application forms sent to a prospective member, would you phone or write to the Office, (02) 689 2417, 11 am to 2 pm, Monday to Friday or 7 to 9 pm Wednesday, or call in at those times. The mailing address is to PO Box 1066, Parramatta, NSW. 2150.

WICEN

The State WICEN Committee has called a meeting of the WICEN membership for Saturday, February 14, at 2 pm, to be held at 109 Wigram Street, Parramatta. A separate posting will be made to WICEN members.

The next major WICEN exercise will be the Bungonia Caving weekend — March 14/15. Advance registrations are required by mid-February. Further details via the weekly nets on repeaters 7150/8275 at 8.30 pm, Thursday, or the Sunday Broadcasts.

A reminder that the Gosford Field Day will be held at the Gosford Showground on Sunday, February 22. There is plenty of covered areas so the event can be held in any weather.

LIBRARY

The list of publications mentioned in the notes last month have not been completed. It will appear later in the year.

The dates of the next Trash and Treasure Sale and Seminar have not yet been determined as these notes were prepared (In 1986).

The Broadcasts will give warnings of these and other coming events. If you miss hearing either of the Sunday Broadcasts, you can always check up on the major points with the Telephone News Report — Monday to Saturday on (02) 651 1489.

ANARTS will recommence their VK2TTY Broadcasts on February 1.

The Sunday voice broadcasts are in need of full-call operators, in particular, for the evening sessions. If you can help, contact Dave VK2KFU, (Broadcast Officer) or advise the Divisional Office.

SILENT KEY

As these notes were being completed, I learned of the passing of Dave Duff VK2EO, on December 28, 1986.

Dave was a Life Member of the Division and a Past President. He was active in the Division (to my knowledge) in the 50s and early 60s. He was involved with the establishment of VK2WI, Dural, and the selection and purchase of 14 Atchison Street. Dave served in the Navy during WWII. He was a leading CW operator on the HF bands.

—73 de Tim VK2ZTM

ar

JOIN A NEW MEMBER

VK3 WIA Notes

Jim Linton VK3PC
IMMEDIATE PAST-PRESIDENT
WIA VICTORIAN DIVISION
412 Brunswick Street, Fitzroy, Vic. 3065

NEW MEMBERS

The following applications were received in November and accepted by Council November 27, 1986. A warm welcome is extended.

Margaret Anderson, William Bell VK3WK, P J Burke VK3PYI, Glenn Greenhall VK3KLW, Keith Irving, Lindsay Martin, Christopher Nihill, E M S Randall, Alan Robinson VK3SQ, Carl Schlink VK3PMH and Ernst Zimmer VK3XMQ.

We are now well into the New Year, and 1987 will be a crucial one for the future of our hobby. Take time now to reflect on where amateur radio, and the WIA, are headed in the years to come.

In Victoria, 1986 was a tough year for amateur radio with a noticeable increase in opposition to the erection of radio masts by radio amateurs. This hits at a key tenet or our hobby — the right to be a recreational activity carried out in residential dwellings. This opposition will grow unless the WIA can be an effective buffer between local government and the radio amateur.

We should all be concerned about local governments' attack on amateur radio — whether or not we personally intend to put up a mast — and see that the WIA is able to defend your fellow radio amateurs.

The sweep of change is moving across amateur radio with the DOC policy of deregulation and examination involvement.

If you care about our hobby, find the time to digest what these developments mean and give thought to their potential impact. Let your voice be heard within the next two weeks by putting your opinions and views down on paper and sending them to the WIA Victorian Divisional Councillor, Alan Noble VK3BBM.

The hobby has changed in the past decade, but unfortunately many fail to take the broad view, or just ignore the changes around them whilst pursuing self-interests. Apathy is clearly evident with a lack of a broad awareness of amateur radio beyond the individuals' own interests.

Change will escalate in the coming decade. It will be reflected in both the state-of-the-art facilities in commercially available equipment, and modes of emission on the amateur bands.

An understanding and appreciation of Packet Radio and its impact on the hobby is also needed — even if you are an ardent brass pounder or HF DX operator.

What about restructuring of the licensing system — this matter should concern you — but will it happen for the good of amateur radio if apathy among those already licensed prevails?

Decisions have to be made on how to accommodate change in the Amateur Radio Service. Will you participate in the decision-making process or just sit back without caring what happens? Do you really care about the future of the Wireless Institute of Australia?

The WIA Victorian Divisional Council is unable to effectively cope with its task of representing radio amateurs and shortwave listeners without a much greater input and support from the membership. Because of apathy from the membership, the Victorian Division is failing in its objectives and in providing a worthwhile organisation to benefit all radio amateurs.

Very few members in recent years have contributed to the manpower and intellect resources of the Division. Those in the leadership positions on Council are unable to effectively carry out their tasks of office because they are tired and overworked. Their willingness to put something back into the hobby by helping out with the administration of the Victorian Division is negated by councillors who do nothing, and the lack of members seeking election on council.

The amateur radio fraternity is a minority in today's society and will suffer unless it stands united and prepared to defend itself.

The WIA has, in the past, been an effective advocate for your hobby. But its strength has been cut by the lack of membership involvement. With its limited manpower, the council has made managerial changes and ensured the Division is on a sound financial footing. But it cannot give adequate attention to the challenge of change facing amateur radio when the workload rests on the shoulders of a few virtually over-worked, burnt-out councillors, acting in an honorary capacity.

The 1987-88 year could be a great one, making a lasting contribution to the hobby — but it will not if all members do not in some way help their Division and long-term harm may very well be suffered by your hobby.

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Five-Eighth Wave

Jennifer Warrington VK5ANW
59 Albert Street, Clarence Gardens, SA. 5039

Well, our Jubilee year has finally come to an end, but far from *fizzling* out, it ended with two notable activities. Our Christmas Social on December 9, was (as many people remarked afterwards) one of the best we have had in many years. Kevin Kitto and the Glenlea Singers got us into the Christmas spirit with several brackets of bright and breezy Christmas music, and John Hampel VK5SJ, led us back through the years of radio in South Australia with his audio presentation. It was appropriate that we presented John with the ICS Award for Services to Amateur Radio, for co-ordinating the Jubilee 150 Nets throughout the year and for arranging the amateur radio involvement with the Marion Centenary celebrations. Because the ICS Award was not presented at the September Display of Members Equipment, due to a lack of entries, it was decided to present it, also, at the December meeting for services to amateur radio.

Although it is not usual for it to be given to a Council member, it was considered by the other members of Council that Rowland Bruce VK5OU, had earned some sort of recognition for his part in making the Jubilee 150 Award so successful. For those who do not know, Rowland worked out the original details of the rules and sent them off to magazines all over the world. He was involved with the design and printing, in co-operation with the South Australian Government Tourist Bureau and has since written out and arranged postage (not to mention signing by the Premier!) of over 1000 Awards. He also operated from the *Failee* (a refurbished ketch), and from the Marion Library.

Not bad, when you consider he is also Federal Councillor, Vice-President and DOC Liaison Officer!

Other presentations that night included a small token of appreciation to Wendy Clegg (YF of David VK5AMK), who has organised our Christmas Social Supper for several years and our Clubs' Convention meals for the past three. We are now looking for someone to take Wendy's place in either one or both of those areas. *Please* let us know if you can help.

Ian Hunt VK5QX, in his role as Federal Contest Manager, presented the Contest Champion's Trophy jointly to Lindsay VK5GZ and Bob VK5BJA. It was appropriate that in his last term as Contest Manager the recipients were both VK5s. Ian pointed out that this presentation was a *symbolic* one with the old trophy, as two new trophys were soon to replace the old one.

Peter VK5ZPT, Jenny VK5ANW and John VK5SJ, at the Colonial Picnic. (Antique radio equipment is courtesy of Peter Thomas).

—Photograph courtesy Wendy Warrington

Despite much *collusion* between myself and Joan White, the YF of Neil VK5WN, we were not able to get Neil along that night to present him with an engraved pen and pencil set, in appreciation of his past services to the VK5 Division. It was only a chance remark a couple of months ago, when Neil was about to resign as the 160 metre Roster Co-ordinator (a position that he had held for over 13 years) that led me to look back into his past history with the Division. According to Marlene Austin's book, *The First 60 Years* compiled from old Council Minutes, Neil, then VK5ZAW, was on the program committee in 1957. In 1959, Neil informed Council of his intention to form a VHF group, and by 1960, had been elected to Council holding the positions of Program Organiser and VHF Representative. In 1961, he became the VHF Section Vice-Chairman. He resigned from Council around that time, but returned around 1970, when, as VK5WN, he became the Publications Officer. Later, that same year, he again took on the job of Program Organiser, and held both positions through 1971, and continued as Publications Officer through 1972. Around 1973, he was asked, at very short notice, if he could do the Sunday Morning Broadcasts from his home and he did so for the next seven weeks (an experience he remembers as somewhat nerve-wracking!). He must have got help after that because he started the 160 metre Roster, which as I said before he only relinquished a couple of months ago. Neil can still be heard every seven weeks, or so, as the 160 metre operator on the Sunday Morning Broadcast. When I made the presentation to Neil, at his home, he protested that there are many others who have done as much, or more, for the Division. Perhaps so, but this time it was Neil that we *found* and it was nice to be able to say: "Thanks Neil."

Going back to the Christmas Social, we were pleased to have, as our Guests, Rob Gurr VK5RG, State Manager of DOC, and Rob's wife Margot; and Geoff Stevens VK5ZG, DOC Liaison Officer with the WIA, and Geoff's wife Karen.

Sunday, December 28, *Proclamation Day,* provided us with the last chance to publicly wave our Jubilee *flag* — and wave it we did! For those who may not know, South Australia was proclaimed a State on December 28, 1836, under a large gum tree, in the seaside suburb of Glenelg, where Governor John Hindmarsh first stepped ashore. Every year since, a Proclamation Day Message is read at a ceremony at the same site, with the original gum tree (now more cement and fibreglass than wood!) not quite standing, but forming a picturesque arch. So, when, earlier in the year, Ken Westerman VK5AGW, suggested that the final day of transmitting at the Old Gum Tree site be organised by himself and other Glenelg amateurs, it seemed like a good idea. However, unfortunately when the time came, the local amateurs were all unavailable for the most part, so once again the *old faithfuls* came to the rescue, plus one or two others. Those that were still around when I arrived around 5 pm, included Jack VI5FV, Lindsay VI5GZ, Ken VI5QW, Graham VI5AQZ and Hans VI5KGZ. My apologies to anyone who came and went before that, and thanks of course to Ken VK5AGW, for organising the loan of the Sea-Rescue Squadron Caravan.

I had spent most of that day in Rymill Park, at an Old Fashioned Picnic, to mark the end of the Jubilee. It included a procession of vintage cars, horse drawn vehicles, penny-farthing bikes, etc; also old fashioned races, games and various sorts of amusements and entertainment. There were also displays of many varied types of old fashioned equipment, including (you guessed it!) old radios.

Two of our collectors and restorers of old radios in this Division are Peter Thomas VK5ZPT and John Hampel VK5SJ. When I arrived before noon, Peter, John and Peter's brother Warren, were busily setting up a display of interesting pieces from Peter's large collection. I would like to thank Peter, most sincerely, for his efforts which caused a great deal of interest. (As it was the final match of the Davis Cup round against Sweden that day, we were not sure whether the interest was really in listening to the radios, which dated from 1918, or whether the interest was really in the tennis!). Peter even had a tape of 'historic' broadcasts, and from time to time, we were able to her such things as a young Princess Elizabeth addressing the nation, or Prime Minister, Robert Menzies informing us that we were now at war. We were asked to get into the spirit of the occasion by dressing up in pioneer-style costumes (as radio wasn't that old, John and Peter opted for something nearer the 1920s). If anyone has old unwanted radio gear, don't throw it out, Peter or John will gladly collect it from you for restoration purposes — both are QTHR in the Call Book.

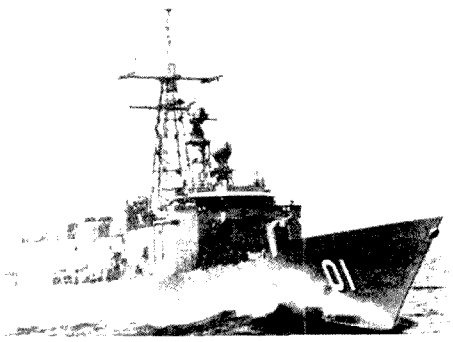
The other event of that eventful day was the operating by Bernie VK5ABG, of the VK5RAN call sign from HMAS *Adelaide*, and I thank Bernie for this report.

ROYAL NAVAL AMATEUR RADIO SOCIETY.

On Proclamation Day, December 28, the South Australian Branch of the Royal Naval Amateur Radio Society, was given special permission to operate their club station call sign, VK5RAN,

Peter Thomas VK5ZPT and John Hampel VK5SJ, at the Colonial Picnic.

—Photograph courtesy Wendy Warrington



—Photograph courtesy Royal Australian Navy

maritime mobile on board the Royal Australian Navy Frigate, HMAS *Adelaide*, which took part in the Proclamation Day Ceremony and Jubilee 150 Celebrations, at Glenelg.

The HMAS *Adelaide* was anchored one and a half kilometres off shore from Glenelg all day.

The RNARS was given permission to operate VK5RAN/MM on two metres VHF, with Ship-to-Shore communication only.

Bernie VK5ABG, was on-board from 0800 to 1700, using an FT-207R hand-held transceiver from the port-side of the bridge.

VK5RAN/MM had 56 QSOs on two metres, which included contacts with other RNARS amateurs in South Australia and with the special VI5JSA amateur station at the Old Gum Tree.

—Courtesy Bernie Edwards VK5ABG, Custodian of VK5RAN & SA Representative of the RNARS Australian Branch

By the time you are reading this, you will no doubt be aware that we have a new Broadcast Producer. I would like to thank Kevin VK5IV for offering to take over the position from Arthur VK4AAR. We hope that you will get a great amount of satisfaction and enjoyment from the job, Kevin, and to Arthur, we extend our grateful thanks for the time that you were able to fill the role. We wish you all the best in the new direction in which you are headed, Arthur.

TO THE MEMBERS OF WICEN

With the bushfire season upon us, I would like to hope that your services will not be needed, but with the thick undergrowth from our wet winter, I think that may be a little optimistic. If you are called out, take care, and we thank you for volunteering yourselves and your equipment.

DIARY DATES

Tuesday, February 24, at 7.45 pm — Ray Bennett VK5RM, will speak on *New Developments in Ionospheric and Radio Wave Propagation Research.*

ar

WA Bulletin

Fred Parsonage
Honorary Secretary,
PO Box 10, West Perth, WA. 6005

Very shortly in these columns will be the notice of the forthcoming AGM which takes place in April, each year. One of the duties at the AGM is the election of the Council. In 1986, there were no nominations including no re-nominations from the sitting Council, therefore, no Council was elected and the sitting Council continued their duties under the constitution, as a caretaker Council.

We hope that the point was made. In every organisation, new blood, new ideas and new enthusiasms are required. Nearly every member of the Council have served for a number of years. Except for the ever attractive and ever young YL members, the Council consists of more mature age persons and we are asking for nominations for the next Council which must be in the Secretary's hands 42 days before the AGM. Think about it now, talk to your mates, get together and make a new Council which all of you ask for. It is no use talking about *them* and the *old guard* if you are not prepared to take their place. The Division and, indeed the Institute, can only be progressive and meaningful is we have a healthy competitive Council. Let us have a ballot for Council, make it necessary to hold one by having nominations.

Also, at the AGM, we discuss business which has been duly notified so if there is anything that you want to discuss at the AGM, whether it is a commendation for a member or a change to the constitution, get it on paper and submit it to the Secretary ***Now!***

In 1987, there will be an increase in subscriptions. This is, of course, inevitable due to increasing costs, particularly in printing of the magazine AR. Your Division has endeavoured to soften this by having no increase in the Divisional portion for the fifth year running. This is possible by good housekeeping by the Treasurer, Cliff VK6LZ, Book Sales by Christine VK6ZLZ and the ever efficient QSL Bureau run by Jim VK6RU, assisted by Ray VK6NRN.

The breakdown of your subscription for 1987 is as follows:

Federal	$12.05	a decrease of 22 cents from 1986
IARU	$00.75	an increase of 28 cents
AR Magazine	$14.20	an increase of $2.44
Total Federal	$27.00	
WA Division	$7.00	Full Call
	$6.00	Associate
	$0.00	Pensioner
	$6.00	Student

From each, 50 cents is placed in the fund for WARC 99.

This holding-down of subscriptions is, of course in reality, a true devaluation in real terms and can only be done by pruning of costs whilst maintaining a viable organisation. It is often said in commercial publications in Letters to the Editor, that the WIA only represents just over 50 percent of amateurs. This, of course, is not strictly correct and the real figures applied to active amateurs would be much higher. However, it cannot be denied that over 40 percent of licenced amateurs do not belong to the WIA, but leave the representation to those who do. This representation benefits all amateurs, whether it be to the Department of Communications, the local government bodies or to WARC, to which, as mentioned above, every member of the Division allocates 50 cents per year of their subscriptions to pay for the Institute team to represent Australian amateurs in 1999.

If amateurs want amateur radio to continue. If amateurs want their share of the frequency spectrum which is today the largest frequency allocation in the world, other than that allocated to the Armed Services, then this representation must be maintained and it can only be maintained by a strong representative membership.

So, maintain your membership and encourage others to join to enable the gains we have made to be kept for us and other who follow.

ar

WOOLPACK/CLYDESDALE MOBILE

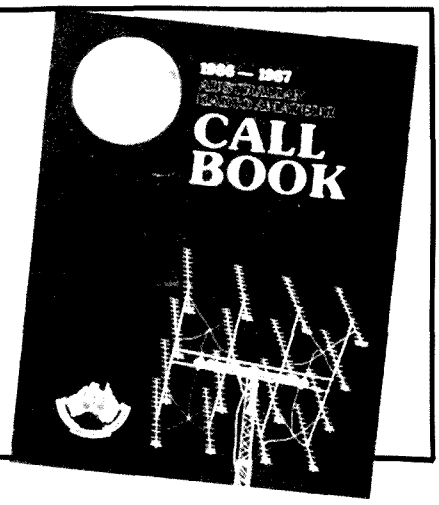
Steve Mahoney VK5AIM, operating *Woolpack/Clydeadale Mobile* north of Adelaide on August 27, 1986.

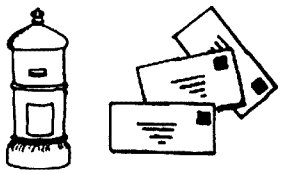
—Photograph courtesy Jenny Warrington VK5ANW

CHANGE OF CALL SIGN OR ADDRESS

Within days of the new Call Book being released, the Federal Office was receiving letters from amateurs that their details in the Call Book were incorrect. The WIA regularly receives updated information from the Department of Communications listing new call sign allocations and changes of call sign and address. The system works well — most of the time. Occasionally, there are delays or omissions.

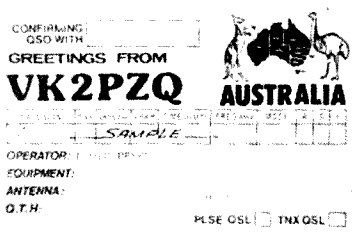
All amateurs, whether they be members of the WIA or not, are requested to notify the Institute of changes of call sign or address to ensure that their entry in the Call Book is correct. When notifying the WIA of a change, please give both ***old details as well as new.*** If you are a member, please include a recent AR label if possible, to enable us to positively identify the record to be changed.





Over to You!

Any opinion expressed under this heading is the individual opinion of the Writer and does not necessarily coincide with that of the publisher.



Lloyd's QSL card.

VK2PZQ MARITIME MOBILE

I, together with a number of other amateur stations, have been following the progress of the above station during his maritime-mobile wanderings around the Pacific islands since January 1, 1986, mainly on 3.600 MHz.

As Lloyd's journey is coming to an end, I would like, on behalf of *our crew* to thank the amateur fraternity for their assistance in allowing us space on the above frequency for our scheds.

Since leaving New South Wales, Lloyd's journey of 8500 kilometres has taken him to New Zealand, Fiji, Vanuatu, Loyalty Island and Noumea. We have collected call signs from all over the Pacific from stations that have assisted with relays when conditions have been unfavourable.

Thanks also go to ZLs 1AHY, 1AYE, 2BFQ, and 1UT for their help and friendship.

Yours faithfully,

Paul Peacock VK2ACK,
PO Box 216,
Miranda, NSW. 2228.

—on behalf of Ted VK2CES, Bill VK2EWP, Doug VK2NNA, Ian VK2PSO, Dennis VK4NDF and all other stations who have been involved with this venture.

ar

FEDERAL TAPES? ? ?

I recently had the opportunity to take some Call Books up to Geraldton (about 400 miles (649km) north of Perth), to sell to the amateur fraternity there, as I was making a visit to my daughter at the time.

In the process I was amazed to hear from some of the fellows that: "I see they haven't changed my old call sign to the new one yet! ! !"

When I inquired had they written or notified the Call Book Editor the reply was that they thought the DOC would do that! ! !

Do you think under the circumstances that an announcement on the Federal Tapes on Sunday's News and a printed explanation in some prominent part of the next Call Book would solve this matter?

No doubt this has been done in the past but a reminder would help to bring the information more up to date, don't you think?

Yours sincerely,

Albert Davey VK6ARD,
12 Lillian Street,
Cottesloe, WA. 6012.

(an announcement has been made on the Federal Tapes — Ed).

ar

TO WHOM IT MAY INTEREST. . .

A recent letter from Walter DK8KV, informs me that he can give technical details of how to convert a *Telereader 685* and *Hal ST6000* to AMTOR. Readers who are interested may write for more information to: Walter Barteczek DK8KV, Weserstrasse 3, D-5303 Boenheim 2, West Germany.

There is also a new satellite tracking program which has been developed by Erich DK1TB. Two interesting features of the program are:

—it displays on a map of the world, the actual part of the surface which is "covered" by the satellite.

—it displays the current shape of the orbit projected onto the Earth's surface.

The program is written for the C-64. Further information is available from Erich Eichmann DK1TB, Kiewningstrasse 54, D-4930, Detmold, West Germany.

Regards.

W Tomezyk VK2OE,
PO Box 1914,
Wollongong, NSW. 2500.

ar

REUNION? ? ?

During 1987, Ray Bennett VK5RM, and myself, would like, if possible, to organise a reunion of graduates from the *Marconi School of Wireless,* in Melbourne, 1940-44.

The Principal of the School in those years was Cec Bardwell VK2IR. Cec guided and encouraged many young men to realise their ambition for a sea- going career. Being wartime, some were lost at sea, but no doubt we still gave a few survivors.

Being so long ago, names of the graduates do not come readily to mind, but perhaps this letter may unearth some of the *old salts* who became radio amateurs in the post war years.

Should this letter elicit a response from those ex-ROs, or other amateurs who may have information of them, a letter to Ray or myself would be very much appreciated.

Sincerely,

Bob Clifton VK5QJ,
4 West Terrace,
Beaumont, SA. 5066.

ar

WONDERFUL, EXCEPT FOR. . .

Your magazine is wonderful, except for the price per copy, which is quite high. Only well-to-do readers here can afford it — and there are not many Philippine amateurs who like reading technical articles!

Anyway, I am an amateur myself, having passed the Class "C" licence last year. However, I don't have equipment yet or a call sign. I cannot afford one in the present circumstances, so I am not active. I sat the exams as I was bored — but, what do you know? I passed!

My real hobby is actually collecting, particularly headgear from all over the world. Firstly, I get penfriends from abroad, then we exchange things such as stamps or handicrafts from the Philippines or a good ethnic hat.

I am particularly fascinated by an Australian Slouch Hat. This is my primary reason for writing to *Amateur Radio.* I would like to find some Australian penfriends for friendship and hopefully I may acquire a Slouch Hat.

Toy Llaguno, (aged 34 years),
788 Rizal Street,
Oaraga, Albay 4912,
Philippines.

ar

SET ASIDE FREQUENCIES!

In reference to December AR, I agree with VK2SR's proposal about setting aside frequencies for AM, QRP, etc. For 80 metres, 3.580 MHz should be suitable. Crystals for this frequency are available for about $3, which would encourage owners of crystal controlled equipment.

Valves seem to offer a solution. They are available from old radios and valve circuits can be simple. A one or two valve receiver can be perfectly suitable for receiving 80 metres.

It is true that AM is less efficient than SSB but, when signals are extremely strong (S9 + 20 dB), it doesn't matter. As a SWL of amateur radio for two years, I have heard no AM. AM does use more band space, but often the 80 metre band is sparsely populated; eg Sunday mornings after the WIA News broadcast.

I would also like to thank the following amateurs who have helped me with advice or by QSLing my reception reports. VK2AYH, VK3BSB, VK4YA, VK5FV, VK6s SA, LC, AJ, NCO, ART, AFA, EJ, HC, YL, HD, IR, VK7s RF, KJ and VK9XZ.

73,

Peter Parker VK6NNN,
C/- PO Witchcliffe, WA. 6286.

ar

LOOKING FOR A QSO!

I am a member of ORARI (the Indonesian Radio Amateur Organisation). I am interested in amateur radio QSOs abroad, especially with members of the WIA.

Thank you very much in anticipation.

Zaenal Abidin YD8ZEX,
Jalan Bosoirl 86,
Ternate, Maluku Utara,
Indonesian.

ar

ANOTHER "BROADCASTING SHIP"

With reference to the paragraphs in the December issue of AR by Joe Baker, *Listening Around,* about the shortwave broadcasting station aboard the MV *Kanimbla (9MI), there was, at this time, although it does not appear to be as well-known, a broadcasting station aboard the MV Gwatea. Gwatea* was from the Union Steamship Company of New Zealand shipping line.

In a 1937 copy of an American radio magazine, there was an illustration of the ship's QSL card, which had been received by the well-known pre-war DX correspondent to various American magazines, Joe Miller.

The details appearing on the card were:

Tx — 300/400 watts
Aerial — 90 ft vertical
Rx — 16 valve double superheterodyne
Aerial — Doublet between the funnels
Freq at the time — 13.6 mcs

Reception was in New York on 13/12/36.

No details were given as to the make of the equipment, but a shrewd guess would be that it was AWA.

The call sign appearing on the card is interesting inasmuch that it is the ship's normal commercial call, ZMBJ, and not, as in the case of the *Kanimbla,* a broadcast station call sign.

Norman Burton,
130 The River Road,
Revesby, NSW. 2212.

ar

SIMPLE SOLUTIONS SELDOM ARE!

With reference to the article in AR, December 1986, on page 50, *Technical Mailbox* — DX Polarisation Protection.

I think that the silicon diodes which are arranged in the bridge configuration as shown, will each drop approximately 0.6 volts when conducting. Since there will always be two in circuit, then 1.2 volts will be dropped, which would result in a loss of about 20 percent in power assuming a supply voltage of 12 at the bridge. . .

Dave Gibbons VK1GD,
PO Box 3,
Hawker, ACT. 2614.

(Quite right, Dave. As Murphy said, "Simple solutions seldom are"! —Ed)

ar

WHY? ? ?

Why have you stopped putting the AOCP Exam Sample Paper into *Amateur Radio* a month before the exam?

I am a Novice, 68 years old, and this Sample Exam Paper helped me a lot in study for the AOCP exam.

Yours faithfully,

E Hengartner VK2NEH,
PO Repton, NSW. 2454.

(We are sorry to admit we have run out of approved papers. Changes in the DOC system have made it difficult to produce new papers. We would appreciate sample questions from anyone who feels competent to send some in. —Ed)

ar

OLD TIMER

I am, what I consider, an Old Timer. Now 85 years of age, I was granted a Radio Listeners Experimental Licence from the PMG in 1923, and have a licence since that time.

I passed the AOCP licence in 1935 and received the call sign VK2JF and have been a member of the WIA ever since.

At the age of 10, I made a telephone line stretching about a quarter of a mile to my brother-in-laws house. Over this line I could hear some Morse and faint speech, which I thought was radio but it was, in fact, induction from a railway inter-station telephone from the railway line four miles away. Their line was parallel with my phone!

The standard Australian ship radio was ¼ kW rotary converter run from the ships 110 volts DC, with a rotary spark gap on the end of the converter shaft. The ships receiver was one valve and an emergency transmitter was a one inch spark coil run from a battery. The backup receiver was a twin crystal (a zincite-bornite pair). I obtained a pair of these from AWA.

The crystal receiver I made received good Morse from coast stations and many ships radios from which I learned Morse code. I erected a 50 feet pair of masts and a three wire 120 feet aerial. When broadcast station 2FC commenced transmission on 11 000 metres and 3LO on 17 000, I could receive good signals at night.

At this time, I lived in the Inverell district, some 500 miles from Sydney.

I later built a one valve receiver with an AWA tube, which received many stations on the 32 metre bands which were then in use (on a Pi Regenerative circuit). On this band there were Dutch stations in the Indies using ARC with frequency shift keying.

I read the article in the RAOTC column on Willis Island with great interest — the purpose of this letter — as a radio operator I knew , Colin McGaskel, did a few tours-of-duty on Willis Island at the Meteorological Station.

Once, he started the petrol motor there which back-fired and he was badly burned. His co-operator rendered first-aid as best he could but it was quite a few days before the supply ship could transport him to Townsville due to storms.

Colin was a ship's operator, not an amateur. He was a pilot of flying boats and was seconded to the Navy In WWI. He was selected to fly, as a radio operator, on a top secret flights from Perth to Ceylon (now Sri Lanka). The plane was packed with spare petrol tanks and the radio room was only a few feet square. On the very first trip a petrol tank ruptured and the radio room was flooded, and the flight had to return to Perth.

On a later trip the crew noticed splashes on the sea water under them which were later discovered to be enemy bombs. They executed the trick that Sunderlands were adept with, dived down as low as they could and dodged among some little islands and sandbanks.

The enemy boasted to have shot them down, severing the only connection to India.

Willis Island is some 400 km east of Townsville and I have been told that there is some mention of automation of the instrumentation there.

During one of Colin's periods there, a flying fox stayed on the island for a few days. They were also invaded by baby turtles and had to lead them seawards by torch light.

I was born in Henham, Essex, England, in 1901.

For about 10 years I was the operator of one of only two radio receivers in the Inverell district. The other set was owned by a doctor. When told of my results by a man who had spent an evening listening to my set, the doctor commented: "Absolutely impossible. He is only getting some reradiation from my aerial!"

73,

Ivan Newport VK2JF
"Hluhluwe"
356 Terrace Road,
Freemans Reach, NSW. 2756.
ar

CALLING ALL SCHOOLS

As a school teacher I have decided to take some of my radio equipment to school and start a radio group among the students at Endeavour High School, in the Sydney suburb of Caringbah.

I would be interested in hearing from other amateurs/teachers who have radio equipment set-up in their schools. One idea is for contacts between different school groups before letting the students loose on normal amateurs.

Any interested can contact me on (02) 57 1426 most/some evenings to arrange a sched or I am usually on about 3.624 MHz at 7.30 am local (2030 UTC during DST), Saturdays and Sundays.

Yours faithfully,

Peter O'Connell VK2EMU,
3A Algernon Street,
Oatley, NSW. 2223.
ar

PIRATE OPERATORS USING VK1 PREFIX

Whilst performing the duties of Inwards QSL Manager for the VK1 call area, I have observed for some time now, the activities of pirate operators using the VK1 prefix. As I have received in excess of 200 such cards for pirate operators in such a small amateur radio population, I would like to draw readers attention to this matter in the hope that these operators will be ignored.

I realise that this action will not completely halt pirate operation, but it may draw sufficient attention to their activities to noticeably curtail them.

Two (or possibly the same operator) are consistently using the following call signs: VK1s A; B; C; D; E; AA (all official Government call signs), VK1QAV and VK1GDW. All contacts made under these calls are in the CW mode and have never been heard in the Australian Capital Territory (VK1). I have also received cards bearing the call signs, VN1A, VN1B, etc. Incidentally, there are *no* Australian amateur call signs with a single letter suffix. Another pirate operator is using the call, VK1ZZZ and most contacts have been made on 40 metres SSB (Australian Z-calls are not licensed to operate on the HF bands!).

Another pirate operator is using the call, VK1M/M and could also be part of the former operators repertoire of bogus call signs. It would be appreciated if any amateur or SWL knowing the whereabouts of any of these operators could drop me a line with details.

As an avid DXer, I can appreciate the dismay to the sender when I am forced to return a card through the Outwards Bureau stamped 'pirate operator.' Because VK1 is a small amateur population, many overseas amateurs are listening for VK1 to complete award requirements.

John Clare VK1CJ,
GPO Box 600,
Canberra, ACT. 2601.
ar

THIRD PARTY SOLICITING AN OPEN LETTER TO DOC

Mr Hunt
Department of Communications
Regulations and Licensing Branch
PO Box 34
Belconnen ACT 2616

Dear Mr Hunt

I write regarding the recently announced guidelines restricting the soliciting of third party traffic by radio amateurs.

I urge you most strongly to remove all such restrictions for the following reasons:

1 They are against the expressed intentions of the then Minister for Communications, Mr Staley, who, when announcing granting of third party privileges in August 1980, stated that they would be identical to the privileges enjoyed by US amateurs. There are no restrictions on soliciting in US regulations.

2 Such restrictions are totally unnecessary. If they are based on fears that uncontrolled soliciting will adversely effect Telecom or the OTC then please consider the following examples of such soliciting:

a) Willoughby Park, December 1984. Several hundred members and friends of the Australian American Association attended their annual picnic. Despite a high profile amateur radio display, including invitations to send messages, only seven messages came in. Bear in mind that most people there would have at least one friend or relation in the US.

b) 1980, Crestwood Amateur Radio Club put on a public display station inviting the public to send messages. Only 15 messages resulted.

c) September 1983, 1984, 1985 and 1986, Willoughby Family Fun Fair run by the town Council and the NSW Sports and Recreation service, Willoughby, Sydney — averages about 20 messages per year.

d) Festival of Sydney 1982, 1983, 1984, Hyde Park — also generated about 20 messages per year.

e) The June 1981 STD telephone breakdown resulted in amateur operations which attracted only 170 messages by the principal station involved, despite excellent media coverage.

When you compare the above figures with the millions of calls handled by Telecom and the OTC every day, it is clear that soliciting by radio amateurs for third party messages is not, nor ever could be, a problem. The provision of free national and international telephone links for two Australian Traffic Net (ATN) stations during the Mexican earthquake indicates very strongly that neither Telecom or the OTC consider amateur radio a threat of any kind. It also exemplifies the excellent relationship between amateur radio and Telecom/OTC.

Example d) above has special relevance as without soliciting it would not have been the significant event in the history of public service by radio amateurs that it was.

It could be argued that it was the media who did most of the soliciting In the above example. However, the media obtained their information from radio amateurs, so who did the actual soliciting? My point is, that what represents soliciting and what does not is open to interpretation, and interpretations can change with those making them. It is altogether too fine a line to tread.

3 Without soliciting it would be harder to maintain enough traffic to keep up the interest of regular traffic operators or gain newcomers to that aspect of our hobby. We need as much practice as possible during normal times so that when emergencies do occur we have the experience, numbers, national and international links.
I cannot stress the above point strongly enough. News of the involvement of amateur radio in any emergency is soon spread, but the groundwork for that involvement is done during normal times. We need to solicit to keep up that ground work.

4 For six years now radio amateurs have operated their stations blissfully unaware of the previous restriction on soliciting, with no complaints from any potentially affected body (please correct me if I am wrong). To quote an old saying, "the proof of the pudding is in the eating". Surely, this reason alone is sufficient cause to remove all restrictions on soliciting.

5 Anyone promoting the amateur radio service as a communications aid for any non-emergency situation, be it a canoe race, a sister city event, a car rally, a marathon, etc, could be breaking the law — a ridiculous situation.

Finally, we who make continued use of our third party privileges do so not out of simple interest alone, but also as a means of improving the relationship between the general public and the amateur radio service on a world-wide basis, for the ultimate good of all concerned. The restrictions will hamper us in this aim.

I wish to do nothing detrimental to the excellent relationship between the DOC and the ARS, a relationship built up by people on both bodies. I just feel that any restriction on soliciting is to a degree illogical, totally unnecessary and detrimental to the public service potential of amateur radio, and therefore to amateur radio itself, and must be opposed.

I urge you, once more, to remove all restrictions on soliciting.

Yours sincerely

Signed: David Bell VK2BBT
RMB 5445
The Ridgeway
Holgate (Gosford) NSW 2250

Silent Keys

It is with deep regret we record the passing of —

MR R CARTER	VK2HC
MR G CLAY	VK2ECA
MR DAVE DUFF	VK2EO
MR J A FURZE	VK2HF
MR D M HUTCHENS	L50527
MR J B JANSEN	VK7NJJ
MR C H JUOD	VK5HQ
MR C P LITTLEBOY	VK4PB
MR L E MALLINSON	VK4LM
MR DICK ROY	VK3ADR
MR ANGUS THORNTON	VK3IY
MR E J THORNTON	VK6BF
MR H M WATSON	VK5HW
MR G T G WHITBY	VK3ADY

Obituaries

ROBERT (Bob) V BARRINGER VK2RR 1920 - 1986

After a long illness, Bob passed away in Hornsby Hospital on December 1, 1986, at the age of 66 years.

Bob began life as a "Crow-eater" in 1920 and proceeded through youthful activities until May 1938, when he joined the workforce of the Adelaide Electric Supply Company, as a junior electrician and graduated through various stages until 1944. At that time, he joined the staff of Broadcast Station 5KA.

During the intervening years, Bob married Pat Cahalan, in 1943. After some years involved with broadcast techniques, Bob rejoined the AESCo (now the Electricity Trust of SA), where he became occupied with power line carrier equipment for communications and control systems. Much later after moving to Sydney in 1957, Bob joined the British Automatic Telephone and Electric Co, who were subsequently incorporated with STC and later Plessey.

Bob remained with Plessey until 1976 when he joined the Electronic Engineering Department (later to become the Biomedical Engineering Department of the Royal North Shore Hospital, Sydney), where he remained until his retirement in 1985.

It was during this past period of his life that Bob was most satisfied and totally immersed himself in the day-to-day activities of the caring situation he found at the hospital. His particular qualities of quiet assurance and dedicated attitude were an example to all with whom he came in contact, both staff and patients.

In his private life, Bob was an active member with the Wahroonga Uniting Church, particularly in youth activities, and was always available, on demand, to cope with technical problems of a sound or photographic nature. The are many photographic records of a happy and fully occupied life with Pat and their daughter Jeni.

Bob became interested in amateur activities in 1968 and became licensed with the call sign VK2ZIB. His activities were primarily centred on the VHF bands and he was an ardent two metre man, particularly portable and mobile.

In 1983, Bob upgraded to VK2RR much to his and his friends delight, as he was now able to keep in touch with them, particularly in the latter days.

Bob also pursued his professional status and was an Associate Member of the Institution of Radio and Electronic Engineers of Australia.

Even during the latter days, and periods of hospitalisation, Bob was always intensely interested in technical developments, the increase of knowledge, was always forward thinking with positive ideals and a real care for people

For Bob there was always hope for the future. He was a real gentleman and will be remembered well by all who knew him.

Bob is survived by his wife, Pat and daughter Jenifer, to whom we extend deepest sympathy.

—Contributed by Fred Stirk VK2ABC
ar

GORDON PEARCE VK2PGC

Gordon Pearce was born in Victoria, spent his school days in Sydney and then joined the 5th Army Troop Company, in Victoria.

He spent the war years in New Guinea and the Solomon Islands.

In 1946, together with his brother, Gordon ran an old fashioned country general store in Tawonga, near Mount Bogong, north-east Victoria.

When his children needed high school education, Gordon returned to Sydney. Because of his experience with master tradesmen in the Army, he was permitted to do his electrician's training, studying at night and working with the PMG during the day.

When Gordon became an electrician, he applied for a Field Officers position and was trained by a veteran amateur radio enthusiast Arthur Mead. At various times he has been responsible electrically and mechanically for Australia Post buildings in Canberra and the south of New South Wales.

After a severe illness, he retired at 60 years of age and became interested, first in CB radio and then amateur radio. He passed theory and Morse code at five words per minute and was still struggling with Morse at 10 WPM when he passed away in August, last year.

Gordon was always pleased to talk with other radio enthusiasts and has left a son and grandson who hope to become amateur radio men one day.

ar

PIETER VAN LOUWERSEN VK2DBL

On November 9, 1986, Pieter Van Louwersen became a Silent Key, passing away peacefully at his home in Artarmon Road, Willoughby, NSW, after a long and gallant fight against terminal cancer. He was aged 68 years.

Pieter was born in Walscharen, Holland and served with the Netherlands Navy in World War II as a "Sparker", in the North Sea, North Atlantic Ocean, Indian Ocean,and the Pacific. He was a Chief Petty Officer Telegraphist on his discharge from the Navy at the conclusion of hostilities. He married and settled in Sydney.

Pieter became an engineer with the Sydney City Council Water Board and, upon his retirement at 60 years of age, devoted nearly all his spare time to amateur radio, particularly CW DX contacts.

He is survived by his wife Beda, and son Karl, to whom the sympathies and condolences of the many friends he made on the amateur bands, including the writer, are extended.

Pieter, although born a Hollander was a truly "Dinkum Aussie."

—Contributed by Harry Vauae VK2HV (ex-VK1HV, ex-VK4HV)
ar

GEOFF CLAY VK2ECA

It is with great sorrow that I report the death on November 26, 1986, of Geoff Clay VK2ECA, late of Cessnock, following a short period of indifferent health.

Geoff served with the Royal Australian Navy during the Pacific Campaign of World War II. The remainder of his working life was spent as a coal miner, until a serious accident cut short his career. He took up amateur radio as a hobby only in recent years but he had a great interest in the 'sport' and was an accomplished CW operator and the recipient of many awards for DX chasing.

The funeral for Geoff Clay VK2ECA, aged 61 years, was held in Cessnock and was attended by several of his close radio amateur friends. Geoff is survived by his wife, Dorothy to whom we extend deepest sympathy.

—Contributed by Keith Howard, Secretary, Westlakes Amateur Radio Club
ar

ALLAN HEATH VK5ZX

Allan passed away on April 14, 1986.

He was born in 1914 and very early in his life showed an interest in amateur radio — precise details of his early activities are not available, but it is believed he was first licensed in 1933.

With the prospect of war he joined the Wireless Reserve and subsequently, in 1939, served in the RAAF Signals, rising to the rank of Squadron Leader (though this was not ratified).

After the War he returned to his watchmaking and jewellery business in Adelaide, living at Brighton.

Much of his early home-brew equipment lay disused for many years until 20 years ago when his son showed an interest in radio. He then bought an NXC5 transceiver and regularly listened around the bands, occasionally having a QSO. It became his only interest in life.

As his son I recall the day of my 21st birthday, 14 years ago. My party could not begin until his tower was erected! It was a classic case of "too many chiefs!"

He was very proud of his NCX5, then state-of-the-art and kept it even after purchasing a transistorised set.

In 1981, he was presented with a Lion's Club Award for dedicated service in conjunction with the program *Hunting Lions in the Air* 1969-81. The family is presently sorting through a huge amount of correspondence associated with this Award!

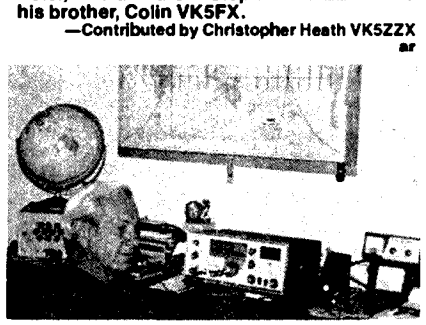
In 1985, he was admitted to hospital for a short period and it became obvious that he would not be able to continue with the family business. He closed the shop on the south-end of King William Street, ending a tradition of 32 years of service to many valued customers.

His condition did not improve, as was normally to be expected. He was admitted to the Kapunda Hospital in February, 1986. After initial improvement, he deteriorated so much that an operation was never performed. He passed away just before lunch with his wife at his side.

Allan's funeral was at his home church of St Jude, Brighton, where some 150 people paid their last respects to a man who was much respected by all who knew him.

Allan is survived by his wife Joan, sons Peter, David and Christopher VK5ZZX. Also his brother, Colin VK5FX.

—Contributed by Christopher Heath VK5ZZX
ar



Allan's shack in the dining room, approximately five years ago.

NO NEEDLES ACUPUNCTURE

A do-it-yourself acupuncture device called *Acuhealth* is being developed in Adelaide. The needle-free acupuncture uses a battery-powered hand-held unit which applies mild electrical impulses to the tension points on the skin where acupuncture needles are traditionally inserted.

Prototypes have been tested by sports medicine clinics, chiropractors, physiotherapists, acupuncturists and the general public.

TELECOM LOOKS AT WIRELESS

The use of wireless office systems to replace fixed wiring installations is being considered by Telecom.

Based on milli-watt wave frequencies, such systems have few bandwidth restrictions and are suitable for limited ranges of around 100 metres.

The Telecom Research Laboratories are investigation multiple access techniques and network architectures suited to wireless office and personal communication systems.

Cabling and associated engineering is estimated by Telecom to make up about 70 percent the cost of connecting a telephone and wireless may be a cheaper solution.

DOLLAR CRISIS HITS

Due to the fall in the Australian dollar value pushing the Japanese import prices up, Hitachi has closed its branches in Western Australia, South Australia and Tasmania.

Hitachi Sales Australia Pty Ltd, the wholesale distributor of Hitachi consumer goods and power tools will also reduce their staff in other States.

DEADLINE

All copy for inclusion in the April 1987 issue of Amateur Radio, including regular columns and Hamads, must arrive at PO Box 300, Caulfield South, Vic. 3162, at the latest, by 9am, February 20, 1987.

Hamads

PLEASE NOTE: *If you are advertising items FOR SALE and WANTED please write each on a separate sheet of paper, and include all details; eg Name, Address, Telephone Number, on both sheets. Please write copy for your Hamad as clearly as possible. Please do not use scraps of paper.*

* Please remember your STD code with telephone numbers
* Eight lines free to all WIA members. $9.00 per 10 words minimum for non- members
* Copy in typescript, or block letters — double-spaced to Box 300, Caulfield South, Vic. 3162
* Repeats may be charged at full rates
* QTHR means address is correct as set out in the WIA current Call Book

Ordinary Hamads submitted from members who are deemed to be in the general electronics retail and wholesale distributive trades should be certified as referring only to private articles not being re-sold for merchandising purposes.

Conditions for commercial advertising are as follows:

$22.50 for four lines, plus $2.00 per line (or part thereof)

Minimum charge — $22.50 pre-payable

Copy is required by the Deadline as indicated below the indexes on page 1 of each issue.

TRADE ADS

AMIDON FERROMAGNETIC CORES: Large range for all receiver and Transmitting Applications. For data and price list send 105x 220mm SASE to: **RJ & US IMPORTS**, Box 157, Mortdale, NSW. 2223. (No inquiries at office . . . 11 Macken Street, Oakley). Agencies at: Geoff Wood Electronics, Lane Cove, NSW. Webb Electronics, Albury, NSW. Truscott Electronics, Croydon, Vic. Willis Trading Co, Perth, WA. Electronic Components, Fishwick, Plaza. ACT.

WANTED — ACT

CARTRIDGE — Z-80: for Commodore 64. Allan Stephenson, Box 255, Woden, ACT. 2606. Ph:(062) 91 9534

ICOM-22S or similar FM rig for mobile & packet use. Write with details of rig & price to Richard VK1UE, QTHR.

WANTED — NSW

BISCUITS FOR CH 2, 4, 9: from front bank of Philips B&W TV tuner type CZ.109-011. Appear similar to old type 3001, but mounting lugs differ. VK2AFU, QTHR. Ph:(02) 53 5774 or (047) 82 1617.

CIRCUIT DIAGRAMS OR SERVICE MANUAL: for Eddystone rx, type 770R & 770U. All expenses paid for photocopying & postage. Ray Davies VK2FW. Ph:(063) 65 3410.

KENWOOD TRIO TS-930S: required in good condition. Please phone details to VK2AXR, QTHR. Ph:(02) 477 6275.

TOWER: 6' ex-Army tower sections — 1, 2, or many. Also, tower up to 30-35'. VK2EMU. Ph:(02) 57 1426.

WANTED — VIC

AMATEUR RADIO MAGAZINES: April 1971; Jan, Apr, Jun, Aug, & Sep 1973; Nov 1975; Mar 1976; Jan, Apr & May 1984; Jan 1986. Please contact Tom Lee. Ph:(03) 232 7337 AH.

CIRCUITS FOR FOLLOWING: Hallicrafters SX-100 HF rx. Hallicrafters S-27D VHF/UHF rx. Will pay all costs incurred. Dick Forrester VK3VU, QTHR. Ph:(053) 35 7663.

OSCILLATOR COIL: B/C for 175 kHz IF Aegis or similar. Bill Smith. Ph:(03) 20 3456.

COMMAND RX & TX METAL COVERS: for top & bottoms, front plug in units. Will purchase incomplete sets for these components. Also, No 11 wireless set jumper leads & No 19 SF6, 101 sets & Command rx plugs. VK3AQB. Ph:(03) 337 4902.

WANTED — QLD

CIRCUIT DIAGRAM: for AWA Cathode Ray Oscillograph, Type R6673 Ser No 108. Unit is WWII vintage & ray tube approx 5 cm across. VK4SS, 35 Whynot Street, West End, Qld. 4104. Ph:(07) 844 6528.

KYOKUTO 2025A: FM 2m tcvr. Norm VK2ENT/4. Ph:(07) 208 4570.

FOR SALE — NSW

COLLINS STATION: suit collector, mint condition. KWM2A & 516F2, one of the last of this famous range. Manufactured by Rockwell Collins. Complete with 312B-5 & 30L-1 linear, plus crystal pack, noise blanker & host of spare tubes. Manuals & cables. Not cheap, but quality never is. Also Drake TR4.CW with power supply & speaker, noise blanker. Hardly used. Spare tubes. $300. Ph:(02) 547 1467.

PEARCE SIMPSON SUPER PANTHER: CB, AM & SSB. 23 ch in excellent condition. With power mic, including mod details, circuit & thumb- wheel switches to convert to 12 & 10 m bands. $260 NO. John VK2CJV, QTHR. Ph:(02) 809 5024.

YAESU FT-101B HF TCVR: includes extra VFO FV-101 and Spectronics digital display — modified. All in good order. $300. VK2ABU. Ph:(02) 212 3833 BH or (02) 328 1261 AH.

FOR SALE — VIC

HY-GAIN AERIAL TAPE: Stainless Steel, Ireq range 3.5-30 MHz, portable. Rolls up and packs like surveyor's tape to 5" x 9". Perfect for travelling. Ex cond. $150. RTTY GEAR: Tono 7000E communications computer, Tono Monitor CRT-10, Tono Dot Matrix Printer. Perf cond. $1450 ONO. VK3BRE, QTHR. Ph:(055) 62 6016.

ICOM FL-34: 10.75 MHz AM filter. Mint condition. $80 or offer. VK3BJN, QTHR. Ph:(03) 29 3949 AH.

WINCH UP 2 SECTION GALV TELESCOPIC MAST: 14m in excell cond. All guys, etc. $75. Alan L30845. Ph:(03) 750 1205.

SIEWA VHF FM MON RX: 144-174 MHz with nicads & charger. $60. Forestphone on 1.825 MHz AM. $45. Willis UHF FM converted to 70 cm with 4 rptrs & 1 simplex ch. $140. VHF FM marine mon rx. $25. Willis VHF converted to 2m FM, 25 W with 8 rptrs & 4 simplex ch. $150. Teleprinter Siemens M-100 with side-arms exc. $90. M-100 w/o sides-arms. $40. Ian VK3AYK. Ph:(03) 523 9405.

YAESU FT-290R: with carton & instruction manual. Excellent condition. Includes repeater reverse mod. $395. Tim VK3BXP. Ph:(03) 723 3943.

YAESU FT-480R: 2m all mode tcvr. Hardly used, still in box. $490. Kenwood TR-2400 2m FM hand-held tcvr. As new. Still in box. $290. Ian VK3ZCP. Ph:(054) 91 1566.

FOR SALE — QLD

ICOM IC-25H: 45W, FM 2m tcvr. Good condition with mic, bracket, manual & carton. $425. Icom IC-22S good condition, serviced by Icom last year. $150. Ross VK4IY, QTHR. Ph:(075) 65 1445 after 6.30 pm Qld-time.

KENWOOD TS-180S: all solid state HF tcvr. Complete with remote VFO-180, WARC bands, digital display, speech processor, manuals, original condition, cartons, memories may be added, mic. $750. VK4KBC, QTHR. Ph:(071) 21 5405 after 4 pm EST.

KENWOOD TS-520S: Mic, manual, original carton. $470 ONO. Yaesu FT-200 FP-200. Like new. Spare valves & mic. $325 ONO. VK4WR, QTHR.

KENWOOD R-5000 RX: hardly used, original carton. Best offer. Ph:(075) 32 0751.

FOR SALE — TAS

COMPUTER PROGRAMS for VZ-200/300 : 4 programs on 1 cassette for $20. Log book, Morse code, Beam headings, Typing tutor. J Hirst, RSD 170, Exeter, Tas. 7251.

KENWOOD TR-3500 70 CM TCVR: 10 memories, 1.5 & 3W output, plus MS1 mobile stand/charger, SMC25 speaker mic, extra battery pack, plus Tokyo Hy-Power 70 cm, 20W amplifier. Your gift at $475. Keven VK7KV. Ph:(002) 43 8972.

FOR SALE — NT

KENWOOD TS-120V HF TCVR: PS-20 regulated power supply. SP-120 speaker, all matching units. Very good condition, with mobile mount, mic, manuals. Complete novice station. $850. Phil VK8NPL, QTHR. Ph:(089) 80 5599 AH or (089) 80 5222 BH.

STOLEN EQUIPMENT

IC-751, Serial number 01365. Lost or stolen in transit between VK5 and VK3 by Comet.

YAESU FT-290R, Serial number 3C260713, two-metre transceiver. Lost on November 12, 1986, between 12.30 and 3.30 pm. Geoff Donnelly VK2EGD.

Advertiser's Index

SYDNEY — MELBOURNE — BRISBANE

NEW
1000 WATT TUNER
EAT — 1000A

YOU HAVE ASKED FOR IT — WE HAVE MADE IT!

This new EAT-1000/A is EMTRON'S latest antenna tuner built on special request by many amateurs. Built with finest components available, 5 position internal antenna switch, cross needle SWR/power meter, built in 4:1 balun for open feedline and antenna terminals for coax line, open feedline aswell as longwire. EAT-1000A will tune almost everything from 1.8 to 30 MHz. At lowest price, professional design and quality that EMTRON provides.

MADE IN AUSTRALIA!

ONLY $449
& $20 Delivery
AVAILABLE IN 4 WEEKS

NEW from EMTRON EAT-300A

The finest 300 watt antenna tuner on the market with quality that only EMTRON can provide! Unique features such as:

● Cross needle SW12/forward & reverse power meter ● Built-in 100 watt dummy load ● Antenna switch including bypass ● Built-in 1:4 balun for open feedline ● Lowest price & professional design ● Matches everything from 1.8-30 MHz ● Made in Australia by Emtron

$329 & $15 delivery

OVER 800 FAMOUS EAT-300 SOLD!!!

EMTRON'S fastest selling 300 watt antenna tuner with SWR meter, built-in 1:4 balun, heavy duty ceramic switch and top grade components. Works with all rigs and is found in Amateur, Commercial and Marine services.

$210 & $10 P & Post

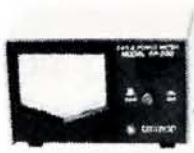
FOR SWL EMTRON DESIGNED ETP-1

Antenna Tuner & Low Noise Amplifier For Receivers!

ETP-1 will match your antenna to your receiver for maximum signal from MW to SW. It utilizes a low noise 12dB gain preamplifier to boost weak signals. Special spring loaded long wire terminals as well as SO239 connectors make ETP-1 the most versatile tuner/amplifier on the market.

ONLY $159 & $10 P&P

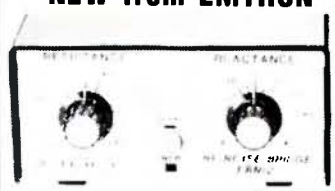
EMTRON'S PRECISION CROSS NEEDLE RF SWR METER



Yes this new from EMTRON — highly accurate CROSS-NEEDLE SWR & POWER meter, model EP-200 with a freq range from 1.8 MHz to 60 MHz and two power ranges 20, 200 watts, gives instantaneous readings of forward/reverse power and SWR

ONLY $99

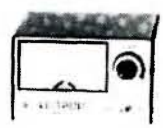
NEW from EMTRON



Professionally made noise bridge for all kinds of RF measurements antena adj etc

NOISE BRIDGE EXPANDED EBN-2
$129 & $10 P&P

EMTRON'S NEW HF SWR METER EP-1



Specially designed with PRICE, QUALITY AND ECONOMY IN MIND. Freq range from 3.50 MHz. Reads forward and reflected relative power. Ideally suited for amateur and CB services.

$49 & $5 P&P

NEW from EMTRON EAA230 active antenna a SWL delight

Specially designed for SWL. Based on the famous "DRESSLER DESIGN", the unique electronic circuitry gives to receiver a perfect impedance match from 100kHz to 30MHz. A 12 dB low noise pre-amplifier gives weak signals a boost comes complete with 240V AC 12V DL supply and 10M of coax.

$259 & $15 DEL.

CORRESPONDENCE: BOX K21, HAYMARKET, NSW 2000

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NSW. 2000. TLX:AA73990
P.O. Box K21 Haymarket, NSW. 2000.
Ph: (02) 211 0988
FAX: (02) 281 1508

VICTORIA:
288-294 Queen St, Melbourne
Vic. 3000.
Entrance from Lt. Lonsdale St.)
Ph: (03) 67 8551 or 670 0330
FAX: (03) 670 0671

QUEENSLAND:
416 Logan Road, Stones Corner
Qld. 4120. TLX:144696
Ph: (07) 394 2555
FAX: (07) 349 4316

New IC-R7000

introducing a Professional Scanning Receiver at an Affordable Price.

25-1000 MHz Plus! frequency coverage

(no additional module required for coverage to approx. 2.0 GHz.)

ICOM announce a scanning receiver that offers professional performance with IC-R7000 advanced technology – 25-1000MHz coverage, multi-mode operation and a sophisticated scanning and recall system.
IC-R7000 covers aircraft, marine, business, FM/AM broadcast, amateur radio, emergency services, government and television bands.

ICOM IC-R7000 has many outstanding features.

- **99 MEMORIES:** You can store up to 99 of your favourite frequencies for instant recall. Memory channels can be called up by simply pressing the memory channel knob or direct through the keyboard.
- **KEYBOARD:** Tuning can be quickly achieved by selecting precise frequencies directly through the IC-R7000 keyboard or by turning the main tuning knob.
- **SCANNING:** Instant access is provided to commonly used frequencies through the scanning system. The Auto-M switch enables signal frequencies to be memorized while the IC-R7000 is in the scanning mode. Frequencies that were in use can be recalled at the operator's convenience.
  An optional voice synthesizer automatically announces the scanned signal frequency to ease problems with logging.
- **MULTI MODE:** Push button selection enables FM wide/FM narrow/AM/SSB upper and lower modes to be received.
- **6 TUNING SPEEDS:** 01, 1.0, 5, 10, 12.5 and 25kHz through knob selection.
- **ADVANCED TECHNOLOGY CONSTRUCTION:** The IC-R7000 has dual colour fluorescent display with memory channel readout and dimmer switch.
  Dial lock, noise blanker, combined S-meter and centre meter.
  Optional RC-12 infra red remote control operation. All the above professional features are produced in a convenient, compact unit of size:

Height	282mm
Width	286mm
Depth	276mm

- Specifications guaranteed from 25-1000MHz and 1260-1300MHz.
  No additional module is required for coverage to approximately 2000MHz. No coverage is available from 1000-1025MHz.

Please send me details on: ICOM 3353

☐ IC-R7000 ☐ ICOM's full range of communications equipment.

Senders details:

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ADDRESS _____

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PHONE: _____ (BUSINESS) _____ (HOME)

POST TO: ICOM, 7 DUKE STREET, WINDSOR, VICTORIA, 3181. PH: (03)529 7582.

All stated specifications are approximate and subject to change without notice or obligation. ICOM customers should be aware of equipment not purchased at authorized ICOM Australia Agents. This equipment is not covered by our parts and labour warranty.

ICOM

The Frequency of Ideas.

Amateur Radio

JOURNAL OF THE WIRELESS INSTITUTE OF AUSTRALIA
VOL 55, No 3, MARCH 1987

- An Introduction to AX.25 Protocol
- Antarctic Communications
- Troubleshooting Tips
- EME in the USSR
- Eddystone 770R
- No Fuss PCBs

Keep your Ears on...

Unheard of value for amateur gear and accessories! You'll think we've gone mad low prices and big savings. So March in to your nearest DSE store now...

Heathkit

Deluxe HF Antenna Tuner Kit

Impressive 1kW (CW) rating over the entire HF band for proper antenna-transceiver matching. Features roller inductor, dual watt meters and built-in 4:1 balun.
Cat G-3000

$885

The Cantenna...

• Build it yourself and save!

Eliminates thirsty work: forget unnecessary QRM during tune-ups. Handles 1kW of RF with VSWR <1.5:1 up to 450MHz. Requires 4 litres of transformer oil.
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Coax switch kit... routes up to 4 antennas

Switches one RF source to any one of several antennas or loads while grounding all outputs not in use. 2kW PEP with maximum 1.1:1 SWR to 250MHz dB isolation.
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$69.95

Magnavox World Receiver

Your passport to international entertainment. Tune into local AM, FM plus SSB and 11 SW bands. • PLL for precise tuning • 16 preset memory functions • Auto search • Direct frequency key in and triple speed manual tuning • Connections for antenna, headphones, DC and line out.
Cat D-2999

- **Alarm clock**
- **Two speakers**
- **Bandwidth selector**
- **Quartz controlled**

$769

Nickel screening conductive coating

Electro-conductive spray turns plastic project boxes into electrically conductive surfaces. Ideal for RF screening, touching up connections and many other useful applications.
Cat N-1049

$27.50

2m/70cm Duplexer

What convenience! Now VHF enthusiasts can connect two transceivers to one antenna...
Cat D-3550

$29

LIMITED — ONLY WHILE STOCKS LAST!

6m/2m Duplexer

This 'Maldol' duplexer is ideal. Same principle... connect two transceivers to the one antenna. No fuss. Cat D-3555

LIMITED — ONLY WHILE STOCKS LAST **$29**

Bargain 2m Hand-Held Transceiver

Superb features and reliable performance! Covers entire 144-148MHz band.
• Repeater splits • easy thumbwheel tuning • Built-in condensor mic... and much more. RF output: 1.5W (150mW low). Cat D-3520

$299

Premium Coax Cable

Only the best coax for your UHF/VHF communication needs: premium RG-58CU 18 pitch coax. Low loss, RF shielding and heat resistant dielectric. Cat W-2092

95¢ per metre

"J" Pole folded 2m vertical

WHILE STOCKS LAST!

Similar to the famous "Slim Jim": a space-saving antenna that won't cramp your style. Pre-folded for your convenience — why take the chance doing it yourself?
Cat D-4211

$19.95

Famous Oskerblock HF Power/SWR Meter

Checks accuracy/efficiency of your antenna and HF rig for optimum performance. • Covers 3-150MHz... suits 50 and 75 ohm lines • Directional coupler and through line techniques for minimal loss.
Cat Q-1340

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Amateur Radio

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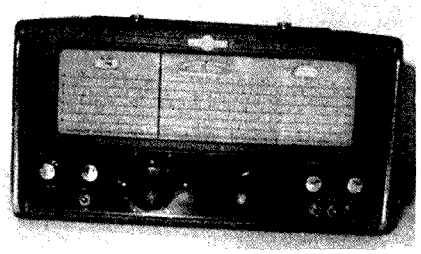

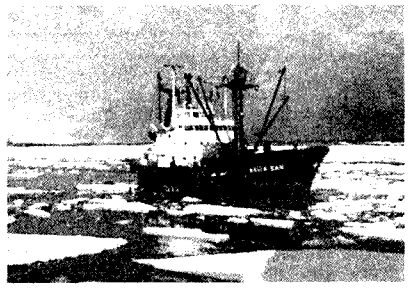

The Antarctic resupply vessel, *Nella Dan* **anchored off the Vestfold Hills, near Davis Station.**

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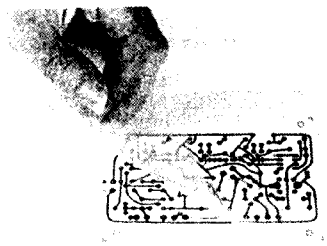

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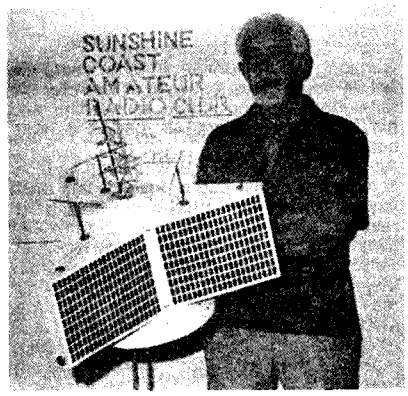

EMDRC

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Editor's Comment

MAINLY NAUTICAL

March is here and Autumn begins, the "season of mists and mellow fruitfulness" at least in temperate zones. To your Editor and about 600 other owners of trailable sailing boats it also means the Victorian Labour Day holiday week-end and the annual Marlay Point Overnight Sailing Race.

The Marlay is an event like no other for those who "mess about in boats". Its very size, at least 600 vessels taking part, makes it unique in the world, although possibly this claim could be contested by Denmark. Six hundred boats racing in darkness is a spectacle which one has to join to appreciate. TV or photography simply cannot do justice to the fleet of little lights, red, green or white, depending on which way one looks from where! And if all these craft are drifting slowly through the narrow McLennan Strait, which joins the two main Gippsland Lakes, Wellington and Victoria, the traffic problems can be incredible. Mist or fog, yes, sometimes. Strong winds, sometimes. The 40 plus nautical miles have been traversed and the race won long before sunrise. In other years the full 24 hours is not enough, at least for the tail-enders, among whom your Editor and his hapless crew are all too often numbered!

Amateur radio mixes well with such nautical activities. At least half a dozen boats each year may be heard discussing their progress or otherwise either on 2-metre FM simplex or via the Latrobe Valley repeater. This year the new repeater at Nungurner (near Bairnsdale) will be available. Some may also use the HF bands while maritime-mobile. All boats are also required by race rules at least to monitor the official 27 MHz marine channels, for obvious safety reasons.

This leads us to the wider field of ocean cruising (usually in something a little larger than a trailer-sailer) and the use of amateur radio as the main means of communication. Many of these "blue-water yachties" find it to be an excellent medium, particularly when use is made of the various regular 20-metre nets. Some of the call signs tend to raise doubt as to whether their users are really licensed amateurs! Some are well-known to be pirates, at least in the radio sense.

A letter has been received recently from a WIA member with strong views on this topic. He accuses the Institute of being too soft with such pirates, and alleges that this magazine has publicised, rather than criticised, their activities. If this is so, and I doubt it, it has been in complete ignorance of any illegitimacy, at least while I have been Editor.

But what can be done about unlicensed operators? On land, they are within the jurisdiction of DOC and will eventually be caught. The Radiocommunications Act, partly as a result of suggestions by the WIA, contains several powerful clauses which make piracy a much greater risk and its penalties far more drastic than under the old Wireless Telegraphy Act. Legitimate operators risk their own licences by communicating with pirates, whether ashore or afloat. But . . . is that odd call sign /MM in mid-Pacific genuine or not? How can one tell? It is a little impractical for DOC to board the yacht and inspect the licence. The boat is outside DOC's territory anyway. There may be an emergency of some kind. If so, the rules are waived. So many of these situations are not black or white; but one thing is sure. The WIA does *not* condone unlicensed operation. Let any offenders take note and be warned!

Bill Rice VK3ABP
Editor

LISTEN

The ever-thoughtful and DX orientated amateur, Ian VK5QX, made an STD call just as this magazine was going to press, giving information that he had just received from Bharathi VU2RBI.

Bharathi advised Ian that the Andaman and Nicobar Islands would be activated from February 20 to March 31, this year, using the call signs VU4APR and VU4NRO. She also advised that they would operate on all bands except 160 metres, both CW and SSB.

This DXpedition to a much wanted country is being conducted under the auspices of the National Institute of Amateur radio (NIAR) and QSLs go to VU2APR.

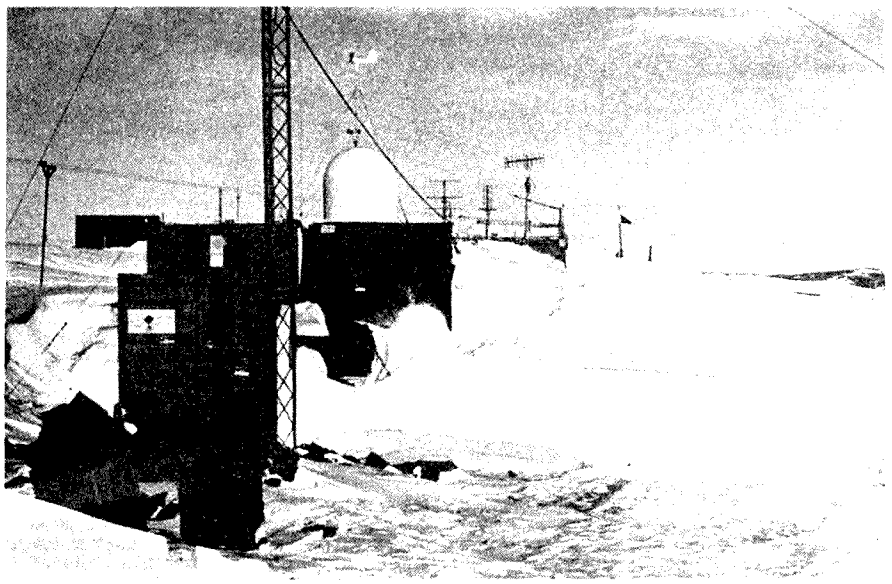
A special announcement of a super article scheduled for next month had to be removed to make room to allow amateurs the opportunity to work this very rare country which is very high on everyone's Wanted List, since VU7ANI became a Silent Key.

Good luck to all that need this one for their DXCC score.

—de Ken VK3AH.

Bert Trupp VK5BVN
PO Box 2531, Mount Gambier, SA. 5290

ANTARCTIC COMMUNICATIONS



Lying unspoiled at the end of the world, surrounded by storm-swept seas, the mention of Antarctica kindles thoughts of ice and adventure in nearly everyone.

Although Antarctica is expensive to reach and difficult to live on, at least 17 countries support research programs from 44 permanent stations. Data from this polar region is not just interesting, but now crucial to the understanding of Earth's basic processes. Much of this would not be possible without extensive radio communication facilities, as the sampling modes become more sophisticated and collection efforts are intensified.

Lying unspoiled at the end of the world, surrounded by storm swept seas, the mention of Antarctica kindles thoughts of ice and adventure in nearly everyone. Yet only a very few are ever lucky enough to visit this frozen continent. Each year a number of nations send forth comparatively small groups of expeditioners to continue the research work at Antarctic stations.

By September, snow has drifted up to the roofs of buildings. The INMARSAT dome can be seen mounted on the roof of the radio shack.

The Australian National Antarctic Research Expedition (ANARE) outpost in the Vestfold Hills, Davis Base, is one such station. Situated on bare rock above a sandy cove, the station is home to about 25 wintering expeditioners. Affectionately known as the *Riviera of the South*, the ice free area of the Vestfold Hills covers about 400 square-kilometres and is dotted with numerous lakes.

Sometimes described as an Antarctic oasis, the area is kept ice free by wind blowing snow away and solar warming. These areas are unique as more than 99 percent of the continent's surface is covered in ice.

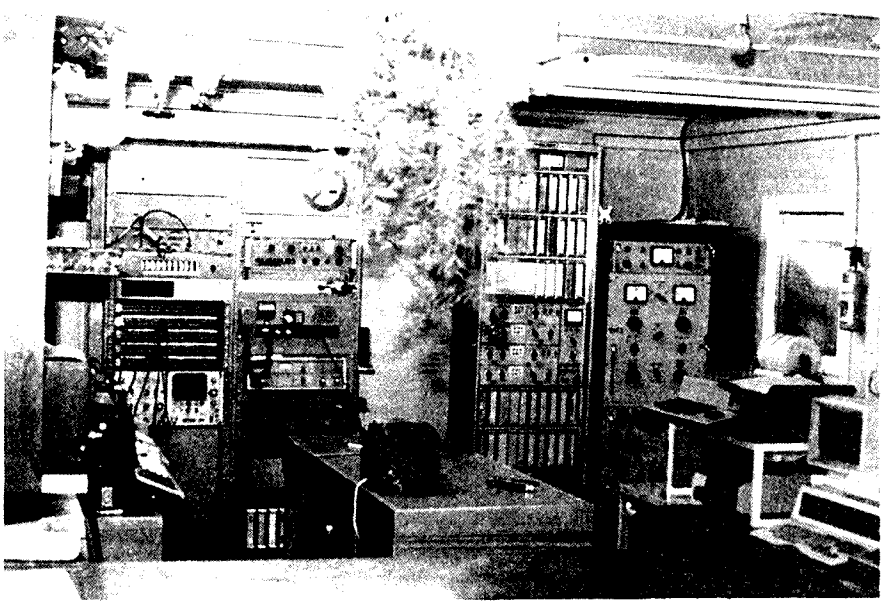
Davis was established in January 1957, as preparation for the International Geophysical Year of 1957/58. The wintering party numbered five, including a radio operator and radio supervisor. Radio activities commenced almost immediately, after the erection of four aerial masts — two Kelly and Lewis 15 metres and two wooden nine metre masts. Traffic initially consisted of one sched a day, with more scheds opening once weather traffic commenced. Radio equipment was reconditioned war surplus gear. A deal of time was spent on repair and maintenance! Power was obtained from a 15 kVA generator housed in the newly constructed engine room/workshop/bathroom.

By 1959, the equipment consisted of two AT20 transmitters, a Collins 51J-4, two Kinsley AR7 receivers and an ART-13 MF beacon. After sharing with the Meteorological Section for some years, a dedicated building was constructed to house the communications equipment. All scheds were either CW or phone and traffic was mainly meteorological observations.

The station was temporarily closed between January 1965 and February 1969, allowing concentration of the Antarctic Division's resources on the building of a replacement for Wilkes station — Casey. In 1969, an early model teleprinter was provided to receive an AAP news service. Upgrading in 1971 saw the installation of a 1 kW SSB Racal transmitter and two M-100 teleprinters. This now allowed the establishment of a Radphone (radio-telephone) service back to Australia for the expeditioners. Slowly over the years the equipment improved and traffic increased. The aerial farm was also expanded with a number of large rhombic aerials. These were erected on 22 metre steel masts guyed to withstand the occasional 100 knot winds.

A remote transmitter hut was erected in 1972 which then also housed the MF non-directional beacon (NDB). This beacon is used by the re-supply ships and visiting or over-flying aircraft. The original ART-13 was replaced by a locally made version and, in 1976, by a commercial DCA unit reconditioned after use in the Prince Charles Mountains. Newer equipment has since been provided.

For the safety of field parties working in the Vestfold Hills and on the ice plateau, radios were always carried. The very early field radios required hand cranked generators. Difficulties encountered during these field trips ranged from aerials buried in snow to forgetting the crank handle! Fortunately, the early sets were replaced by lighter battery powered 5 to 15W SSB HF units. Under evaluation today is a VHF repeater which services most of the Vestfold Hills.



The interior of the Davis Radio Station, VLZ, showing the teletype area. The pot plant is plastic!

At present, simplex and duplex HF circuits service nearly all traffic needs. Various modes of radio-teletype transmissions carry the bulk of the meteorological, administrative and private traffic.

Radphone circuits are still scheduled with OTC coast radio stations for calls to Australia and overseas. These provide expeditioners with the only direct social contact with the outside world. Privacy on the radphone circuits is encouraged wherever possible.

The installation of an INMARSAT satellite station in 1985 heralded the beginning of a new era. This now gave the station 24 hour access to international telephone and telex systems. However, its use is limited due to the high costs involved. Within the next two years, satellite communications with ANARE stations is to be upgraded with the installation of new equipment utilising INTELSAT VISTA satellite links. This will provide higher capacity telex-data transmissions, facsimile, telephone and possibly video services comparable to those presently available in Australia.

A typical day for the communications officer at Davis starts about 2330 UTC, with opening up the shack, tuning sets and warming up the Morse key. One of the Meteorological folk drop in the overnight observations (obs) in preparation for the first sched with Mawson at 2350 UTC (duplex CW).

Davis has the smallest communications section of the three Australian Antarctic stations on the continent. For much of the year traffic sent is just what is originated from the station itself. Whereas Casey normally operates a 16 hour radio watch, collecting Meteorological traffic from Dumont D'Urville and relaying all meteorological and administrative traffic for continental ANARE stations back to Australia. Mawson station operates as the main meteorological data collection centre for Greater Antarctica and hence is the busiest with a 19 hour per day radio watch.

The Davis phone, telex and CW scheds continue throughout the day ending around 1315 UTC, when the last balloon flight and meteorological observations data is sent via telex, again to Mawson. Routine message traffic is usually prepared between scheds as time permits. Main equipment today consists of Rhode and Schwarz EK-70 and Drake DSR-2 receivers and a Racal TTA-1860 1 kW main transmitter. A new Dansk S76210 1 kW transmitter will replace the old Racal TA-127 as a standby unit.

The advantage of operating from an Antarctic station is the electrically quiet bands largely free from industrial noise. However, the HF links are susceptible to vagaries of the ionosphere. Whistlers can be heard occasionally — they are a product of VLF energy generated by lightning flashes that are ducted down magnetic field lines to the poles. Blackout of HF communications, due to sudden ionospheric disturbances or magnetic storms, may last up to about five days. After a major solar flare, an event known as polar cap absorption may disrupt communications for up to 10 days. Periods of magnetic and solar activity may cause poor quality circuits for weeks creating havoc with radphone call bookings. Even when the ether is quiet, S9 static noise may be generated by wind-blown snow during blizzards. Despite this, 90-100 percent circuit success is normal for Davis, as it appears the most favourable location for HF communications of the three ANARE stations.

Of the scientific research programs underway in Antarctica, the most important to the amateur are the studies in Upper Atmospheric Physics (UAP). A kaleidoscope of geophysical phenomena is manifested as a result of direct and indirect processes occurring in the magnetosphere and the ionosphere.

Experiments monitor interaction of solar wind energy and particles in the geomagnetic field, taking advantage of Davis' unique location under the projection of the polar cusp. The beautiful, majestic auroral substorms result from high energy particles colliding with atoms and molecules causing them to emit their intense characteristic coloured lights.

Magnetic storms are recorded on fluxgate magnetometers which measure the H, D and Z components of the Earth's magnetic field. Other magnetometers measure declination, horizontal and vertical components and geomagnetic pulsations. A riometer (relative Ionospheric opacity meter) also monitors cosmic noise for measurement of ionospheric absorption. The ionospheric region directly above the station is probed with a swept frequency radar known as an ionosonde. The echoes received are recorded on 16 mm film and can identify particular regions of the ionosphere's reflections layers.

Daytime during the Winter Solstice at Davis.

In addition to the principal UAP research objectives, such observations will also form a sound basis for correlation studies with other geophysical phenomena. This may, one day, end speculation on whether the bombardment by ionised solar particles is linked with long-term changes in the weather.

For only a short period each year the isolation of wintering expeditioners is broken. Each year from about November to March the sea-ice breaks out sufficiently to allow the Ice strengthened resupply ships access to the coastal stations. This summer the Antarctic Division chartered two ships, the *Icebird/DPIB* and the *Nella Dan/OZKC*.

The ships bring tonnes of food, fuel and equipment, as well as relief personnel for the coming year and additional summer scientists and support staff. Life is hectic with frantic activity everywhere. Communications traffic increases to staggering proportions. Extra scheds are required to accommodate summer field parties, logistics and ships traffic. This season, major field camps will be operating at Heard Island and in the Bunger Hills behind the Shackleton Ice Shelf. ANARE resupply ships often leave helicopters at stations for the summer, so air-ground communications are established. The days are long but there is ample sunlight available during the summer solstice — 24 hours of it!

Amateur radio activity has been encouraged in the past as an adjunct to normal means used to communicate with family and friends. The station's emergency radio shack is usually made available for this purpose. However, equipment use is necessarily restricted occasionally to avoid interference with ANARE communications or some of the sensitive scientific instruments used around the station.

As with radio communications everywhere, many frustrating hours can be spent beside the set to no avail. The sound of a clear, easy reply is greatly appreciated by the Antarctic amateur. The remoteness and isolation fade a little as contact is made and a friendly voice brings news and information from the outside world. QSOs between other Antarctic and sub-Antarctic outposts are also popular, bringing news of fellow expeditioners. If you are lucky enough to contact with an Antarctic station don't despair if no QSL card is forthcoming. The only mail service is during the shipping season when the resupply occurs, so the QSL card may be up to a year late.

The experience of working in the Antarctic leaves one with indelible memories. Special bonds of friendship are formed. The colossal forces of nature create fantastic scenes in ice and snow. Natural wonders abound. The future is bright for Antarctica. It has a major part to play in our understanding and management of the Earth. Through this article I hope to have given you an insight to this unique world.

LIST OF SOME ANTARCTIC STATIONS

STATION	CALL SIGN	QTH
Novolazarevskaya	UDY	71S 12E
Syowa	JGX	69S 40E
Molodezhnaya	RUZU	68S 63E
Mawson	VLV	68S 63E
Davis	VLZ	69S 78E
Mirny	UUT	67S 93E
Vostok	RKIS	78S 107E
Casey	VNJ	66S 111E
South Pole	NPX	90S -
Dumont D'Urville	FJY3	67S 140E
Leningradskaya	UMA4	70S 159E
McMurdo	NGD	78S 166E
Scott Base	ZLQ	78S 166E
Russkaya	UDR3	75S 137W
Rothera	ZHF45	68S 68W
Bellingshausen	UGE2	62S 59W
General Belgrano	LTA8	78S 37W
Halley Bay	VSD	76S 23W
Georg Von Neumayer	DLA	71S 08W
Sanae	ZRP	70S 02W

ABOUT THE AUTHOR

In September 1984, Bert joined the Department of Science and Technology, Antarctic Division, as a Communications Officer. He was appointed Senior Communications Officer for Davis Station and spent from November 1984 to January 1988, at the station. After returning from the Antarctic, Bert worked for some weeks at the Antarctic Division's Head Office as a relief operator in the Communications Section, whilst the permanent staff were on leave.

Bert is now employed by Television Station, SES8, in Mount Gambier, as a Senior Technician. He is not particularly active in amateur radio but endeavours to maintain an interest in amateur activities.

ar

An Introduction to AX.25 Link-Layer Protocol

Gil Mays VK6AGC
74 Moolanda Boulevarde, Kingsley, WA. 6026

This paper presents an introduction to the subject of amateur packet radio implementing the AX.25 link-layer protocol for level 2, version 2.0 as described in the ARRL specification dated October 1984[1].

IT IS ALSO INTENDED to supply an overview of the protocol used by the TAPR TNC-2 software, which adheres to this specification, and describes some of the commands supported by the TNC-2.

Introduction

Packet radio is the most recent development in digital communications in amateur radio. It provides an error-free communications path over which amateur packet radio stations can be linked directly or by means of a network.

The format in which a packet of data is sent and the procedures governing a packet transmission, are described by the packet radio protocol, officially known as the *AX.25 Amateur Packet Radio Link-Layer Protocol for Level 2, Version 2.0* (AX.25L2V2).

The AX.25L2V2 protocol is based on the *International Standards Organisation* (ISO) Recommendation HDLC (High-Level Data-Link Control). The CCITT (International Telegraph and Telephone Consultative Committee) adopted and modified HDLC as part of the X.25 network interface standard, and called it LAPB (Link Access Procedure Balanced) which is compatible with HDLC[7]. Two significant extensions are made to LAPB in the amateur version called AX.25; the extended address field, and the Un-numbered Information (UI) frame — both are discussed later.

The various formats of a packet frame and the proper responses to the protocol are all controlled by a microprocessor device, called a Terminal Node Controller, or TNC. The TNC incorporates specialised firmware and software programs to correctly control the commands and responses associated with the protocol.

Packet radio stations communicate on a single frequency employing Time Domain Multiplexing (TDM) as opposed to frequency diversity as used in RTTY modes. This has the effect of increasing channel utilisation by supporting multiple packet QSOs on a shared frequency. A packet transmission sends information (data) using the ASCII code rather than a special error-correction code as is used for AMTOR[5].

Current VHF/UHF packet radio operation uses the Bell 202 modem standard running at 1200 bps FSK using tones of 1200 Hz and 2200 Hz resulting in a shift of 1000 Hz. Most HF operations below 28 MHz uses 300 bps, 200 Hz shift FSK and tones of 1600 Hz, and 1800 Hz as typical modulator tone frequencies.

General Description of Protocol

The hardware and software design employed in the TAPR TNC-2 is developed in accordance with the ISO layered network model. This model describes seven layers and is officially known as the *ISO Reference Model of Open Systems Interconnection* (OSI), or simply the ISO model for the development of computer networking.

The TAPR TNC currently implements the first two layer: viz, the Physical Layer and the Link Layer[2]. Since a detailed description of the ISO model is beyond the scope of this paper (see reference 7), only the first two layers will be discussed.

In the unbalanced mode of communications, one master device, called the DCE (Data-Circuit Terminating Equipment), is connected to one (or more) slave device/s, called DTE (Data Terminating Equipment). This type of unbalanced operation is not practical in AX.25 as presently defined, since it is assumed that both ends of the link are of the same class of device. The term DXE (Data Switching Equipment) is used to describe the balanced type of device used in AX.25 link-layer communications.

The interface between the devices operating at each end of the X.25 link consists of three distinct levels as illustrated in Figure 1a. The AX.25 interface is depicted in Figure 1b.

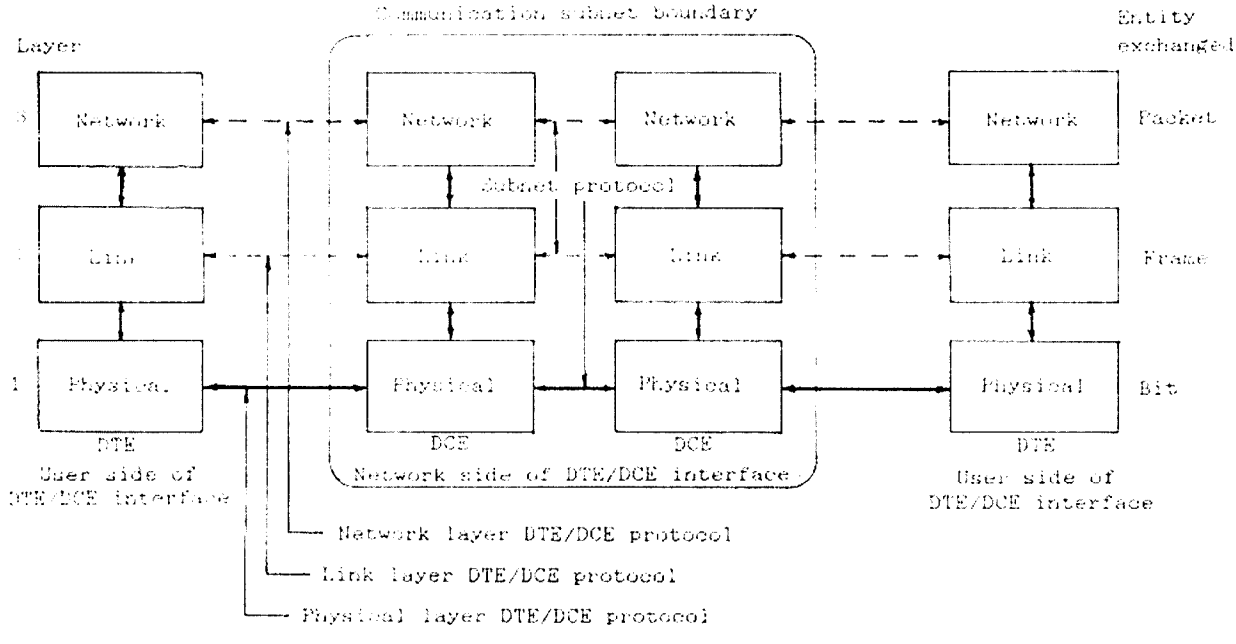


Figure 1a — Network Architecture of X.25 Interface.

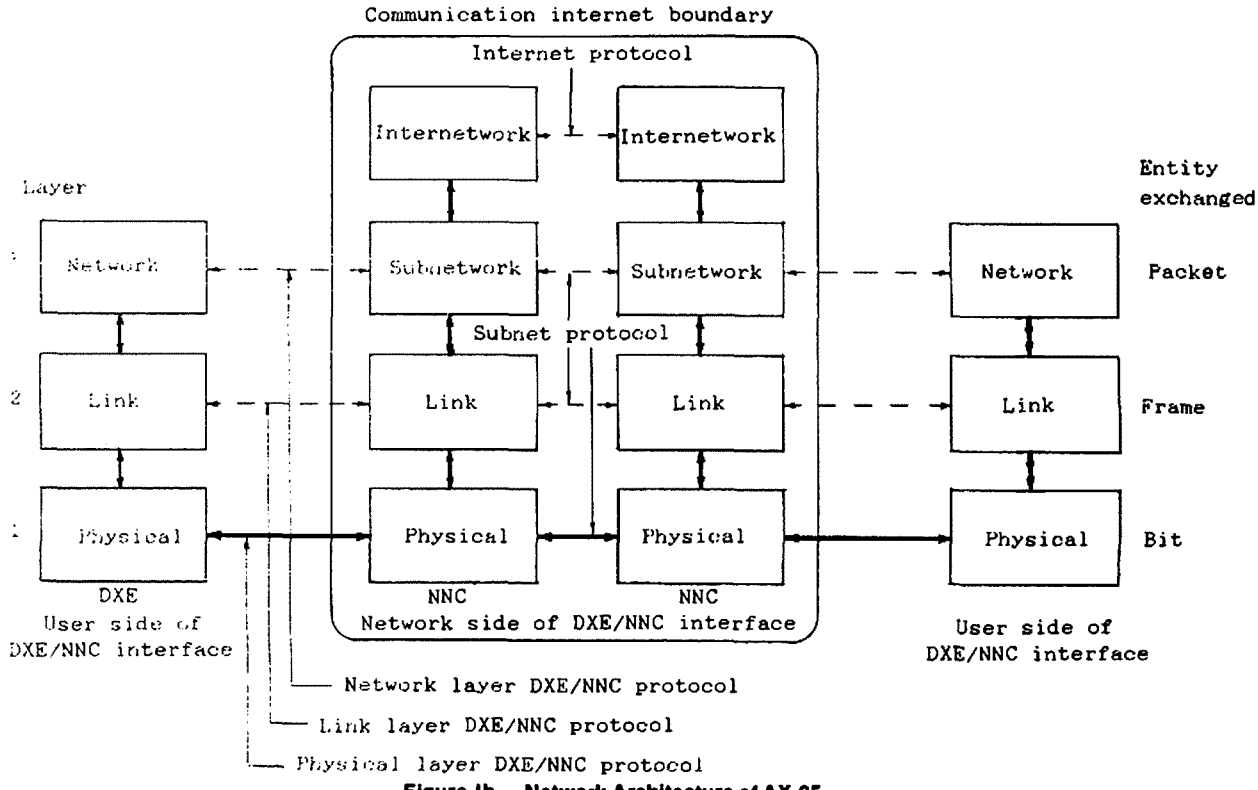


Figure 1b — Network Architecture of AX.25 Interface Depicting Level 3 Internetwork and Subnetwork Sublayers and Network Node Controller (NNC).

Level 3 Network Layer (Packet)
Level 2 Link Layer (Frame)
Level 1 Physical Layer (Bit)

Each of these levels function independently of the other level, with the exception that failures at a level may affect the operation of higher levels[6].

Data is not transferred directly from layer n at one end of the link to layer n at the other end of the link except in the lowest layer (physical). Instead, data and control information is passed from one layer to the layer immediately below it, until the lowest layer is attained. At the lowest layer there is physical communication at both ends of the link, as opposed to virtual communication used by the higher layers. In Figure 1, virtual communication is shown as broken lines and physical communication is shown as solid lines[7].

Physical Layer

The Physical Layer, layer one of the ISO Reference Model, is concerned primarily with the transmission of individual data bits over a communication channel. Several important design issues must be satisfied to ensure that each bit, which is sent by the Source or Originating station, is correctly received by the Destination station.

Typical design issues applicable to the Physical Layer include details such as voltage levels used, rate of data transmission, modem standard, and even pin designation on the interface connector.

In the amateur radio environment, data at the Physical Layer is sent over a RF link in synchronous serial bit form. In serial operation, RS-232C is accepted as the standard interface for defining voltage levels, data and handshaking signals, the types of connectors use, and the pinouts.

Flag	Address	Control	FCS	Flag
01111110	14 to 70 bytes	1 byte	2 bytes	01111110

Figure 2a — Typical Format of U and S

Flag	Address	Control	PID	Information	FCS	Flag
01111110	14 to 70 bytes	1 byte	1 byte	maximum of 256 bytes	2 bytes	01111110

Figure 2b — Typical Format of I Frame.

Destination	Source	Digipeaters (8 maximum)
7 bytes	7 bytes	0 to 56 bytes

VK6AFC (de) VK6AGC (via) VK6AAA, VK6ZZZ

Figure 2c — Typical Format of Address Subfields.

The rate of data transmission and the modem type are a function of the RF link used in amateur packet radio communications. High-speed data transfer communications at 9600 bps over a HF data path, may possibly prove to be unreliable due to the adverse effects of signal fadeout, and static noise- bursts.

Link Layer

The responsibility of the Link Layer, layer two of the ISO Reference Model, is to: transform a serial data transmission received by the Physical Layer, into a stream of data that appears to be error-free to the higher level protocols, and conversely, provide the Physical Layer with an error-free stream of data for transmission from the higher level protocols.

Since the Physical Layer merely receives and transmits a stream of data bits without any regard to meaning or structure, transmission errors are not detectable at level one. It is the responsibility of the Link Layer to ensure that data integrity is maintained through the physical devices implemented, by detecting and rejecting corrupted data, retransmitting unacknowledged data, and detecting the reception of duplicate data.

In order to assure an error-free (virtual) connection to higher level protocols, level two accomplishes this task by partitioning the data received from the higher level, to be transmitted by level one, into smaller individual blocks of data, called Frames, which are then sent to level one for actual transmission. There are three general types of AX.25 frames: the Information (I) frame, the Supervisory (S) frame, and the UN-numbered (U) frame, as illustrated in Figure 2.

Each packet frame consists of several smaller groups, called *Fields.* Each field of a packet frame is made up of an integral number of 8-bit bytes (or octets), and serves a specific function as outlined below.

Flag Field

The Flag Field is one byte in length, and consists of the binary number 01111110 (7E hex). The purpose of the flag is to delimit frames, and it therefore occurs at both the beginning and end of each frame. Consequently, two frames may share one flag, which would signify the end of the first frame and the start of the next frame.

To prevent the possibility that the flag bit sequence could inadvertently appear elsewhere in the frame, a procedure called *Bit-Stuffing* is employed. The source station continuously monitors the data-bit sequence to detect the presence of five contiguous one bits. Whenever five contiguous one bits are to be transmitted, a zero bit is inserted by the sending station immediately following the fifth one bit. Upon reception of five contiguous one bits, the destination station discards the zero bit immediately following the five one bits, thus restoring the original data-bit sequence of the frame[1].

Due to the bit-stuffing requirement, the actual length of the data-bit sequence of each frame will vary even if all information fields are of constant length. Hence, the thru-put of a packet radio network will vary slightly with the information field transmitted.

Address Field

The *Address Field* of all packet frames is used to identify both the destination and source amateur call signs for the frame. In addition, the address field contains command and response information as well as facilities for level 2 digipeater operation. If level 2 packet routing utilising digipeaters is required, the call signs of all digipeaters used are included in the address field (Figure 2c).

In the LAPB Recommendation, the address field is limited to only one byte whereas the address field of the AX.25 Recommendation has a minimum of 14 bytes, and may include a total of 70 bytes, containing the source station call sign, the destination station call sign, and an optional list of one to eight digipeater station call signs.

Station identification (call sign) is set with the command *MYCALL* (MY) which stores the users station call sign in bbRAM (battery-backed RAM).

```
cmd: MY VK6AGC
MYCALL was NOCALL
```

The TNC responds by informing the user of the previous value of the MYCALL parameter, which initially is *NOCALL.*

The final byte in each address subfield is reserved for the Secondary Station Identifier (SSID). The SSID subfield allows the operation of several packet stations under the same call sign. If the SSID extension is not specified, the value defaults to zero. The SSID is a number from 0 to 15 which is appended to the station call sign with a hyphen:

```
cmd: MY VK6AGC-2
MYCALL was VK6AGC
```

This facility is useful when a "packeteer" wishes to provide an on- air Packet Bulletin Board System (PBBS) in the LAN in addition to a regular packet station.

Control Field

The *Control Field* is used to identify the type of frame being sent, and controls the commands and responses associated with a level 2 connection in order to ensure proper link control. The control field is one byte in length and is based on the CCITT X.25 control fields for LAPB operation, and a supplementary control field derived from ADCCP (Advanced Data Communications Control Procedure) standardised by the American National Standards Institute (ANSI)[2], to allow connectionless and round-table operation — both are discussed later.

PID Field

The *Protocol Identifier* (PID) field is one byte in length and appears in HDLC information frames I and UI. The purpose of the PID field is to identify the type of level 3 protocol implemented, if any. For the AX.25 protocol at present, no level 3 protocol is implemented, and by convention the PID=$FO (11110000).

Information Field

The *Information Field* (I) is used to convey user data from the source station at one end of the link to the destination station at the other end of the link.

The I field can contain a maximum of 256 bytes in length of user information, prior to the insertion of zero bits as specified by bit-stuffing.

The maximum length of the data portion of a packet is determined by the PACLEN parameter. The TNC-2 automatically transmits a packet when the number of bytes to be transmitted reaches the user-specified PACLEN value, the default value is 128.

FCS Field

Error recovery of a packet frame depends on a mathematically derived check sum which is computed, in accordance with ISO 3309 (HDLC) Recommendations, by both the source and destination stations. The check sum consists of a 16-bit binary number, called the *Cyclic Redundancy Check* (CRC) or the *Frame Check Sequence* (FCS), and is unique to each frame.

For a particular frame, if the FCS computed by the destination station agrees with the transmitted FCS, the destination station assumes no error in the received information, and sends an ACKnowledgment back to the source station; if not, an ACK is not sent and the source station retransmits the entire frame of information.

Local Area Network

Packet radio activity is concentrated in a *Local Area Network* (LAN) which comprises several packet stations[5]. A packet QSO is initiated by a connect sequence, which sets up the "handshaking" between two packet stations, that assures a reliable communication link. The *CONNECT* (C) command is used to initiate a connect request to another station.

```
cmd: C VK6AAA
*** CONNECTED to VK6AAA
```

The *** CONNECTED to message informs the user that the connect request is successful. A packet QSO is terminated by a disconnect sequence, which leaves both stations free to initiate new QSOs. The *DISConnect* (D) command initiates a disconnect request with the currently connected station.

```
cmd: D
*** DISCONNECTED
```

The *** DISCONNECTED message indicates that the disconnect request is successful. An actual QSO might be initiated or terminated by the other station, in which case, the appropriate message would be displayed.

Occasionally, a connect sequence will be initiated that cannot by completed; this may be due to the fact that the station, with which a connection is requested, is not on air or it may not be within simplex range, or simply because the path is poor.

If the TNC does not receive a response to the initial connect request packet, after a certain time lapse, the t will be sent again. In fa03ct, the number of attempts the TNC makes is specified with the command RETRY. The default number of retry attempts is 10. Setting RETRY to 0 effectively disables the retry count and does not set a limit to the number of retries.

The retry count is also enabled once a packet QSO is established. Each packet which is received by the destination station is acknowledged (ACK), indicating that the packet was received without transmission errors. Sometimes a packet may not be received, either due to a minimal RF link prone to noise, or unintentional interference (QRM) caused by another packet station — a packet "collision." In both cases, an unacknowledged packet is retransmitted and the retry count incremented. If the maximum count set by RETRY is exceeded, the TNC automatically disconnects and displays the message:

```
*** retry count exceeded
***DISCONNECTED
```

The automatic disconnect feature prevents the TNC from indefinitely retransmitting the same packet and unnecessarily using the channel.

Digipeating

One of the very convenient features of the AX.25 level 2 protocol, as currently implemented in the Tucson Amateur Packet Radio (TAPR) TNC-2 and clones, is the capability for each packet radio station to serve as a "digipeater," for other packet stations in the LAN[2]. A digipeater is simply a standard TNC which receives (and stores) an incoming packet destined for another station, prior to retransmitting (forwarding) the packet to the destination station (or next digipeater) on the same frequency.

The current TAPR implementation allows up to eight digipeater stations in a given communication network link. This is a convenient extension of the ISO X.25 Recommendation, and forms a significant part of the difference between X.25 and the amateur version called AX.25[4].

A specified routing algorithm may be setup in the network when a direct or simplex connection is not possible, due to the unfavourable topographic nature of the LAN. This allows a packet QSO to make use of digipeaters which can automatically digipeat packets from one station to the other over a specified route.

In order to establish a connection using an intermediate digipeater station, the call sign of the digipeater is preceded by VIA in the call sign address field, and the following command is issued:

cmd: C VK6BBB VIA VK6AAA

This directs the TNC to setup a connection to VK6BBB using VK6AAA as an intermediate digipeater. When several digipeater stations are used in a particular routing strategy, the additional digipeaters are specified in the order in which they would be encountered:

cmd: C VK6CCC VIA VK6AAA, VK6BBB

In the above situation, a connect request is issued to VK6CCC using VK6AAA and VK6BBB as digipeaters.

At the present time, it is anticipated that the multiple-digipeater facility offered by AX.25L2V2 is a temporary means of providing a packet routing strategy within the LAN — thus allowing successful interconnection of stations distributed over a wide geographical coverage area — until such time that a Network Layer protocol for level 3 networking protocol is in use, digipeater links will gradually be phased out.

Optimising Channel Thru-Put

An important factor to be considered in optimising channel thru-put concerns the method by which packets are acknowledged in a multi-hop network. Communications integrity is assured by a method known as "END-TO-END ACK"[5]: the digipeater station simply relays packets without acknowledgment to the source station. The digipeater is not concerned with the type of packet being digipeated. The destination station sends its ACK back through the same digipeaters to the originating station.

Since the digipeated packets are not acknowledged by digipeaters, an unsuccessful transmission must be retried from the beginning by the originating station, thus increasing the channel congestion.

In order to minimise the resultant increase in channel congestion, which occurs when digipeated packets suffer collisions, the digipeater is given priority. Ordinary packet stations, instead of transmitting immediately after detecting a clear channel, must wait a specified period of time. This restriction applies to all stations except the digipeater, which is permitted to transmit relayed packets immediately.

Multi-Connect Operation

Multi-connect operation is a recent extension to AX.25 level 2 protocol, and allows several point-to-point connections to be established to a packet station from other stations: this occurs when more than one station requires the services of another station. This capability is extremely useful for traffic net operation, multi-user bulletin board systems, path-checking, and QSOs in general.

The multi-connect facility supports several commands, some of which are described below which the TNC-2 defaults to the following parameters.

CONPERM OFF
STREAMCAll OFF
STREAMSWitch $7C (I)
USERS 1

This configuration sets up the TNC-2 to operate in the "normal" manner which does not permit multi-connect operation. An outline of each multi-connect related command follows.

The *USERS* command controls the management of only incoming connect requests by assigning a non-allocated "stream" (connection link) to a specific incoming connect request. This has no affect on the number or management of connections that a TNC-2 may initiate, and is outlined below:

USERS 0 incoming connect on any free stream
USERS 1 incoming connect on stream A only
USERS 2 incoming connect on streams A and B
USERS 3 incoming connect on streams A, B, C

and so on through USERS 10.

To allow multiple simultaneous connections to a packet station from other stations, the USERS parameter Is set to any valid setting other than USERS 1, as indicated above. The multi-connect feature allows a maximum number of 10 connections (QSOs) to be in operation simultaneously.

The *STREAMSWitch* command allows the user to specify the ASCII character ($00-$FF) which is used to select s new stream for the multiple- connect QSO/s.

When operating with multiple connections, the current QSO stream can be switched by entering the STREAMSWitch character (default I $7C), followed by a stream identifier (a character "A" to "J"). However, for this command to function properly, the STREAMSWitch character must not be one of the stream identifiers (A to J).

The *STREAMCAll* command is used to enable the display of the connected-to <call sign>, of the station with which a connection is established, following a stream identifier. This feature is particularly useful when the operation of multiple simultaneous connections is allowed.

The *STREAMCAll ON* option enables the TNC-2 user to immediately identify the stream on which a particular station is connected. Thus, an incoming packet on stream B is now displayed as "IB:<call sign>:" instead of "IB". Notice that the STREAMSWitch character and stream identifier "BI" without ":" displayed immediately following, indicates that the user entered these to switch to stream B for the multiple- connect QSOs.

In some networking applications involving marginal RF-links, such as HF work, disconnects will usually occur as a result of retried frames sent to the other station exceed the RETRY attempts to get an acknowledgment. In this situation, it may be desirable to force the TNC to initiate a subsequent connect request in order to try and re-establish the current connection. The command CONPERM, when enabled ON, is used for this scenario and Is only effective when a connection is established on a particular stream.

The *CONPERM* command is employed on an individual stream basis when multi-connect operation is allowed. Connections on other streams which do not have CONPERM in effect continue to operate in the normal manner of disconnect based on RETRY.

During the multi-connect operation, it is often desirable to check the connect status of all streams in use. The *CSTATUS* command provides the user with the current link status information applicable to the 10 streams (links). The information depicts the stream identifier and the link state for each stream, the current input and output stream, and whether or not a stream link state is "permanent" as specified by CONPERM.

An example of the information displayed as a result from issuing the CSTATUS command is shown in Figure 3. This example shows the A stream is assigned the current input and output stream. The B stream is connected to VK6DDD "permanently." The D stream is connected to VK6CCC using VK6BBB as a digipeater. All other stream states are depicted as they might normally appear with multiple connections.

```
cmd:CS
A stream    IO Link State Is :
            CONNECTED to VK6AAA
B stream    IO Link State Is :
            CONNECTED to VK6DDD P
C stream    IO Link State Is :
            DISCONNECTED
            to VK6DDD P
D stream    IO Link State Is :
            CONNECTED to VK6CCC via
            VK6BBB

...
I stream    IO Link State Is :
            CONNECTED to VK6EEE
J stream    IO Link State Is : CONNECT
            in progress
```

Figure 3 — Link Status Information Displayed by CS Command.

Multiple simultaneous connection operation is a further development in the direction of "proper" networking, and it is anticipated that a level 3 networking protocol should eventually allow some form of multi-way operation. Multi-way operation, which is not available at this time, would provide a means to allow multiple stations within the LAN to simultaneously interconnect to each other, and thus enable each station to receive all data, passed from any station in the network, error free.

Connectionless Operation

Connectionless operation is a mode of packet communication which is not specifically accommodated by AX.25 level 2 connection protocol. This operation, called the round-table, comprises several packet stations engaged in one conversation. Although the round-table type of operation is technically outside the AX.25 level 2 connection protocol, the manner in which it is implemented still uses the HDLC frame format. A special frame, called the Unnumbered Information (UI) frame, is used for what is called "unprotocol" mode.

The UI frame contains PID and information fields and is used to pass information along the link outside the protocol flow controls. This allows information fields to be sent back and forth along the link without flow control procedures. Therefore, since the UI frame is not acknowledgeable, if one suffers a collision and is destroyed, there is no means by which it can be recovered. When no destination address subfield is specified, unconnected packets are sent as UI frames, in unprotocol mode, to the address specified by the *UNPROTO* command (default CQ).

Transmit Timing Parameters

The transmit/receive switching time delays which are characteristic for specific types of amateur radio transceivers vary considerably. Before the TNC commences sending a packet frame, sufficient keyup time delays must be imposed on the TNC, in order to ensure that the transmitter has properly "turned-on" and the receiver has had adequate time to synchronise on the incoming signal, otherwise the packet will not be received correctly.

The time delay between the transmitter keyup and the actual commencement of packet transmission is governed by the command *TXDELAY*. During the time interval that the TNC is keying the transmitter, but not actually sending information, a continuous series of synchronising audio signals (flags) are sent. This allows the detection of a busy channel more reliable. The TXDELAY is a value from 0 to 120 and is specified in 10 msec increments.

If an audio repeater is being used to repeat packets (which works fine), the necessary keyup delay may need to be increased considerably in comparison to the delay required

for direct or point-to-point communications. However, once the audio repeater is in use and has not had time to "drop out" since the last transmission, the additional keyup delay is not required.

The command *AXDELAY* is used to specify the additional time delay the TNC is required to wait once the transmitter is keyed. This parameter is useful for packet stations using audio repeaters to extend the coverage of the local area network. The AXDELAY is a value from 0 to 180 specified in 10 msec increments.

The command *AXHANG* is specifically used to increase channel efficiency when an audio repeater with a "hang-time" greater than 100 msec is used. AXHANG specifies the audio repeater hang-time in 100 msec intervals. For a repeater with a long hang-time, in excess of 100 msec, it is not necessary to impose the repeater keyup delay (AXDELAY), after the transmitter of a packet station is keyed, if the repeater is still transmitting. Hence, if the TNC has detected a packet sent during the hang-time of an audio repeater, the repeater keyup delay (AXDELAY) is not added to the transmitter keyup delay (TXDELAY).

The total combined keyup delay is given by the equation below:

Keyup delay = (TXDELAY+AXDELAY)*10 msec

If channel activity is detected within the time interval AXHANG*100 msec, the keyup delay is given by:

Keyup delay = TXDELAY*10 msec

Packet Timing Considerations

The AX.25 link-layer protocol automatically provides for the retransmission of packets if no acknowledgment is received from the destination station within a certain period of time. There are several reasons why a packet might not be ACKed: channel noise may corrupt the packet transmission, the packet might suffer a collision with another packet transmission, the channel may be congested by other packet stations thereby preventing the destination station from sending an ACK immediately, or the ACK may subsequently suffer a collision.

The time lapse imposed before the source station retransmits the packet is specified by the command *FRACK* (FRame ACKnowledge time). If the source station does not receive an ACK within the frame acknowledge time, the RETRY counter is incremented and the frame is sent again.

If the address field of a packet frame includes the call signs of digipeaters, the time delay between retries is adjusted accordingly:

Retry interval = FRACK*(2n+1) sec

where n is the number of intermediate digipeaters used in the link, the FRACK is a value from 1 to 15 specifying frame acknowledge time in one second intervals.

In a multi-hop network, an important aspect of AX.25 protocol is the means by which each station utilises the information about channel activity obtained by listening to the channel. *CSMA* (Carrier-Sensed Multiple Access) is the basis for which time domain multiplexing is utilised to achieve maximum channel thru-put with minimum interference.

The TNC monitors for the presence of a RF data-carrier on the channel, and once a data-carrier is detected (DCD) the TNC will not transmit until after a specified time delay has expired since the DCD condition cleared. Furthermore, in order to minimise the probability of a collision, a wait time interval can be imposed on the TNC before a packet is transmitted.

The wait time is set by the command *DWAIT* which is a value from 0 to 250 specifying 10 msec intervals. Thus, an optional automatic wait time (DWAIT) can be imposed on any packet station not digipeating a packet. This wait time is intended to help alleviate the drastic reduction of thru-put that occurs on a channel when digipeated packets suffer collisions.

If the users of a local area network do not require the use of digipeaters, the DWAIT parameter can be set to 0, but in any case DWAIT should be set to the same mutually acceptable value by all users of the LAN.

The time delay incurred between the receipt of a packet and the subsequent transmission of the acknowledgment packet is set by the command *RESPTIME*. This delay runs concurrently with the imposed wait set by DWAIT and any random wait in effect. During normal packet operation the RESPTIME delay can be set to 0. The default value is 12. The delay is a value from 0 to 250 specifying 100 msec intervals.

This delay can be used to increase channel thru-put during data-file transfer operations when the maximum number of full-length packets is usually sent. RESPTIME is specifically used to prevent collision between an acknowledgment packet and another packet from the source station.

In a multihop network employing digipeaters, the probability of either the original packet or the acknowledgment being destroyed due to a packet collision, increases drastically with the number of digipeaters used.

In order to avoid unnecessary packet retries, the protocol implements a collision avoidance strategy which applies to all packets except those being digipeated. On subsequent transmissions of a particular packet, the TNC waits an additional random time after detecting a clear channel before commencing a retry keyup procedure. This helps prevent repeated collisions of packets by the same two stations.

The additional random time is a multiple of the TXDELAY parameter. The interval between the TNC detecting cessation of a carrier and beginning to transmit is:

wait time = DWAIT*10 msec

for the initial transmission of a packet.

For subsequent transmissions of the same packet the interval is:

wait time = DWAIT*10+(r*TXDELAY)*10 msec

where r is a random generated number from 0 to 15.

Several packets may be transmitted before waiting for an acknowledgment. The maximum number of unacknowledged packets, which the TNC can have outstanding at any one time, is specified by the command *MAXFRAME*. This parameter also sets the maximum number of packets which the TNC can send during a single transmission. The default value is four and the maximum value is seven packets.

If some, but not all, of the outstanding packets are acknowledged, a smaller number may be transmitted the next time, or new frames may be included in the retransmission, so that the total unacknowledged packets does not exceed the value set by MAXFRAME.

MAXFRAME in combination with PACLEN, which sets the maximum number of bytes in the information field of a packet, determines the quantity of information which can be sent in a single transmission. The optimal combination for efficient data-file transfers is determined by experimentation and is dependent on the quality of the link used.

Conclusion

Most radio amateurs using packet radio today are using the AX.25 level 2 standard, and the majority of packet systems available support the AX.25 level 2 protocol. AX.25 level 2 protocol has been proven and accepted as a practical protocol in the amateur packet radio environment.

Since packet radio is still in the development stage, suitable extensions, based on field feedback from active packet users (packeteers), undoubtedly will be implemented in some technical specifications as the mode attracts more users.

It is hoped that this paper will assist the newcomer to amateur packet radio understand the fundamentals of the AX.25 link-layer protocol, by using the TAPR TNC-2 as a basis for discussion. Furthermore, I hope that this introduction to the subject of amateur packet radio invokes interest in potential packet radio enthusiasts.

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Glossary

ADCCP Advanced Data Communication Control Procedure standardised by ANSI.

ANSI. American National Standards Institute.

AX.25L2V-2. ARRL Specification entitled, "AX.25 Amateur Packet Radio Link-Layer Protocol, Version 2.0".

Balanced. Devices operating at both ends of the link communicate with one another as equals.

CCITT. International Telegraph and Telephone Consultative Committee, a part of the International Telecommunication Union (ITU).

DCE. Data Circuit-terminating Equipment, a master device operating in unbalanced mode of the X.25 link layer.

DTE. Data Terminal Equipment, a slave device operating in unbalanced mode of the X.25 link layer.

DXE. Data Switching Equipment, a device (neither master or slave) operating in balanced mode of the AX.25 link layer.

HGLC. High-level Data-Link Control Procedures, a specification as defined in ISO 3309 standard.

ISO. International Standards Organisation.

ISO3309. International standard entitled, "Data Communication High- Level Data-Link Control Procedures — Frame Structure".

LAN. Local Area (Access) Network, comprises several packet stations operating within a local geographical service area.

LAPB. Link Access Procedure Balanced, a link layer protocol for X.25 balanced-mode communications developed by CCITT.

NNC. Network Node Controller, a device used to interconnect local area networks.

OSI. Open Systems Interconnection, a communications protocol reference model defined by the ISO.

TAPR. Tucson Amateur Packet Radio Corporation, a non-profit organisation involved in amateur packet radio research and development.

X.25. CCITT Recommendation entitled, "Interface between Data Terminal Equipment (DTE) and Data Circuit-Terminating Equipment (DCE) for Terminals Operating in the Packet Mode on Public Data Networks".

■

Feedline Data Calculations for the VZ200/300

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This program came about when the price of the VZ200 dropped dramatically.

The story of how this program came about is simple, but I believe it could be of interest. It all began when the price dropped on the VZ200 and Wal VK4AIV, bought one.

After learning the basics of its operation, he began to search for useful programs involving amateur radio, finding them few and far between.

Much later, I purchased a VZ300 at the same price as Wal's VZ200 and naturally asked Wal what programs he had.

Upon discovering the scarcity, I sat down and wrote a series of short programs to ease the problems of endless work with calculator, pen and paper, for amateur radio work.

Copies of these programs were given to Wal, who tidied them up and tied them together. This listing is part of the result.

The program is to enable those interested to quickly calculate parameters for the construction of coaxial cable or open wire feeder sections for matching antennas to feedlines.

The calculations are derived from standard amateur radio books and simply are converted into Basic statements.

They are as follows:

COAXIAL CABLE DATA

1 Impedance of a cable of a given size.
2 Inside diameter of outer conductor for a given impedance and inner conductor size.
3 Outside diameter of inner conductor for a given impedance and outer conductor size.
4 Cut off frequency for a cable of given size and impedance.

OPEN WIRE FEEDER DATA

1 Impedance of feeders of known wire size and spacing.
2 Spacing required for a given wire size and impedance.

There is space in the program for future additions to be inserted. I hope many amateurs will find it of use.

```
10 CLS:GOSUB2000
20 PRINT@99,"1- COAXIAL CABLE DATA"
30 PRINT@195,"2- OPEN WIRE FEEDER DATA "
40 PRINT@291,"3- "
50 PRINT@387, "4- "
60 PRINT@448,"CHOOSE OPTION":INPUTN
70 IFN=1THEN100
80 IFN=2THEN2000
85 REM**********************
90 REM**********************
100 GOSUB2000
110 PRINT@99,"1-IMPEDANCE OF COAXIAL"
120 PRINT@131,"          CABLE"
130 PRINT@195,"2-INSIDE DIA.OF OUTER"
140 PRINT@227,"        CONDUCTOR"
150 PRINT@291,"3-OUTSIDE DIA.OF INNER"
160 PRINT@387,"4-CUT OFF FREQUENCY"
170 PRINT@448,"CHOOSE OPTION":INPUTN
180 IFN=1THEN500
190 IFN=2THEN1000
200 IFN=3THEN1200
210 IFN=4THEN1400
220 IFN<1THEN1010
230 IFN>4THEN1010
235 REM**********************
240 REM**********************
500 GOSUB2500
510 INPUT"ENTER INSIDE DIAMETER OF OUTER CONDUCTOR";D1
520 INPUT"ENTER OUTSIDE DIAMETER OF INNER CONDUCTOR";D0
530 X=SQR(K)
540 Y=D1/D0
550 Z=LOG(Y)/2.30259
560 W=138*Z/X
570 PRINTW;"OHMS IMPEDENCE"
```

```
580 PRINT"ANOTHER TRY?Y,N"
590 INPUTA$
600 IFA$=CHR$(89)THEN500
610 IFA$=CHR$(78)THEN10
620 REM**********************
630 REM**********************
1000 GOSUB2500
1010 INPUT"ENTER IMPEDANCE";Z
1020 INPUT"ENTER OUTSIDE DIAMETEROF INNER CONDUCTOR";D
1030 X=SQR(K):Y=Z*X/138
1040 W=(10^Y)*D
1050 PRINT"INSIDE DIAMETER OF OUTER CONDUCTOR=";W
1060 PRINT"ANOTHER TRY?Y,N"
1070 INPUTA$
1080 IFA$=CHR$(89)THEN1000
1090 IFA$=CHR$(78)THEN10
1091 REM**********************
1092 REM**********************
1200 GOSUB2500
1210 INPUT"ENTER INPEDANCE";Z
1220 INPUT"ENTER INSIDE DIAMETER OF OUTER CONDUCTOR";D
1230 T=SQR(K)
1240 U=Z*T/138
1250 V=10^U
1260 W=1/V
1280 X=W*D
1290 PRINT"OUTSIDE DIAMETER OF INNER CONDUCTOR=";X
1300 PRINT"ANOTHER TRY?Y,N"
1310 INPUTA$
1320 IFA$=CHR$(89)THEN1200
1330 IFA$=CHR$(78)THEN10
1390 REM**********************
1391 REM**********************
1400 GOSUB2500
1410 INPUT"ENTER INSIDE DIA.OUTER CONDUCTOR";D1
1420 INPUT"ENTER OUTSIDE DIA.INNER CONDUCTOR";D0
1430 Z=SQR(K)
1440 X=7520/(D1+D0)*Z
1450 PRINT"CUT OFF FREQUENCY=";X;"MHZ"
1460 PRINT"ANOTHER TRY?Y,N"
1470 INPUTA$
1480 IFA$=CHR$(89)THEN1400
1490 IFA$=CHR$(78)THEN10
1491 REM**********************
1492 REM**********************
1616 REM**********************
2000 GOSUB3000
2010 PRINT@99,"1-IMPEDANCE OF OPEN"
2020 PRINT@131,"      WIRE FEEDER"
2030 PRINT@195,"2-SPACING OF OPEN"
2040 PRINT@227,"       WIRE FEEDER"
2050 PRINT@291,"3- "
2060 PRINT@387,"4-"
2070 PRINT@448,"CHOOSE OPTION":INPUTN
2090 IFN=2THEN2400
2100 IFN=1THEN2200
2110 A$=INKEY$:IFA$<>CHR$(45)THEN2110
2120 IFA$=CHR$(45)THEN10
```

```
2191 REM**********************
2200 CLS:PRINT"OPEN WIRE IMPEDANCE"
2210 INPUT"SPACING";D1
2220 INPUT"DIA OF WIRE";D2
2230 X=D1/D2
2240 W=X+SQR((X*X)-1)
2250 Y=LOG(W)/2.30259
2260 Z=Y*276
2270 PRINTZ;"OHMS IMPEDANCE"
2280 PRINT"ANOTHER TRY?Y,N"
2290 INPUTA$
2300 IFA$=CHR$(89)THEN2200
2310 IFA$=CHR$(78)THEN10
2400 CLS:PRINT"TO FIND SPACING OPEN WIRE"
2410 INPUT"ENTER IMP";Z0
2420 INPUT"WIRE DIA";D
2430 X=Z0/276:Y=10^X:A=D*(Y*Y-1):S=A/(2*Y):PRINT"SPACING=";S
2440 PRINT"ANOTHER TRY?Y,N"
2450 INPUTA$
2460 IFA$=CHR$(89)THEN2400
2470 IFA$=CHR$(78)THEN10
2500 CLS:PRINT:PRINT"DIELECTRIC CONSTANTS:":PRINT"AIR=1"
2510 PRINT"POLYTHENE=2.26":PRINT"FOAM POLYTHENE=1.2"
2520 PRINT"TEFLON=2.1"
2560 INPUT"ENTER DIELECTRIC CONSTANT";K
2570 RETURN
2571 REM**********************
3000 CLS:PRINT@0," ********************************"
3010 PRINT@32," *       +++++MENU+++++          *"
3020 PRINT@64," *                               *"
3030 PRINT@96," *                               *"
3040 PRINT@128," *                               *"
3050 PRINT@160," *                               *"
3060 PRINT@192," *                               *"
3070 PRINT@224," *                               *"
3080 PRINT@256," *                               *"
3090 PRINT@288," *                               *"
3100 PRINT@320," *                               *"
3110 PRINT@352," *                               *"
3120 PRINT@384," *                               *"
3130 PRINT@416," ********************************"
3150 RETURN
```

THE FIRST

All historians face the same dilemma, *"Who was the first to achieve this or that ? ? ?* Many firsts are credited to the 'inventor of radio', Marconi — however, the truth is that this great man was more an improver and entrepreneur than an inventor.

Below is an extract from the *Wireless Weekly* dated November 17, 1922. At the time when the undermentioned David Hughes was conducting his experiments in the 1870s, Marconi was a very young child.

FIRST WIRELESS FIND IN LONDON

"The crude, but sensitive instruments with which David Hughes first discovered wireless waves have been unearthed in a London tenement and transferred to a place of honour in the South Kensington Museum.

"Hughes experimented with electric waves long before Marconi, but the latter gained the distinction of being the discoverer because he was the first to recognise them as ether waves

"The newly found instruments consist of a spring-wound device that sent out electric impulses at regular intervals and a carbon microphone used by Hughes as the detector. History tells us that during an experiment in 1879, Hughes started the transmitter and then walked slowly away from his laboratory with the receiver in his hand, noting how far the sounds could be detected. At times he was able to hear them 50 feet distant.

"Although Hughes was an extremely able scientist, he lived and worked in a frugal manner. Most of his instruments were made up of odds and ends, such as pins, needles, scraps of wire and pieces of metal utensils. Yet, even with these, he was able to produce delicate mechanisms that were the forerunner of those in operation today.

"The carbon grain transmitter was first tested by Hughes and a widely used electrical device known as an induction balance was invented by him. Later, he published a theory of magnetism that brought him distinction.

"Hughes was born in America where he lived during his early years; but after inventing a printing telegraph, he moved to England and the Continent. There he tried for many years to have the machine approved by foreign telegraph firms. Finally, after being accepted by the French Government, it was adopted by all the leading companies and brought wealth to the inventor."

(Many brilliant experimenters never gained proper recognition).

—Courtesy Alan Shawsmith VK4SS

THE WHITE LADY

Next time you become the owner of an old piece of something or other — like an ancient car, a radio, or item of furniture — take the time to ponder on its past life. Just for a moment let your imagination have a free rein. In my mini-museum are vintage bits and pieces of all kinds; could they talk, some wondrous even bizarre tales would be told.

Let me relate the true story of one of my radio masts, a high quality dead-straight spar of oregon pine 35 feet (10m) in length. Because of the whims of destiny it had circumnavigated the globe as part of a sailing ship, more times than can be known. Later it was almost destroyed by fire but survived to serve several amateurs admirably, finally doing yeoman service at the Ionospheric Research Station at the University of Queensland.

I nicknamed the pole "The White Lady"; males always refer to ships or parts thereof in the feminine gender. After a few coats of white paint it stood stark and clear against the sky. It (or she) came into my possession in 1935 when visiting my uncle, a sea captain. Pointing to the 50 feet (15m) spar he said, "I pulled her off an old burnt windjammer in Moreton Bay. She must be 60-years old — but still as sound as the day they milled her in the States — and she's been south of the Horn more than once I'll wager. If she's any use — take her!"

I did take her, with alacrity. The mast was round (almost 6 inches (150 mm) in diameter) and untapered, with a slight heat scorch mark at one spot, and she stretched before me straight-as-a-die — a beautiful piece of timber. I wondered about the tall erect tree from which she had been cut.

Lack of ground space demanded I shorten it to approximately 35 feet (10m), a process as painful as cutting off an arm. Until WWII was declared in 1939 it stood erect at my Dutton Park QTH, when, on receipt of that infamous 'red' (actually pink) telegram from the PMG, it was lowered with tenderness to the ground and stored for the next six years.

In 1946, the White Lady was taken 'out of mothballs', transported and re-erected at my new QTH in West End. Here, because I had lost my head for heights, climbing spikes were inserted every 18 inches (450 mm) — about 20 in all. This proved to be another unpleasant operation, like drilling teeth. Visiting amateurs, especially ex-Navy W/OS could run up and down it like a rigger but I still tackled it with great caution.

Gordon VK4EK and Gil VK4CF removed it in 1949 and took it to the former's QTH. Three years later Gil, of Mitchelton, assumed ownership but did not put it into use; he subsequently gave it to Gerry VK4CF who then donated it to the Radio Physics Department of the University of Queensland for their research into Whistling Atmospherics, which was conducted by Dr R W E McNicol VK4WM (SK 1974) at Moggill. It remained there in regular service for all passers-by to see, being well maintained and painted (TLC) until it finally collapsed during the great Brisbane flood of 1974. A survivor of cyclone and fire, the deluge of that year proved too much.

So the White Lady was finally laid to rest at the ripe old age of somewhere around 100 years. Who would deny that for the roles it played, miles it travelled, service it rendered and pleasure it gave to so many on sea and land it sure was a mighty stick of wood. No wonder I remember with affection the White Lady and the DX it helped me work.

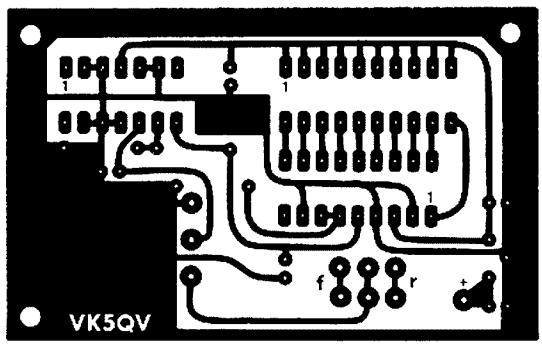
—Courtesy Alan Shawsmith, VK4SS.

The White Lady (at left) on site at Ionospheric Research Station, Moggill, Queensland.

Try This!

NO FUSS PRINTED CIRCUIT BOARDS

Ivan Huser VK5QV
7 Bond Street, Mount Gambier, SA 5290



This method of PCB production allows quality boards to be produced literally on the kitchen table.

The method was devised by Dr Roland Milker, a German chemist, and simplifies Printed Circuit Board production to just three easy steps.

1 The required pattern is photocopied onto plastic film.

2 The positive image on the film is then transferred to the copper laminate using an ordinary domestic smoothing iron.

3 After the film is removed, the board is then etched in the normal way.

My introduction to this intriguing method of reproducing printed circuit boards came when I acquired some TEC-200[1] plastic film especially developed for the purpose. My first attempts were absolute disasters and with my valuable stock of film being rapidly devoured by my wife's smoothing iron, I sought an alternative product with which I could experiment.

After trying several different plastic films with varying degrees of success, I decided to try the film used for making overhead projector transparencies on a photocopier and — eureka — it worked!

PHOTOCOPYING

Any photocopier that heat fuses a toner onto plain paper may be used as long as it is in good condition and in particular, has a clean roller.

The overhead projector film[2] used has a smooth and a not so smooth side. It is *essential* that when used in this application, the copy be made on the *smooth* side.

Because of the nature of the image transfer process, the master used must be a *mirror image* (component side view) of the desired copper pattern. If the pattern is obtained from a magazine, an intermediate transparency will almost certainly have to be made and then reversed using the photocopier. If however, you are making your own master, then it should be produced as a mirror image to avoid the need for the intermediate step.

Place the PCB pattern, as published in a magazine or your own master, on the photocopier and run a paper copy to gauge the quality. Adjust the machine if necessary until a good dark copy with a clear background is obtained.

Place a sheet of plastic film *smooth side up* in the tray of the photocopier and run a copy. Check for quality and, if necessary, run another copy.

IMAGE TRANSFER

Thoroughly clean the copper laminate using a mild abrasive such as a scouring pad or a piece of steel wool and then clean the surface with acetone or a good quality proprietary line of PCB cleaner. *Do not omit this last cleaning process.*

The board should then be warmed in a hot oven for a few minutes so that it does not sink too much of the heat from the iron during the transfer process.

Cut the pattern to be transferred from the plastic sheet allowing about 20 mm clearance around the pattern. Place the film on the warm laminate with the toner side in contact with the copper and cover with a thin cotton cloth. An old handkerchief is ideal.

With the iron temperature around 150 degrees Celsius, lightly apply the iron to the handkerchief until the pattern adheres to the copper. Once the plastic film has adhered, apply a *firm* pressure and carefully smooth the entire area to be transferred until the temperature of the board is close to that of the iron. This takes around 30 seconds or so for a medium size board. The handkerchief and plastic film can now be carefully peeled from the laminate to reveal the transferred pattern.

Note that the film *must be removed from the laminate whilst hot.* If the plastic film is removed when cold, the toner becomes brittle and parts of the pattern will come away with the film.

The quality of image transfer is a function of temperature, time and pressure and some experimentation will be necessary to develop the 'feel' for the process. For the smoothing iron I used, the best setting was found to be at the low end of the cotton range. It was confirmed using an iron pyrometer that the iron was cutting out at 150 degrees Celsius and it is suggested that time could be save if your local appliance repairman could set your iron at this temperature for you.

ETCHING

As soon as the board has cooled and the toner hardened to produce a resist, the board can be etched using your favourite etchant and then sprayed with a protective lacquer.

It is suggested that an active etching agent be used to reduce the problem of undercutting associated with long etching times.

FINALE

If you have access to a photocopier and follow the procedure outlined in this short article, you probably will not be too far removed from producing an acceptable board with your first try.

The more complex the PCB pattern and the finer the lines, the more critical will be the relationship between temperature, time and pressure. With care however, this procedure should be quite satisfactory for most requirements.

Good Luck!

Notes:

1 TEC-200 is a trademark of the Meadowlake Corp — New York.

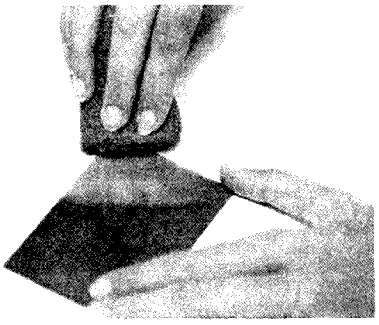
2 0.004 inch (0.1 mm) OHP film is available from stationery suppliers.

References:

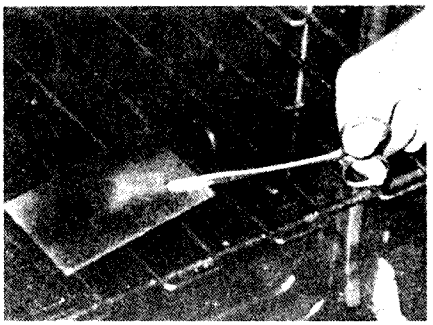
1 Making Printed Circuit Boards — Dr Roland Milker — *Radio and Electronics World*, November 1985.

2 TEC-200 Technical Bulletin — The Meadowlake Corp, PO Box 497, Northport, New York, 11768.

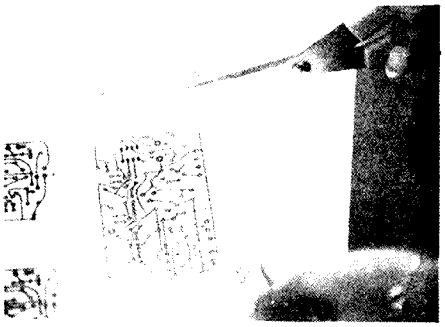
—Photographs courtesy Betken Productions



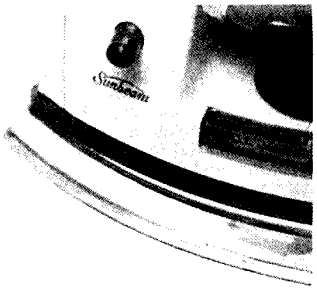
1. Thoroughly clean the copper laminate using a mild abrasive such as a scouring pad or a piece of steel wool and then clean the surface with acetone or a good quality proprietary line of PCB cleaner.



2. The board should then be warmed in a hot oven for a few minutes so that it does not sink too much of the heat from the iron during the transfer process.



3. Cut the pattern to be transferred from the plastic sheet allowing about 20 mm clearance around the pattern.



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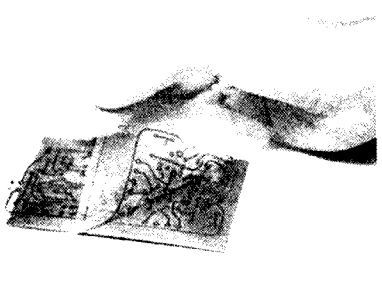
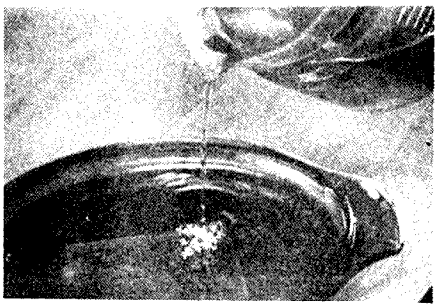


5. The handkerchief and plastic film can now be carefully peeled from the laminate to reveal the transferred pattern. The film must be removed from the laminate whilst hot. If the plastic film is removed when cold, the toner becomes brittle and parts of the pattern will come away with the film.



6. As soon as the board has cooled and the toner hardened to produce a resist, the board can be etched using your favourite etchant and then sprayed with a protective lacquer.

CAUTION: Etching and photosensitive chemicals are toxic — take adequate precautions.

RADIO FREQUENCY MANAGEMENT OPERATIONS BRANCH OFFICES

* HEADQUARTERS *

ASSISTANT SECRETARY, Benjamin Offices, Belconnen, Canberra, ACT. 2617. (Postal: PO Box 34, Belconnen, ACT. 2616). Telephone: (062) 64 4608

* AUSTRALIAN CAPITAL TERRITORY *

DISTRICT RADIO INSPECTOR, Shop 5, Level 3, Block F (Aqua), Benjamin Offices, Belconnen, ACT. 2617. Telephone: (062) 64 4677. (Postal: PO Box 132, Belconnen, ACT. 2616)

* NEW SOUTH WALES *

STATE MANAGER, Upper Ground Floor, MLC Building, 105-153 Miller Street, North Sydney, NSW. 2060. Telephone: (02) 922 9111. (Postal: PO Box 970, North Sydney, NSW. 2060)

DISTRICT RADIO INSPECTOR, Australian Government Offices, 218 Molesworth Street, Lismore, NSW. 2480. Telephone: (066) 21 6393

DISTRICT RADIO INSPECTOR, Suite 8A, First Floor, Tonella Commercial Centre, 125 Bull Street, Newcastle West, NSW. 2302. Telephone: (049) 26 4199. (Postal: PO Box 5190C, Newcastle West, NSW. 2302)

DISTRICT RADIO INSPECTOR, Suite 2, Corner Bourke and Marius Streets, Tamworth, NSW. 2340. Telephone: (067) 66 7211.

DISTRICT RADIO INSPECTOR, 15 Trail Street, Wagga Wagga, NSW. 2650. Telephone: (069) 21 1855. (Postal: PO Box 808, Wagga Wagga, NSW. 2850)

DISTRICT RADIO INSPECTOR, Australian Government Offices, 86-88 Market Street, Wollongong, NSW. 2500. Telephone: (042) 28 9611. (Postal: PO Box 1766, Wollongong, NSW. 2500)

* VICTORIA *

STATE MANAGER, Fifth Floor,14 Queens Road, Melbourne, Vic. 3004. Telephone: (03) 266 8921. (Postal: PO Box 6444, St Kilda Road Central, Melbourne, Vic. 3004)

DISTRICT RADIO INSPECTOR, MLC Building, 104 Curtis Street, Ballarat, Vic. 3350. Telephone: (053) 31 1317

DISTRICT RADIO INSPECTOR, 56 Nunn Street, Benalla. Vic. 3672 Telephone: (057) 62 3288

DISTRICT RADIO INSPECTOR, First Floor, National Mutual Building, 5 View Point, Bendigo, Vic. 3550. Telephone: (054) 43 1110. (Postal: PO Box 40 Bendigo, Vic. 3550)

DISTRICT RADIO INSPECTOR, Suite 5A, Bass Court, 398 Raymond Street, Sale, Vic. 3850. Telephone: (051) 44 4555

* QUEENSLAND *

STATE MANAGER, Tenth Floor, Aviation House, Corner Wickham and Ballow Streets, Fortitude Valley, Qld. 4006. Telephone: (07) 52 8822. (Postal: PO Box 555, Fortitude Valley, Qld. 4006)

DISTRICT RADIO INSPECTOR, Lonsdale Court, Corner Walker and Targo Street, Bundaberg, Qld. 4670. Telephone: (071) 72 2111. (Postal: PO Box 862, Bundaberg, Qld. 4670)

DISTRICT RADIO INSPECTOR, State Government Insurance Office, Corner Shields Street and The Esplanade, Cairns, Qld. 4870. Telephone: (070) 51 4333. (Postal: PO Box 1225, Cairns, Qld. 4870)

DISTRICT RADIO INSPECTOR, 2A Sydney Street, Mackay, Qld. 4740. Telephone: (079) 51 1828. (Postal: PO Box 337, Mackay, Qld. 4740)

DISTRICT RADIO INSPECTOR, 6 East Street, Rockhampton, Qld. 4700. Telephone: (079) 27 6922. (Postal: PO Box 1401, Rockhampton, Qld. 4700)

DISTRICT RADIO INSPECTOR, Townsville Commonwealth Centre, Walker Street, Townsville, Qld. 4810. Telephone: (077) 72 9555.

* SOUTH AUSTRALIA *

STATE MANAGER, Fifth Floor, QBE Building, 108-116 King William Street, Adelaide, SA. 5000. Telephone: (08) 212 2153. (Postal: PO Box 2248, Adelaide, SA. 5001

DISTRICT RADIO INSPECTOR, 40 James Street, Mount Gambier, SA. 5290. Telephone: (087) 25 6170. (Postal: PO Box 1545, Mount Gambier, SA. 5290)

DISTRICT RADIO INSPECTOR, Customs House, Horwood Street, Whyalla, SA. 5600. Telephone: (086) 45 5999. (Postal: PO Box 575, Whyalla, SA. 5600)

* WESTERN AUSTRALIA *

STATE MANAGER, First Floor, 256 Adelaide Terrace, Perth, WA. 6000. Telephone: (09) 325 5877. (Postal: PO Box 6189, Hay Street East, Perth, WA. 6000)

DISTRICT RADIO INSPECTOR, Wilson Street, Port Hedland, WA. 6721. Telephone: (091) 73 2309. (Postal: PO Box 182, Port Hedland, WA. 6721)

* TASMANIA *

STATE MANAGER, First Floor, Continental Building, 162 Macquarie Street, Hobart, Tas. 7000. Telephone:(002) 20 5011. (Postal: PO Box 63, Sandy Bay, Tas. 7005)

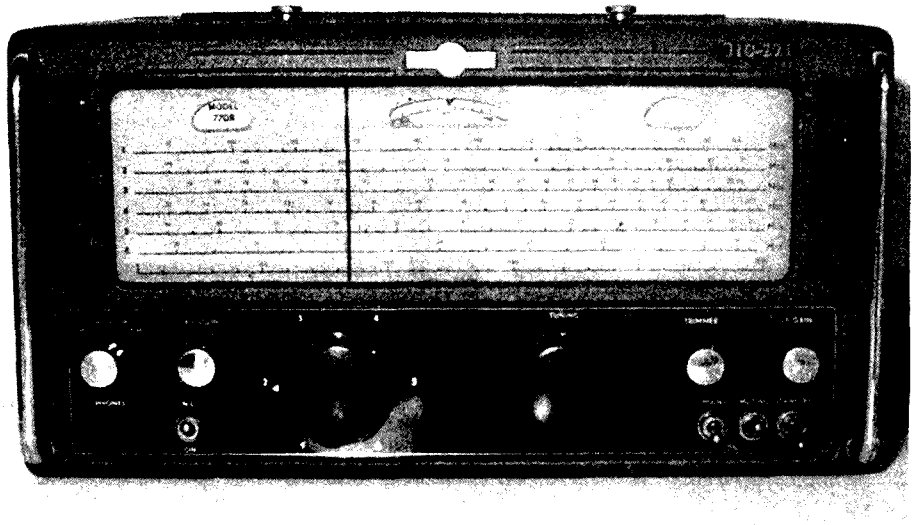
* NORTHERN TERRITORY *

DISTRICT RADIO INSPECTOR, Custom Credit House, 83 Smith Street, Darwin, NT. 5790. Telephone: (089) 81 5566. (Postal: PO Box 2540, Darwin, NT. 5794)

CLASSIC COMMUNICATIONS EQUIPMENT

The EDDYSTONE 770R VHF RECEIVER

Colin MacKinnon VK2DYM
52 Mills Road, Glenhaven, NSW. 2154

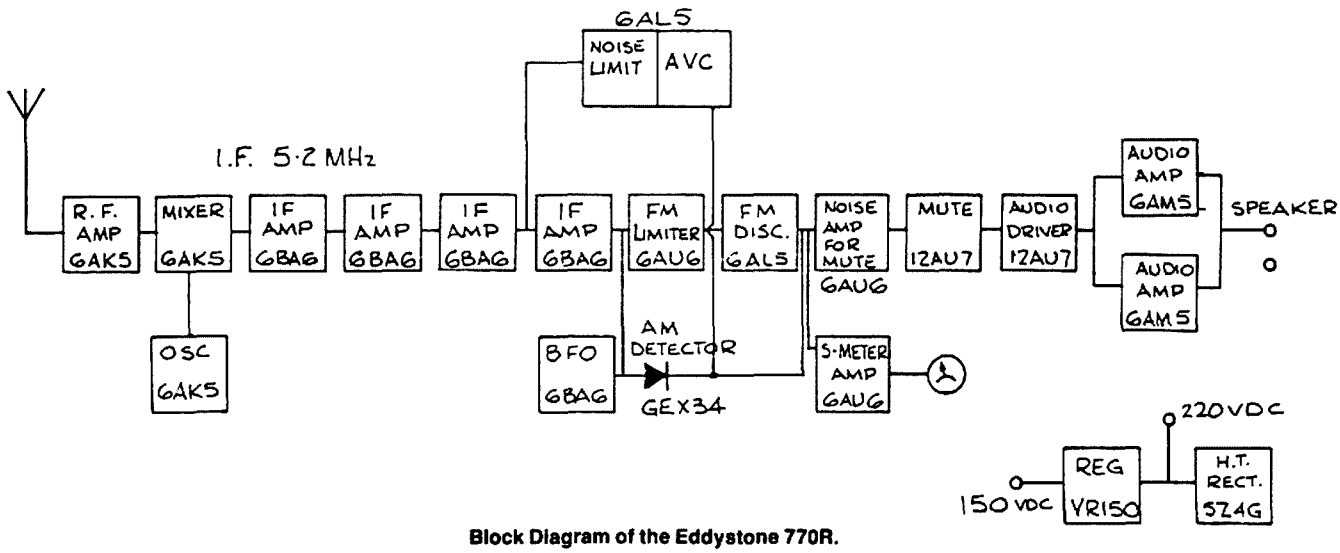


The 770R is a 19 valve, general coverage receiver giving continuous coverage from 19 to 165 MHz.

Eddystone is the brand name of the English company *Stratton and Co Ltd*, which had its origins in 1860 as a manufacturer of pins for the millinery trade. The "Eddystone" brand name was first used in 1923 for wireless components and receivers, and the company continued in supplying the amateur and public listener market until WWII. During that conflict they made thousands of transmitters, receivers and other parts, and afterwards, they concentrated on the high quality, professional communications field. In 1965, the company was purchased by the Marconi Company.

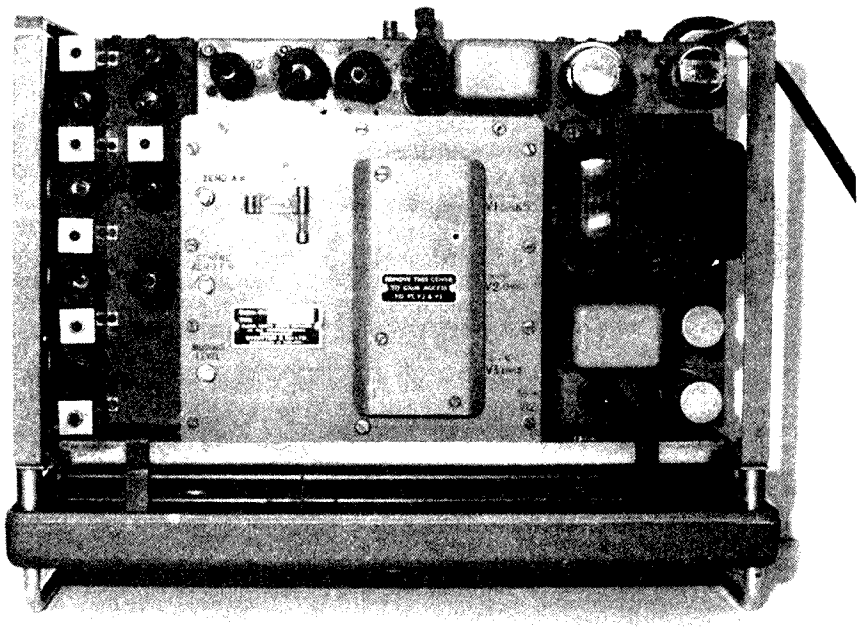
In the 1950s, the company brought out a series of receivers for the professional market and the well-heeled amateur that had a similar external appearance but different frequency ranges. The model 888A covered the six amateur bands of the era, the 770R covered the VHF range from 19 MHz to 165 MHz and the 770U covered the UHF frequencies from 150 MHz to 500 MHz. The 770R is this month's subject and the 770U will be described in a later article.

The 770R is a 19 valve, general coverage receiver designed in 1953-54, that gives continuous coverage from 19 MHz to 165 MHz in six bands. It can receive AM, FM, and CW but is not really setup for SSB. The outstanding visual feature of the set is the large horizontal dial with its smooth reduction drive, with a ratio of approximately 140:1. The front panel is a die-casting attached to a solid steel chassis, and the sheet steel case slides on, but has a lift-up lid for minor access.



Block Diagram of the Eddystone 770R.

View from the top — IF strip on left, tuning turret in centre and power supply to the right.



The receivers in this series are also similar in internal layout, with the power supply on the right (looking from the front), the RF and band- switching in the centre, and the IF and audio stages on the left side.

The block diagram shows that the antenna input at 72 ohms, unbalanced, is switched for the six different bands to tuning coils and then to the RF amplifier, the ubiquitous 6AK5. The tuning gang is three sections of 90+90 pF (split stator). The following mixer and the oscillator are also 6AK5s, and the resultant IF at 5.2 MHz goes through four IF amplifiers. The four position mode switch for CW, AM, NFM (narrow band FM), and FM (wide), loads the IF coils to vary the passband. For FM there is an FM limiter and discriminator, whilst in the AM mode the signal goes to a germanium detector diode. A BFO oscillator is switched in for CW, whilst other valves provide noise limiting and AVC, and control the S-meter for signal strength or centre tuning for FM. There is a mute amplifier to drive the 12AU7 muting stage before the audio gets to another 12AU7 push-pull driver. The audio is boosted to three watts to the 2.5 ohm speaker output by a pair of 6AM5s, also in push-pull.

The power supply is a tapped transformer allowing inputs between 110 and 250 volts and utilises a 5Z4G rectifier and a VR150/30 regulator.

The control layout on the front panel is dominated by the large straight line dial. A 0 to 100 vernier disc rotates 25 times from edge to edge of the dial, giving a scale length of 34 feet (or 10.3632 metres). The meter is at the top right and as mentioned, functions as an S-meter on AM and CW, and a centre tune meter on FM.

Below the tuning scale, on the left, there is the four position mode switch with a headphone jack below that again. Next there is an AF gain control with a Noise Limiter On/Off switch below it. Then comes the six position band switch, which has band one as the highest. Interestingly, the main dial tunes from the high end on the left to the lower frequency on the right (and they say we are "down-under"?). The tuning coils are in a turret arrangement, reminiscent of the older television tuners, and the band-switch has an arrangement to index the turret and then lock it so that the contacts are correctly aligned. The flywheel tuning knob rotates the vernier disc and moves the dial pointer across the dial. Towards the right end there is an antenna trimmer, then an IF gain control. Below these are a mains On/Off switch, a mute On/Off and a standby switch. The mute operates on all modes whilst the standby switch desensitises the receiver and also allows other equipment to be switched via an external relay.

The rear panel has, from the left, two fuses in the mains input lines; terminals for the external standby controlling relay; the antenna socket, below which are speaker output screw terminals; and over on the right are terminals for a pick-up input direct into the audio amplifiers.

Technical Specifications of the 770R are as follows:

FREQUENCY RANGE:

Band 1	114 to 165 MHz
Band 2	78 to 114 MHz
Band 3	54 to 78 MHz
Band 4	39 to 54 MHz
Band 5	27 to 39 MHz
Band 6	19 to 27 MHz

INTERMEDIATE FREQUENCY: 5.2 MHz

SENSITIVITY: better than five microvolts for 15 dB S/N ratio and 50 milliwatts output on all ranges.

SELECTIVITY:

AM and CW	-40 dB down - 50 kHz off resonance
Narrow FM	-40 dB down - 80 kHz off resonance
Wide FM	-40 dB down -175 kHz off resonance

BFO: set to 1000 Hz beat note.

FM DEVIATION:

Narrow	15 kHz
Wide	75 kHz

FREQUENCY STABILITY: less than 0.003 percent drift per degree/Celsius.

DIAL CALIBRATION: within one percent on bands one and two and within 0.5 percent on the other ranges.

MUTE SENSITIVITY: internally adjustable.

DIMENSIONS: approximately 432 by 229 by 356 mm (WHD).

WEIGHT: 25.4 kilograms (56 pounds) — so at least it is only half the weight of sets like the AR-88 and B-40!

It is interesting to compare the design philosophy of this set with, say, the AR-88. The 770R does not have an RF gain control or variable BFO, and has a fixed level of noise limiter. The provision of an IF gain control is unusual, particularly when it is suggested that it should be well advanced except in the presence of strong CW signals. I would class this receiver as a modest general purpose unit suited for monitoring VHF broadcast AM and FM signals under good conditions. In contrast, the AR-88 is a specialised receiver for digging out signals from the noise and congestion on HF that we all know and love.

Thumbnail Sketches

KENNETH CAMPBELL GUNN VK4LG/ VK4LD (SK) AQCP Laidley Qld, 1932

MW SOUND broadcasting came to the cities in the early 1920s, but most country people had to wait until the mid-30s, or post war, to have the luxury of a National or 'B' Class Commercial Broadcaster within daylight range of their receivers. In this area the amateur 'DJ' was able to provide a valuable service — and none did it better than Ken VK4LG.

From 1932 until war erupted in 1939, he entertained the rural community of the Brisbane Valley with regular programs which featured the local artists as much as possible. Sometime during the middle 30s his call sign was changed to VK4LD (presumably 4LG was given to the commercial broadcaster at Longreach, Qld). Original letters from BCLs indicate that Ken contributed to broadcast on the MW band *after* the city 200 metre amateur DJs were closed down (1935). No doubt this was possible because of the service provided and the fact that no QRM was caused to any other station.

Ken's equipment was home-brewed down to the last nut and bolt and photographs of his MW transmitter show it to be very professional in appearance. *Radio Monthly* magazine, March 1934, featured a four page story on Ken and his home-brewed rigs, including a 10 tube Superhet and the 200 metre set- up. During the mid-1930s, he was a regular contributor to *Teleradio* magazine, writing the "Hams Page."

Post-war Ken renewed his call, VK4LD, and turned his attention to SW, but his eight years given over to entertaining the residents of his local country area were his best.

SPOT THE OBLAST.

Call signs are the nucleus of amateur radio!

Barry Clarke VK5BS
17 Sycamore Avenue, Novar Gardens, SA. 5040

IT HAS BEEN traditional In the past to be able to identify the country, state and personal identification of the station with which you are communicating. It has become obvious, however, over the past few years, that call signs are *not* what they used to be. Some governments have adopted a de-regulation policy that has created chaos and havoc with the result that no longer do we know if, for example, KC6 emanates from the Pacific Island it once represented or whether it is now simply another US Government Issue.

At the other end of the scale are the little understood call signs of the USSR which, ironically, are perhaps one of the best organised systems of all, leaving no doubt as to where a particular station is located. It is so designed to indicate not only the country and the state, but the location within that state. This is identified on their QSL cards as *OBL* . . . (Nr). OBL is the abbreviation for Oblast, (which incidentally is not a Russian expletivel).

Oblast is the term used to cover the Administration Centre of an area franchised to issue call signs within that region. The nearest approximate equivalent in Australia would be our State Governments.

The are 184 oblasts throughout the entire country, all issued with a block of calls that re so arranged that the whereabouts of any station can be located with ease.

Allocation of call signs depends on whether stations are located within the areas embraced by the Russian Soviet Federal Socialist Republics (RSFSR) or the Autonomous Socialist Soviet Republic (ASSR). The methods used are quite different in both areas.

In the RSFSR, the two letter prefixes — UA, UW, etc — followed by the usual number, are the order-of-the-day, but in the ASSR the principle is the letter before and after the number that spells out the oblast.

Table 1 shows the types of prefixes and various call signs that apply to each area; eg UJ7SZ : J indicates the country, 7 the area and S identifies the oblast.

One of the slightly confusing aspects of the Russian system is the occasional use of the E-series of calls. These do not follow the normal pattern of a specific block to a call area, but are issued to stations in certain regions, cities or towns which had some significance during World War II. Consequently, they are difficult to pin-point geographically*.

The /R suffix is used by World War II veterans who have been given the necessary permission to use them. (The R stands for *Rodina* or Homeland).

As with all systems, there are a few anomalies that do not adhere to the general rules. These are either:

1 Old Timers who have been permitted the privilege of retaining their original call sign; eg UA1DZ, UH8DC, etc. (Neither of these fall within the current call structure as there is no UA1D listing.
2 Continued use of older UK prefixes by the authorities such as the Central Radio Club, Moscow, which still signs UK3A, UK3B and UK3F

Table 1.

PREFIX 1st	2nd	Republic	DXCC	Examples of Call Signs
	A, N, V, W, Z	*RSFSR*	UA	UA1MAY, UZ2FWA, RA2FC, RZ3AM
			UA 9/0	UV9AX, UA0UBA, UN1BA, RA0FA
		ASSR		
U or R	B, T, Y	*Ukraine*	UB5	UB5MCI, UT4UJ, RB5IA, UB1RR
	C	*Byelo-Russia*	UC2	UC1AWZ, RC2AA, UC20BA
	D	*Azerbaijan*	UD6	RD8DX, UD6DKW, UD7DWZ
	F	*Georgia*	UF6	RF3V, RF0FWW, UF7FWW, UF8WAQ
	G	*Armenia*	UG5	UG6GAW, RG6G
	H	*Turkoman*	UH8	UH8EA
	I	*Uzbek*	UI8	UI8ZAA, UMTAA, RI0AA
	J	*Tadzhik*	UJ8	UJ8JA, RJ8R
	L	*Kazakh*	UL7	UL7RAO, RL8PYL
	M	*Kirghiz*	UM8	UM8ML, UM9MWO
	O	*Moldavia*	UO5	UO5OO, UO4OXV
	P	*Lithuania*	UP2	UP1BZO, UP7A
	Q	*Latvia*	UQ2	UQ1BXZ, UQ2GDQ
	R	*Estonia*	UR2	RR2RU, UR1RWX

Table 2 — Oblasts of the USSR.

RSFSR				ASSR			
1A	169	6J	93	B-A	75	I-C	49
1C	136	6L	150	B-B	76	I-D	173
1N	88	6P	96	B-C	80	I-F	47
1O	113	6U	115	B-D	63	I-G	54
1P	114	6W	86	B-E	60	I-I	51
1Q	120	6X	87	B-F	70	I-L	48
1T	144	6Y	102	B-G	78	I-O	50
1W	149	8T	174	B-H	71	I-O	185
1Z	143	8V	175	B-I	73	I-T	52
2F	125	9A	165	B-J	67	I-U	55
3A	170	9C	154	B-K	72	I-V	181
3D	142	9F	140	B-L	77	I-Z	56
3E	147	9G	141	B-M	59	J-J	40
3G	137	9H	158	B-N	57	J-K	182
3I	126	9J	162	B-P	58	J-R	42
3L	155	9K	163	B-O	64	J-S	41
3M	168	9L	161	B-R	81	J-X	183
3N	132	9M	146	B-S	74	L-A	179
3P	160	9O	145	B-T	79	L-B	16
3Q	121	9O	134	B-U	65	L-C	28
3R	157	9S	167	B-V	66	L-D	29
3S	151	9U	130	B-W	68	L-E	25
3T	122	9W	84	B-X	62	L-F	27
3U	123	9X	90	B-Y	82	L-G	190
3V	119	9Y	99	B-Z	69	L-I	17
3W	135	9Z	100	C-A	188	L-J	19
3X	127	0A	103	C-C	9	L-K	24
3Y	118	0B	105	C-I	8	L-L	26
3Z	117	0C	110	C-L	5	L-M	22
4A	156	0O	111	C-O	7	L-N	31
4C	152	0F	153	C-S	10	L-O	20
4F	146	0H	106	C-W	6	L-P	23
4H	133	0I	138	D-N	2	L-Q	18
4L	164	0J	112	D-D	1	L-R	178
4N	131	0K	139	D-K	3	L-T	21
4P	94	0L	107	F-F	12	L-V	30
4S	91	0O	85	F-O	15	L-Y	176
4U	92	0O	98	F-Q	14	M-M	36
4W	95	0S	124	F-V	13	M-N	34
4Y	97	0U	166	G-G	4	M-P	177
6A	101	0W	104	H-A	191	M-O	33
6E	109	0X	129	H-B	180	M-T	184
6H	108	0Y	159	H-E	44	O-O	39
6I	89	0Z	128	H-H	43	P-B	38
				H-W	45	Q-G	37
				H-Y	46	R-R	83
				I-A	189	T-J	187
				I-B	53	T-U	188

In view of the fact that there are in excess of 100 000 amateurs currently licenced In the USSR, and these are being increased by approximately 4000 each year, it is obvious that the method of issuing call signs has to be logical as well as methodical.

Much interest has been fostered in the UK and USA over recent years in *Oblast Hunting* with regular columns appearing in magazines. Russian DXpeditioners are appearing spasmodically from rare areas such as UA8, which was recently activated.

Oblast Hunting is no easy task, but it is certainly a challenge.

Table 2 is an alphabetical listing of all Russian Oblasts showing the necessary identifying symbols. Good Huntingl

* The author has an incomplete list of some of these call signs which may be of assistance to other attempting to relate them to their appropriate areas.

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SPECIAL INTRODUCTION

A special introductory price of $1250 for 3x5.5 metre sections when placed together giving a tower height of 16.5m (54 feet) complete with hinged base, freight and insurance delivered anywhere within mainland Australia. The only extra cost one can incur is for ground guy anchors, turn-buckles and associated hardware.

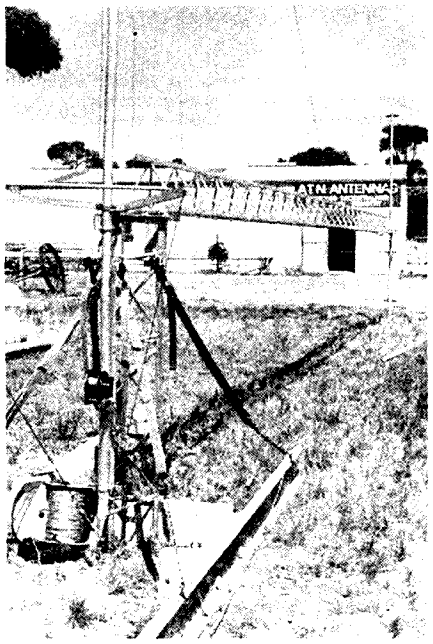
Two levels of guys are recommended at 120 degree spacing on the 8 and 16 metre point above ground. Alternatively, a bracket couid be used from a building in lieu of the lower set.

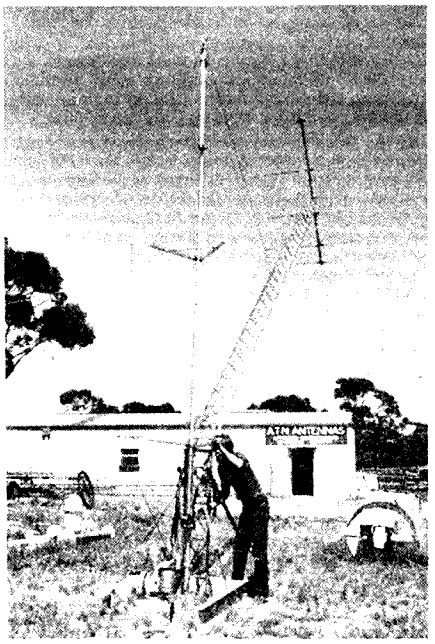
The 16.5 metre triangular towers that are 32cm across each side will be most popular with amateurs as they come complete with hinged plate, top plate with weather proofed bearing, two metres of scaffold tube masting, stainless steel hardware, assembly tool kit, galvanised base bolts and hardware, tower guy anchors, thimbles, winch steel cable pulleys and hardware for easy erection and lowering of your tower plus easy to follow assembly and installation instructions. The packaged weight is a mere 70kg.

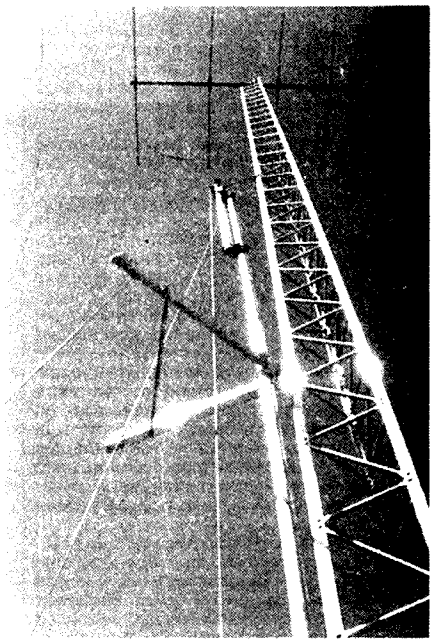
A typical installation would have the hinged base adjacent to the highest point of a house or building to which a pulley is attached. A steel cable from the winch (mounted on 1 metre of 38 mm vertical water pipe which is in the same concrete block as the base bolts) runs over the pulley and out to a point on the tower approximately 8 metres above ground. (The house is acting as a gin-pole).

This tower is self supporting and can be used without guys to support an omni-directional antenna which presents very little extra wind load, however guying with preferably Debeglass® , Dacron® or Paraphil® is mandatory with the larger beam type antennas.

These towers can handle a vertical load of 6000 kg and be made to a maximum height of 99 metres, the 16.5 metre version as with other versions have a tremendous safety factor incorporated in their design.







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SIX METRES — a band of milk and honey

Arnie Katarzynski VK4JXZ/VK4FXZ
33 Munbilla Drive, Kelso, Qld. 4815

While the HF bands have been producing only spasmodic DX openings at the bottom of the Solar Cycle, VHF operators have been enjoying a feast of activity.

The observation that low solar activity can produce better Sporadic Es has been around for a long time, and the 1985-86 season confirmed that once again. So far as this season's summer Es are concerned, it would appear that this is going to be our best season ever! But it seems that not only "Old Sol" is responsible for the fast and furious activity seen on six lately.

The latest Japanese technology has conceived a new generation of transceiver that is not only HF capable, but also VHF The ability of these transceivers to cover an extended spectral range has given many would-be operators the opportunity to engage in six metre DX.

In the past it may not have been considered worthwhile because of the apparent prohibitive cost of purchasing the necessary equipment for a single band, now operators like myself, who start off with a combined licence, can enjoy HF and VHF with the one transceiver without the inconvenience of having an outboard transverter temporarily deny the multi-band capability, that was dearly paid for in the transceiver's purchase price.

Competitive pricing of multi-band and single-band six metre rigs in Australia has also enticed many newcomers onto six.

Recent inquiries made show the FM module "option" of a well-known brand of six metre transceiver is selling at nearly twice the price on the Japanese domestic market than here in Australia. The same seems to be true of the rigs themselves, as the Japanese manufacturers try to stay competitive on a world market that is under immense pressure from an ever rising Japanese Yen.

But when it's all said and done it's the lure of DX that is now bringing more and more operators onto six. Most of the activity observed has been on 52.050 MHz, the Oceania SSB calling frequency. It seems that the FM mode is not being supported as much as in past years but the emergence of new FM repeaters in Sydney and Gladstone may help to change that.

Observations made since June 1984, from my home QTH of Townsville, have shown that most of the SSB activity has occurred from August to the end of May each year. August, September and October are the months centred on the Spring Equinox and In most years have brought a reasonable level of trans-equatorial propagation (TEP). This was not the case in 1984 and 1985 when very few contacts were made on this mode to the northern Pacific area. Activity this year was much better and the number of openings in this season alone have outnumbered 84/85 combined.

March, April and May brings the Autumn Equinox, regarded by some as the better of the two. 1985 saw three solid openings in March and April while this year brought only patchy openings that the keenest of observers used to their advantage.

During the middle of the year, the band entered the deep solar winter with no contacts at all for three months and only one VK2 opening for the entire period from 26/4 to 11/9. During that time, it seemed that amateur radio would never be the same again since even the HF bands offered no DX to escape this dreaded solar pattern. But the 24/8 gave us hope of activity, when at 0850 UTC, a weak carrier emerged on 49.750 MHz and I have never been so pleased to hear a signal emanating from Russia.

Nevertheless, it was a long wait, as nothing developed out of this until the 12/9 when a fine opening occurred and I worked 13 JAs from 0755 to 0825 UTC. Lloyd VK4FXX, and I pounded the band from JA1 to JA7 with about 400 watts ERP and gave the JAs another parcel of QSLs to send to Australia.

Although the Russian television was audible most nights no further opening occurred until the 22/10 when the band opened to JA4, 5 and 6. Meanwhile, the Es season had begun on the 10/10 and we found ourselves trying to monitor to the north and south at the same time on three different parts of the band, plus beacons. In this situation the shack begins to swell as the need for more equipment grows and you find yourself converting CBs to six metres, trying to cope with the band's seemingly endless DX possibilities!

As the Russian television became weaker each night and no further JAs were heard, and interest centered on Sporadic E. October proved to be full of pleasant surprises when the band opened on six occasions to VK2, 5 and 8. Compared to the previous two years this was about one month early and it was reasonable to expect that this would be a bumper season.

With November 6 came an early opening to VK7. It's normally a difficult call area to work on six. The month was in general excellent with an opening every three days, but signal strengths were way down and for a while it appeared that the band was suffering from "one-way-itis." In reality, polarisation favoured the vertical mode.

December however, stole the show completely. On the first day of the month there was a three hour opening to P29. Four stations were worked, but again the signals were in the mud. The next day the band behaved as the six metres of old, with a fine opening into VK1, 2, 3, 5 and 7 lasting ten hours — late into the night. At last the needle was bent and I didn't have to build that pre-amplifier after all!

The climax occurred on the 5/12 with the band open almost continuously from the 28/11. There was an early start to the day when at 2115 UTC the band opened to VK2, half an hour later to ZL2 and 3 with colour pictures from ZLTV 1 fading in and out. I took the IC-505 to work with me and monitored occasionally. Surprisingly the band didn't take its usual midday dive, and intensified during the day. A mad rush home after five and I found that things were "hotting up" with every beacon to the south audible.

Minutes later I discovered the VK0 beacon keying away at 5x5 and a small dogpile of phone and CW stations trying their luck at an unresponsive keyer. Lloyd was in my shack at the time and we were discussing the events, when Sojo VK0SJ, suddenly came up on phone. Lloyd turned into a greyhound and broke the hundred metre dash record to his shack.

The result of course is well-known. Four VK4s made the contact that afternoon with John VK4FNQ, being the longest haul from Cairns. In the following hours I made contact with VK2, 3, 4, 5 and 7. It occurred to me that there now existed the possibility of setting a new Australian record for working all States and call areas in a short period of say, 24 hours. If that could be achieved, it would be in the six metre record books for a very long time. Now the hunt was on.

At 0957 UTC, I worked VK1BUC, but couldn't get a report as the band was too weak. The rest of the night only produced more VK2s. The next morning however, I had another contact with VK1BUC and exchanged reports of 5x9. At 0209 UTC, VK8ZMA called and was also 5x9. Things looked promising for that VK6 contact and at 0300 UTC. I heard VK6BE on CW at 5x1. I had never been so nervous on the key since my last CW examination but completed the contact.

This left only VK9 to get — and about three hours to do it in — If I was to complete the attempt in the 24 hours. To my knowledge *there were no* operators on any of the islands except maybe Willis Island. A call to the Brisbane Weather Bureau gave me the direct dial telephone number, using AUSSAT.

All hope faded as Willis Island personnel told me that I had called at an inconvenient time and they could not assist. Next week would be fine if I rang back. I had made the request during their busiest period when the bi-annual supply ship had arrived and no hands could be spared.

Nevertheless, it was great fun trying and experiencing the trials and tribulations of a very fascinating band. Now all ears are on the Pacific area as we In North Queensland try to contact VK4ZNC on his journey to various tropical locations. I can't wait for that first faint signal.

ar

DXCC JUBILEE

At midnight UTC on New Year's Eve, the DX bands exploded with activity as award hunters began the quest to work 100 DXCC countries during 1987.

Rules for the award are simple, any mode and band (except 10 MHz) may be used for contacts, and no QSL cards are required — just a log extract showing call sign, country, date, band, and certified by the applicant to be correct. An attractive certificate will be sent to each qualifier. The application fees is $US5 or 12 IRCs.

A special application form (MCS-555), available from ARRL Headquarters makes the application process painless and foolproof.

When the DXCC award was first announced in 1937, there were five charter members — and it had taken each of them several years to accumulate their country totals. How long will it take to duplicate their feat 50 years later, at the bottom of the sunspot cycle.

—The ARRL Letter, December 23 1986

PETITION FOR LABELS

THE WASHINGTON LEGAL foundation, a national public interest law firm, has filed a petition that would require manufacturers of cellular telephones to put warning labels on them. The labels would state that the communications over the phones are not private. The Foundation noted that cellular calls can be received by many scanners and television sets, and that such warning labels are already required on cordless phones.

—The ARRL Letter, December 23 1986

1986 STATUS REPORT OF EME IN THE USSR

Following is an extract from the column *VHF•UHF•SHF* of S Bubennikov, appearing in the Russian journal *Radio* No 09 of 1986. The translation from the original Russian in *Radio* was by Dexter Anderson W4KM, and his work is hereby acknowledged.

There appears to be a good level of activity in the USSR on this rather exotic mode of propagation but it is interesting to note the complete absence of any stations from countries in IARU Region III being worked by the Soviets. Perhaps the moon "window" was unsuitable or maybe interest within our Region has disappeared.

If that is so, what a pity because it may well be that "moonbounce" originated within our Region. A recent "Looking Back" article in *Break In* (September 1986, Page 19) briefly described the (unsuccessful) attempts of one Stuart Kingan, then ZL3GD, to "bounce' a five metre signal off the moon in 1935/36. By today's standards the equipment was very crude indeed but the point remains that the idea and the initiative to exploit the idea was around — in 1935.

EME

The possibility of using the moon as a passive repeater for terrestrial super-DX radio communication was demonstrated in a practical way over a third of a century ago. A series of research experiments were carried out, and a project was even proposed for creating a world-wide television system.

In the 70s, the moon began to be used as a passive reflector. At first 144 and 430 MHz were used, then 1215 MHz and higher-frequency bands. In the early period, at least one of the two stations used professional gear, principally antennas. Later radio amateurs made their own equipment that overcame fading on the path Earth-Moon-Earth, equal to 253 dB on 144 MHz and 262 dB on 430 MHz. . .

The most intensive operation involving new EME QSOs takes place during the two-round (Fall and Spring) ARRL EME Contest.

The first EME QSOs in our country were made in May 1979 by UK2BAS operators in the 430 MHz band. In 1981, the following almost simultaneously logged "Moon" QSOs on 144 MHz: UT5DL, UA3TCF, UB5JIN, UA3LBO, UA1ZCL, UG6AD, UD6DFD.

Last Fall several of our stations had their first Moon communications on 144 MHz all at once. RA6AX (ex-UA6YB), from Belorechensk, had 30 QSOs with 12 stations beginning October 1985, and ending at the end of March 1986. His neighbour, RA6AAB (ex-UA6YAF), worked nine stations during the same period, and UA6BAC, from Novorossiysk, made his first EME QSO with W5UN. The operators at UZ6LXN, in Taganrog, have had three contacts. UA6BDC, from Yeysk, has worked over 20 stations.

UY5OE and RB5LGX, from Khar'kov, had their first EME contacts in December 1985. By March 1986, RB5LGX had made 22 QSOs and UY5OE 11.

RB5LGX reported that in March, "Moon" signals from KB8RQ, were monitored by his neighbors RB5AO, RB5AL, RB5EU, UY5DE.

UA0WAN, has shown up in Siberia — from Chernogorsk, Khakasskaya Autonomous Oblast. He wrote that on November 2, 1985 he pointed his 8x9 element antenna toward the Moon and immediately heard DX stations. He finally gave a call and got an answer right away from KB8RQ, then worked WA1JXN/7, DL8DAT, W5UN, UA1ZCL, YU3WV, and F6BSJ.

RL7GD, from Alma-Ata, heard KB8RQ and W5UN, in the Fall contest. RL7GD recorded W5UN's loud signals on a tape recorder for a demonstration to ultra- shortwavers of his area.

RA3LE, after a break, has resumed operating via the moon. He is now able to work DL9KR on SSB; by the way only UA6LGH, from Taganrog, and UA3TCF, from Gor'kovskaya Oblast have thus far been able to work DL9KR.

RA3LE notes that on 144 MHz particularly strong signals come from W5UN and KB8RQ from the USA and from DL9KR and DF3RU from the FRG — coming through in a bandwidth of 3 kHz at a level of 13 to 20 dB. If these pairs are on, it's hard to work other stations. On February 22-23, and April 19-20, 1986, RA3LE was on the air for about 26 hours, making 69 QSOs with 44 stations (UA1ZCL, RA3YCR, UG6AD, UA6YAF, UA3TCF from the USSR), of which 26 were new ones for him. On 144 MHz they included DJ7UD, DK9IP, HG1YA, SM5DRV, YU7AA, WA1JXN/C6A, WA1JXN/7, and DK2PH, and on 430 MHz SM0DYE, OZ7VHF, W0SD, N4GJV, G3SEK, G3LGR, F1ELL, and YU1AW. RA3LE monitored two signals from RA3YCR from Bryansk: One was coming through via the troposphere and the other by reflection from the moon. They were separated in frequency by 0.4 kHz and in time by 2.5 seconds.

UA9FAD, from Perm', is active in communication via the moon. The Fall contest brought him 23 stations, four of them new. For the first time in two years of operation he noted, on November 3, 1985, an effect in which the troposphere acted as a collecting lens (sobirayushchaya linza) of signals reflected from the moon, and in which fading on the propagation path decreased abnormally. As the moon was setting at the end of the contact with F6CJG at 0904 UTC, the received signal strengthened noticeably. Then UA9FAD heard a loud CQ from YU2PV. At 0920 UTC they signed. He quickly worked OK1MS who called him. UA9FAD heard his own echo at +12 dB. He couldn't finish the next QSO with I1RSQ because the moon went behind the horizon. For the Spring contest, UA9FAD installed a new preamplifier for two bands using KP320 transistors, enabling him to receive solar noise 1 dB louder on 144 MHz and 4 dB louder on 430 MHz. The addition of 1 dB brought him 31 QSOs, bringing his total of EME stations to 77! He hasn't yet transmitted on 430 MHz.

UA1ZCL, from Tumannyy, Murmanskaya oblast, had, by Spring 1986, had new contacts with N4AR, EA2LU, WA4LIT, WB0YZN, SM5GEL, SM0DJW, W7FN, YU3PV, K3GAU, WB0QMN, WA1VTA, KF0M, W0RWH, SM2CEW, UA6YB, RB5LGX, UY5OE, DJ5AR, G3LTF, UA0WAN, NP4X. The last two gave him two new squares for a total of 35. In the Spring, UA1ZCL rebuilt his antenna and was able to receive solar noise 2 dB louder. After this he was able to have 80 QSOs, among them LA2AB, PA3COB, W4ZD, WB2NPE, DK5LA, DL2LAH, YU7AA, LZ2US, FD1FHI, OK2PZW, OK2VMD, OH5LK, EA3DXU, WA1DJG, SM4KYN, F6DRO, LZ1KPG, PA3CSG, F1ANQ, HB9CRQ, WA3DJG. UA1ZCL has now worked 263 EME stations.

UA6AD, from Yerevan, using a new four by 16-element antenna, had 60 QSOs with 33 stations on five continents from February through April of 1986. Included were UA1ZCL, RA3LE, UA9FAD, HG6DX, ZS6ALE.

Contributed by David Rankin 9V1RH/VK3QV

Novice Notes

SOME TROUBLESHOOTING TIPS

Drew Diamond VK3XU
Lot 2, Gatters Road, Wonga Park, Vic. 3115

What do you do when a fault occurs on one of your favourite items of equipment? Do you send it to the place where you bought it, or contemplate having a go at fixing it yourself? A glance at the circuit would probably cause most of us to adopt the former approach. It is possible however, for the amateur to make a successful attempt at repairing even complex equipment if a logical approach is adopted. Whole books (see bibliography) have been written about electronic troubleshooting and repair methods, and it is beyond the scope of this article to present anything like a full treatment of the subject. What I would like to do though, is to relate a few of the most useful trade secrets — things that I learned during nine years at the electronic service bench.

Obviously, a full understanding of how a piece of equipment operates will greatly assist in any troubleshooting job, and if time and resources can be spent on this, then fine, but often, for various reasons, this may not be feasible or economically possible. It may even be necessary to start without so much as a circuit diagram for instance.

Most faults can be firstly divided into two primary categories; solid (there all the time), and intermittent (comes and goes, or when the unit is hot or cold). A further sub-division into "worked before" or "never worked" may also be made. A device that has worked satisfactorily, and is now faulty will probably be found to have a component failure, whereas a device that has never worked: eg a home-brewed project, must be approached rather differently, as the problem could be due to incorrect component(s) installed, wrong polarities, wiring error, incorrectly marked components (I have seen diodes with the cathode marked at the wrong end!), or — Heaven forbid; design error.

At this point let me sound a cautionary note; when working on equipment where high voltages are used, always have another responsible person in your vicinity and make sure they know where the mains switch is. If you are inexperienced in high voltage work; seek the guidance of someone who is experienced. The potentials used in much amateur equipment ***CAN KILL,*** or cause serious burns. Switch off and remove the power plug from the mains socket when changing fuses, soldering and so on, and make sure that all filter capacitors have discharged to a safe level.

Contrary to popular belief, the easiest fault to trace is often the catastrophic one, ie blows a fuse very quickly. Examine the fuse. Is the glass completely blackened? This sort of effect is usually produced by a "dead short." Check the power supply rectifier diodes, filter capacitors and any other accessible passive components in the power supply area. If these appear okay, try to remove all loads from the secondaries of the power transformer, and, with a new fuse installed; apply power. If the fuse still blows, the transformer is probably faulty, but check the capacitors in a mains filter if fitted.

A fuse which blows 'quietly' ie after a period of time from power-on may be more difficult to locate. You could have a leaky diode or filter capacitor, or shorted turns in the power transformer (does it get hot and make a 'brown smell'?).

Much of the basic test equipment required we carry around with us all the time, that is; our eyes, ears, nose and fingers. Visually check for broken wires, loose connectors, signs of charring, smoke stains, leaked substances (eg wax. Beware of any oily substances — particularly in old equipment as they could contain very toxic polychlorinated bi-phenyls. Do not touch the substance, and no further work should be attempted on such equipment).

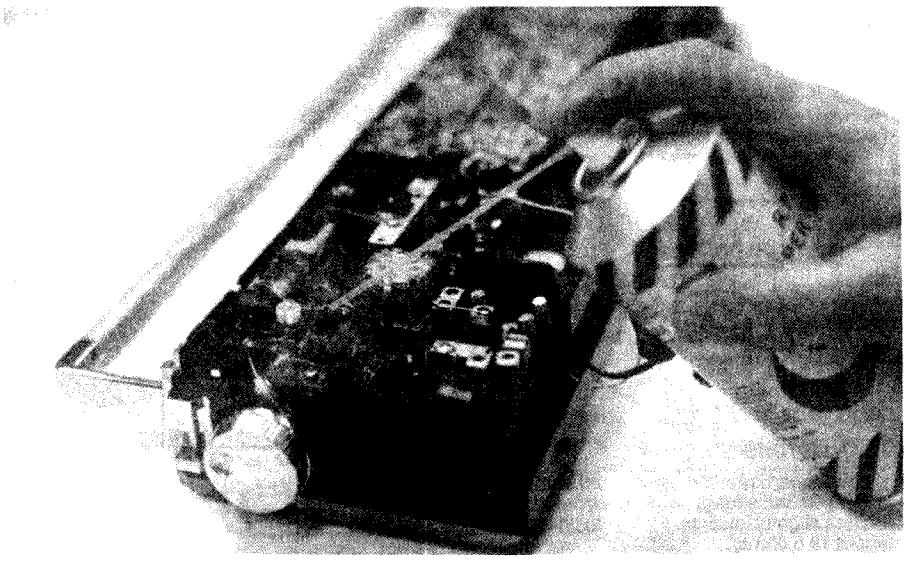
It is probably safe to say that the majority of faults occur in the power supply or power output stage of any equipment. This is because of the stresses caused by the voltage, current and heat levels involved. In addition, any circuitry where the equipment interfaces to the outside world through inputs and outputs, show a marked vulnerability to damage from external sources.

Always approach any problem with an open mind. Test the effectiveness of every control (sometimes called "milking the front panel") to determine what circuit functions are effected. For example; does the background hiss of a receiver change in level as the volume control is rotated? Does rotation of the bandswitch cause audible clicks? Can the crystal calibrator be tuned in, on the spot expected? and so on. In other words, valuable time could be wasted checking the RF amplifier only to find that the voice coil of the speaker was open!

If you are fortunate in having a circuit with voltages indicated (bliss); then measure these around the suspected area. Be very careful not to let the probe tip slip whilst making measurements. Few things are more infuriating in a repair job than to cause more problems than we had when the job was started — and don't blame Murphy — most problems of this kind are due to plain carelessness. A voltage which is significantly different from that indicated could mean you are getting close to the problem. Remember to keep in mind any effects that probing with your multimeter might have on the circuit. If in doubt; use a high impedance meter such as a DVM if one is available to you.

No matter what the fault may be, it is a good plan to begin any job by measuring the supply rails. These could be +12V, -12V, +5V for instance. If any of these are absent or out of tolerance, this problem should be tackled first. Sometimes a shorted component such as a bypass capacitor will pull a rail down, making it appear as if that supply rail is not working, when in fact it has simply gone into the current limit mode. If possible, isolate items which are sourced from this supply one at a time, until the faulty area or board is located. If no visible signs exist; it should be possible to pinpoint the problem with ohm meter checks, lifting off one lead of suspected components, one at a time. A meter which can measure low values of resistance with resolution will be found useful in tracking a short on a supply rail, as the reading with respect to common (usually earth) will decrease as you get closer to the short.

Intermittent faults can be very frustrating, although one or two helpful techniques are available to us. An intermittent problem which responds to a mechanical stimulus, by rocking or vibration, can usually be located by careful probing in the suspected area with an insulated prod. A knitting needle is ideal for this. Gently probe, push and pull the various components, particularly connectors, or socketed devices, and observe the effects. A fault can usually be very quickly located in this manner. Sometimes we must tackle intermittent faults where the effect of our probing is not readily perceived. For example, troubleshooting an S-meter circuit. So that we may concentrate our eyes upon the probe; it is possible, provided that no high voltages exist, to attach an AF amplifier —



AC coupled via high impedance probe, to the "live" side of the output area of the circuit under investigation. In this case, one side of the S-meter coil. We can now *listen* to the effect of our probings. This is a very handy technique, and has been of use to me on hundreds of occasions — even some involving digital circuitry, by listening to the change in sound produced in a bit stream for instance.

A significant number of problems may be described as "temperature sensitive." For example; as the device warms up the fault appears, or the converse may occur. Two very powerful tools are available to us; the "instant freeze" can, and our soldering iron (see photo 1). Most electronic shops stock cans of instant freeze. This fluid needs care in its application. It must not be furiously applied in a haphazard manner, but rather, should be gently sprayed sparingly onto suspected components, one at a time (see photo 2). Noisy semiconductors, resistors, leaky capacitors, and marginal connections generally respond very well to this treatment, as the suddenly cooled component is stressed by the cooling action, and the fault will cycle.

A soldering iron may be used to apply heat to suspected components. The tip must not be directly applied for obvious reasons. A length of teflon tape (the kind used for plumbing) may be folded several times to make a buffering device, and held between the iron tip and the component (see photo 3). The heating effect so obtained may be just what is required to stimulate a faulty P-N junction into going open or short (or frantically noisy), a resistor to go open/noisy, an IC to stop functioning and so on.

A great degree of care must be exercised when applying the heat/cold treatment, as any electronic device will malfunction if it is too hot or cold, so we must be prudent about how much is applied. If the fault has been occurring at or near ambient temperature; then clearly, not significantly greater or lower temperature will be required to cycle the fault.

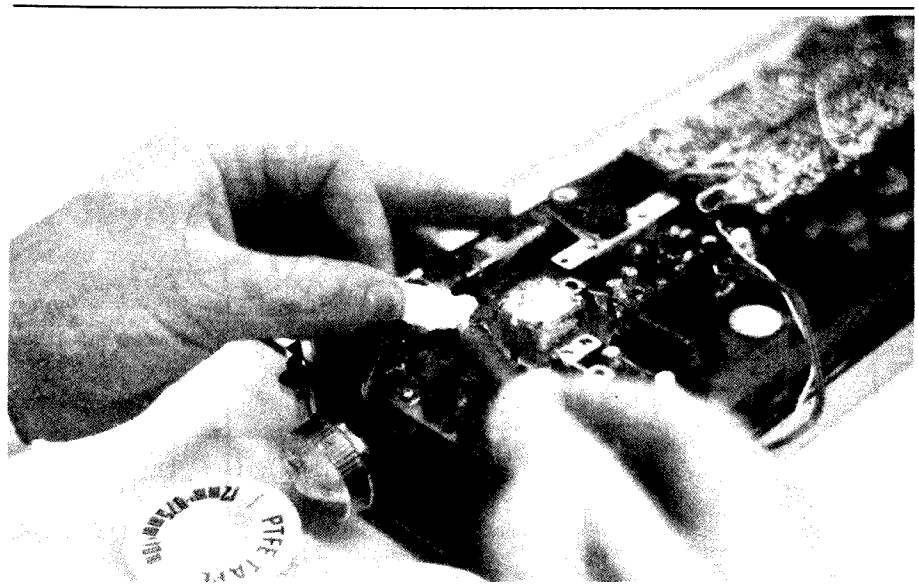
A can of freon will be found handy around the workshop. Noisy potentiometers can be easily cleaned by squirting a small amount into the pot and the shaft quickly rotated several times and allowing the dirt-laden fluid to run out. Noisy switch contacts usually respond to a quick spray whilst the switch is operated through its range. Freon is also useful as a mild coolant as well as a cleaning and degreasing agent. Take care with some plastic materials however, as freon may react.

The ordinary analogue or digital multimeter must be just about the handiest item about the shack. Apart from the well-known functions of voltage, current and resistance measurement; our multimeter can be used to check diodes, transistors, most FETs, SCRs, capacitors and power transformers. It must be remembered that most meters have a positive potential on the black lead when measuring resistance in the ohms mode. So, when a diode junction is to be checked, the black lead (+) would be applied to the anode and the red lead to the cathode for forward conduction. On ohms X1, about 20 ohms would be about normal for a silicon junction. Reversing the leads should indicate an open. Any silicon diode which does not show infinite resistance in the reverse direction is faulty and should be replaced.

Transistors can be checked in a similar manner, but now we have two P-N junctions to deal with. For an NPN transistor, the black lead (+) would be connected to the base, and the red lead to the emitter and collector in turn. It will be noted that for a good transistor, about 20 ohms (depending on the meter) will be read, with the B-C junction just slightly lower in resistance than the B-E junction. Reversing the leads and going to ohms X1000 should indicate an open for both junctions. Once again; any silicon junction which is not infinite in the reverse direction is suspect. Some idea of leakage can be obtained by connecting the black lead (NPN) to the collector, and the red lead to the emitter with the meter on ohms X1000. A very high resistance reading should be obtained.

Capacitors larger than about 0.01 uF can be given a functional check by first disconnecting one lead, and connecting the meter set to ohms X1000 for small capacitors, X1 for very large capacitors, and observing the upward kick of the meter needle as the capacitor charges. Reversing the leads should produce a stronger kick, finally settling back to infinite for small non-polarised capacitors, megohms for electrolytics. The polarity of the voltage source — in this case our multimeter on ohms, must be correct for the final reading on polarised capacitors.

Inductors and transformers used at power frequencies may also be given a preliminary check with our multimeter set to ohms X1. The meter leads are first applied to the winding and the resistance read (some circuits do indicate the DC resistance to be expected). Now the leads may be reversed. For a good winding it should be observed that the needle moves off the stop very sluggishly, and crawls to the final resistance reading previously noted (the residual magnetism in the core, by Lenz's Law, opposes the setting up of the new field polarity). Smaller transformers and inductors like IF transformers, interstage transformers etc may be checked for simple continuity on ohms X1.



CONCLUSION

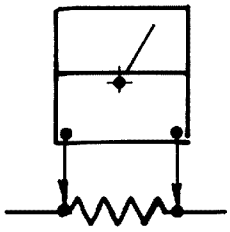
This has been a very brief treatment of an interesting subject. Unfortunately, there is just so much that can be imparted by words alone, because troubleshooting is a very practical pursuit, so skill and speed must be obtained by 'hands-on' work. Any opportunity therefore, to gain experience should be taken up if possible. Domestic radios, cassette players etc are so cheap these days that many people just throw them away when something goes wrong, and these items would provide a rich harvest of valuable experience for anyone wishing to improve his or her skills.

SOME FURTHER READING

Radio Servicing Pocket Book — Capel. Newnes Butterworth ISBN 0408001445.
Radio & Electronic Laboratory Handbook — Scroggie. Newnes Butterworth ISBN 040800373.

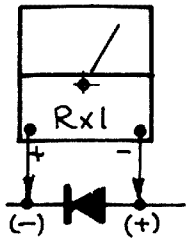
Handbook of Solid-State Troubleshooting — Gardner. Reston ISBN 0879093390.
Tested Electronics Troubleshooting Methods — Buchsbaum. Prentice-Hall ISBN 0139069585.
Advanced Electronic Troubleshooting — Cameron. Reston ISBN 0879090022.
Digital Troubleshooting — Gasperini. Movonics TM101.
Techniques of Digital Troubleshooting — Hewlett Packard Note 163-1.
"Finding Those Faults." ETI Magazine. March. '86.
Practical Wireless Fault Finding Guide. PW Magazine April. '76.
Power Supply Servicing. Ham Radio Magazine. (USA) November. '76.
Fault Finding. Practical Electronics Magazine. (UK) January. '78.

USING YOUR MULTIMETER TO CHECK SOME COMMON COMPONENTS



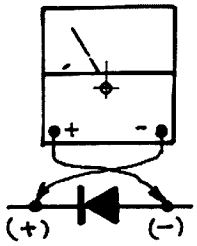
RESISTANCE

Check resistance directly.

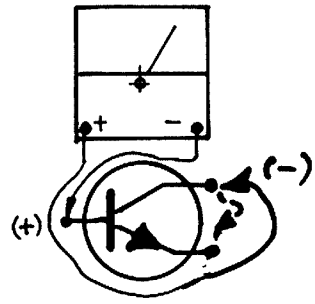


DIODES

1. Low forward reading of about 20 ohms for silicon and 10 ohms for germanium (remember, on most multimeters the red lead is negative when in ohms).

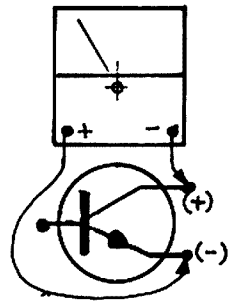


2. High resistance reading. Infinite for silicon, about 100k for germanium.

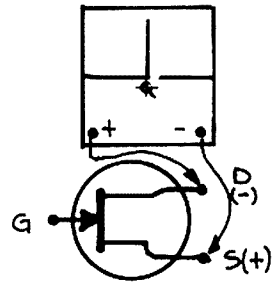


TRANSISTORS

1. Low forward reading of about 20 ohms for silicon, 10 ohms for germanium, from base to emitter, slightly lower from base to collector (about 19.5 ohms).
PNP: Polarities reversed.

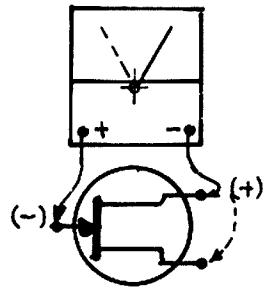


2. Leakage: Good silicon transistors should be near infinite.
PNP: Polarities reversed.

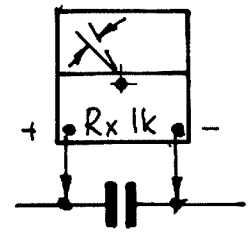


JUNCTION FETs

1. Drain-source: Tens of ohms to hundreds of ohms. Same in both directions.

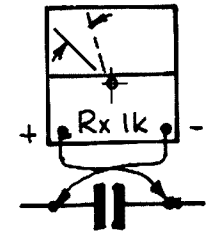


2. N-Chan. Low forward reading. Reverse leads: Infinite reading (diode effect).

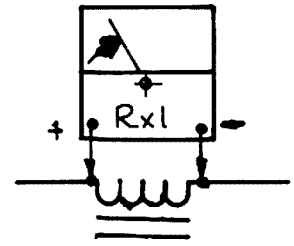


CAPACITORS greater than about 0.01 uF (good or bad).

1. Charge: Connect leads and observe upward kick.



2. Discharge/charge: Reverse leads and observe larger upward kick. No residual reading for good capacitors.



INDUCTORS (Applies to inductors used at audio frequencies; eg power transformer).

Observe sluggish deflection to final resistance reading. Reverse leads, and needle should be even more sluggish due to residual magnetism in core and inductance. An inductor with shorted turns will not have these characteristics.

SYDNEY — MELBOURNE — BRISBANE

NEW

1000 WATT TUNER
EAT — 1000A

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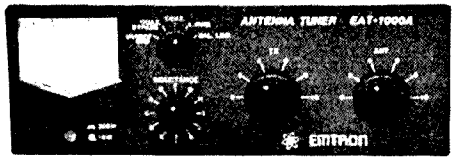
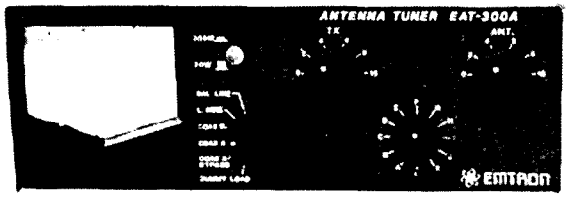


This new EAT-1000/A is EMTRON'S latest antenna tuner built on special request by many amateurs. Built with finest components available, 5 position internal antenna switch, cross needle SWR/power meter, built in 4:1 balun for open feedline and antenna terminals for coax line, open feedline aswell as longwire. EAT-1000A will tune almost everything from 1.8 to 30 MHz. At lowest price, professional design and quality that EMTRON provides.
MADE IN AUSTRALIA!

PRICE $499
PLUS $15 delivery



NEW from EMTRON EAT-300A

The finest 300 watt antenna tuner on the market with quality that only EMTRON can provide! Unique features such as:

● Cross needle SW12/forward & reverse power meter ● Built-in 100 watt dummy load ● Antenna switch including bypass ● Built-in 1:4 balun for open feedline ● Lowest price & professional design ● Matches everything from 1.8-30 MHz ● Made in Australia by Emtron

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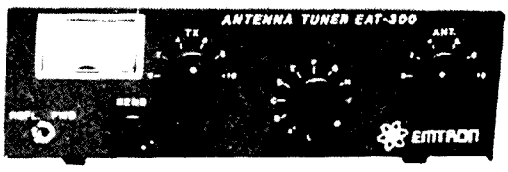

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Antenna Tuner & Low Noise Amplifier For Receivers!

ETP-1 will match your antenna to your receiver for maximum signal from MW to SW. It utilizes a low noise 12dB gain preamplifier to boost weak signals. Special spring loaded long wire terminals as well as SO239 connectors make ETP-1 the most versatile tuner/amplifier on the market.

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EMTRON'S PRECISION CROSS NEEDLE RF SWR METER

Yes this new from EMTRON — highly accurate CROSS-NEEDLE SWR & POWER meter, model EP-200 with a freq range from 1.8 MHz to 60 MHz and two power ranges 20, 200 watts, gives instantaneous readings of forward/reverse power and SWR.

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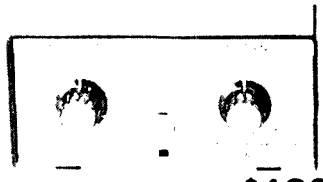

Professionally made noise bridge for all kinds of RF measurements antena adj etc

NOISE BRIDGE with EXPANDER EBN-2 $129 & $10 P&P

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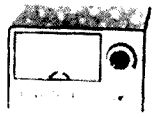

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VICTORIA:
288-294 Queen St, Melbourne
Vic. 3000.
Entrance from Lt. Lonsdale St.)
Ph: (03) 67 8551 or 670 0330
FAX: (03) 670 0671

QUEENSLAND:
416 Logan Road, Stones Corner
Qld. 4120. TLX:144696
Ph: (07) 394 2555
FAX: (07) 397 3531

How's DX?

Ken McLachlan VK3AH
Box 39, Mooroolbark, Vic. 3138

SAVED MARCH

The ARRL 1986 National Convention, held in San Diego, placed an item on the agenda that was so successful it will become an annual event.

The event was a Youth Forum, attended by 150 enthusiasts, consisting of five panelists of notable names including Dr Anthony "Tony" England W0ORE, Gordon West WB6NOA, a well-known teacher and technical writer, Jerry Boyd KG6LF, Chief of Police for the City of Coronado in California, teenager Scott Springate N7DDM, a Contributing Editor for *QST*, and Harold Price NK6K, a computer communications consultant who has an avid interest in amateur satellites.

It was interesting to read the report of how some of these amateurs began their hobby and their general remarks. Interesting was Gordon's question to the gathering; "What was the hardest part of getting your amateur licence?" Some answered "the code", others "the technical part." Gordon accepted neither answer. His answer: "Getting to your first class lesson."

Scott was licenced at the age of 11, through the help of a local amateur. He wrote to *QST* complaining there was nothing in the magazine to attract or interest young people. You guessed it, he got the job!

Jerry, an enforcer of law and order, feels that amateur radio helps a person in three ways — Friendship, Public Service and Career Guidance. Jerry stated that he got started and progressed in his career because of the hobby. He said that no matter what field you choose today, communications and electronics are an integral part of it — insurance, teaching, banking or being a doctor — it doesn't matter what field. If you have the kind of background the hobby gives you, you will do well.

Tony became interested around the age of 13, when he frequented an amateur radio store in Fargo, South Dakota. Other amateurs frequented the store too and he learned a lot from them. He got his licence and bought an old receiver, and his pals helped him build a simple transmitter. Tony said; "I was always building junk and most of it didn't work, but I learned a lot doing it."

PERSONAL THOUGHTS

If anyone has got this far they are probably asking themselves what this has to do with DXing. As a columnist and dedicated to the hobby, I feel it has a lot to do with it as, where are our DXers and amateurs of the future going to come from? Are we going out and seeking to introduce the younger generation to a different form of electronics than what they are accustomed to in a pinball machine? Are we being selfish by not going into the schools at primary level and introducing the "magic" of a worthwhile and rewarding hobby? I feel we are and if we don't do something positive in the immediate future, by the turn of the century, there will be few VKs who are DXers, or for that matter, amateurs! This matter should immediately be brought to the attention of your Division, so that it may be discussed at the next Federal Convention, to formulate a plan for recruiting, before the hobby as we know it becomes extinct.

HELP WANTED

A note from Ted K1BV, a well-known DXer and award hunter, requests help in preparing an up-to-date Awards Directory. Ted now has some 300 awards on his computer listing and would like details of national, state and club awards.

Tom emphatically notes that this is not a commercial venture as he feels awards are an important part of the hobby and wants to see more promulgated with their rules.

Award custodians, please assist our friend as this will help all who are interested in this facet of the hobby.

Information should be forwarded to Ted Melinosky K1BV, 525 Foster Street, Windsor, CT 06074, USA.

SILENT KEYS

It is sad to relate that Joy VK2EBX, an avid DXer and consistent contributor to this column, lost her son, Will VK2VJC, in a freak accident on December 22, 1986 at the age of 33. Joy also lost another son aged 20, six years ago. Sincere condolences Joy, to you and your family on such a tragic loss.

Well-known DXers, Shri VU2VG and Roy G3JEQ, became silent keys late last year. Sincere condolences to both families from all their amateur friends.

SWAZILAND

Gertjan PA3CPG, hopes to be signing 3D6. . until August this year, if he can procure the correct authorisation. Here's hoping!

DISAPPOINTMENT

After being within 80 kilometres of his objective, Bob KD7P, was a disappointed man when his mission was aborted due to only one helicopter being operational on the vessel. The captain could not take the risk of using it to place Bob on Peter I Island. If there were any hitches or another breakdown it could have been catastrophic. Bad luck Bob, better luck next time! In the meantime, it is hoped you have many OSOs with the call sign, KC4USR, from Antarctica.

POLICE ASSOCIATION

Members of the *International Police Association* are scheduled to be presently operating from Saint Martin using the call FS51PA.

SWEDEN

A special call, for prefix hunters, will be used by a handful of Swedish operators towards the end of this year. The call will be 7S#FRO. Reason is unknown at present.

AVES ISLAND

Martha and Carl Henson WN4FVU and WB4ZNH, have been invited to join the 4M0ARV DXpedition, scheduled for this month. If they accept watch for some slick operating from this duo and the rest of the group. It may be a new YL country for many, too.

ISRAEL

The restructuring of the Israel call signs will be along the following lines. Novices will be issued with call signs in the 4Z9AAA-4Z9ZZZ bracket. Grade B (full frequency privileges with 150 watts maximum output) will keep their present 4X4, 4Z4 and 4X6 prefixes. Grade A, entitling holders to all privileges, plus 1500 watts output, will change to a 4X1 prefix.

Israeli amateurs will again be operating special event stations over Easter. This year, instead of the usual two, there will be five operating from historical and biblical sites including Bethlehem, Jerusalem, Nazareth, Mount Tabor and Mount Beatitudes. All operations will be under the auspices of the Israel Amateur Radio Club and it is believed that special cards will be available.

SOUTH SHETLAND ISLANDS

Dan VK1ST, was advised in a contact with CX4AS that CX0XY will be operating from the Islands until this month. The Chilean station 3G9SBY, will be on-air from the same QTH.

Dan has had some good contacts, including one with BY4AA, who is running an IC-750, plus linear of 200 watts, to a seven element Yagi on 20 metres. Other contacts include EA8TE, VQ9HW, DP0GVN and VK0DA, with his KWM2A, 30L1 and TH3 Mk3 at 10 metres above "terra firma."

LARGE ANTENNA

Tom K1JJ, has constructed the antenna to beat allcomers on 60 metres. The horizontal Yagi antenna has 11 elements, each 33.5 metres long on a 91 metres boom. Each element is supported by a 18 metre mast and is fed by a quarter-wave stub controlled by a remotely controlled tuning capacitor. The forward lobe may be reversed instantaneously by the use of 11 relays.

BELGIUM

A note from Jane ON7WW relates that the bands are very quiet in that area and the only contact of interest to be logged is 5A0A. Jane's OM, John, needs only one more CW contact for the Honour Roll. Congratulations John.

BITS AND PIECES

The South African Government are planning to build a large airport on Marion Island, ZS8. What plans are afoot? ** Fernando CE0ZIP will be visiting VK1 on a Trade Mission this year. ** Craig VK9XW after 20 years, has left Christmas Island. ** 4K1F is operating from the USSR base of Bellingshausen in the South Shetland Islands. ** 7P8BE was George VE3FXT operating out of Lesotho. ** 9N5YDY the UNICEF Amateur Radio Club has only limited operating permission. ** QSLs for TI9W and crew should go to TI2KD. ** Frank VK0DA is now QRT from Heard Island. Cards to VK9NS. ** 5A0A still finding it hard to get OSOs . It appears his paper-work is identical to that of G3JKI/5A which is acceptable to the DXCC desk at Newington. ** South African Antarctic stations now use the prefix ZS7. ** His Majesty King Hussein JY1 is expected to visit VK again later this year. ** 3A7A will be used to celebrate the National Day of Childhood on March 29. A special QSL card has been struck for the occasion. ** Jim VK9NS and Bob W5KNE hoped to be operational from VK9Y last month. Jim also hoped to be active from VK9X.

THANKS

Sincere thanks to the Editors of weekly, bi-weekly and monthly publications such as: *ARRL Newsletter; BARG; CQ-QSO; The DX Family Foundation Newsletter; Inside DX; KH6BZF Reports; Long Island DX Bulletin; NIAR News Letter; Papakura Radio Club Bulletin; QRZ DX; RSGB DX News; QRZ DX, RSGB DX News* and *The W6GO/K6HHD OSL Manager List.*

Magazines including *Break In; cqDX; DX Post; JA CQ; JARL News; KARL News; Meteorological News; QST; Police Life; RadCom; Veron; Weather News* and *Worldradio*, to mention but a few.

Individual contributors this month include VKs 1SK, 2PS, 3YL; K1BV, ON7WW and staff of the Lillydale Municipal Library.

Sincere thanks to one and all and good DXing.

LATE NEWS — PETER I ISLAND FACTUAL

Amateurs world-wide has a present with the actuation of Peter I Island by Norwegians, LA1EE and LA2GV, who put it on the DXCC Countries List as from January 24.

The two operated without fear or favour, at times with the cacophony of people tuning on their operating frequency to high-power operators calling outside their band allocation and abusing others for using the frequency they were not supposed to be operating on. It is quite a long period since I have heard such a spread of stations calling from all continents at the one time and unfortunately operating procedures have deteriorated to unnecessary profanities and remarks, against all regulations and principles of the privileges we are given.

To the stations that missed out I commiserate, but many VKs did make it without too much hassle, including myself, with a very "croaky" voice, on the third or fourth try. To those who worked them a number of times to "make sure" on one band, I will leave the readers to think what my remarks could be.

Congratulations to the operators, the captain and crew of the vessel that landed the group and stood-by off shore whilst the action too place in such an inhospitable and lonely part of the world.

SOME RARER DX WORKED ON THE EAST COAST

14 MHz

3Y2EE, 3U2EE*, 3Y2GV, 3Y2GV*, 4S7NS, 4S7WP*, 4X6RA, 7S3FRO, 8R1RPN, FK25DK, HK5BEG*, IS0ATP,

KC4AAC, KC6HA, T32AF, T77F*, UO5OEK*, V85SB (YL-Sophia), VK0DA (HI), and ZL6OR.

21 MHz
3Y2EE, 3Y2GV*, DL6WT*, EA4BWN*, F2NB*, HA5OG*, HB9BQB*, IK2FMI*, OE5CA*, and YU7BZD*.

28 MHz
JAs from most call areas.

** denoted CW, others SSB.*

—73, Ken VK3AH
ar

SAINT HELENA

The much sought after DXCC country of small Saint Helena Island is 122 square-kilometres in area, has a population just in excess of 5000 and is located 1850 kilometres from the west coast of Africa.

The Island was discovered on May 21, 1502, the Feast Day of St Helena (mother of the Roman Emperor, Constantine), by Joao da Nova Castella, a Portuguese navigator. The island was known to other seafarers of the era, particularly the captain and crew of a Dutch East India vessel, the *Witte Leeuw* who lay at anchor in St Helena's James Bay, when she was ambushed by Portuguese vessels in 1613. According to reports of the time, the vessel was blown to pieces.

The *Witte Leeuw* was returning from the Far East and, according to her manifest apparently carried by a sister vessel, was carrying a full cargo of spices, 1311 diamonds and other valuables such as jewels and Chinese porcelain. This was not too much of a challenge for Robert Stenuit, a man renowned for his study of researching wrecks and an experienced diver. Armed with ample research that gave him the history of the vessel and backed by a crew of experts just over a quarter of a century ago, he decided to seek the remains of the *Witte Leeuw* and the treasures she contained.

Robert, and later his crew, dived in James Bay, eventually finding and verifying the wreck. They found an abundance of porcelain, jade and other valuables scattered for several metres around the wreckage, but no diamonds. Upon further research and assistance, they realised the truth in the statement "blown to pieces." The diamonds had been scattered and covered by the sands of time — an impossible task to find the majority, sheer luck to find one! (Incidentally, the majority of the recovered pottery now graces Amsterdam's Rijksmuseum and has proved valuable in establishing the authenticity of antiques fired before and after that era.) It is thought that most of the salvaged collection came from Chingtechen, where a century later a travelling Jesuit priest reported that 18 000 potter families kept 3000 kilns burning.

The English East India Company claimed ownership of St Helena in 1659, after a brief Dutch occupation. In 1673, the Company again confirmed their ownership and it was estimated that half the population were imported slaves. It was not until 1836 that the slaves were freed.

It is not generally known that, due to the remoteness, Saint Helena was the ideal location to place exiled Emperor Napoleon Bonaparte, in 1815. The English took control of the island until his death in 1821 and it was handed back to the East India Company until 1834, when the English again took possession.

The island was reasonably prosperous until the opening of the Suez Canal in 1869, which dramatically changed the trend of shipping routes.

During WWII, this tiny island, even though it could not support an airfield, was of significant importance to the allies.

In 1960, it was decided to place a telecommunication centre on Ascension Island which provided employment for some of the island's inhabitants.

In 1966, royal instructions, through and Order in Council, gave St Helena a considerable measure of self-rule, becoming effective on New Year's Day, 1967.

The island is of volcanic origin, though any activity is now extinct. An annual rainfall of 750 millimetre in the centre of the island, tailoring down to a mere 200 millimetres on the coast, falls on the undulating area of cliffs varying in an average height from 135 to 600 metres. The highest points are Mount Actaeon and Diana Peak, which are approximately 820 metres above sea level.

The Climate is temperate because of the Atlantic Ocean's trade winds and varies in temperatures of 21 to 29 degrees Celsius in summer to between 18 and 24 degrees Celsius around the coastal region. Higher areas of the island are approximately five degrees lower in all seasons.

The middle of the island is suitable for agriculture and forestry and support a native bush gorse (spiny evergreen shrub), cabbage palms, eucalypti of various species, willows, poplars, maize, potatoes and green vegetables. Rabbits, mice and an abundance of rats inhabit the island which has only one native bird, the wirebird, which can be likened to a small plover. Introduced species, plentiful though not abundant, include ground doves, ring-necked pheasants, partridges and Java sparrows. There are no fresh-water fish, but strangely, of the 65 varieties of salt-water species caught, 17 are peculiar to the island.

As less than one third of the mineral-free island is suitable for cultivation, the economy is strained and relies on the sale of carvings, fancy woodwork, and furniture made from timber grown in accessible areas and a fishing industry of mainly tuna, caught by trawlers out of the only port, Jamestown, which can accommodate vessels of any size.

In excess of two-thirds of the island's budget is subsidised by the United Kingdom, the balance being made up by the sale of lace, threadwork, beautiful stamps for which the island is renowned, frozen processed fish, woodwork and furniture.

The population consists of European (mainly British), intermingled with those of Asian and African descent, all speaking English, the only recognised language. The area, including the Dependencies of Ascension and Tristan de Cunha, are now administered by a governor who is also the President of the Legislative Council, constituted by 12 elected members.

The area is catered for by a small hospital which supports a small medical and dental staff. Schooling is free, yet compulsory for children aged between five and 15. The Judiciary consists of a Chief Justice, Magistrate and elected Justices of the Peace.

So, to those who are dedicated to going on DXpeditions, go to St Helena Island, the Island that's only bay probably holds a fortune, and combine a little diving with the radio! One diamond could finance a DXer's trip, including free QSL cards, for a lifetime. Any takers?

DISTRESS CALLS

Many amateurs, during the course of their pursuits for DX, unfortunately encounter distress and "Mayday" calls. It is every amateur's duty to cease normal traffic and assist, to the best of their ability. Also, it is an offence to interfere with emergency communications or to communicate them to a third party for gain or reward!

The National Maritime Safety Division of the Commonwealth Department of Transport is responsible for coastal and seafaring vessels within Australian waters, and they will return your telephone call or you may call direct and reverse the charges in the case of an emergency.

For Australian mainland catastrophes the nearest police station or police communications headquarters in each State will be able to assist.

The following is to be used as a guide and is part of Section 3.1 of the National Search and Rescue Manual, which is presently being extensively revised. However, the following information should be used in the interim.

If possible it is advantageous if both sides of the radio contact can be tape recorded for checking by the authorities and also for one's own reference.

APPENDIX 3.1
DISTRESS CALL INTERROGATION FORM
For use by operators of the Inshore Boating (IBRS) and Amateur and Citizens Band (CBRS) radio communication services

PART 1: Essential Information

Note: If any answer indicates that a genuine distress situation exists, immediately carry out standard procedures, then continue interrogation.

WHERE
1. Where is distress position? Latitude, Longitude/ Bearing and Distance from geographical feature or place.
2. What part of Australia is it near?

WHAT
1. What is the nature of the distress?
2. What help is required?
3. What is the weather situation at the distress?

WHO
1. How many people are in Distress?
2. Who are they? Hikers/Motorists/Boats/Aircraft.
3. Any identification? Names. Registration numbers/Call signs.
4. Description of distress vehicle.

WHITHER
1. What are distressed persons' intention?
2. Are they remaining at scene of distress?
3. If not, where are they going?

WHEN
1. When was call first heard/last heard?

PERSONAL IDENTIFICATION AND COMMUNICATION DETAILS
1. Name of Receiving Operator.
2. Address.
3. Telephone Number.
4. Do you think call is genuine? WHY?
5. Is any station still in contact? YES/NO
6. If YES how may they be contacted?
7. Is the message being recorded on tape? YES/NO

PART 2: DESIRABLE INFORMATION

MARINE INCIDENT

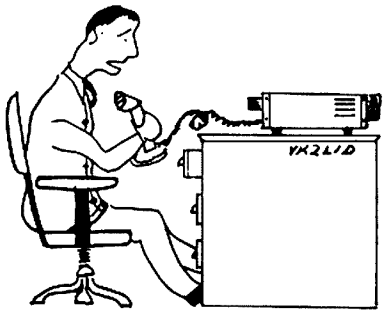
Description of Vessel
What type of vessel is it? Fishing vessel/Motor boat/Yacht
What is its name?
How many masts?
Length; Registration Marks; Fuel Type; Hull (colour); Sail Number; Radio Call Sign; Sails (colour); Deck (colour); Superstructure (colour); Type of Engine fitted; Hull (material); Range or Endurance.

Safety and Emergency Equipment
Anchor YES/NO
Lifebuoys YES/NO
Flares YES/NO (type and number)
EPIRB YES/NO
Dinghy YES/NO
Food (amount) pounds/kg
Life raft YES/NO
Water (amount) gallons/litres
Life Jackets YES/NO
Radio Type Frequencies

Voyage Details
Departed Date/Time Destination
ETA Contacts Address
Phone No
Owner/Agent
Next of Kin

Special Medical Assistance
If a medical problem exists:
(a) Is the person conscious? YES/NO
(b) Can the person walk? YES/NO
(c) If medication is delivered, will the problem be solved? YES/NO
(d) What medication is required?
(e) Is a doctor/nurse required? YES/NO
(f) Is there an area suitable for helicopter landing?
(g) Could the person be winched into a helicopter?
(h) Are seas considered calm enough for seaplane landing?

The Call
What time was call first heard/last heard? —/—
What was signal strength/readability? —/—
What was accurate text of call?
How often was it heard?
Did your station acknowledge the call? YES/NO
Did any other station acknowledge? YES/NO
Identity:
Were acknowledgments heard by distress station? YES/NO



"THAT M/M STATION . . . I'M SORRY, OM, I WASN'T PAYING ATTENTION — WHERE DID. YOU SAY YOU WERE SINKING?!"

Was two-way communication achieved? YES/NO
Was the person Calm/Agitated/Coherent/Incoherent?
Was the accent Australian/Other (identify)
Was any background noise heard (Engine noise, talk, party voices, etc)?
Were the answers given to your questions sensible or reasonable?
What do you think was not sensible or reasonable?
Do you think the call may be a hoax? YES/NO WHY?

If location of distress not clearly given
Did skip conditions exist? YES/NO

If YES, from what distant areas were calls of similar signal strength being received?

The Receiver
Type of set (Manufacturer and Model)
If frequency is unknown, what channel was call received on?
How many channels on your set?

My advice is, if you cannot actually assist and the stations have good propagation, monitoring the frequency taking notes. If relays are required briefly advise the station in control, or taking the information, of your call sign and indicate that you have adequate copy and are backing up.

IARU 50 MHz BEACONS

Freq MHz	Call Sign	Location	Country	Mode	Ant	ERPW	Notes
50.003	PY1RD	Rio de Janeiro	Brazil	A1			
50.005	H44HIR	Honiara	Solomon Islands				QRT?
50.005	PY1AA		Brazil	CW			
50.005	ZS2SIX	Cape Province	South Africa	CW	T'stile	10	
50.006	GB3RMK	Inverness	United Kingdom	F1A	DP (N/S)	30	
50.007	TF3T		Iceland				QRT?
50.010	JA2IGY	Mie	Japan	A1A		10	
50.010	ZS1STB	Still Bay	South Africa	F1	2 el DL (N)	50	
50.010	ZS6STB	Vereening	South Africa				
50.013	P29BPL		Papua New Guinea	A1A		30	
50.015	SZ2DH	Athens	Greece				QRV after 1300
50.020	GB3SIX	Anglesey, Wales	United Kingdom /I073TJ	F1A	3 el Y (W)	100	
50.025	ZS6SIX	Kempton Park	South Africa				QRT?
50.025	5Z4YV		Kenya				QRT?
50.025	6Y5RC		Jamaica	F1	3 el Y (NW)	40	QRT
50.030	ZE3VV	Yucatan	Mexico /EL50EX	A1	GP	5	
50.030	ZS6PW	Pretoria	South Africa	A1A	(N/NWW)		QRV 1000-2000 UTC
50.033	LU8YYO		Argentina				
50.035	EL2CA	Monrovia	Liberia				QRT?
50.035	HC1JX	Quito	Ecuador				QRT?
50.035	ZB2VHF		Gibraltar /IM76HE	A1	5 el Y (WNW)	100	
50.038	FY7THF		Fr Guiana	F1	Vert	100	
50.041	WA8KGG	Ohio	USA				
50.045	OX3VHF	Julianehaab	Greenland /GP60QQ	A1A	GP	20	QRT
50.045	DL3ZM /YV5	Caracas	Venezuela				
50.048	VE6ARC	Alberta	Canada	A1	GP	50	
50.048	WA6IJZ	California	USA	A1	Vert	10	
50.050	GB3NHQ	London	United Kingdom /I091VQ	F1A	T'Stile	15	
50.050	LU2DH		Argentina				QRT?
50.050	ZS6LN	Petersburg	South Africa				QRT?
50.055		Oslo	Norway				Proposed
50.055	WA9FEF	Chicago, IL	USA	A1			
50.060	GB3RMK	Rosemarkie, Scot	United Kingdom /I077UD	F1A	DP (N/S)	20	
50.060	PY2AA	Sao Paulo	Brazil		GP	25	
50.060	WA8DNQ	Cincinatti, OH	USA	A1	Hor Omni	2	
50.060	ZS6DN	Pretoria	South Africa		4 el Y (N)	100	QRT?
50.062	W3VD	Laurel, MD	USA /FM19	A1	Halo	10	
50.064	N4PZ	Sarasota, FL	USA	A1	Vert	0.5	
50.064	WA5UUO	New Orleans, LA	USA				
50.064	N7DB	Boring/ OR	USA /CN85			30	
50.065	W5VAS	Metairie, LA	USA	A1	Halo	1	
50.065	WB5ZRL	New Orleans, LA	USA	A1	Halo	2	
50.065	W0IJR	Denver, CO	USA /DM79	A1	Halo	20	
50.066	KA0CDN /W0IJR	Denver, CO	USA	A1			
50.067	WA6IJZ	Oxnard, CA	USA /DM04		Vert	770	
50.069	W0BJ	North Platte, NE	USA	A1	T'stile	6	
50.070	VP9WB		Bermuda				QRT?
50.070	K1NFE	Burlington, CT	USA /FN31		GP	25	
50.070	W2CAP/1	Cape Code, MA	USA /FN41	A1	Vert DP	10	
50.070	KS2T	Toms River, NJ	USA /FM29VX	A1	Halo	10	
50.070	WA2YTM	Rochester, NY	USA				
50.070	KA4VEY	Harvest, AL	USA		Vert	10	
50.070	WB0CGH/5	Lewisville, TX	USA /EM13	A1	Halo	1.5	
50.070	WA7ECY	Troutdale, OH	USA		Vert	10	
50.070	K0HTF	Des Moines, IA	USA /EN31DX	A1	Omni	2	
50.070	ZS3E		South West Africa				QRT?
50.070	4U1ITU	Geneva	Switzerland				Proposed
50.071	WA2YTM	Victor, NY	USA /FN12	A1	Hor Omni	15	
50.072	W9KFO	Eaton, IN	USA				
50.073	W7KMA	AZ	USA				
50.075	VS6SIX		Hong Kong	A1A	GP	10	
50.075	N5JM	New Orleans, LA	USA /EL49	A1	Vert	3	
50.075	ZS3E		South West Africa				QRT?
50.077	N0LL	Smith Centre, KS	USA	A1	Halo	30	
50.077	VE3DRL	Toronto, ON	Canada				
50.080	TI2NA	San Jose	Costa Rica	A1			
50.080	W1AW	Newington, CT	USA /FN31	A1/F	Beam west	50	
50.080	ZS5TR	Durban	South Africa				QRT?
50.080	ZS5VHF		South Africa	A1	Halo	10	
50.066	VE2STL	Val Belair, PQ	Canada		DP	3	
50.088	VE1SIX	NB	Canada				
50.096	HD1QRC	Quito	Ecuador				QRT?
50.099	KH6EQI	Pearl Harbour	Hawaii				QRT?
50.100	HC2FG	Guayaquil	Ecuador	A1			
50.100	PY5YD		Brazil				
50.109	JD1YAA		Minami Tori-shima				

1987 PERTH INTERNATIONAL ELECTRONICS SHOW

Last years show was hailed by both the industry and the media as the most successful electronics show ever staged in this country. The 1987 show plans to build on this goodwill, and no effort will be spared to make this, the ninth show, even more successful and a most worthwhile event for its exhibitors.

The Electronics Show will again be held at the Claremont Showgrounds from July 29 to August 2, 1987. However, July 29 has been set aside for an exclusive trade and media only preview.

The floor layout has been given an exciting "new look" hope to enhance exhibitor exposure at the show.

Further information may be obtained from Chris Gulland, Manager of the Perth Electronics Show, PO Box 745, West Perth, WA. 6005. Telephone (09) 382 3122.

ar

50.110	KG6OX		Guam				QRT?
50.110	ZS6LN		South Africa	CW	7 el Y	t00	Intermittent
50.120	ZS3E		South West Africa				QRT?
50.125	ZS3AK		South West Africa				QRT?
50.246	LU8MBL		Argentina				QRT?
50440	K1NFE	Hartford, CT	USA				
50.500	KH6EOI	Pearl Harbour	Hawaii /BL01XH	A1	3 el Y	80	
50.500	5B4CY		Cyprus /KM64PR	F1A	GP	15	
50.945	ZS1SIX	Cape Province	South Africa	FSK/FM	Omni	8	
51.020	ZL1UHF	Nihotupu	New Zealand	F1AAN		25	
51.030	ZL2MHB	Fernhill	New Zealand	F2AAN		10	
51.225	ZL2VHT	Inglewood	New Zealand	F1AAN		15	
52.033	P29BPL		Papua New Guinea				
52.100	ZK2SIX		Niue Island				
52.150	VK0CK	Macquarie Island	Antarctica				
52.200	VK8VF	Darwin, NT	Australia		GP	15	
52.250	ZL2VHM	Pahiatua Track	New Zealand	F1AAN		8	
52.300	VK6RPH	Perth, WA	Australia				
52.300	VK6RTV	Perth, WA	Australia				
52.310	ZL3MHF	Christchurch	New Zealand	F2AAN		20	
52.320	VK6RTT	Carnarvon, WA	Australia				
52.325	VK2RHV	Newcastle, NSW	Australia				
52.330	VK3RGG	Geelong, Vic	Australia	F1	XDP	4	On trial
52.350	VK6RTU	Kalgoorlie, WA	Australia				
52.370	VK7RST	Hobart, Tas	Australia				
52420	VK2RSY	Sydney, NSW	Australia				
52425	VK2RGB	Gunnedah, NSW	Australia				
52435	VK3RMV	Hamilton, Vic	Australia				On trial
52440	VK4RTL	Townsville, Qld	Australia				
52450	VK5VF	Mt Lofty, SA	Australia				
52460	VK6RPH	Perth, WA	Australia				QRT?
52465	VK6RTW	Albany, WA	Australia				
52470	VK7RNT	Launceston, Tas	Australia				
52490	ZL2SIX	Blenheim	New Zealand	F2AAN		10	
52.500	JA2IGY		Japan				
52.500	ZL2VHM	Palmerston North	New Zealand				
52.510	ZL2MHF	Mt Climie	New Zealand	F1AAN		2	

Compiled by IARU, October 16, 1986

DOC STATISTICAL SUMMARY

This summary outlines details of stations currently licensed as at September 1986.

AMATEUR

Station/Service	ACT	NSW	VIC	QLD	SA	NT	WA	TAS	TOTAL
— Beacon	—	18	20	30	4	2	21	2	97
— Limited	54	873	1033	375	275	26	221	103	2960
— Limited/Novice	16	335	295	242	125	20	94	42	1169
— Novice	53	888	759	616	332	48	214	97	3007
— Unrestricted	184	2793	2443	1452	1042	71	908	348	9241
Subtotal	307	4907	4550	2715	1778	167	1458	590	16474
									REPEATERS
— Amateur	—	43	52	33	14	2	15	13	172

VHF UHF — an expanding world

Eric Jamieson VK5LP
1 Quinns Road, Forreston, SA. 5233

All times are Universal Co-ordinated Time and indicated as UTC

AMATEUR BANDS BEACONS

FREQUENCY	CALL SIGN	LOCATION
50.010	JA2IGY	*Mie*
50.060	KH6EQI	*Honolulu*
50.075	VS6SIX	*Hong Kong*
50.109	JDIYAA	*Minami Tori-shima*
52.013	P29BPL	*Loloata Island*
52.020	FK8AB	*Noumea*
52.100	ZK2SIX	*Niue*
52.150	VK0DS	*Macquarie Island*[1]
52.200	VKBVF	*Darwin*
52.250	ZL2VHM	*Manawatu*
52.310	ZL3MHF	*Hornby*
52.320	VK6RTT	*Wickham*
52.325	VK2RHV	*Newcastle*
52.345	VK4ABP	*Rockhampton*
52.350	VK6RTU	*Kalgoorlie*
52.370	VK7RST	*Hobart*
52.420	VK2RSY	*Sydney*
52.425	VK2RGB	*Gunnedah*
52.435	VK3RMV	*Hamilton*
52.440	VK4RTL	*Townsville*
52.450	VK5VF	*Mount Lofty*
52.460	VK6RPH	*Perth*
52.465	VK6RTW	*Albany*
52.470	VK7RNT	*Launceston*
52.485	VK8RAS	*Alice Springs*
144.019	VK6RBS	*Busselton*
144.400	VK4RTT	*Mount Mowbullan*[2]
144.410	VK1RCC	*Canberra*
144.420	VK2RSY	*Sydney*
144.430	VK3RTG	*Glen Waverley*
144.465	VK6RTW	*Albany*
144.470	VK7RNC	*Launceston*
144.480	VKBVF	*Darwin*
144.485	VK8RAS	*Alice Springs*
144.550	VKSRSE	*Mount Gambier*
144.565	VK6RPB	*Port Hedland*
144.600	VK6RTT	*Wickham*
144.800	VK5VF	*Mount Lofty*
144.950	VK2RCW	*Sydney*
145.000	VK6RPH	*Perth*
432.057	VKBRBS	*Busselton*
432.160	VK6RPR	*Nedlands*
432.410	VK6RTT	*Wickham*
432.420	VK2RSY	*Sydney*
432.440	VK4RBB	*Brisbane*
432.445	VK4RIK	*Cairns*[3]
432.450	VK3RAI	*MacLeod, Melbourne*
432.535	VK3RMB	*Mount Buninyong*
432.540	VK4RAR	*Rockhampton*
1296.171	VK6RBS	*Busselton*
1296.420	VK2RSY	*Sydney*
1296.480	VK6RPR	*Nedlands*
10300.000	VK6RVF	*Roleystone*

1 As Sojo VK0SJ, was to leave Macquarie Island in February 1987, and his place taken by VK0DS, whom I understand will also be operating on VHF, I have changed the call sign of the VK0 beacon to VK0DS, pending any advice to the contrary.

2 My note book tells me someone from VK4 said the two metre beacon was now signing VK4RTT instead of VK4RBB. The list is amended accordingly. However, I am not aware if VK4RBB on 432.440 has also changed. Would someone please advise me of the status and call signs of the various beacons in VK4, particularly around the Brisbane area. I have corrected the location of VK4ABP, which for some reason last month I listed as being in Rockhampton instead of Longreach. Sorry!

3 A new North Queensland beacon in Cairns, has appeared on 432.445 MHz, signing VK4RIK. This is direct from Ian VK4AFC, in Cairns. Ian also told me that permission has been granted for the Cairns people to establish beacons on 52.445, 144.445 and 1296.445 MHz, as well as the 432.445 beacon already listed. The others will appear as they are assembled.

THE BEACONS

The beacons throughout Australia have certainly played their part during the Es openings this summer. I found myself checking them more than ever before and in most cases they have been reliable pointers to band openings, at least giving some warning even if there is no one listening at the other end to reply to your call! There is no doubt I worked ZK2RD because I had been monitoring the ZK2SIX beacon for some time and alternately calling near the beacon, also on 52.050 MHz. VK5ZWP, kindly informed me where I could find Robert and promptly worked him. I was not so successful with VK0SJ, as I heard the beacon on three occasions but still missed Sojo. *Them's the breaks! ! !*

SIX METRES

From the viewpoint taken in VK5, the Es summer period, which has now quietened down to some extent, was certainly another very healthy season, even if somewhat different from last year. I felt the band started opening earlier in 1985 with the results there was a slackening off for a couple of days on 28/12 and 29/12. Sure, there were contacts to be made but not with the ferocity one expects around that time — not here anyway. I was portable at Meningie and on the band all day, and every day for a week, so I did not miss too much, but I still did not work as many stations as I had expected.

I felt there was a greater awareness of the possibility of two metre contacts by many more operators this year, hence they were off six metres for longer periods. Their vigilance paid off because it was another incredible year on two metres, but you will have to turn to the Two Metres Section to read the details.

As I said last month, there would be some important events leading up to Christmas which I would have missed and that turned out to be so! But by being on the bands more I was able to fill in a few of the missing spots. I was surprised to learn of all the JA stations which had been worked around the end of October, particularly 26/10 which appeared to be the best day into North Queensland and as far south as Sydney. JA4MBM had a ball by working VK1, 2, 4 and 6. The next day, JAs worked Alice Springs; on 1/11 VK2XJ worked a string of JAs in their 1, 2, 4, 5 and 7 districts.

It appears the eastern States may have been having better Es conditions than VK5 for the first half of November. ZLs were certainly being worked on a daily basis, FK8EM was there in the mornings, also FK1TK. Someone said they were hearing a beacon signing FK8KAB around 50.050 MHz and the VK0SJ beacon was being heard frequently leading up to several VK3s, including VK3AZY working VK0SJ on 20/11 around 0900. On 23/11 it was a good day for Niue Island with the ZK2SIX beacon alerting VK2 and VK4 the path was open. Nev ZK2AZ/VK4ZNC, then worked stations in Brisbane, Sydney and ZL. The next day the great conditions continued when VK0SJ worked VK2, 3, 5 and ZL. ZLs are still coming in every day mixing it with the VK2s and VK4s.

Short skip opening from VK5 to VK3 around 0400. The FKs had been heard most days, but not strongly, but on 2/12 FK worked into VK6 as I reported last month, plus VK6YU working a FK25. Heaps of ZLs and P29 worked from VK5. Later in the day, P29 to VK3 and VK4. Last month I reported 5/12 as being a good day, but I missed that VK0SJ had been very active, even Jim VK3AZY, worked him three times that day! 5W1GA worked VK2 and VK3 and later VK2BA worked VK0SJ. Hard to believe he could be on so much and VK5LP didn't work him! Interesting to hear that Nev 5W1GA worked FK25TK on 0020. No reason why he shouldn't of course, as it is around 1250 km which would be okay for Es.

That fills up some of the gaps but I know there are a lot more. Anyway, now on to 22/12. The band was open well before 0000 UTC and plenty of ZLs. Then VK2 and VK4 filled the band and many were worked, rarely anyone under S9. VK1VP worked at 0119 while VK2 and VK4 continued to predominate. At 0449, VK5LP worked FK8EB 5x6, but later he was much stronger. At 0512, I was pleased to work Robert ZL2RD at 5x7. Niue Island was a new country for me. Earlier, VK2YDC had been heard working P29BH at 0036, but not audible here. Also learned that, on 21/12, VK1VP had worked ZK2RD and P29ZES worked to Rockhampton, whilst for good measure, Lyn VK4ALM worked VK0SJ. ZLs were working to Alice Springs. Had contact with VK5NC at Mount Gambier who said he had worked VK0SJ on 24/11 (late news obviously).

23/12: VK5LP starting to get ready for portable expedition to Meningie, 100 km south-east of Adelaide taking 52, 144 and 432 MHz. Still keeping an ear on six though. Noted VK4ALM saying he was hearing FK8, but darned if he could work him. ZK2RD worked VK3AMK and about 20 others from 0530. ZLs everywhere! Heard FK8EM. Also noted plenty of two metre activity but this is reported elsewhere. Travelled to Meningie on 24/12.

PORTABLE FROM MENINGIE

26/12: No opportunity to get on before this date due to Christmas commitments. First contact was Les VK3ZBJ 5x9 on 144 so that looked promising. Six metres was a bit quiet so used the other two bands until ZLs poured in around 0600. Worked ZL3 and 4, then the ZLs became more interested in working VK6 from 0700 onwards! At 0745, heard VK0SJ at S2, but missed him. 0350 VK8GF worked FK8EB 5x9 also P29BH, VK2 and VK4 to VK8. VK4FNQ and others in Cairns also worked VK0SJ. VK4JH at Townsville heard FK8. VK4FXX reported band open all day to VK8. Excellent tropo conditions on other two bands.

27/12: Band open from about 2200, VK2 and VK4. At 0002 (UTC day 27/12) there was Dave VK6AOM, Carl VK6XW and Bob VK6BE all 5x9 to 0100. VK8s decided to stay in for most of the day, both from Alice Springs (VK8s ZLX, ZMA, GF, etc) and Tennant Creek, VK8ZCU. VK2 and VK4 much of the time, VK4ALM at 0049, VK4ABP (Longreach) 5x9 at 0225, then over to Joe VK4JH at Townsville for quite a long chat (no one else seemed to want him), VK8ZLX worked VK2BY at Broken Hill. Still plenty of two metre activity.

28/12: Open before 0000 to VK2 and VK4. Said "Good Morning" to Lyn VK4ALM again today. Then worked some VK4s on two metres (details elsewhere), VK4ALM in and out for most of the day. At 0717, worked Colin VK4ACG on Thursday Island 5x5. Colin said there would be another six metre operator on the island before long. Band went quiet.

29/12: A day spent in the doldrums. No six metres. Just as well some contacts could be had on 144 and 432. Six metres opened at 0800 to VK8ZLX 5x9, but he did not want to speak to me. However, VK4FXX did, even though I receiver 5x1. From 0830, the band came good with VK2 and VK4s. Worked Bob VK2ASZ, at 0838, who said he and two other VK2s and several VK4s had worked 3D2ER at 0800. Had spoken to Nev VK4ZNC earlier and been advised Nev had left some gear and a beam for six metres on 3D2 and 3D2RM would be using it. Another station, 3D2DW could only operate on Saturdays but would be on. Bob had also been hearing the ZK2 beacon which had become very reliable. VK2s still going strong at 0930 UTC.

30/12: Next morning a further "Good Morning" to Lyn VK4ALM, then at 2310 it was VK4ZJB, 2311 VK4FXX and 2352 VK8ZLX. VK4s until around 0300. Heard VK6AOM. At 0330 heard VK2ZHE working FK8EB, VK5NY and VK5LP heard him but could not get through the VK2 QRM. VK6AOM at 0520, VK6BE at 0549. 0721 VK2BQY, then up to VK4FNQ at Cairns, ending at 0813 with VK8KTC, at Tennant Creek. During the contact with Steve VK2BQY, he told me that on 13/12, VK0SJ had worked VK4ABP, VK4FNQ and VK4FXX, so Sojo was certainly getting plenty of widespread contacts.

31/12: Lyndsay did not appear this morning but Peter VK8ZLX said "Good-day" at 0000, then there was plenty of VK4s and VK2s, who stayed around for several hours. John VK4FNQ was there around 0315, then 0328 VK8ZCU and VK8KTC, from 0405 it was back to VK4FXX and VK4ZWB at 0559, 0631 to VK8ZLX — the band certainly chops around. At 0818, worked FK1TK, then VK2ZGB.

1/1/87: Six metres a bit slow starting, but had a ball on 144 and 432. From 0104 it was VK4PU, 0114 VK2EXB, 0120 VK4ZNC, 0145 VK7JG, VK7ZOO and VK7LZ. At 0221, VK7ZIF was heard mobile. At 0328, VK6AOM, 0350 VK4ALM (good afternoon), 0414 Bill VK4ZWH, 0443 VK2BBR. At 0641, the ZLs pounded in and worked ZL1, 2, 3 and 4. By the way. Paul VK2EXB, told me there are eight six metre stations in P29, including P29ZEF, BH, PL, ZFS and, I think, PR (he faded out as he told me). Lyn VK4ALM, has also upgraded to solid state six metre equipment. At 0731, worked Jim VK3AZY/3 at his portable site at Metung and he gave me, first-hand, some details of the VK0SJ two metre contacts into VK3. Also worked VK3AUU at 0756 and VK3ZAT at 0801, then over to VK8ZLX at 0812 with his usual 5x9 signals. And that was the end of the Meningie expedition for this summer.

Since then, on 3/1 VK4FXX worked P29ZEF On 4/1 at 0134 VK4FXX, VK2s, then 0514 VK4ZET/4 and that was the last Ross Hull Contest number exchange I had. With the close of the contest there seemed less activity on the band but it may have been conditions. On 5/1, some VK2s and VK4s, same on 6/1 but with VK8s. On 8/1, it was VK6BE at 0920, VK8ZLX at 0925 and 1010 VK5AIM! During the contact with Bob VK6BE, he remarked that the six metre band had been open in Albany daily for five weeks. While talking to Peter VK8ZLX, he told me he was about to start testing on 1296 MHz, so he is certainly going all-out to cover the various bands. On 9/1, starting before 0000 it was the turn of the ZLs again. At 0020, ZL4TBN 5x9, 0033 ZL2CD 5x9, 0046 ZL4KB/2 5x6, 0103 ZL1TZA 5x6, 0121 ZL3THM 5x9 and there were others. Bill ZL2CD, who works only six metres, said he was pleased with this year, his best contacts being to 3D2, FK1, VK0, P29, VK6, 5W1, JA and ZK2. He said there seemed to be a lot of VK6s, up to 12 at a time. The day was rounded off with VK4ALM at 0916. On 11/1, VK2, VK4, VK1, VK6 and ZL1. On this day, VK5LP kept the usual sched with Mark VK0AQ at Mawson, who advised he was keeping the VK0MA beacon on the air as much as possible in keeping with the problems they have down there of the AC power dropping out, which necessitates a trip to the beacon shack (about 600 metres away through the snow) to get it going again! Frequency is 52.408 and is running about 70 watts output. So far Mark had heard no six metre signals this summer. 13/1: VK2 and VK4 and ZL1. 14/1: VK4 plus ZL1. The band is quietening down!

TWO METRES

As expected, two metres has once again provided an incredible number of contacts all over Australia and New Zealand. Anyone who has the equipment and has not had a share of the Es contacts available has either been unfortunate or inattentive. VK5LP did not work as many stations as last year, but that was my fault, they were there to be worked! Not only have there been so many outstanding Es contacts Australia wide, but there have been some really excellent tropo contacts as well.

The Es coverage is shown fairly dramatically on the accompanying map which this year has been given some more detail as the map caused quite a lot of interest overseas last year, and the extra details and State boundaries will more clearly define the areas covered. No tropo contacts are shown on that map, although many such contacts were into the areas on the map. The tropo contacts are mentioned throughout the text as we go through it, there seems little point in splitting the two in the narrative. To allow readers to compare this year with last year, I have also reproduced last year's map. It becomes immediately apparent that much more territory has been covered this year!

The increased interest shown by the Alice Springs operators in upgrading their equipment and their antenna systems paid off handsomely with increased contacts, and their awareness that they live in a rather unique area and will be in demand keeps others looking for them with the result that if the band does open to VK8, you can almost be assured there will be someone on the band to work, and that is a comforting thought for those still requiring a VK8 on two metres to complete working all States.

The band really got underway quite early. Considerable continuing activity using aircraft enhancement for signals between VK3, VK1 and VK2 are now the order of the day. Those involved include:

VK3UM, VK3AUG, VK3AUU, VK3AZY, VK3KEG, VK3ZAT, VK3NM, VK1VP, VK1BG, VK1RK, VK2ZAB, VK2ZRE.

These operate using the flight paths of aircraft between Melbourne and Sydney. Also, VK5NY, VK3AIH and VK3LK also do the same thing using aircraft on the Adelaide to Melbourne path.

One of the first good tropo openings occurred on 4/11 between VK3AUU and VK3AMZ to VK2DVZ and VK2ZAB, from 1000 to 1100 UTC. As the high pressure system moved out into the Tasman, excellent conditions prevailed from Sydney to New Zealand with VK2ZAB at least being worked on 70 cm to ZL2.

Probably the most exciting news for the month was the first ever contact between a VK0 station and Australia. This occurred on 24/11 at 0854 when VK0SJ worked VK3AMZ on 144.150, followed by VK3AZY at 0856. Jim said signals were S1 at his OTH. Further contacts were established at 0951 up to S7 with QSB and Sojo worked VK3DUT, VK3AWY, VK3XQ, VK3AQR, VK3ZZX and VK3BRZ. VK7JG heard VK0SJ during this time but did not work him. Sojo said there had been a magnetic disturbance and some auroral activity. Six metres had been S9+ for several hours leading up to these contacts. Congratulations. Thanks to Jim VK3AZY, for this late information, also for what may have been the first VK3 to VK6 Es opening when VK6AOM worked 12 VK3s between 0920 and 1005. I hope there is no confusion between these contacts and those I reported last month for 28/11 when VK6AOM worked 10 VK3s and five VK5s on tropo!

TWO METRES AND ABOVE FROM MENINGIE

26/12: Station set-up and tested okay by 0230. At 0233, worked Les VK3ZBJ, on 144.100 at 5x9. 0425 VK3ATN 5x4 on 70 cm and 5x7 on 144.100. 0436 VK5NY both bands; 0518 VK3BDL 5x5, 0527 VK3AIH 5x5. Then tried 70 cm with VK3AIH and signals were 5x8. 0806 VK5NC 5x9 both bands, 1038 VK3BRZ/3 on Blue Mountain 5x7, VK3AUU 5x8 on two and 5x3 on 70 cm, 1055 VK3UG 5x6, VK3CM 5x3, VK3DKJ 5x3, VK3AXH 5x7 all on two, 1105 VK3BRZ/3 5x5 on 70 cm. VK3AOS 5x4 on 70 and 5x6 on two, 1203 VK3UM 5x5 on two, 1220 VK3ZBJ both bands about 5x5, 1242 VK3HV 5x3 on two and VK5ZDR 5x7 on 70 cm with beam on Melbourne.

27/12: The next morning, the tropo conditions were still very good, although Roger VK5NY, was having considerably more success than I was. However, at 2345 I worked VK1RK 5x2 and could hear VK2ZAB to S4 with QSB, but unable to work him. VK5NY worked VK2ZAB 5x2 at 2317, also VK1RK, 1VP and 1BUC. Roger had been alerted by strong signals from various repeaters and noted VK1RCC the beacon was S2 at 2003. He used the Wagga repeater to alert the VK2s and worked VK2SW, VK2KAW and VK2ZMP; and VK2DPG and 2BY in Broken Hill. Later at 0406 VK5NY worked VK8ZLX on two metres 5x9, heard VK8GF but no contact.

VK5NY said VK1RK had been audible for more than two hours during the morning of 26/12 (UTC). At 2300 VK1RK, 2339 VK1BUC, 2348 VK1VP. Most contacts were on 144.200 MHz. Those involved in all this activity included VK5NY, ZDR, RO, ZPS and LP. At 0420 VK8ZCU heard VK5NC on 144.100 for a few seconds.

Roger VK5NY, reported very strong signals to Les VK3ZBJ, on 144 and 432, so naturally the 1296 gear was fired-up. He worked VK3ZBJ 5x9, VK3DQD 5x2/3 at 1255 and VK3NM same strength at 1350. VK3ZL, at Ballarat, was heard but not worked. With all these happenings it is small wonder Roger broke open a bottle of his favourite tawny port and celebrated!

28/12: Reasonably strong signals from VK2 and VK4 on six metres before 0000 UTC. At 0110, Jim VK5ZMJ, at Port Pirie, and other VK5s, worked Brian VK2CMC on two metres. At 0120, Roger VK5NY worked Brian with signals varying from S3 to S9+20. At 0151, VK5NY worked VK4ZET and VK4GP and I was getting further down in the dumps! Then suddenly at 0158, there was Jim VK4AJO at 5x9 and during the next half hour I worked VK4ZWB, VK4ATP, VK4KLJ (Lorraine — for her first VK5 on two metres!), VK4AGQ, then VK4ZWB again as he kept calling CQ with no response.

Sporadic E on 70 cm?

While all this was going on, Roger VK5NY at 0218 was transmitting a signal on 432.100 to Steve VK4ZSH, and whilst *no* two-way contact eventuated, it seems certain Steve was copying Roger's CW ident/call sign. Had a contact resulted it would certainly have been the first from VK5 to VK4 on 70 cm, but there are other ramifications. Some authorities over the years have expressed doubts as to whether Es ever gets as high as 70 cm, but in this case, as Roger says, had it been via tropo there surely would have been other closer stations following the path to Brisbane which is the normal tropo pattern. On the other hand, 0218 is not a time when many 70 cm stations would be in the normal course of events. If any other stations between VK5NY and VK4ZSH did hear Roger's signals I am sure he would like to know so the propagation type can be better established. For the moment it seems likely to have almost been a Es contact. Perhaps next year more of us should try on 70 cm when there are good two metre openings. Australia is well suited geographically for these experiments to be conducted and centres of VHF/UHF population are well spaced to allow Es to eventually happen if it is going to! A good effort Roger and Steve — another tawny port please.

TWO METRES AGAIN

Still on 28/12, VK5NC, VK5ATD, VK5MC and VK3LK/5 (all in the south-east) worked VK4LE after confirming the band could be open by watching the FM channels. No other VK4s on. While talking about using FM band (commercial) for VHF pointers, Peter VK8ZLX said on 27/12 that he worked VK5NC after noting that Channel 3 television was snow free in Alice Springs. At the same time, VK5NC was heard in Tennant Creek.

When I was talking to Colin VK4ACG on six metres, he informed me that two metres had been open to the Cairns repeater during the morning.

The next morning at 2331, VK5NY worked VK7DC 5x2. At 2340, VK7ZOO was weak on 144.100 MHz, but VK3AIH was 5x9 at 2313 on two and 5x4 on 70 cm when VK5LP worked him. VK5NC worked VK7DC on 70 cm. The good tropo opening was drawing to a close but there were still some good signals around although many from Melbourne were not strong.

29/12: Mostly VK5 144 and 432 contacts during which Roger VK5NY advised he had again worked all States on two metres. That is rather good when one thinks it took some of us around 30 years to do due to the absence mainly of VK8 stations.

31/12: Mick VK5ZDR, worked a VK4 for a brief flitting contact. Conditions were good to Mount Gambier with 5x9 signals on both 144 and 70 cm to VK5NC, VK5AXV from Meningie around 0200. Worked VK3ZBJ at 0728 on 144 and then on 432

both signals being 5x9. Then went on to work VK3AUU 5x6, VK3ZAT 5x5, VK3AMZ 5x4, VK5DK and VK5NC (Mount Gambier) 5x9 both bands. A check later in the evening indicated the cool change was causing signals to tall off. However, next morning at 2352, Jim VK5ZMJ, was 5x9 on 144 and 5x7 on 432 so conditions were better to the north-west for me.

1/1/87: Very pleased to work Neil VK5ZEE, at Woomera, at 0003 on 432 at 5x9 and on 144 also to S9. The distance is around 750 km and is rather a poor path from my home QTH. Caught up with Jim VK5ZMJ, again at 0010 and had nearly an hour with him cross-band 144-432, discussing pleasantries. Jim mentioned he had worked Doug VK3UM on both bands. At 0117, VK5NC worked VK4ZAZ, and another eight VK4s on two metres, also VK3UM, VK3AUU, VK3BEH, etc. Roy VK3AXV, at South End (south-east) worked eight VK4s in 11 minutes. Bill VK4ZWH, at Bundaberg, reported working VK1, 2, 3 and 5 on two metres during the morning. A report came in that VK8LM, in Darwin, had worked a VK2. I checked this with Peter VK8ZLX, who telephoned Darwin and was advised no such contact had been made! So you see your scribe does check up on things every now and again particularly if they do not quite fit into the pattern of propagation. VK4ZWH said the two metre band had been open to ZL for more than two hours on 22/12 with ZL1BHX S9 for four and a half hours! On 26/12, he had worked VK8ZCU and VK8KTC, in Tennant Creek, at S9+ and was able to have a good contact using only one watt. Bill said he had worked more than 300 VK3s on two metres over the past three years — not a bad effort and illustrates what a good path exists to Bundaberg and with an alert operator at that end.

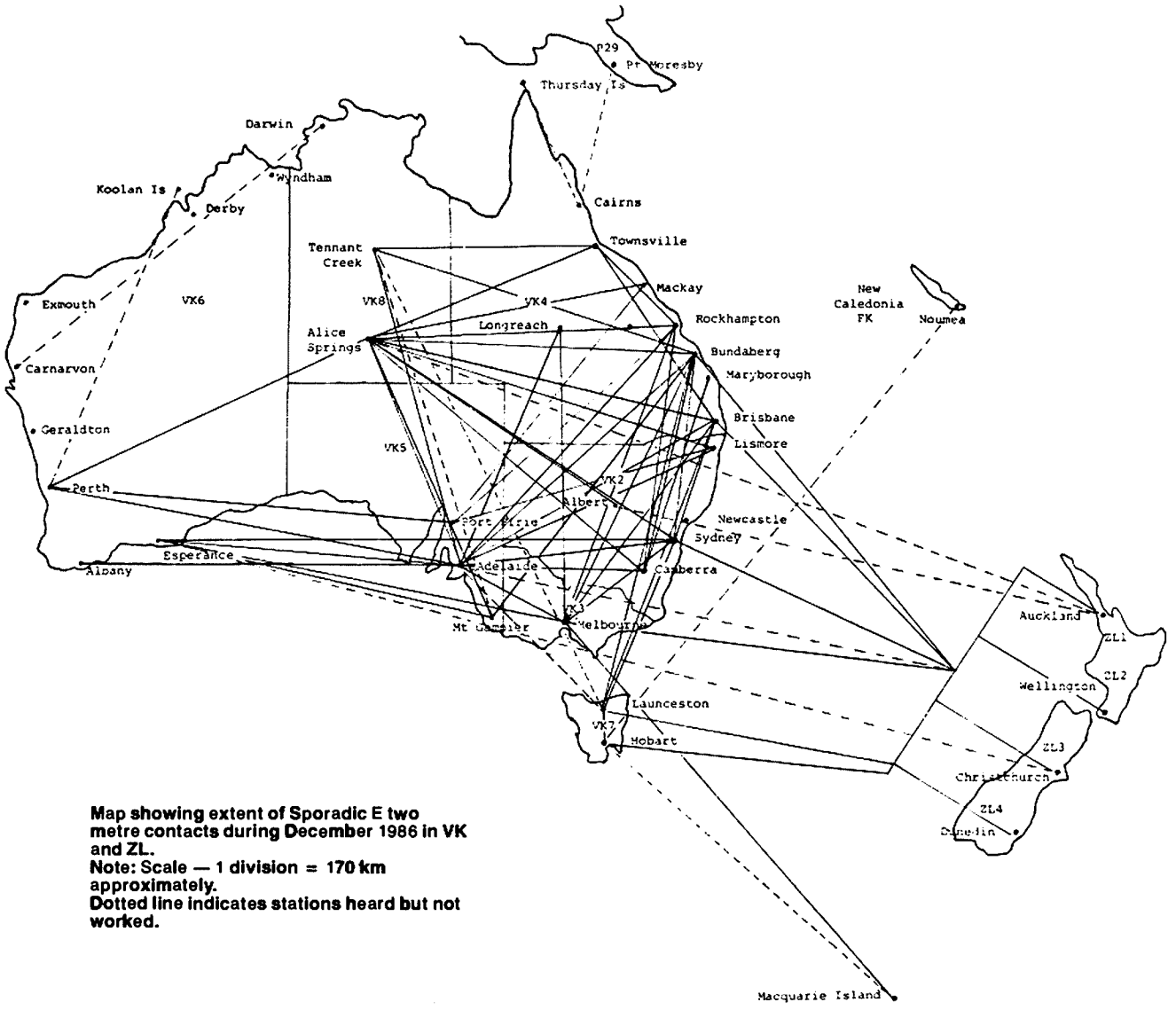
Talking with Joe VK7JG, on six metres, he told me that the had heard VK0SJ on two metres. At that time Sojo ws working the VK3s and that VK7KJ had heard an FK8 on two metres and VK3VD, had worked ZL3PN during that opening. VK3UM and VK3AUU worked VK2KAW at Wagga and Gordon VK2ZAB, in Sydney.

From here on, the activity dropped off with the end of the holiday period and with a reduction in the Es propagation. But on 7/1, VK5NY and others were having plenty of contacts into VK3 on 144 and 432. On 8/1, ZL4TBN was 5x9 into VK2. Peter VK8ZLX worked VK2DDC and VK2EMA at 0343 and 0346 and heard a weak VK3. Peter said the FM band was full of signals at the time and Channel 4 television was snow-free.

Summarising: We all thought December 1985 was a tremendous two metre period but I am sure most would agree December 1986 was even better if this was possible! The coverage this time was Australia-wide; last year VK6 missed out but this time with the contacts into Perth and Esperance from VK5 and VK8 in particular all have shared. The ZLs have been particularly active and kept the boys in the eastern States, in particular, on their toes both on 144 and 432. The upgrading of stations and the keenness of the VK8 boys has also been instrumental in keeping vigilance on two metres at a very high level.

Four years ago, I started hammering away in these columns that some very good two metre periods would be coming our way in the low part of the cycle and this, together with much better antenna systems as the result of activities through OSCAR and other satellites has ensured a lot of people on the air prepared to watch two metres and they have certainly been rewarded. Continuing typical comments noted on six metres were: "Six is pretty good, can we try two metres" or "Do you have two metres — take a listen on 144.100 as I have a signal there now" etc.

Of particular note has been the change of apparent circumstances leading up to two metre contacts. Previously, most authorities said it was necessary for very strong short skip contacts to be available on six metres before it was worth trying two metres. Last year, I noted that when Col VK5RO, and I worked VK8GF on 16/12/85 to give us Worked All States on two metres that six



Map showing extent of Sporadic E two metre contacts during December 1986 in VK and ZL.
Note: Scale — 1 division = 170 km approximately.
Dotted line indicates stations heard but not worked.

metres, whilst good, was not excessively good. Later, contacts to VK2 and VK4 confirmed such situations did exist. The same was found this year. I recall working a string of VK4s in the Dalby region when the band was virtually clear of VK4 six metre signals, even Channel 0 was absent! There were no short skip VK3 40 over S9 signals to say try two metres. I could hear VK5NY working the VK4s some time before I could, but by monitoring two metres they eventually came to my area showing the areas covered can be quite selective. It was an uncanny experience to hear Roger giving the VK4s 5x9 reports one after the other and I could not hear one!

What I am saying, I suppose, is that under suitable conditions, two metres is open more often than we previously thought, and that, whilst short skip still indicates a high or rising MUF, it is not the only required circumstance, but an additional one. One other good indicator is the commercial FM band, particularly in areas away from capital cities which fills with signals from all over the country as the MUF rises. Finally, of course, the Australia-wide beacons also help to warn operators of possible openings; the existing television channels to 5A also serve as indicators.

Next December? I see no reason why we should not have further good two metre and possibly 70 cm Es openings, particularly if we are still not too far out of the low part between cycles. Time will tell, of course, but if each year we still continue to have good two metres in parallel with six metres, then all I can say is that, for too long we have been missing out on good openings because, in the main, we have been looking for short skip and with insufficient operators on the band with the required dedication to make it work.

ROSS HULL CONTEST

There were certainly a lot of stations around giving out numbers and some really good scores as well. Las VK3ZBJ, must have got close to 1000 (perhaps he went over) and that is good scoring from three bands. There were many stations also saying they were not in the Ross Hull Contest but were prepared to give numbers to those wanting them. My own log book shows I worked a total of 93 different stations with whom I exchanged numbers.

As the continuation of the contest looks like being a Federal Convention matter this year, we need to ensure that the contest is continued and that would be helped if there was a good log return to the Federal Contest Manager. I believe VK7 will look after the Contest next year.

I am presently researching the Ross Hull Contest and propose writing it up as a separate article for *Amateur Radio*. I would appreciate any constructive comments from the fraternity. I would like to have them on my desk by April 10, please. Matters I would like to discuss concern the length of time of the contest, the dates, bands to be used and the scoring table. If you have any input on these matters, please write to me in a constructive way. I have letters already from Peter VK3YRP and Graham VK1BGG (ex-VK8GB), now in Canberra. I stress again, please write to me because if I can have my article finished by April, it cannot get into AR before June at the earliest and that is six months after the start of the last contest; so time is precious.

THE TWO METRE MAP

This shows the extent of two metre contacts throughout Australia and New Zealand for the 1986 Summer Es period, no tropo contacts have been included, if there were, there would be even more lines on the map! The map is drawn to scale so those not conversant with the distances in Australia can at least work out the path distances of contacts. Unfortunately, some promised logs have not arrived here by my deadline for copy *so* the information shown relates purely to what I have observed or heard on the air and been involved in during my own contacts. My relatively large notebook contains 19 pages of information gleaned from listening around the bands since the beginning of November 1986! Whilst all you other people do not have to bother with notes if you don't want to, if I am to feed you information later, then my pencil does overtime all the time I am on the bands. Jim VK3AZY, would know what I mean — I expect he does plenty of writing too.

The map comes to you E & OE (errors and omissions excepted — or should it be accepted?). I believe it is substantially correct and it has been vetted by Trevor VK5NC, *who* paid me a state visit recently before publication.

To save too many lines going across the Tasman to New Zealand I have again drawn a parallel line system for that country and the point of intersection from other areas does not indicate a specific call area, but just that ZL was involved. Since all four main ZL areas were heavily involved this year, there is no point in dividing them up.

We "down under" have had two exceptional two metre Es years. Last year the Northern Hemisphere did not react in the same way apparently, and did not follow the VK/ZL pattern. It will be very interesting to see if they follow it in June 1987.

THE ENDING

In fairness to the Editor, I think I should start closing off now. I am holding over a couple of letters which will still be relevant next month and extracts from various magazines as well. It is important the results of the summer Es period are written up for posterity soon after it all happens, otherwise it loses its relevance very quickly.

If you want some depressing reading, I suggest you read the article by Leo McNamara and Roger Harrison, in January 1987 AR, entitled *Predicting the size of the next maximum of the solar cycle.* I know Peter VK8ZLX will be really depressed!

Did Darwin miss out on the Es this year or was it that there are no operators. I might have missed them on six metres and nothing heard down this way on two metres. Don VK6HK, told me that VK6UF, on Koolan Island, accessed the Perth repeater VK6RAT, on Es but no contacts. VK6GU, worked Japan from Wyndham on two metres, but has now shifted to Derby. With the change of angle it will be interesting to see if Japan is workable!

On 5.7 GHz, Don VK6HK, has equipment with an output of 1 mW and this signal is detectable at two kilometres using an inside dipole. More testing is going on!

Finally, I did not sum up the Es period on six metres. Suffice to say it has been a great year in most places (there have been a few quite spots), and all VK States and ZL districts have been worked by most operators. So you have had VK1, 2, 3, 4, 5, 6, 7, 8, ZL1, 2, 3, 4, P29, YJ8, 5W1, 3D2, ZK2, FK and, of course, VK0. I have never heard any H44 or VK9 activity.

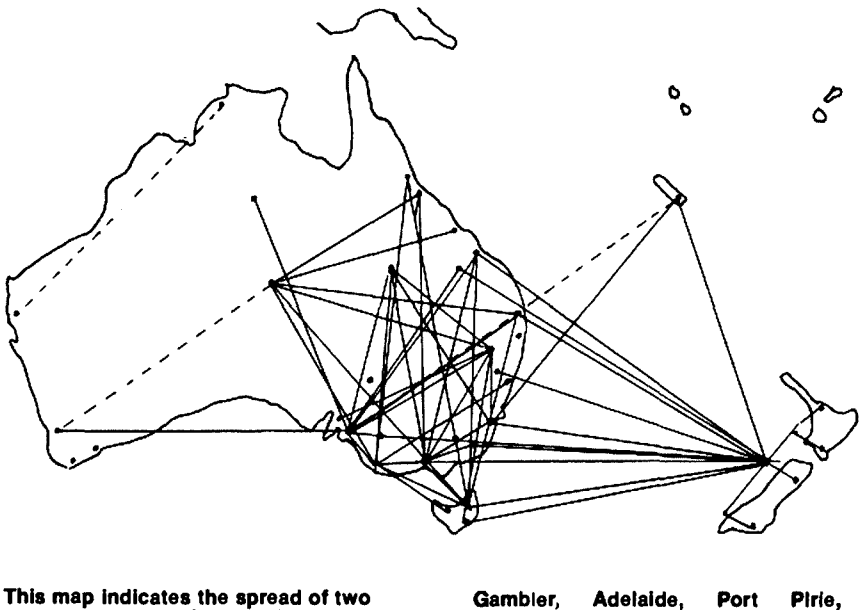
Our thanks must go to Neville VK4ZNC, for mounting the DXpedition to the various areas of the Pacific (ZK2, 5W1 and 3D2) which have given a number of operators their first chance to work some rare countries on six metres. I would also like to commend Nev's skill as an operator, he certainly is able to extract the most from the band and give the maximum of contacts possible in a given time. Well done, Nev.

CLOSURE

Closing with two thoughts for the month: *One who never asks knows either everything or nothing* and *Some people make you feel at home. Others make you wish you were.*

—73 *The Voice in the Hills*

ar



This map indicates the spread of two metre contacts during late-December 1985, between Australia, New Zealand and New Caledonia. To stop crossing lines into New Zealand all contacts have been indicated to a central point, which could mean any one of the four ZL call areas. The dots around the Australian coast-line, starting from North Queensland and going clockwise are for Cairns, Townsville, Rockhampton, Mackay, Brisbane, Byron Bay (blank), just inland is Narrabri, Taree, Sydney, Canberra, Melbourne, Mount Gambier, Adelaide, Port Pirie, Esperance and Albany (blank), Perth, Carnarvon and Darwin at the top. In the centre is Alice Springs and above that Tennant Creek. Longreach is in Central Queensland and Springsure/ Emarald is further east towards Rockhampton. The dotted lines indicate signals heard but not worked. Tasmania shows Burnie in the north, Launceston and Hobart towards the bottom. Noumea (New Caledonia) is the island in the Pacific with lines drawn to it.

What the Government gives you,
the Government can take away,
and once it starts taking away,
it can take more than it gave!

Attributed to Samuel Gosper, US Labour Leader, 1850-1924, and published in *QRM*, November 1986

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TECHNICAL MAILBOX

COAXIAL CABLE

VK3 . . . Mitcham, Victoria
(What about some input other than VK3! ! !)

"I have heard that coaxial cable commonly used as antennae feedline has a useful life span of six years. Is this true? How can I check if my existing feedline or secondhand coax is okay?"

Well John, your questions brought back memories of one of my past encounters with secondhand coaxial cable, once purchased from a now defunct secondhand outlet. Beautiful half inch RG-8, it appeared in genuine 1948 mint-condition! I lost no time in installing the connectors, ran it up the tower and attached it to the 50 MHz beam. Fired up the rig — beauty . . . 1:1.05 SWR!

It soon became abundantly clear that signals from across town were some 40 dB lower than normal. Conversely, my signal was similarly attenuated.

Attenuation or lossy coaxial cable! ! ! Wish I had kept the cable for I would love to donate it to a certain local who has just moved in on my patch.

Back to John's questions — firstly, with respect to the useful life of coaxial cable. The six years you mention John, does not appear to have much substance and may have been promoted by those retailing such products? It is more to do with just how well it has been installed and maintained. Cockatoos can play a significant role if you have them in your area.

It is probably best to differentiate between modern coaxial lines to those produced prior to 1975. It is true that in earlier types the material used for the insulator and outer protection cover degraded with age. The inner, as many will recall, will be found to have changed colour from milky or translucent to that of a distinct yellow. These visible changes signal that the loss of the cable may well have increased above that when originally manufactured. The outer covering may also become brittle to the point of cracking and generally is the result of the sun's ultra-violet radiation.

The modern versions have improved dielectric properties; eg foam, lower loss and outer protection less susceptible to ultra-violet radiation.

Firstly, I believe that if the price exceeds that equivalent to "falling off the back of a truck" figures. . .don't buy! Good coaxial cable should be the next priority after your rig or even taken to the extent of purchasing a less expensive rig and spending more on your feedline. In other words, secondhand coaxial cable is a risk and especially if you wish to use it for VHF/UHF. .don't. Secondhand Heliax® is somewhat different. In this case the product is of a modern generation where the cost is significantly dearer and, as such, a "punt" is worthwhile.

Now for some visual tips to guide you. Naturally, ascertain that the length is suitable and you will not have to use joiners. Next, have a look at both ends by stripping back about 30 cm to expose the shield. Is the shield bright and shiny without any sign of corrosion? Is the centre insulator translucent and not showing signs of yellowing? Strip back a small piece of the insulator. The centre conductor should also be bright and shiny. The point here is to be sure that water has not found its way into either end of the cable.

If both ends appear sound, the next step is to carefully inspect the entire length for cuts, nicks or abrasions that may have allowed moisture to enter. Reject if the outer cover has been damaged.

In the case of foam Heliax, repeat the above and additionally inspect the outer for possible crimping. Reject! In this case, it is difficult to be sure that moisture has not entered the ends of the Heliax, however if there is slight discolouring this is a fair sign of trouble. It is wise, before installing connectors on such cable, to assume moisture ingress and to cut 30 cm from each end. Whilst mentioning connectors for Heliax, remember that these are most expensive if you should have to purchase them new.

Finally, when inspecting your prospective buy, make sure of the cable impedance. Trying to match a 50 ohm load via 75 ohm coaxial cable can cause considerable consternation.

As can be seen, moisture is a major problem. Should it penetrate the ends, can they be cut back sufficiently to overcome the problem (and still leave enough for your run!). If it has penetrated mid-length it would be scrap value only. It is amazing just how far moisture can travel down a coax, having entered solely via a poor connector.

It can be seen that installing coaxial cable is just not as straight forward as you may wish. Connectors taking the weight of the feedline, coaxial cable rubbing on towers or sheds, sharp bends or in line connectors should be avoided.

Now regarding the method of measuring your feedline loss. It is worthwhile to remember that even if water has entered the cable and losses are present, it is likely you will be unable to pick this from measured SWR, which may improve.

Assuming you have both ends of the cable available in the shack, connect the far end to a matched dummy load and the near end via a power meter to your transceiver. If you do not have these items, try and borrow them from a friend. Forget the "old wives tale" of using incandescent light bulbs. Switch to CW and adjust your output power to the highest possible without overtaxing the final. Without changing your transmitter settings, move the power meter to the dummy load end of the line and repeat. Note the power at this point. Calculate the line loss in dB. (You work out how — a refresher course!). Relate this figure in dB to the length of your coaxial cable with that of the manufacturer's published loss in dB/100 feet or dB/30 metres. If a noticeable discrepancy is apparent then check your connectors again and, if okay, (I do not subscribe to cheap "mud" versions), it is time to make a decision. .This attenuation will add to your receiver noise factor and on VHF/UHF it is paramount to keep such losses as small as possible.

The bottom line is — do not skimp on your feed. It is money well spent, should last for years if installed correctly, and may well be cheaper than a linear amplifier which will only improve your transmission.

In most instances, a good feedline will improve your station's overall performance *more* than adding a linear.

A top feedline, plus a linear. . .well that is a different story!

It is pointless having a "big mouth and wax in your ears"! ! !

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Try This!

COMMUNICATIONS/MUSIC SPEAKER SYSTEM

Rodney Champness VK3UG
31 Helmes Court, Benalla, Vic. 3672

In the January issue of *Electronics Today International*, there was a project on a communications speaker. This, to me, was quite interesting but it had one drawback in that, if you wish to listen to music it was necessary to disconnect it and replace it with another speaker or endure poor reproduction of the music.

I decided there was an easy way out of the problem, build the system with a switch that bypassed all the frequency shaping components. This was done and, to equalise the audio output, a resistor was wired in series with the speaker.

The speaker system now performed both operations well. The switch was mounted in a convenient position on the front panel of the speaker box and was suitably labelled.

The only extra components used are a DPDT toggle switch and a half- watt 3.9 ohm resistor.

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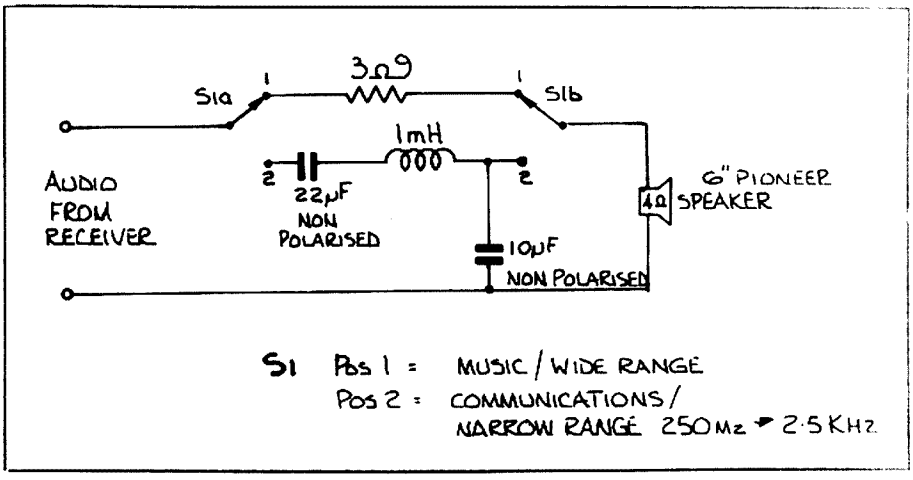
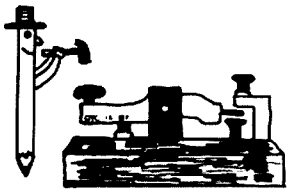




Pounding Brass

Gilbert Griffith VK3CGG
7 Church Street, Bright, Vic. 3741.

I love seeing photographs of other amateur shacks. I am as ready as the next person to purloin an idea. So, whenever I am visiting or looking at shacks, I always take note of any layouts that look particularly good.

Many amateurs can get along quite well on the dining-room table, if allowed. But I prefer to be as efficient as possible, especially as I am a little pushed for space, in a 2m x 2m x 1.2 metres wide old storeroom/cupboard over the stairs. Therefore, I have about one square-metre of floor space and the same in desk space. I made the desk-top about 1.2 metres deep so that I can put a rig on it and still have room for pads, logs, keyers, coffee, etc.

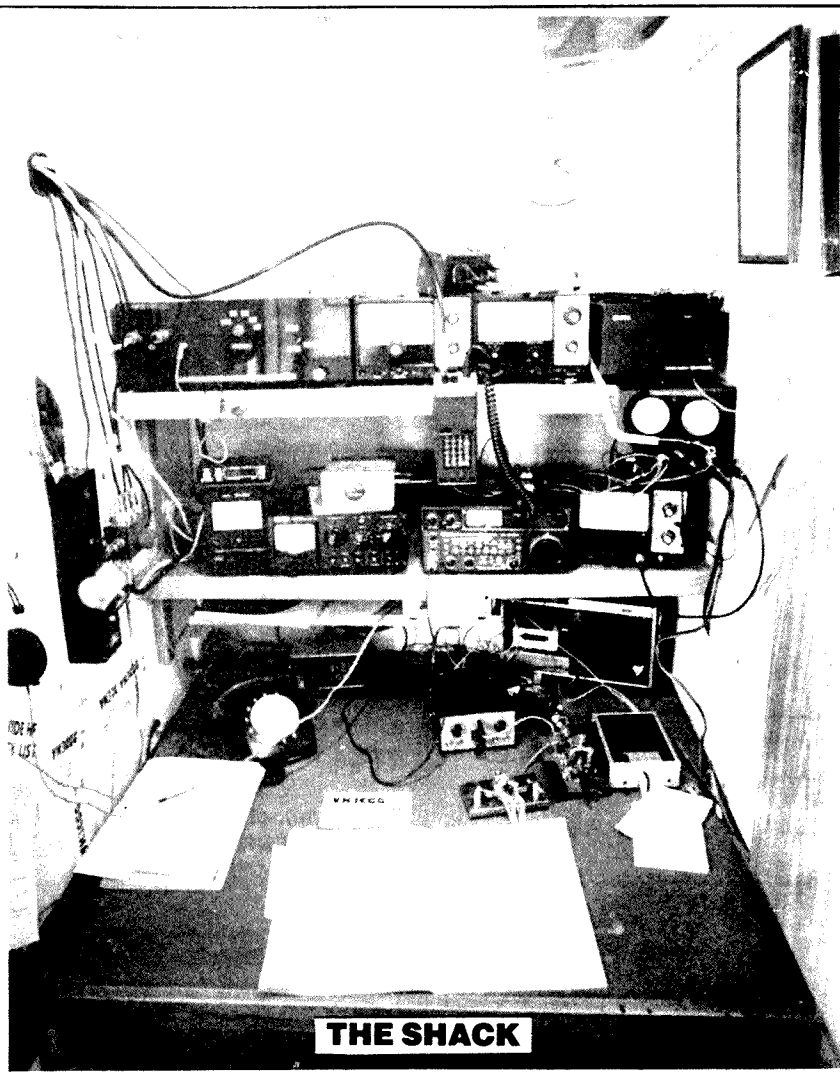
If you have more than one rig, a shelf or two can be built over the desk to hold as many pieces of equipment as you like. Try starting your lowest shelf at about 300 mm above the desk-top so that you can rest your elbow on the desk whilst tuning — the readouts then come to about eye-level. The rest of the layout is up to yourself — it may be quite different if you are a "south- paw", or if you prefer phone to CW!

Try to make your shack comfortable. I fell it should be as comfortable as your bed as many of us seem to spend as much time in the shack as in bed!

There is nothing quite so frustrating as having to curtail a QSO or a good rag-chew because the other person is freezing to the key or can't hear because of the rain on the roof. A good supply of Insulation or cane-lte lining does wonders and only take you a day or so to install. (It will also give you a great surface for pinning up QSL cards, tool). I have cut numerous holes in my cane-lte lining to install a tuner, power-board, etc, and all it took was a ruler an a sharp knife.

If you need to add height to your chair, use castors — they are easy to weld on and may save you from a sore back.

If you are starting afresh, ensure you install a good earth. Heavy braided cable can be run from terminals (as many as you can) to a few long stakes in the ground outside the shack. Consider a quiet extractor fan as, with all the insulation, you will find that even on a cool night your gear will warm the shack considerably and opening the window will only invite the mosquitoes. (Have you ever tried to work with headphones on and with a "mozzie" buzzing around you?).



THE SHACK

I have mounted a 200 mm piece of 50 mm plastic pipe through the wall to exit my antenna wires — it is easy to thread a wire complete with a coaxial plug through, even with seven or eight wires already installed. If it is permissible in your locality, install a large circuit breaker in the 240 volt feed to the shack, if you feed the clock/s from the lighting circuit you can then pull the big switch to turn everything off.

As for antennas, I think I will leave that up to you — or you can make suggestions to me! What do you use? I have a five-way coaxial switch with five tuned antennas for three different bands. This is fed to one input of the transmatch/power/SWR meter so that, no matter which of the antennas is 'on' I can press one button and I'm on the 20 metre beam, or press another and get the antenna matched to another band, via the tuner. It takes me no more than five seconds on four watts to fine-tune a mis-matched antenna or a long wire, and I refuse to talk to anyone who takes more than 10 seconds to tune-up, especially when it is on top of someone else. I cannot understand why an operator wishing to break-in cannot QSY 2 kHz down to tune-up and then come back on frequency to call! Any comments?

Do I give you the impression that I am an efficiency expert? I hope not. It is just that, if you don't do your best, you will never be a good operator. Whether you work DX or contests, you will have to be good if you want the best, or most contacts. Being an award holder or a contest winner should not take brains or a lot of money, it needs dedication and effort. Who was it who said; "you get out of something, that which you are prepared to put in"? For instance, what happens at your place in an emergency? Have you a spare antenna rolled up somewhere? What about batteries? These days we can expect to be called on to do our share in an emergency, and it is good PR if you are prepared. (Even better if you tell people about it).

A couple of ex-Telecom batteries, or even slightly worn car batteries will keep you on air, even at reduced power. All you need is something to keep them charged, anything from a solar-panel (they are getting cheaper), to a mains charger or an old car alternator and mower engine. You might even get involved in the John Moyle Memorial Field Day, the once-a-year-contest that everyone participates in.

Well, there's a few ideas for those days and nights when the QRN is just too much. How about sending me a photograph of your pride and joy — the shack — for this column?

I received a letter recently from Merv VK3ADX, who has built nine paddles. Merv was referring to my Gilcher article in January AR, and asked "What is the definition of a good paddle? Is it individual choice or are there definite parameters to be met?"

I have a couple of my own ideas which I incorporated into the Gilcher paddle, but maybe you can help. Can one learn to drive any paddle well? Do we go for price, looks, function or what? I have heard some terrific CW sent on a hacksaw blade used as a keyer, conversely, I have heard some real trash from a Bencher paddle!

A few months ago, I built a paddle with no moving parts at all, just two touch plates, thinking it would be the "ultimate." It now belongs to Phil VK3CDU, who calls it the *Beast*. I thought the idea was new, but since then I have seen a circuit for the same sort of paddle in a very old magazine. The old circuit even had a sensitivity control and a power supply, so it's another case of 'it's already been done.'

However, it was fun building it and crazy learning to send on it, as you had to take the finger right off the contact and only lightly touch it to generate CW. Have a try yourself and see if it suits you — cost is about 50 cents, or less!

73 es cul, Gil VK3CGG.

WICEN News

Ken Ayres VK4KD
STATE WICEN CO-ORDINATOR
WIA Queensland Division

WICEN IN A NUTSHELL

HOW OFTEN HAVE YOU HEARD AMATEUR RADIO IS ONLY A HOBBY

Agreed, we all enjoy the chit-chats with our amateur radio friends, get a thrill out of working the elusive country or experimenting with RTTY, ATV, Packet Radio, Satellite, etc — that is the "Hobby" we all enjoy.

WICEN is *NOT* a hobby, it is a *SERVICE* provided by the Amateur Radio Service for the Statutory Authorities and in participating we are putting something *BACK* into the hobby, instead of *TAKING* all the advantages that the hobby offers.

As a Back-up Communication Service for Australia, we are dealing with the authorities, whether it be the State Emergency Service, the Police, the Army or the Navy.

Therefore we have to have the following:

1 A Chain Of Command
2 Discipline
3 Training

1 A CHAIN OF COMMAND

Any organisation, if efficient, has to have a policy. In the case of WICEN this is set by the Federal Executive of the Wireless Institute of Australia through and on the recommendations made by the Federal WICEN Co- ordinator in Canberra, ACT.

This policy is given to the State Co-ordinators, who are responsible for organising the State accordingly.

Whilst WICEN, in the Individual States, is an autonomous organisation, it is subject to any by-laws laid down by the State WIA Divisional Councils within the overall policy. Each State Co-ordinator works closely with the State Council and important issues, such as financing or major changes on the state organisation, are mutually agreed upon.

In Queensland the chain of command for WICEN is as shown.

STATE CO-ORDINATOR
Regional Co-ordinators (Regions 1, 1A, 2, 3, 3A, 4 and 5)
WICEN Officer — WICEN Officer
WICEN Operators — WICEN Operators
WICEN Operators — WICEN Operators

A Regional Co-ordinator is responsible for a number of *WICEN OFFICERS.*

A WICEN Officer is responsible for a group of *WICEN OPERATORS.*

Each group has its own Net Control Operators, Signal Clerks and Deputies.

2 DISCIPLINE

We are not a Para-Military Organisation as has been sometimes said.

We each have to carry out the responsibilities as instructed by the person delegated to Issue such responsibilities.

Such persons are elected or nominated by popular choice in a democratic manner. If any of us acted contrary to such instructions, chaos would soon result.

Bear in mind that we could be involved with a life and death situation and any foul-up or delay could result in a tragic result, either to persons or property.

The regulations clearly state that to handle Emergency Traffic for the Statutory Authorities this can only be done by a recognised Emergency Organisation, ie WICEN.

It is not mandatory to be a member of the Wireless Institute of Australia to be a member of WICEN.

In Queensland, we have recently issued a policy in conjunction with the authorities, which requires that members of WICEN groups providing communications for the authorities *to formally join the State Emergency Service.*

This provides insurance protection from claims arising for personal injury during an emergency or disaster. Under certain circumstances vehicle and/or equipment damage may be covered.

It also gives members of such groups the privilege of being issued with a SES Identity Card so that, if necessary, one can enter an area in the course of duty which may be prohibited to the general public.

On formally joining the SES one does so as a WICEN Communicator and would not be expected to carry out rescue work as the normal SES Personnel are so trained to do.

A local group of trained WICEN/SES members can be approved and recognised by the SES as a Special Resources Group.

At all times, WICEN personnel are expected to carry out the duties as detailed by the WICEN officer only.

The SES gives the WICEN officer the communication tasks required.

3 TRAINING

WICEN Operators should be completely familiar with:

a Types of messages and how to speak
b Phonetic alphabet and pronunciations
c Precedence and priority of messages
d How to offer and receive messages
e Use of pro-words
f Map reading

This training, and more, is laid down in the *Queensland WICEN Manual of Operating Procedures and Information.*

One duty of the local WICEN officer is to ensure that the members of his group are *trained* in these procedures, either by regular lectures, on-air training nets and/or practical exercises.

WICEN NEEDS YOU! ! !

The more communications during an emergency or disaster, the more lives can be saved or property salvaged.

The larger the area covered and the greater participation of trained radio amateurs, the better the service we, as stations in the Amateur Radio Service, can provide for the authorities.

Individual radio amateurs can, alternatively, be of service to the community by participating in *Welfare Traffic* for the public provided by the *Australian Traffic Network (ATN).*

For further information on this network, please write to Sam Voron VK2BVS, 2 Griffith Avenue, East Roseville, NSW. 2069 or John Aarsse VK4QA, PO Box 211, Nambour, Old. 4560 (SASE please), or see page 176 of the *1985/1986 Australian Radio Amateur Call Book,* remembering that operational procedures may be slightly different to those of WICEN, but still require a similar discipline, training and chain of command to be of value to the community.

Inquire at your local club about WICEN or read page 166, of the *1985/1986 Australian Radio Amateur Call Book,* or write to your State WICEN Co-ordinator.

WICEN — BE IN IT!

ar

Intruder Watch

Bill Martin VK2COP
FEDERAL INTRUDER WATCH CO-ORDINATOR
33 Somerville Road, Hornsby Heights, NSW. 2077

As I write this column in January 1987, with the thermometer sitting on 30 degrees Celsius, I am reminded of the world-wide fraternity of amateur radio, as I recall receiving Season's Greetings from Intruder watchers in Japan, the United States, Holland, New Zealand, all States of Australia and from many other amateurs scattered in various parts of the world. Surely no hobby is as far-reaching as ours! Intruder-wise, the scene has been fairly static (no pun intended) but we continue to receive support from interested amateurs and SWLs.

Those who contributed for November 1986 were:

VK1GD, VK2s CNS, DVW, G H A Bradford, VK3s AMD, DKE, XB, VK4s AFA, AKX, BG, BHJ, BTW, DA, KHQ, KHZ, VK5s GZ, TL, VK6s JQ, RO, XV, VK7RH and VK8JF.

The breakdown of reports is as follows:

308 broadcast intruders (A3E), 190 CW intruders (A1A), 95 RTTY intruders (F1B), other modes 192, and 59 intruders sent their call sign.

One interesting report is that Colin VK4AKX, is hearing the USSR Naval intruder *UMS* on VLF, 16.5 kHz! This intruder is really getting around.

The *Voice of America* was reported by several on 14.070 MHz, and we hope this is only a temporary transgression.

Jammers were prolific on 15 metres, and were all presumably USSR-based, according to their call signs.

The Woodpecker was reported on 7, 14 and 21 MHz.

As reported in an earlier column, the statistics for the whole of 1986 will probably be available for the April issue of AR.

VK3XB is suffering a lot from cordless telephone interference on 3.511 and 7.022 MHz.

Bumped into Roy VK6XV, quite by accident on 20 metres recently, who was operating the special event station, VK6CUP. Roy was promptly joined by Roy VK6BO, and Bruce VK6XZ, the IW Co-ordinator for VK6. It is always nice to meet people by chance on air.

In six years, I have worked *one* South African station, 'way back in 1984, and his card arrived via the bureau a couple of days ago. Almost restored my faith in human nature. (ZS's are very rare in this shack!). Wish I could get one from VU.

So, here we are, well into another year, and we hope that the year in retrospect will see more good things to report on intruder activity, and less gloomy news. See you next month, and take care.

ar

WIA VIDEO TAPE PROGRAM TITLE LISTING

SEE NOTE	TITLE (In chronological order within each subject grouping)	LECTURER	PROD	APPROX TIME In MINS	COL/ B&W	YEAR MADE/ 19..	DESCRIPTION & OTHER INFORMATION
GENERAL PROMOTIONAL FILMS							
—	The Ham's Wide World		ARRL	30	Colour	89	*Superseded by "The World of Amateur Radio"*
—	This Is Amateur Radio		ARRL	15	Colour	70	*Pitched at Teenagers*
—	Moving up to Amateur Radio		ARRL	15	Colour	78	*Pitched at CBers*
©	7J1RL DX- pedition		JARL	60	Colour	78	*General Amateur Radio Interest: LOAN ONLY*
—	This Week Has Seven Days looks Into Amateur Radio		HSV7	25	Colour	78	*Pitched at Teenagers: Includes some ARRL footage*
—	Amateur Radio — The National Resource of Every Nation		VK5KG	6	Colour	79	*Encapsulates AR: good for public exhibition*
—	The World of Amateur Radio		ARRL	30	Colour	82	*Pitched at Adult Level*
HISTORIC INTEREST							
©	Wireless Telegraphy — circa 1910		?	10	B&W	10	*Archive Material courtesy David Wardlaw VK3AOW*
‡©	Amateur Radio (TV Pilot Program		WIA NSW	30	B&W	66	*Archive Material courtesy TEN Channel 10*
—	Opening of Burley Griffen Building — SA HQ		VK5KG	50	Colour	77	*Archive Material*
—	History of ATV in South Australia		VK5KG	30	Colour	80	*Archive Material, still building*
—	ATV in Australia 1978 — made for British ATV Club		VK5KG	30	Colour	78	*Archive Material*
—	ATV in United Kingdom 1978 — reply from BATC		G8CJS	30	Colour	78	*Archive Material*
‡	Port Macquarie Field Day — 1983		VK2BFM	25	Colour	83	*Archive Material*
‡	VK2 75th Anniversary Seminar Keynote Speeches		WIA NSW	135	Colour	83	*Dr David Wardlaw & State Manager DOC*
©	Heard Island DX-peditions		Ch 2,7,9&10	20	Colour	84	*Archive Material: No Loan or Copy Available*
‡	Heard Island DX-pedition	VK2BCC	WIA NSW	60	Colour	86	*Raw Unedited; from 1986 VK2 Seminar*
‡	Opening of Amateur Radio House — NSW HQ	VK2BCC	WIA NSW	102	Colour	83	*Archive Material*
ANTENNAS AND PROPAGATION							
©	G6CJs Aerial Circus	G6CJ	WIA	90	B&W	77	*The Definitive Antenna Lecture: Loan Only*
—	Wire Antennas	VK5RG	VK5KG	40	B&W	78	*Antennas for HF and Antenna Tuners*
—	Loaded Wire Antennas	VK5NN	VK5KG	50	Colour	80	*Using Inductive and Capacity Loaded Antennas*
—	Getting Started in Understanding the Ionosphere	VK5NX	VK5ZBD	50	Colour	83	*How the ionosphere Aids HF Communication*
‡	VHF Signal Enhancement by Aircraft	VK2ZAB	WIA NSW	70	Colour	86	*Raw Unedited; from 1986 VK2 Seminar*
‡	Antennas and Directivity	Guy Fletcher	OTC	73	Colour	85	*Lecture given to a group of radio amateurs*
‡	Antenna Rotator Systems	VK5AIM	VK5KG	50	Colour	88	*Servicing the several different types*
‡	Broadband Antennas	VK5RG	VK5KG	62	Colour	88	*Includes terminated antennas*
SPACE — GENERAL INTEREST							
—	Apollo 13 Disaster	VK5JM	VK5KG	90	Colour	80	*Australian Tracking Procedure Saved Apollo 13*
—	SSTV Pictures from Space — Voyager		VK5KG	15	Colour	83	*SSTV Pictures Converted from Saturn Fly-Past*
—	AUSSAT — Australia's Domestic Communications Satellite	VK5JM	VK5KG	62	Colour	84	*Technical Description of Services Offered*
‡	Amateur Radios Newest Frontier		ARRL	26	Colour	85	*Amateur Radio in Space; General PR*
‡	Working W5LFL in Orbit from VK10RR		Richard Elliot	23	Colour	88	*Raw Unedited Actuality Footage*
AMATEUR SATELLITES							
—	Getting Started in Amateur Satellites	VK5HI & VK5AGR	VK5KG	60	Colour	83	*Superseded (see below)*
—	An Introduction to Amateur Satellites (Part 1)	VK5AGR	VK5KG	60	Colour	84	*An Overview of Amateur Satellite Operation*
—	Micro-Computer Aids to Satellite Tracking (Part 2)	VK5AGR	VK5KG	30	Colour	84	*Programs for Tracking and Decoding Telemetry*
—	Using Phase 3 Amateur Satellites	VK5HI	VK5KG	90	Colour	84	*History, Construction and Use of High Orbit Satellites*
—	The AMSAT OSCAR Phase 3 Story	Dr Karl Meinzer DJ4ZC	VK5KG	80	Colour	85	*"The Father of OSCAR" includes film of the Launch*
‡	Antennas for Satellites	Dr Trevor Bird	WIA NSW	75	Colour	88	*Raw Unedited from 1986 VK2 Seminar*
DATA TRANSMISSION							
—	Getting Started in Amateur RTTY	VK5JM	VK5KG	85	Colour	83	*RTTY using Teleprinters and Micro-Computers*
—	Amateur Packet Radio	VK5AGR	VK5KG	60	Colour	84	*Theory and Demonstration*
‡	Packet Radio — 10 months on	VK2KYJ & VK2AAB	WIA NSW	65	Colour	85	*Raw Unedited from 1986 75th Anniversary VK2 Seminar*
‡	X.25 Protocols and Packet Switching	Barry News	OTC	47	Colour	88	*Lecture given to a group of radio amateurs*
AMATEUR COMPUTERS							
—	Demonstration of VX5RTVs Micro-Compater Controller # 1	VK5KG	VK5KG	10	Colour	79	*First Micro-Computer Controlled Repeater in Australia*
—	Understanding Micro- Processors	VK5PE	VK5KG	60	Colour	88	*A Somewhat Dated Technical Description*
—	An ATV Ham-Shack Micro- Computer	VK3AHJ	VK3AHJ	10	Colour	81	*Describes now unavailable Micro-Computer Kit*
—	Getting Started in Amateur Micro- Computers	VK5IF	VK5KG	33	Colour	83	*Demonstration of Hard and Software for Amateur Radio*
AMATEUR TELEVISION: Technical							
—	The Signal to Noise Story	VK3ATY	VK3AHJ	45	Colour	82	*Superseded by "UHF Pre-Amplifiers" (see below)*
—	UHF Pre- Amplifiers	VK3ATY	VK3AHJ	45	Colour	83	*Explanation and Demonstration of Low Noise Pre-Amplifiers*
—	Getting Started in Amateur Television	VK5KTV	VK5KG	55	Colour	83	*How to Set-Up an Amateur Television Station*
—	Testing Amateur Television Transmitters	VK5KG	VK5KG	50	Colour	83	*How to Correctly Measure Amateur Television Systems*
*	High Definition Television Tutorial	Don Fink	WB2LLB	60	B&W	83	*A Look at What is to Come in Broadcast Television*
*	ATV Hamfest, York Pennsylvania, September 1983	Various	WB2LLB	360	Colour	83	*Various ATV Technical Lectures from USA*
AMATEUR TELEVISION: Activity							
—	ATV in Australia 1980/81 — Made for British ATV Club		VK5KG	60	Colour	80	*Clips from ATV Groups in VKs 2, 3, 4, 5, and 7*
—	ATV in United Kingdom 1978/81		G8CJS	30	Colour	81	*Re-make of their Previous Effort*
*	CQ ATV DX International 1983		WB2LLB	60	Colour	83	*ATV in USA and Europe*
	ATV in Victoria, 1984		VK3AHJ	54	Colour	84	*Courtesy of "The Roadshow Gang"*
AMATEUR TELEVISION: General Interest							
—	Low Definition Television	Chris Long	VK5KG	25	Colour	82	*Re-Creation of Television as Transmitted by Baird*
*	Overseas Television Clips about Amateur Television, etc		WB2LLB	60	Colour	83	*Broadcast Television Clips from USA and Europe*
—	Model Aero-Nautical Mobile ATV	VK5GO	VK5KG	6	Colour	83	*Amateur Television Camera and Transmitter Mounted in a Model Aeroplane*
‡	VK5RCN — Australia's First Wind Powered ATV Repeater	VK5KAU	VK5KG	61	Colour	88	*A Tour in and Around VK5RCN*
MISCELLANEOUS							
—	An Auxiliary Battery Charger	VK5NX	VK5KG	30	Colour	81	*Charging a Second Mobile Battery*
—	Lecture — Winning Fox- Hunts	VK5TV	VK5KG	45	Colour	81	*How to do it from one who has!*
—	Getting Started in Amateur Construction	VK5AIM	VK5KG	50	Colour	83	*Mechanical Hints for Novice Constructors*
—	Communication Consequences of Nuclear War	Dr John Coulter	VK5ZBD	60	Colour	83	*Why Your Gear May Not Survive, Even if You Do*
—	The Far Eastern Broadcasting Company		VK5KG	60	Colour	84	*How a Shortwave Broadcaster Operates*
—	The Australian "Over the Horizon Radar"	Dr Paul Whitham	VK5KG	60	Colour	84	*How the "Australian Woodpecker" Works*
—	What to Expect When the Radio Inspector Calls	Geof Carter DOC	VK5KG	34	Colour	84	*Geof is a Department of Communications Field Officer*

‡	**Doppler Direction Finding for Fox-hunters**	VK2BYY	WIA NSW	43	Colour	**85** *Raw Unedited from 75th Anniversary VK2 Seminar*
‡	**Fitting BNC Connectors**		OTC	7	Colour	**85** *Correct Assembly of Crimp Type BNC Plugs*
‡	**Handling Static Sensitive PCBs**	Paul Targent	OTC	6	Colour	**86** *Improving Reliability of Printed Circuits*
‡	**Extra License Grades**	VK2ZTB	WIA NSW	70	Colour	**86** *Raw Unedited; from 1986 VK2 Seminar*

NOTE:
© denotes Copyright: no copy service
‡ denotes New Addition
** denotes Optically Converted to PAL from NTSC by WB2LLB — noticeable flicker*
Standard Formats: Beta; Video 8 St & L Play; Dolby and Hi-Fi sound — please specify when ordering

John Ingham VK5KG
FEDERAL VIDEOTAPE CO-ORDINATOR
37 Second Avenue, Sefton Park, SA. 5083

Now *every* radio club can provide their members with quality technical lectures on subjects covering the whole range of amateur radio activities by taking advantage of the WIA Federal Videotape Library. You will find this a boon, particularly if yours is a country club which often has difficulty obtaining a variety of expert lecturers for regular meetings.

Individual amateurs and librarians should take note of the new Duplication Fees at the end of this article.

For radio clubs affiliated with the WIA, it is inexpensive and easy. Here is how it works:

Except for those titles for which the WIA does not hold a copyright licence, all you have to do is . . .

Supply the Videotape Co-ordinator with a video-cassette of an available format

Enclose another stamped, return-addressed padded mailbag and the program is free for you to use in support of amateur radio in your area . . . including copying and transmission over the air if you wish

Those programs which are copyright are available only on loan. To obtain any of them send with your request . . .

Information about your preferred VCR format

A statement signed by a responsible officer of your club that "I undertake that while (Program Title) is assigned to me, I will not allow it to be transmitted over the air, nor copied by any means whatsoever, and that I will return the same promptly after showing".

A stamped addressed padded mailbag suitable for cassettes of your preferred format.

The present available formats are . . .
U-MATIC — size 260 x 173 x 40mm, mass 900 grams (to institutions only). Standard play — one hour maximum only. Standard sound only on channel 2 (No Dolby).
VHS — size 200 x 110 x 30mm, mass 350 grams. *Standard play four hours maximum, or long play eight hours maximum as requested. * Standard Sound — Dolby On or Off as requested. Hi-Fi FM Sound also present on all VHS cassettes.
BETA — size 160 x 100 30mm, mass 300 grams. Standard play three and a quarter hours maximum only. Standard sound only (No Dolby).
VIDEO 8 — size 103 x 68 x 20mm, mass 80 grams. *Standard play one and a half hours maximum, or long play three hours maximum as requested. Hi-Fi FM sound is standard (No Dolby).

Obviously, the smaller and lighter the cassette, the less postage.
* NOTE: Be sure to request Standard or Long Play, Dolby On or Off.

NOTE TO INDIVIDUAL AMATEURS

Since the inception of the WIA Federal Video Service, cassettes have been made freely available to all comers, especially isolated amateurs. However, recently there has been a rapid rise in the number of requests from individual amateurs, some asking for over 10 hours of programs at one time.

Video duplication is a real-time, one-at-a-time operation for which the costs of maintenance of the equipment is not small. Obviously, the Service is much more economical if, say, one tape is seen by 30 members of a club than if each of the 30 members were to request their own personal copy. If every member of the WIA requested just one program, it would take about four years at 40 hours a week to service!

So, in an effort to encourage requests from groups of amateurs rather than individuals, from now-on a Duplication Fee of $2 per hour, or part thereof, will be payable in advance for all requests from individuals. All such fees will go towards upkeep of the duplication equipment.

NOTE TO LIBRARIANS

A number of educational institutions have already availed themselves of the technical lecture tapes from the WIA. While this service will continue to be available, from now-on a Duplication Fee of $10 per hour, or part thereof, will be payable in advance by all institutions not affiliated with the WIA. All such fees will go towards the production costs of future Technical Lectures.

ar

Contests

Ian Hunt VK5QX
FEDERAL CONTEST MANAGER
Box 1234, GPO, Adelaide, SA. 5001

CONTEST CALENDAR

MARCH	
1	French Phone Contest (concludes)(Rules February issue)
2	YLRL YL-OM CW Contest (concludes)
7- 8	ARRL DX Phone Contest
7- 8	QCWA Phone QSO Party
14-15	John Moyle Memorial Field Day Contest (Rules February issue)
14-15	RSGB Commonwealth Contest (Rules December issue)
21-22	YL ISSB Phone Party (Rules February issue)
21-23	BARTG Spring RTTY Contest
28-29	CQ WW WPX SSB Contest

At this time I do not have details or rules for any contests which will be held during April. I would simply suggest that, If you are interested, look at the calendar for April last year.

I have been advised that the *Commonwealth Contest* is scheduled for March 14 and 15. This, unfortunately, clashes with the John Moyle Memorial Field Day Contest, the date for which was decided upon around the middle of last year (1986). It was necessary that the date for the Field Day Contest be decided at that early stage due to arrangements necessary in connection with simultaneous running of the NZART Field Day Contest.

For some reason the organisers of the Commonwealth Contest have never provided details of dates of this contest to the WIA Federal Contest Manager. It may be that details will have been provided separately to the magazine via another source as has happened in the past. It could well be of benefit if something more positive could be sorted out on this contest in the future, however, I have not had time to chase this matter up as yet. This situation is unfortunate, particularly as I am led to believe that this year is the Golden Anniversary of the Commonwealth Contest.

There does not seem to be very much news on the contest scene for this issue. By the time you read this it will be close to the Annual Federal Convention. One of my tasks will have been to produce my Annual Report, together with whatever recommendations which need to be made to the Federal Council regarding running of contests. Last year I had asked whether some action could be initiated to obtain suitable prizes which could be given to winners of various contests. I have not heard of any results of possible approaches to potential donors of such prizes or plaques, although I am still hopeful that something along such lines can be arranged. Maybe there are some amateur radio equipment suppliers out there somewhere who might read this and be prepared to contribute In some way.

I do hope that members will make themselves familiar with details of agenda items for the Federal Convention which are supplied to each Federal Councillor and that, as a result, a healthy discussion will have ensued regarding not just contest matters but all those matters which of necessity must be addressed If we are going to continue with amateur radio in this country along well devised lines. Please remember that it is only through your interest and support of your own organisation that we can achieve the success we all desire. Running off in other directions and screaming does no good whatsoever and, in fact, can cause harm to our hobby. I would refer you to a recent letter which was printed in the New Zealand magazine *Break In*, a copy of which appeared in this magazine just a few months ago in which I pointed out that, whether or not you like it, the WIA is the organisation which is officially recognised by the Australian Government as representing the amateur radio operator In this country. It thus behoves us as individuals to make ourselves properly aware of the true facts pertaining to the Amateur Radio Service In this country and not to go about spreading mis-information as has happened where other sources other than the WIA purport to be authoritative and claim to have the answers to the problems our hobby may face.

The comments I have made apply certainly to the subject of running of contests and, Indeed, to all of the aspects of amateur radio as well. I would encourage your input and comment to your selected representatives as I believe that we should have a well informed, united and healthy organisation to represent what I believe is one of the best hobbies in the world. You can make your organisation work for you If you are prepared to take an interest in it.

I trust that there will be a good number of stations operating in the John Moyle Memorial Field Day Contest.

Many of you may not be aware of just who John Moyle was. A short resume regarding John, who held the call sign VK2JU, has appeared from time to time in the Call Book. John was a most knowledgeable man and, amongst other things, was a good administrator, had a wide technical knowledge and also acted as editor for the magazine *Radio & Hobbies*, which was the name given to the publication now known as *Electronics Australia*. (Incidentally, for a time it was also named *Radio, TV & Hobbies*).

I can remember very well the days around the mid 1950s when the familiar situation occurred where our bands were in danger as a result of Government policy and a forthcoming World Administrative Radio Conference. Much activity ensued within the amateur ranks with people such as Max Hull VK3ZS, making rapid trips back and forth between Melbourne and Canberra In attempts to lobby politicians and members of the bureaucracy in the interests of amateur radio. It was John Moyle who was chosen to be our representative in Geneva based on his great and proven ability. John went willingly, but carrying with him a burden which very few people ever knew about. By sacrificing the time he spent away in our interests, John showed his desire to help when he could have been spending some of his last days with his family and loved ones. John Moyle was, in fact, suffering from a terminal cancer condition, and whilst he knew it, he did not let on to any but a select few. Even today, this fact is little known. It is therefore, quite fitting that such a contest as John would have approved of should be named In his memory.

This year, once again, our Field Day Contest coincides with the NZART Field Day Contest. This is, of course, by design and resulted from consultation between myself and Jock White ZL2GX, who is the ZL Contest Manager. Whilst the New Zealand contest operates under somewhat different rules, It has been made possible for our Field Day stations to contact the ZL Field Day stations and score additional points for such contacts. I would suggest that you make sure that you fully understand the rules of the contest before commencing operation. They are altered very little from last year.

It may be as well for me to point out that, unlike the rules for our contest, the ZL Field Day stations may only work other *Portable stations.* This thus precludes such as *Home Stations* from contacts with them. The modification of our rules and the coinciding of the two contests should provide added interest for both the Australian and New Zealand field day operators.

Whilst on the subject of field days, I would appeal to all who venture out into the wilds, etc to pay heed to a few safety aspects of their activities. First of all, in connection with generators. Please make sure that you clear away from around your petrol and diesel powered generators any inflammable materials such as grass and twigs and also ensure that your fuel containers are not placed too close to a hot engine. I suggest too that you take great care when re-fuelling as hot engines and gasoline poured about the place can result in a very volatile mixture. We certainly do not want to see anyone come to harm as a result of what should be a fun-type of amateur radio event and we also do not wish to be the cause of bushfires either. Fuel containers should not be left exposed to heat or direct sunlight, so place them in the shade somewhere.

I would also suggest that in many cases it is advisable to peg the generator into position on the ground as often vibration can cause the unit to *walk* and thus move it out of the area which you may have gone to all the trouble of clearing in the interests of safety.

Another most unpleasant occurrence is that of receiving an electric shock. So remember that even portable generating equipment is quite capable of producing same and that such can cause death.

Please ensure that you are properly aware of the requirements for earthing of such devices, both at the generator end and at the transmitting end of the line. Portable earth leakage detector devices properly Installed can play a very useful role here.

On the subject of power lines, I might make the observation that you should be most careful also when erecting any masts, antennas and the like near existing overhead power lines. Contact with such can indeed be fatal. Another tip regarding power cabling is in connection with the lead from the generator to the radio equipment. I would suggest that this lead be as heavy as practicable and also that it should be as long as you can reasonably make it. The heavier the cable means less voltage drop whilst placing the generator a reasonable distance away from the equipment cuts down acoustic noise from the engine and, if placed away from antennas and receivers, the likelihood of annoying ignition interference is also reduced.

There are many other aspects of field day operation which I could refer to, including the need for safe travel to and from the field day site, so you can see that there is a little more to it than just rushing out and doing it. A successful field day *operation is* more likely *if* it is *properly thought* about and planned in advance. So, I hope that the short two weeks or so from when you read this will allow you sufficient time to take yet another look at this aspect of what can be a very enjoyable contest.

When you send in your log entries, I would appreciate some photographs of your activities for publication purposes as well as some short write-up as to the experiences you had. Have fun in the field day — I will be looking forward to making contact with you during same.

You might also bear in mind the possibility of using your field day contest operation to improve the public relations image of amateur radio. Invite your local newspaper or television station to visit your site.

As I write this, the Ross Hull Contest finished just two weeks ago. Up until now I have only received four logs. Included already in the comments received are reports of very little activity. I hope that this will not turn out to really be the case as a lot of work and effort has gone into trying to make this contest more attractive to a larger number of operators. Again, I would state quite frankly, I do wonder at times whether anybody, apart from the few stalwarts who do write to me expressing their opinions, is really interested in what happens with the Ross Hull Contest. Despite putting in time producing a discussion paper and circulating it to all Divisions, I have not received a written reply from any other than the VK5 Division. Perhaps a direct mention of this nature might spur some member/s to query their Council and Federal Councillor as to what they have done about this matter. I can assure you that it does not feel nice to have so many requests for comments ignored particularly when the requests have been made in as polite a manner as possible. Perhaps

one has to accept the fact that in this community the lack of manners has become a normal part of the scene.

The Discussion Paper referred to was circulated to all Divisions back in May 1986, and was also printed in this column so that members in general could become informed and to allow them to express their opinion to their Divisional Councils.

HF CONTEST CHAMPIONSHIP 1986

Provided below are the details of points scored to date in both the Phone and CW sections of the Contest Championship competition for the 1986 contest year. The rules for this contest require that the entrants have participated in at least three of the four HF contests organised by the WIA each year. The contests are:

Field Day, VK Novice, Remembrance Day and VK/ZL Contests.

To date results are available for the first three contests listed. The final results cannot be determined until the results of the 1986 VK/ZL Contest become available. The VK/ZL Contest organisation was undertaken by New Zealand for 1986. I am not aware at this stage as to when the results of the contest are likely to become available. I have listed the points score for the HF Contest Championship for only those stations which have entered at least two of the nominated contests to date. Points are awarded on the basis of 10 points for first place in a contest, nine points for second down to one point for 10th place. These points are awarded and listed on a call area basis.

HF CONTEST CHAMPIONSHIP SCORES 1986

PHONE

CALL SIGN	FD	RD	NOV	TOTAL
VK1LF		8	10	18
VK1RH		1	9	10
VK3DOM		9	9	18
VK3ZI		8	5	13
VK3YH		7	8	15
VK5QX	10	10	9	29
VK5SJ	10		10	20
VK5ATU		5	8	13
VK6ED		8	8	16
VK7NCP		7	10	17
VK7NAI		4	9	13
CW				
VK2DQP		5	9	14
VK2AZR		1	8	9
VK3CGG	10	10	10	30
VK3XB		9	7	16
VK3NK		8	9	17
VK3KS		6	8	14
VK4BRZ		6	8	14
VK4VAT		4	10	14
VK5AGX		9	10	19
VK6AFW		10	10	20

At the December meeting of the South Australian Division I had much pleasure in presenting the Contest Championship Trophies for 1985 to the winners, namely Bob VK5BJA for Phone and Lindsay VK5GZ for CW. This presentation was, however, made only in *symbolic* form as the new trophies for the competition sections have yet to be made available. The Federal Office is currently arranging for the two new trophies to be made. I believe that they will be somewhat unique in design and also particularly appropriate as amateur radio trophies. We will await their provision with great anticipation. I would hope to be able to have a photograph of them published in the magazine in the near future.

Meantime, those concerned can expect to receive small trophies suitably engraved for them to keep.

Well, despite the fact that there did not seem to be very much in the way of news for this month, preparation and typing of the material seems to have taken quite an amount of time.

Once again, all the very best in the Field Day and also in all of your other activities.

—73 de Ian VK5QX.

COMMONWEALTH CONTEST

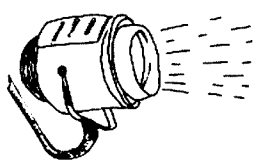
Commonwealth Contest (BERU) regulars are reminded that the contest will run from 1200 UTC March 14, to 1200 UTC March 15.

John Tutton VK3ZC, requests that in the couple of weeks preceding the contest, overseas Commonwealth stations, as well as locals, when contacted, are asked to come on for this, the 50th Anniversary Contest.

GB5CC, operated at RSGB HQ, will be a bonus area of its own, workable by Gs and overseas stations alike.

The medallions for the leading VK entrant and the state team of four will again be up for competition rules — see December AR, P38.

—Contributed by John Tutton VK3ZC



Spotlight on SWLing

Robin Harwood VK7RH
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Well, a quarter of the year has almost gone! It truly amazes me how rapidly time flies as one gets older.

Last month, I reported on the appearance of several clandestine stations in Malaysia and Sri Lanka. The *Voice of the Malaysian Revolution*, which supports the tiny guerrilla bands on the Thai-Malaysian border, has not been heard lately. It was on a nominal frequency of 7.055 MHz on AM, yet it was far from being stable, as it was varying in frequency with the modulation. It may be back on the air by now, and I somehow suspect that the sender packed it in.

The other station was the *Voice of Tamil Eelam* which is thought to be either on the Jaffna Peninsula of Sri Lanka or, probable in SE India. It has now re-timed its broadcasts to 1400 UTC and is still on 7.010 MHz. Patrick McDonald, in Sydney, has been observing the station.

Another clandestine that has been around for a couple of years now is widely believed to be in Transvaal in the RSA. *Radio Truth* broadcasts in English and two African languages, spoken primarily in Zimbabwe. So it is quite easy to deduct where the target audience is. On December 9, it announced that it would be on 3.370 MHz in the local morning and evening hours; ie 0400 and 1700 UTC. This was according to the BBC Monitoring Service. But this does not appear to be the case, as Patrick McDonald, in Dural, heard it on December 19, at 1756 on 5.015 MHz. A Brisbane DXer, Robert Shepherd, also heard it on December 21 at the same time. Rather ineffectual jamming was also noted. Interestingly enough, when the programming concluded, the transmission continued with numbers being read out in Afrikaans, which is the language of the South African white community.

I have been following the propaganda war in the Iran-Iraq conflict, which has been going on for over six years now. Reportedly over one million casualties on either side has deterred the combatants from negotiating peace. Both sides appear intransigent and have been extensively using shortwave radio in their propaganda battle. They also severely jam each other, with the Iraqis winning there!

The number of channels have increased on the Iraqi broadcasts, indicative of new transmitters. Iran is following suit and aims to have 50 transmitters devoted exclusively to Foreign Service programming from four sites. This will, presumably, increase the number of Middle Eastern signals, which are already getting quite numerous. This new QTH in West Launceston appears to be better for signals from that region, than in Newstead. This is probably due to the antenna bearing plus I am several hundred feet higher.

Incidentally, you can readily identify the Iraqi jammers by their high, whistling pulse; eg 7.105 MHz around 0500 and 1300 UTC. This is usually placed on Iranian broadcasts to Iraq, but other nations are also periodically jammed, dependent on the Iraqis are going on the battle-front. 3.774 MHz is an Iranian frequency which usually carries domestic programming yet has come under Iraqi jamming, when they broadcast in Arabic.

It is interesting to hear the two protagonists on radio with martial music and interspersed with sounds of gunfire. Around 0900 UTC you will find the two fairly close together in the 19 metre band. Teheran is on 15.084 MHz, in Farsi, (Persian) and Baghdad is on 15.105 MHz in Arabic. The Iranians on 15.084 have been there for some time, with a French built 300 kW transmitter, but they have apparently been unable to acquire the expertise or spare parts to maintain the senders, as the audio was horribly distorted. They have apparently been able to clean the transmitted signal up recently, for it is much better now.

Other Middle Eastern nations are nervously watching the conflict, particularly Kuwait, which is near to the fighting. You can hear Kuwait, in Arabic, very well on either 9.840 or 15.495 MHz around 0500 UTC. Another station that gives impartial information on the Gulf War is *United Arab Emirates Radio* in Dubai. They can be heard in English at 0530 UTC on 21.700 MHz, which I use as a beacon for Middle Eastern propagation on 15 metres.

There are other stations that the Iranians repeatedly try to jam. There are also many exile groups who utilise senders of some Middle Eastern governments to broadcast back into Iran. Many have been traced back to Egypt. One regular was *Radio Vatan* which was audible on 9.027 MHz and was five kilohertz above Teheran on 9.022 MHz. It was also on 15.555 MHz but has since changed its call, as there has been a combined united front formed of the various anti-Komeni forces, with the notable exception of the Tudeh, who have their own programming from Turkmen SSR and Azerbaijan SSR.

On Sunday, March 1, most international stations make some frequency alterations, because of the seasonal propagational fluctuations. Some stations that broadcast programming to Europe also change the timing to take account of the introduction of Daylight Saving in Europe on March 29. Most programs are on local time rather than UTC, consequently programs are one hour earlier. Also the USSR alter their domestic and foreign service frequencies on April 1, when they go onto Summer Time. All these alterations certainly make it difficult to make a reliable band plan. Incidentally, Daylight Saving finishes on March 15, in Australia and on March 1 in New Zealand. The US commences theirs on April 26.

There have been reports that there are three locations of the Soviet Woodpecker. The first one is at Gomel in Belorussia; the second in the Caucasus Mountains and the third at Nikoleysk an-Amur in the Far East, opposite the northern tip of Sakhalin Island.

Well, that is all for March. Until next month, the very best of listening and 73.

—Robin VK7RH.

International News

IARU INTERNATIONAL CONTESTS

Society	Region	Title	Mode	How Oate Decided	1987	1988	1989
MRASZ	1	HA DX	CW	Third full weekend of January	17- 18	16-17	21-22
UBA/REF	1	French	CW	Last weekend of January	24-25	30-31	28-29
RSGB	1	7 MHz	Ph	First full weekend of February	7-8	6-7	4-5
VERON	1	PACC	CW/Ph	Second full weekend of February	14-15	13-14	11-12
RSGB	1	First 1.8 MHz	CW	Second weekend of February	14-15	13-14	11-12
SRJ	1	YU DX	CW	Second full weekend of February	14-15	13-14	11-12
RSGB	1	7 MHz	CW	Third weekend of February	21-22	20-21	18-19
ARRL	2	International OX	CW	Third full weekend of February	21-22	20-21	18- 19
UBA/REF	1	French	Ph	Last weekend of February	21-22	27-28	25-26
ARRL	2	International DX	Ph	First full weekend of March	7-8	5-6	4-5
PZK	1	SP DX	CW	First weekend ol April	4-5	2-3	1-2
RSF	1	Yuri Gagarin	CW	Second full weekend every third April	11-12		
RSGB	1	Low Power	CW	Second Sunday of April	12	10	9
USKA	1	Helvetia	CW/Ph	Last full weekend of April	25-26	23-24	29-30
RSF	1	CO M	CW/Ph	Second weekend of May	9-10	14-15	13-14
URE	1	Ibero-America	Ph	Last full weekend of May	30-31	28-29	27-28
LABRE	2	World Telecom Day	CW/Ph	Last weekend in May (CW Saturday, Ph Sunday)	23-24	28-29	27-28
DARC	1	Field Day	CW	First or second weekend of June	6-7	4-5	3-4
JARL	3	All Asian DX	Ph	Third full weekend of June	20-21	18-19	17-18
RSGB	1	Summer 1.8 MHz	CW	Last weekend of June	27-28	25-26	24-25
RCV	2	YV DX	Ph	First full weekend of July	4-5	2-3	1-2
IARU	1, 2, 3	HF World Championship	CW/Ph	Second full weekend of July	11- 12	9-10	8-9
LCRA	2	HK DX	CW/Ph	Third full weekend ol July	18-19	16-17	15-16
MARTS	3	SEA Net	CW	Third full weekend of July	18-19	16-17	15-16
RCV	2	YV DX	CW	Fourth full weekend of July	25-26	23-24	22-23
FRR	1	YO DX	CW/Ph	First weekend of August	1-2	6-7	5-6
DARC	1	European DX	CW	Second weekend of August	8-9	13-14	12-13
WIA	3	Remembrance Oay	CW/Ph	Weekend nearest August 15	15-16	13-14	12-13
MARTS	3	SEA net	Ph	Third full weekend ol August	15-16	20-21	19-20
JARL	3	All Asian DX	CW	Fourth full weekend of August	22-23	27 28	26-27
IARU Region	1	Field Day	Ph	First weekend of September	5-6	3-4	2-3
BFRA	1	LZ DX	CW	First Sunday of September	6	4	3
DARC	1	European	Ph	Second weekend of September	12-13	10-11	9-10
EDR, SRAL, NRRL, SSA		Scandinavian Activity	CW	Third weekend of September	19- 20	17-18	16-17
CRRL	2	Can-Am	CW/Ph	Third weekend ol September (Ph Saturday, CW Sunday)	19- 20	17-18	16-17
EDR, SRAL, NRRL, SSA		Scandinavian Activity	Ph	Fourth weekend of September	28-27	24-25	23-24
WIA/NZART	3	VK/ZL Oceania	Ph	First weekend of October	3-4	1-2	7-6
RSGB	1	21/28 MHz	Ph	Sunday of second full weekend October	11	9	15
RKDOR	1	Worked All Y2	CW/Ph	Third full weekend of October	17 18	15-16	21- 22
WIA/NZART	3	VK/ZL Oceania	CW	Third weekend of October	17-18	15-16	21-22
RSGB	1	21 MHz	CW	Sunday of third full weekend of October	18	16	22
DARC	1	European DX	TY	Second weekend of November	14-15	12-13	11-12
CRCC	1	YO DX	CW/Ph	Second Sunday of November	8	13	12
RSGB	1	Second 1.8 MHz	CW	Second weekend of November	14-15	12-13	11-12
OVSV	1	All Austria	CW	Third weekend of November	21-22	19-20	18-19
URE	1	EA DX	CW	First full weekend of December	5-6	3-4	2-3
ARRL	2	160 Metre	CW	First full weekend of December	5-6	3-4	2-3
ARRL	2	10 Metre	CW/Ph	Second full weekend of December	12-13	10-11	9- 10

Compiled on November 17, 1986.

SPECIAL CALL SIGN

PA6IARU will be a special event call sign used during the Region 1 IARU conference to be held in the Netherlands from April 9-20, 1987.

—*The ARRL Letter*, December 23 1986

JAPAN AMATEUR RADIO LEAGUE

Reciprocal operating arrangements have been successfully concluded between the Department of Communications and the Japanese Administration and came into effect on February 25, 1967.

From this time, the JARL will act as a proxy for licensing procedures for alien radio amateurs as the application should be translated to Japanese characters.

Application procedure for short term amateur radio license in Japan

1. DOCUMENTATION

Submit the following documentation with your application.

1 Completed station information form JARL-86-01.
2 Signed letter of attorney allowing JARL to submit the application on your behalf.
3 Photocopy of the photograph page of your passport or equivalent proof of citizenship. (If not immediately available, you may submit it be separate mail before arrival in Japan.)
4 Photocopy of your current amateur radio license.
5 International money order for fund due, or a copy of a bank transfer documenting the funds have been transferred to Japan.

2. SUBMISSION

The application must be submitted at least 60 days prior to your wish to start operation in Japan. Submit your application to:

The Japan Amateur Radio League, Attention: International Section, 14-2, Sugamo 1-chome, Toshima-ku, Tokyo 170, Japan. Tel: 81-3-947-8221.

3.LICENSING INFORMATION

1 Station output power is used to classify amateur radio stations in Japan. It is recommended you request a portable 50 watts station for use anywhere in Japan.
2 A separate license is necessary for establishing a fixed station in addition to a portable 50 watt-or-less station. A fee is charged for each license.
3 After the application is approved, your Japanese amateur radio license will be forwarded to the Japanese mailing address described in Item 6 of station information (JARL-86-01).
4 You may use the JARL address for Item 7 if you chose mobile/portable station, and you can receive your license at the JARL office in Tokyo by presenting your passport, or other kind of ID. In this case, please state: *Hold my license at JARL* in Item 6.
5 Station licenses will be granted for a period of one year, but in any case not beyond the expiration date of your current amateur radio station license.
Five year station licenses are available for alien permanent residents of Japan who provide proof of residence status with your application.
6 Payments can be made by International Money Order payable in Yen to the JARL or by bank transfer to the JARL account:
Mitsubishi Bank, Komagome Branch, Tokyo, Japan. A/C No: 061-9003391. Beneficiary's name: Japan Amateur Radio League. Reason for remittance: Reciprocal Amateur Radio License.
7 The fees payable for station licenses are:
10 watts or less 10 000 Yen (mobile/portable)
More than 10 watts, but 50 watts or less 13 000 Yen (mobile/portable)
More than 50 watts, but 100 watts or less 19 000 (fixed only)
8 Different application procedure is necessary if you plan to run more than 100 watts output. Applications must be made directly to the Telecommunications Administration Bureau (TAB) in the call district In which you will reside during your stay in Japan. After approval by TAB, you must go through on-site inspection of your station by TAB before being granted a license. This procedure may take more than three months. Please contact us beforehand for more details.

Under the Ministry of Posts and Telecommunications regulations, Australian amateurs who hold a valid DOC license have the following privileges in Japan.

LICENSE CLASS	EQUIVALENT JA LICENSE	AUTHORISED MODE/BANDS	MAXIMUM POWER
Full	1st Class	All modes on all bands	500 watts
Limited	Limited 1st Class	All modes except A1A and A1B on frequency bands above 50 MHz	500 watts
Novice	Telegraph Class	All modes on all bands except 10 and 14 MHz	10 watts

For further information contact the Federal Office of the WIA.

—Contributed by Yutaka Kasahara JA1CLN, Manager External Affairs, JARL

AMSAT Australia

Colin Hurst VK5HI
8 Arndell Road, Salisbury Park, SA. 5109

NATIONAL CO-ORDINATOR
Graham Ratcliff VK5AGR
INFORMATION NETS
AMSAT AUSTRALIA
Control: VK5AGR
Amateur Check-In: 0945 UTC Sunday
Bulletins Commence: 1000 UTC
Primary Frequency: 3.685 MHz
Secondary Frequency: 7.064 MHz
AMSAT SOUTH WEST PACIFIC
Control: John Browning W6SP
Bulletins Commence: 2200 UTC Saturday
Frequency: 14.282 MHz

Participating stations and listeners are able to obtain basic orbital data, including Keplerian Elements from the AMSAT Australia Net. *This information is also included in some WIA Divisional Broadcasts.*

ACKNOWLEDGMENTS
Contributions this month are from Bob VK3ZBB, and the American Radio Relay League (ARRL) magazine *QST* January 1987. Thanks must also go to Ross Forbes WB6GFJ, for drawing my attention to this material.

On page 24 of the January 1987 issue of *Amateur Radio,* under the title of *QSP — Geosynchronous Study Plan* mention was made of AMSAT's Vice-President of Engineering, Jan King's Phase 4 Technical Study Plan. In the January issue of *QST* Jan wrote an article entitled *OSCAR at 25: Beginning of a new Era.* From that I quote. . .

What will Phase 4 be like? How will it be to use? According to the preliminary (strawman) concept, initially there will be two satellites placed in geosynchronous orbits. The coverage areas (footprints) of each are shown in Figures 1 and 2. AMSTAR East would be positioned over the equator at 46.6 degrees west. (AMSTAR is a preliminary designation for AMSAT's Phase 4 satellites). From there, it would cover everything east to Helsinki and Durban and west to Seattle. AMSTAR West would cover everything from Boston west to Tokyo and central Australia. Although, technically difficult, it might be possible to link the two birds (crosslink) in such a way as to enable a two- satellite QSO from say, Athens to Melbourne.

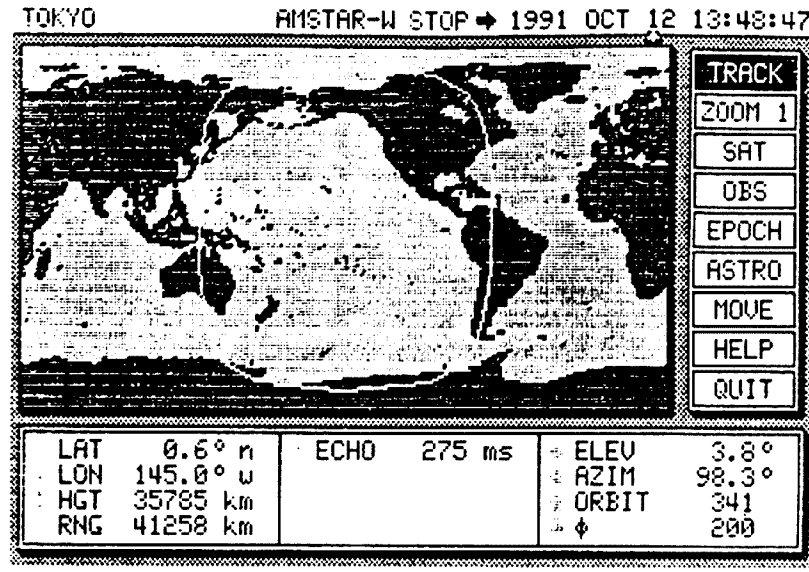

Figure 2 — Footprint of AMSTAR West (see text).

What is especially attractive about the geosynchronous orbit is that the old bugaboo about tracking is gone completely! You just set your antenna at a given spot in the sky and, essentially, weld it in place. You never have to move it: no computers, no locators, no nothing; just AMSTAR in the sky 24 hours a day, 365 days a year, providing the kind of facility emergency communicators and ordinary would-be satellite users have been seeking for years.

What kind of communications services might be enabled by Phase 4? Let us look at the various transponders and examine briefly their capabilities (see Figure 3.)

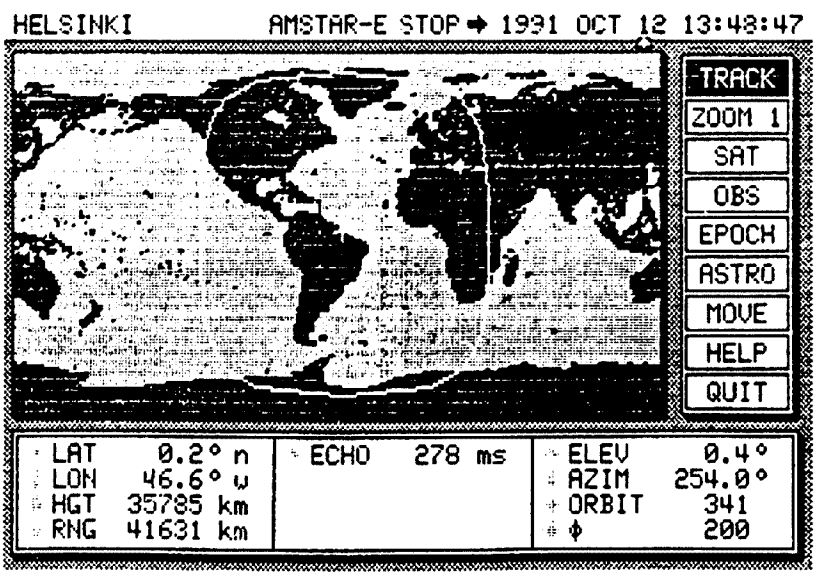

Figure 1 — Footprint of AMSTAR East (see text).

MODE JL

Mode JL is a combination of two modes (J and L) that have been used previously for OSCARs. Mode J (named for JAMSAT, our Japanese colleagues) first flew aboard AMSAT-OSCAR 8 during 1978 in a project sponsored by ARRL. Mode J has recently been reborn with its employment on the new Fuji-OSCAR 12 from Japan. As may be seen in Table 1, Mode J involves a two metre uplink and a 70 cm downlink. Mode J is especially popular in Japan because intense two metre QRM makes reception of relatively weak two metre downlink of, for example Mode B (70 cm up, two metres down) very difficult. On the other hand, the 70 cm downlink is not subject to comparable QRM levels in Japan.

Mode L is a relatively new mode, having flown on AMSAT-OSCAR 10 in 1983 for the first time. With 24 cm uplink and 70 cm downlink and fully 800 kHz of bandwidth, it was designed as a safety valve to absorb anticipated growth on AO-10's Mode B. That growth eventually did reach a stage where it would have likely spurred Model L use, except that the Model L transponder developed sensitivity problems. It was infrequently used for communication and occasionally for experimental purposes.

The combined Mode JL will have its first space test next autumn when the latest Phase 3 satellite, Phase 3C, is launched. With Mode JL, two metre and 24 cm uplinks each result in 70 cm down links. Given the user equipment shown for Mode J in Table 2, the SSB user can expect an average downlink signal-to- noise ratio (S/N) of 10.5 dB (see Table 3). Mode L users do a little better on average with about 11.3 dB S/N ratio on SSB. Peak S/N (the best measure of signal quality in the short term) would be a very respectable 21.5 dB and 22.3 dB for the J and L links, respectively.

MODE S TRANSPONDER

Mode S will also fly on Phase 3C next autumn, but it will be a 70 cm to 13 cm version of Mode S and have only limited bandwidth (25 kHz and power of 1.3 watts). On Phase 4, however, Mode S will comprise of a special 24 cm up and 13 cm down transponder. The Phase 4 Mode S transponder is envisaged to comprise four sub-transponders, each with its own AGC loops and function. Let us

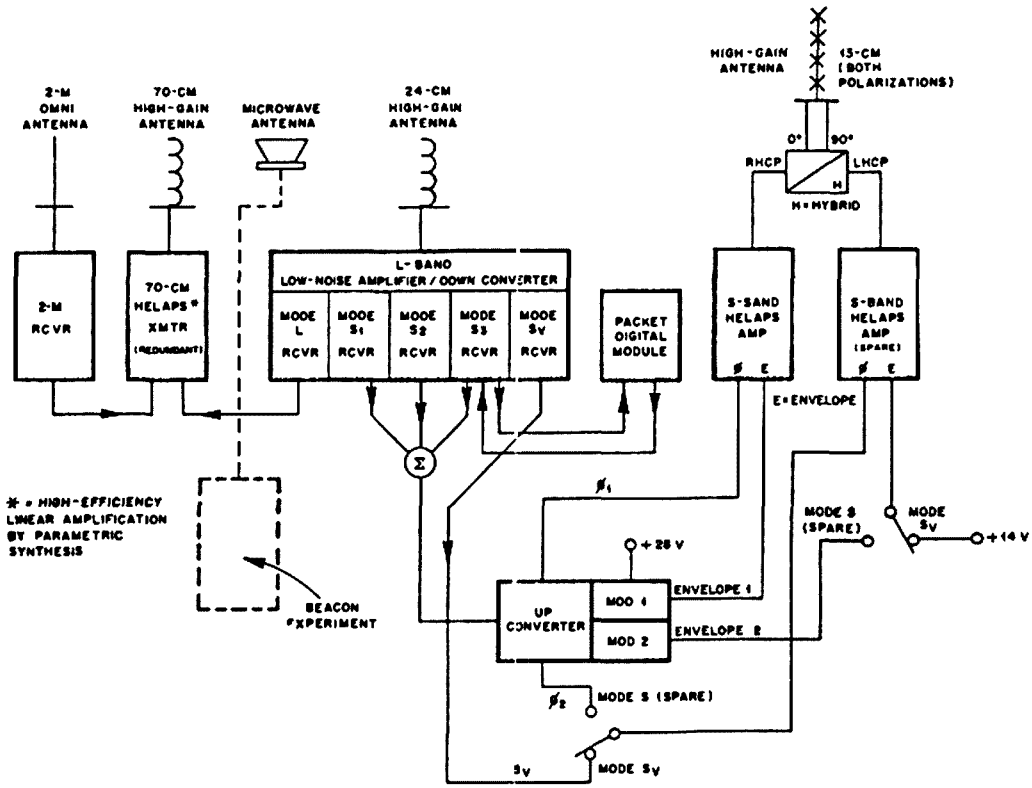

Figure 3 — Block Diagram of Phase 4's Transponders and Their Capabilities (see text).

look at the function and performance of each of these sub-transponders in more detail (refer Figure 3).

S1: General Linear Communications Transponder

The S1 sub-transponder will be used for the traditional type of OSCAR communications most users are currently accustomed to. Essentially, there will be 100 kHz of linear transponder passband for the normal Frequency Division Multiple Access (FDMA) use OSCAR users have been employing since AO-6 days. With 100 kHz, there is ample room for about 25 to 35 QSOs, depending on how well they are "packed" or "stacked". If there are three or four individuals per QSO, as there often are in satellite QSOs, about 100 simultaneous users could be accommodated in this S1 transponder. S1 performance would average about as good as AO-10 got at its best: S/N of about 13.4 dB. Moreover, under ideal conditions S1 could deliver 24.4 dB S/N, peak (see Table 3). In order to realise the specified user S/N, the Mode S1 user equipment suite (or better) would be required. As seen in Table 2, it consists of a 1.5 metre (5 foot) parabolic dish antenna with a dual 24 cm/13 cm feed. A 10 watt average uplink transmitter would produce 1000 watts EIRP using the recommended 23 dB dish gain at 24 cm.

S2: Gateway Interconnect

The S2 transponder will potentially provide one of the most important services as well as one of the most dramatic. S2 will be a gateway interconnect transponder. A gateway is simply a portal from one type of network to another. A terrestrial voice repeater can be viewed as a network — a network of users with radios clustered around and interconnected through the repeater. Similarly, the satellite users can be viewed as a network. Interconnection of these networks is accomplished through a gateway. In this context a gateway could be a repeater equipped with an interface to the satellite. That is an uplink transmitter, a downlink receiver and associated interface and control circuitry. Functionally, the gateway serves to extend the repeater user's telecommunication into the satellite's network of users, and vice versa. Ideally, the interface would be transparent; that is, a user in either domain (terrestrial repeater user community or satellite user community) could be totally unaware of the existence of the facilitating gateway. Furthermore, by extension, a terrestrial repeater user linked to the satellite through a gateway could then be further linked through the satellite to a second gateway and its respective user community. Again, if the links were executed properly, users on either end of the dual gateway circuit could be unaware of the extended circuit supporting their QSO.

But there is much more to this gateway arrangement than novelty. Sure, it is amusing to visualise a pair of two metre hand-held radio users half a globe apart enjoying a pleasant chat, describing their radically different scenes before them. But, because of the very disposition of equipment within the gateway arrangement, gateway operations using combinations of terrestrial repeaters, linked via satellite, offer an extremely important approach to emergency communications.

A portable gateway established at a major flood or earthquake site could, for example, link the disaster reaction team to major relief organisations. Support and logistics control could be organised on an unprecedented level. On-scene leaders could communicate instantly with virtually any other QTH in the hemisphere 24 hours a day. A single hand-held radio hiked to a mountain-top airline crash could communicate directly with state and federal authorities using a gateway on a nearby mountain-top. Establishment of DX communications for local or regional emergency centres could be as simple as implementing the gateway to the continuous coverage satellite/s.

Aside from the unprecedented potential for saving lives and property, gateway facilities would be available for more mundane use between selected repeaters on a daily basis. A limited number of repeater gateways would be authorised access for these routine QSOs when there were no emergency operations underway or if adequate spectrum sharing schemes were to be established. So one age-old fantasy many amateurs have harboured of having freedom of movement (being mobile or even foot-mobile) while engaging in a DX QSO would be realised simultaneously with the penultimate emergency communications resource.!

Moreover, because the real communications "work" involved in communicating the 71 400 km (44 400 miles) or to/from the geosynchronous satellite is accomplished by the gateway, the equipment burden on the gateway user is reduced to an absolute minimum — essentially, only what is needed to communicate over the distance to and from the local gateway/repeater. And that could even be done in some cases with one of these new, ultra-miniature 100 mW hand-held rigs now on the market. For a community of terrestrial repeater users who have an interest in linking their repeater to others across the continent, it makes sense to pool their resources to establish a single gateway for the long-haul to/from the satellite, rather than each individual undertaking the cost. Thus, Time Division Multiple Access (TDMA) system for communicating with the world outside their local repeater community on a given "channel", one of several FDMA channels available.

Compare this TDMA access to the FDMA access users of the S1 transponder enjoy. The S1 FDMA user undertakes his own uplink/downlink burden. It costs him the equipment required to establish the link. For this investment, he obtains

time-independent use of the S1 linear transponder; ie he can use it whenever he cares to. On the other hand, the gateway TDMA user, having pooled the uplink/downlink resource in the form of the gateway equipment, may have to queue up to use the resource; ie wait until it is free for his use. Thus, he has reduced his personal equipment at the cost of time-independent QSOing; he is time-sharing the resource with others.

To establish a gateway SO, the user could simply pick up his hand-held and tap out a few numbers on the DTMF pad to instruct the terrestrial repeater to enable gateway mode. When the gateway replied with a personal signal indicating the satellite's Demand Assignment Multiple Access (DAMA) facility had responded, indicating a vacant channel pair was available, the gateway user would then tap out the code for the other gateway he wanted to link to. The DAMA facility would then assign a channel pair to the originating gateway and the target gateway, and the link would be established for a preset time period. Users of the originating repeater would then be in contact with users of the target repeater.

The technology to achieve this type of circuit is not new. It derives straight from the pages of today's terrestrial cellular mobile telephone systems. Amateur radio implementation of a similar system could be much simpler, however, since much of the redundancy and protection used in cellular mobile radio (to assure privacy and avoid mis-connects) could be eliminated. It is obvious that the S2 sub-transponder could spur enormous achievements in emergency as well as routine communications. . .end of quote.

Next month's column will continue with a description of the other Phase 4 transponders — S3: Packet Gateway Interconnect, the S4: Broadcast Mode Gateway Transponder and the S5: The Mode S Video Sub-Transponder.

—de Graham VK5AGR

ar

THOUGHT FOR THE MONTH!

A smile — none is so rich or mighty that they can get along without it, and none is so poor that they are not made rich by it.

General AMSTAR System Description, Space Segment

JL Transponder

- High-power linear transponder
- 120-W PEP output
- Mode JL: 2 meters and 24 cm up; 70 cm down
- 500-kHz-bandwidth downlink (approx 175 kHz at 2 m; 325 kHz at 24 cm)
- Global beam coverage, all bands
- Spacecraft antenna gain:
  2 m: 2.1 dBi
  70 cm: 12.5 dBi
  24 cm: 16.0 dBi

S Transponder

- Medium-power linear transponder
- 50-W PEP output
- Mode S: 24 cm (1260 MHz) up; 13 cm (2401 MHz) down

Subtransponders:

S_1: 100-kHz passband for "normal" mode (FDMA) global communications

S_2: 100-kHz passband for 20 voice repeater gateway interconnects (TDMA)

S_3: Packet gateway interconnect; nominally 19.3 kbits/s

S_4: The S_2 transponder used in broadcast mode

S_v: Integrated Services Digital Network (ISDN) transponder; 500 kbits/s

- Global beam coverage, uplink and downlink bands
- Spacecraft antenna gain:
  24 cm: 16 dBi
  13 cm: 16 dBi

Microwave Experiment

- Possible 10-GHz stable source for link tests and equipment alignment

TABLE 1.

Preliminary User Equipment Requirements

Mode J

Receive antenna: 15.0 dBi (on-axis)
Preamp noise figure: 1.0 dB
Feed line + misc loss: 1.3 dB
System G/T: −9.8 dB/K

Transmitter power output: 10 W (avg)
Transmit antenna gain: 13.0 dBi (on-axis)
Feed line + misc loss: 1.3 dB
Transmit EIRP: 20.2 dBW (avg)
(105 W)

Mode L

Receive antenna: 15.0 dBi (on-axis)
Preamp noise figure: 1.0 dB
Feed line + misc loss: 1.3 dB
System G/T: −9.8 dB/K

Transmitter power output: 10 watts (avg)
Transmit antenna gain: 19.5 dBi (on-axis)
Feedline + misc loss: 0.3 dB
Transmit EIRP: 29.2 dBW (avg)
(832 W)

Mode S_1 (General Linear Communications Transponder)

Single dish antenna for TX/RX: 1.5 m (5 feet); dual feed with 50% efficiency.
Receive antenna gain: 28.5 dBi
LNA noise figure: 1.0 dB
Pointing loss: 1.0 dB
Feed line + misc loss: 1.1 dB
System G/T: +4.7 dB/K

Transmit antenna gain: 23.0 dBi
Transmitter power output: 10 W (avg)
Transmit misc losses: 1.3 dB
Transmit EIRP: 30.0 dBW (1000 W)

Mode S_2 (Voice Gateway Interconnect)

Same as S_1 station equipment except:
Feed line + misc receive loss: 0.6 dB
Receive noise figure: 0.7 dB
System G/T: +6.1 dB/K

Mode S_3 (Packet Gateway Interconnect: 19.2 kbits/s)

Same as S_2 station equipment

Mode S_4 (Receive Only Gateway Interconnect-Broadcast Mode)

Same as S_2 station equipment

(Mode S_v and microwave beacon user equipment continue under study at this writing)

Table 2.

Link Performance

Mode	Avg Downlink S/N	Peak Downlink S/N	$\frac{E_b}{N_0}$
J	10.5 dB	21.5 dB	12.0 dB
L	11.3 dB	22.3 dB	12.8 dB
S_1	13.4 dB	24.4 dB	14.9 dB
S_2	15.0 dB	33.0 dB[1]	16.5 dB
S_3	—	—	13.2 dB
S_4	21.4 dB	39.4 dB[1]	12.3 dB[2]
S_v	—	—	12.0 dB[3]

[1]ACSSB use assumed; subjective improvement over unprocessed SSB aqual to +8dB.
[2]Result obtained if the S_4 Mode ware to be used as a dedicated packet link at 32 kbits/s.
[3]At a data rate 500 kbits/s.
[4]The ratio of energy per bit to the reference noise.

Table 3.

SATELLITE ACTIVITY FOR THE MONTH OF NOVEMBER 1986

1. LAUNCHES

The following launching announcements have been received:

INTL NO —1985	SATELLITE	DATE	NATION	PERIOD min	APG km	PRG km	INCL deg
085A	Cosmos 1790	Nov 04	USSR	89.4	315	207	72.9
086A	Cosmos 1791	Nov 13	USSR	105.0	1026	972	83.0
087A	Cosmos 1792	Nov 13	USSR	88.9	357	181	64.9
088A	Polar Bear	Nov 14	USA	104.9	1015	960	69.6
089A	Molniya 1-89	Nov 15	USSR	12hr16m	40817	469	62.9
090A	Horizont 13	Nov 18	USSR	23hr57m	35824		1.4
091A	Cosmos 1793	Nov 20	USSR	11hr49m	39323	611	83.0
092A	Cosmos 1794	Nov 21	USSR	115.8	1486	1464	74.0
092B	Cosmos 1795	Nov 21	USSR	115.4	1480	1464	74.0
092C	Cosmos 1796	Nov 21	USSR	115.2	1475	1454	74.0
092D	Cosmos 1797	Nov 21	USSR	115.0	1470	1442	74.0
092E	Cosmos 1798	Nov 21	USSR	114.9	1470	1427	74.0
092F	Cosmos 1799	Nov 21	USSR	114.7	1470	1412	74.0
092G	Cosmos 1800	Nov 21	USSR	114.5	1470	1397	74.0
092H	Cosmos 1801	Nov 21	USSR	114.4	1488	1364	74.0
093A	Cosmos 1802	Nov 24	USSR	105.0	1038	985	63.0

2. RETURNS

During the period 39 objects decayed including the following satellites:

1986-077A	Cosmos 1784	Nov 11
1986-081A	Cosmos 1787	Nov 04
1986-084A	Cosmos 1789	Nov 14
1986-085A	Cosmos 1790	Nov 18

3. NOTES

1986-088A Polar Bear will conduct several experiments to study atmospheric effects on electro-magnetic propagation.

1986-089A Molniya 1-69 has communication equipment designed for long-distance telephone, telegraphic radio and television broadcasting.

1986-090A Horizont 13 has communications and television equipment on board.

Australian Ladies Amateur Radio Association

Joy Collis VK2EBX
PUBLICITY OFFICER, ALARA
Box 22, Yeoval, NSW, 2868

One of the things people not connected with amateur or CB radio find hard to understand is that it is possible to have real friends one has never met.

To amateur radio operators, of course, this friendship is a very real and lasting thing. We get to know someone on air, and before long are having regular scheds, exchanging news, letters and photographs.

We know all about each other's family, home, job, etc share in their joys and feel sadness in their sorrow.

This has been brought home to me personally following the sudden death of our eldest son in a freak accident. The kindness and sympathy of so many *radio* friends has been a great comfort to us. All we can say is a simple, heartfelt *thank you*.

Our son Will, was also an amateur radio operator, and although he did not have much time to devote to the hobby, he was always on hand, in his quiet way, to help when needed, particularly with activities such as JOTA.

He was a wonderful example of the best aspects of amateur radio — friendship and consideration of others. Perhaps these are the things we need to cultivate most in our hobby, and maybe there is a great need for them in this modern sophisticated world.

ALARA CONTEST RESULTS

Call Sign	Points	Comments / Certificates
VK3CYL	1100	Winner Overall and VK3 ALARA member
VK3DMH	918	
VK4ASK	857	VK4 ALARA member
VK3DYL	751	
VK2EBX	731	VK2 ALARA member
VK6DE	721	VK6 ALARA member
FK8FA	704	FK ALARA member
ZL1BIZ	506	ZL ALARA member
VK4AOE	432	
VI5AOV	403	VK5 ALARA member
ZL1BRX	400	ZL non-ALARA member (YL)
VK5YL	395	
VK3CQP	303	OM Certificate
VK3RB	302	
VK7HD	277	VK7 ALARA member
VK4VR	236	
VK6YF	231	
VK3DMS	219	
VK4XX/M	183	
VK4BKM	179	
ZL1BWQ	163	
VK3CLS	159	
VK2EKY	152	
VI5ANW	152	
VE7YL	148	VE ALARA member
VK4BRZ	146	
VK3DYF	134	
VK5GZ	134	
VK8AV	133	
VK2PXS	127	VK Novice and Florence McKenzie Award
WA3HUP	126	W ALARA member
WA3CQN	126	W ALARA member
VK3XF	124	
ZL1BBN	121	
VK3LC	95	
G4EZI	56	G ALARA member
VK7RY	55	
VK2DJJ	55	
VK3AKD	50	
VK2NEV	45	
VK3YU	40	
VK2KDX	34	VK YL non-ALARA member
VK1LF	24	

Check logs were received from VK3ARK, VK3KF, VK3KS, VK3XB, ZL1ALK, ZL2AWP, ZL2BOD, ZL2VQ.

Of the 51 logs received, 28 were from ALARA members, three from YL non-ALARA members and 20 from OM.

Congratulations to Kim VK3CYL for her magnificent achievement and to the runner-up, Jan VK3DMH. Also, to all the Certificate Winners.

Our thanks to all who supported the ALARA Contest and helped to make it a success. It is very pleasing this time to have a winner for the Florence McKenzie CW Novice YL Trophy. Special congratulations to Bobbie VK2PXS.

WEDDING

The amateur radio fraternity were well represented at the wedding of Terry Morrison VK3RB and Jan McKinnon VK3DMH, which took place at Richmond on December 20, 1986.

Also present, but not in the photograph, were Allan Clark VK3CAC, Paul McMahon VK3CGR and wife Anna.

Congratulations, Terry and Jan. We all hope you can reach an amicable agreement about use of the microphone, at least until a little harmonic appears on the scene causing too much localised QRM!

Terry VK3RB and Jan VK3DMH, on their wedding day, December 20, 1986.

SECOND ALARA GET-TOGETHER

Adelaide, September 26-27, 1987

Program: Arrive Friday, September 25 or Saturday, September 26.
Saturday September 26:
9.30 am — Meet at Walford (Anglican School for Girls).
10.30 am — Morning Tea.
12.30 pm — Lunch.
2.30-5.00 pm — Tour of Adelaide including Afternoon Tea at WIA Headquarters.
7.30 or there-abouts — Meet at the QTH of Meg VK5AOV for dinner and social evening.
Sunday September 27:

From Left: Ruth Allen, Don Allen VK3NXN, Bob Milne VK3FO, Kevin Wallis SWL, John Gurney VK3AMC, Ian Williams VK3MO, Terry Morrison VK3RB, Jan Morrison (nee McKinnon) VK3DMH, Ray Berger VK3KEL, Moira Knowles (wife of VK3NGK), Len Verneulen VK3COD.

9.30 am — Meet at Victoria Park Racecourse.
10.30 am — Cleland Conservations Park (cost $3 not included).
12.30 pm — To the QTH of Denise VK5YL, via Mount Lofty.
1.00 pm — Lunch.
End of official program.
3.00 pm — Visit to Hahndorf.

Accommodation — Granada Motor Inn, Flag Motel. Bookings may be made through local Flag Motels or by writing to Granada Motor Inn, 493 Portrush Road, Glenunga, SA. 5064. Telephone (08) 272 8211. (Mention ALARA Group Booking). $25.00 deposit required with booking. Twin Room costs $48.00 approximately.

NEW MEMBERS

Welcome to new members:
Anne VK4KZX, Debra VK6OJ, and DX new members, Betty VR6YL, Betty KA6NZK, and Sylvia G4VBT.

WEEKLY NET

Our 80 metre weekly ALARA Net is well patronised in spite of QRM, QRN, etc. Remember ladies, you don't have to be an ALARA member to come up and have a chat with us — we are a pretty friendly group.

The Net meets on Mondays, 3.580 ±QRM, 1030 UTC (1000 UTC during daylight saving).

Our warmest wishes to Ken McLachlan VK3AH. We hope you are now well on the road to recovery, Ken, following your accident.

Until next month.

—73/33, Joy VK2EBX

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RADIO FAX

O Ambulance Service — Melbourne has a new mobile communications and command unit with, what is claimed to be Australia's first radio-linked facsimile machine.

Adding a new dimension to emergency communications, the donated FAX will be ideal in obtaining printed information needed for patient care following hazardous chemical accidents.

The unit is fitted with radio transceivers, microwave dishes and telephones and can be used anywhere in Victoria during a disaster.

Education Notes

Guest Writer: John Edmonds VK3AFU/ATG
RMB 9320, Moriac, Vic. 3240

Brenda Edmonds VK3KT
FEDERAL EDUCATION OFFICER
PO Box 883, Frankston, Vic. 3199

We have accepted, usually without question, that our pet organisation, professional, academic, sporting or whatever, is in dire need of young blood, that we are losing the interest of the young, that management is old. We have it on the authority of Plato. So the WIA should *do something about it.*

The Institute, individual members, various radio clubs and DOC, have maintained a policy of helping and encouraging the less old. Their methods have generally been the traditional ones, supplemented by the serendipitous occurrence of, and encouraged influx from, CB. Should we be doing more? If so, what?

It is fashionable to criticise the traditional methods.

Because people evolve less rapidly than technology there is no particular reason why methods which have been successful previously should not be used. Unfortunately we are unlikely to be able to speed up the traditional processes.

Also, unfortunately we do not know in any detail the reasons why young people become interested enough to sit for DOC examinations. It is tempting to suggest that another survey is needed. Previous surveys do not stand up to critical analysis although they are useful indicators and could be used to design a survey which would stand statistical treatment. It would be an interesting, but protracted job. What can we do or plan using standard beliefs, myths, traditions and some ingenuity?

The first thing should be to try to get together the many ideas which float around in the amateur and educating communities. We have all heard some of these ideas. We have even seen one or two in print with at least one serious attempt to stimulate interest. So this is a plea for communication. Could we, as some of the worst communicators, make sure that our ideas go to the obvious collection centre, the WIA. Some ideas will be impractical, some will be illogical, some may be amusing, but that does not matter. Most of the bright ideas have seemed irrational to us, aged and conservative.

We cannot repeat the CB influx. We should be able to apply some of its lessons to new aspects of modern technology, presumably to computing.

What are the developing interests of the young?

We seem to have neglected the influence of the old. The common thread in the *Silent Keys* tributes in *Amateur Radio* is that the silent keys encouraged and helped others into the hobby. How many of our recent amateurs have had this sort of help? In the long run it may be more useful to encourage mature age students, or even the very mature, because there will be an inevitable flow on to the grandchildren. Even those of us who were brought up on coherers and slop jars and loop modulation are capable of encouraging enthusiasm for strange and wonderful things like packet radio, linked repeaters and HF DX.

So if you feel strongly about the need for encouragement of the young put your ideas into the word processor, or even write them down, and send them to the WIA. Some of the old people will sort them out and collate them.

The Editor of AR will be threatened with Grey Power if he doesn't publish them.

THINGS WERE EASIER THEN?!?

Recently, whilst searching through some old papers for a particular item, I came across my original AOCP examination paper, April 1935.

This may be of interest for its nostalgic value or even to question some of the comments one hears these days; "Things were much easier then!"

Maybe they were but, as those of that era well recall, getting assistance was well nigh impossible and the only way was *head down and tail up* in the *ARRL Handbook*. Morse was only learned by building a regenerative detector and just listening. (I still think that "just listening" is the best way to learn and enjoy Morse).

Subsequent commercial examinations over the years have not held any greater terrors, nor have they given any greater satisfaction, than getting that magic piece of paper in 1935.

(Incidentally, I never did find what I was looking for!).

Commonwealth of Australia
Postmaster-General's Department
Amateur Operator's Certificate of Proficiency
Victoria and Tasmania April, 1935
Time allowed — 2 hours
THEORY

1. A battery of eight cells is arranged four in series and two in parallel. Find the strength of current if each cell has an electro-motive force of 1.9 volts and internal resistance .3 ohm.
2. (a) Why is it necessary to provide greater smoothing in the power supply to a radio-telephone transmitter than to an oscillator-amplifier CW transmitter? Discuss any methods employed to obtain satisfactory smoothing.
   (b) Is any advantage obtained from the reduction of rectifier valve peak current?
3. (a) For plate efficiency in a power amplifier, what grid bias conditions are required?
   (b) Compare the advantages or otherwise of grid-leak and battery bias.
4. Describe, with the aid of diagrams, the considerations governing the construction and erection of a stable aerial system for operation on the 56 mc band. Indicate any directive properties possessed by the system you describe.
5. (a) With a three-stage transmitter, do you consider any difficulty would be experienced in connection with key-clicks and the emission of a back-wave when keying in the middle stage? Give reasons for your answer.
   (b) Compare two practical methods of keying.
6. (a) In a master oscillator circuit, what are the effects of regenerative reaction between the main and master circuits? Would these effects be experienced similarly in a self-oscillatory circuit?
   (b) What steps are usually adopted to prevent the above condition?
7. (a) Discuss the theory of electron flow in relation to conduction and convention currents.
   (b) Compare the flow of Alternating Current with that of Direct Current.

REGULATIONS

1. What procedure should be observed by a station when sending signals for the purpose of tests, adjustments or experiments?
2. Translate the following abbreviations:
   QRW; QSE?; QSV?; QSZ; QTU?; W; AB; CS; NW; WB.
3. Indicate in Morse characters the signal used by a British warship when calling a coast station, and state its significance.

—Contributed by Ray Kilby VK7RK

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Electro-Magnetic Compatibility Report

SHIELDING: the lost art

Hans Ruckert VK2AOU
EMC REPORTER
25 Berrille Road, Beverly Hills, NSW. 2209

Old timers will remember the time when we had to build our transmitters the home-brew way. An operator learned quickly when he burned his whiskers at the microphone or his fingertips at the Morse key, that the cabinet had to be a shield enclosing all RF power, not just a nicely painted dust-cover. (Figure 1 shows the right and wrong way of installing pre- amplifier pi-filter components). If they become part of an RF current path the cabinet and chassis no longer act as a shield. The cabinet and attached leads (key, phone, coaxial antenna cable, etc), become RF radiators in spite of only nominal shielding. The same applies in reverse for electronic appliances like television, radio and Hi Fi sets, microprocessors in computers, video recorders and cars, to name but a few.

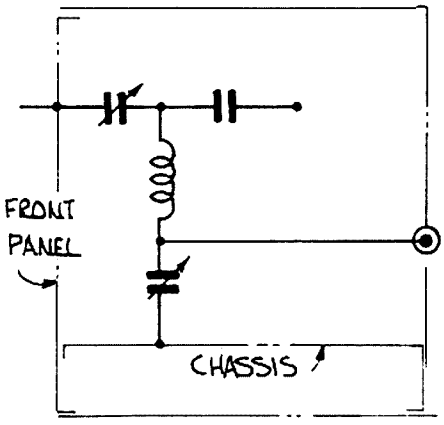

Figure 1a — The Wrong Way of installing the pi-filter capacitors of an amplifier.

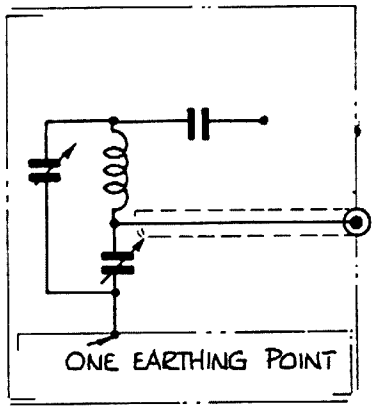

Figure 1b — The Right Way of installing the pi-filter capacitors of an amplifier.

The chassis and front panel must not be a part of the inductance. High RF current goes through the chassis and front panel. Both capacitors must come to the one earthing point on the chassis, and here too the current emitting electrode of the amplifier should be earthed directly, or via a bypass capacitor. The metal shafts of the variable capacitors must go through metal bushes which provide a good contact, otherwise RF can leak to the tuning knob and its metal parts.

The now, often, missing shielding allows the attached cables (shielded or not), the printed-circuit boards, internal wiring and components, to pick-up unwanted RF energy from an ever-increasing variety of sources which result from the development of our electronic age.

Table 1, from the excellent book, *Television Interference* by the Remington Rand Laboratory USA, shows clearly what happens and how to prevent RF leakage. (The writer received the above book in 1956, from Phil Rand W1BDM, after many QSOs discussing television interference). It is only necessary to look at a well-designed signal generator, which is RF-proof to 0.1 uV, to understand what shielding is all about.

QST, reported the case of the RFI experienced by an imported car when the owner installed his mobile radio equipment. The sales representative recommended the amateur "shield" his transmitter's antenna! This is another case of stopping RFI by closing-down the amateur activity. (Please read about the situation in the UK, AR January 1987, p61-62).

We have recently learned of two locally assembled cars which dislike two metre rigs or

Table VI—Filter Circuit Arrangements

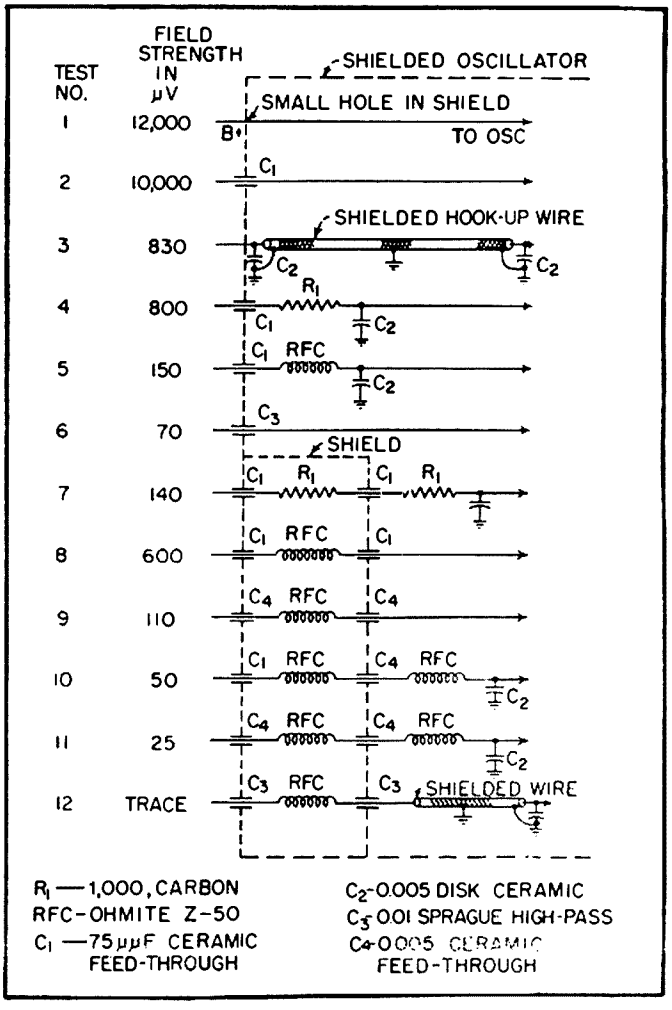

Table 1 — Filter Circuit Arrangements. There is no RF outside an air-tight metal box, enclosing an oscillator, which has only one earthing point inside the shielding box! Magnetic metal would also shield the magnetic RF field component!

cause interference to two metre transceivers (micro-processor shielding and filtering missing).

The West-German electronics magazine *Funkschau* published several special booklets on EMC problems and cures more than 10 years ago. Several dealt with RFI and motor cars. One could also purchase a cassette tape which played RFI sounds as received by mobile receivers. After one minute of characteristic RFI a voice explained the kind of interference, the location of the source and how to deal with the problem in the case of more popular models.

Special firms that deal with car RFI investigate what has to be done as soon as a new model is released on the market. They provide information, filters, coaxial capacitors, shielded cables, resistors and ferrite chokes so that car workshops do not have to repeat the exercise. By leaving the job to a specialist in the particular field saves time and money.

So-called modern equipment assembly methods may help the insertion of a large number of components automatically in printed circuit boards, but this may well be a backward step of 50 years as far as RFI is concerned.

The FT-901DM transceiver is an example of how it should be done. RF or pulses carrying stages are in individual shielded metal boxes plugged into a common metal chassis. Only the driver tuned circuit is not completely shielded. With the help of extender boards one can easily reach most components. Testing the shielding shows that RF escaping from RG8U coaxial cable is many times stronger than any transceiver leakage. The transceiver shielding exceeds about 90 dBm.

This also means that an attached low-pass filter to the antenna terminal will be fully effective.

Its shielding will not be bridged by the RF-cold chassis and dust cover.

The following case demonstrates how wrong the "modern way" can be:

A 100 watt, 435 MHz transistorised final amplifier had all components, including the GaAsFET receiver preamplifier, assembled on one printed board. The strip line inductors were located in the middle. The board was screwed at several places to the heat sink and the bottom was closed by a perforated plate, held by one screw to the sink. (Didn't we learn 50 years ago that shielding can only be effective if the chassis cabinet panels are held by screws every two inches (5 cm)!). It seems our young engineers, who are computer experts, have re-invented this technique now. To make matters worse, the ohm-meter showed that the heat sink and the bottom plate are both anodised with a well insulated skin. Anodising stops discolouration by fingerprints but prevents closing gaps of RF shielding metal plates. As a result, the whole PC board was carrying a high RF potential.

An absorption-type frequency meter (tuned circuit, Ge-diode, 50 uA meter, no amplifier) standing about 30 cm (one foot) away from the rig, showed full scale deflection from stray radiation. RF leaked from the front switches, power meter and especially from the 13.6 volt DC leads which go to the power supply. In this case, harmonic output cannot be suppressed by a shielded filter because the chassis was not at RF-zero-potential and the coaxial feeder radiated strongly, as well.

Bypass capacitors at the 13.6 volt input terminal also had no effect, as was to be expected. A shield across the input and output side of the preamplifier was naturally also ineffective to reduce the tendency to self-oscillation of the stage. The pi-filter type of match-box (antenna coupler) showed power and SWR variation when the 13.6 volt wires were held in the hand. In such a case, when no earthing point can be found, we can only use ferrite rings as RF chokes to reduce RF leakage and unwanted radiation.

By placing the 13.6 volt wires through a large ferrite ring, making a three- turn coil, reduced the leakage substantially to about a tenth of the original amount and the output power also increased by 10-15 watts. Strip line inductors of UHF tuned circuits are easy to repeat and manufacture, but shielding them is a different story when the whole rig is on one printed circuit board.

In the case of television sets, one can do the following If the set has no chassis to speak of and therefore no effective earthing point:

Use a coaxial 2x1 turn transformer close to the television antenna terminal to stop unwanted RF entering the television set via the coaxial feeder braid. Earth the feeder close to the coaxial transformer input end to the nearest water pipe. Wind the mains cable around a ferrite rod close to the set or use a ferrite ring and 10 turns of the mains cable. If nothing helps, a high-pass filter will be useless too, one can use the method recommended by the FTZ (the DOC in Germany). This is to line the inside wall of the television cabinet with metal foil and wire mesh, where ventilation is required. Bond this shield to several of the television's earthing points with two centimetre wide short metal strips. Now a mains line filter and antenna high-pass filter have a chance to help if their shields are re-bonded to the metal enclosure.

Filters should be shielded and sections separated by soldered PC board pieces. This will avoid bypassing the tuned circuits the filter is made of. When holding the television antenna plug near the television set's antenna terminal at a distance of a few centimetres, it can be seen that some television signal is being picked-up already. This is why filter sections must also be separated by shielding walls. The filter case must have no cracks or gaps and should be soldered to ensure it is RF-proof. This becomes even more necessary as more television stations operate on UHF frequencies. This is why signal generators and EMC-testing equipment use "metal RF weather-stripping" between shielding boxes and their lids, which provide reliable contact between the lid and case (no anodising here!).

Figure 4 and 5 show that feeder separating transformers are necessary if unwanted RF reaches the television set via the braid of the coaxial cable. The braid is usually connected to the set's chassis via 470 pF safety capacitors and is not directly earthed. One can us a small twin-hole ferrite core and wind two windings of two to three turns of 0.3 mm diameter insulated wire through the two holes. This transformer does not attenuate signals below 70 MHz. The insertion loss is about 2-3 dB over a wide frequency range. The coil to coil capacitance is about 4 pF If the balun-type television ferrite core cannot be obtained, one can make a 2x1 turn coaxial transformer. Two lengths of RG59U, about 30 cm long, are connected, as shown, per turn, and both rings of cable are placed on top of each other (not as shown as they are shown like this for clarity) and held together with tape. This transformer attenuates the lower frequencies of less than 40 MHz by about 10-18 dB. Between 100 and 250 MHz, the attenuation is 3-5 dB. The cable losses are felt at higher frequencies (Channel 28). The feedline should be earthed near the input end of the filter.

Information about RF Filters may be found in most amateur radio books and in AR, July 1982, p15-17.

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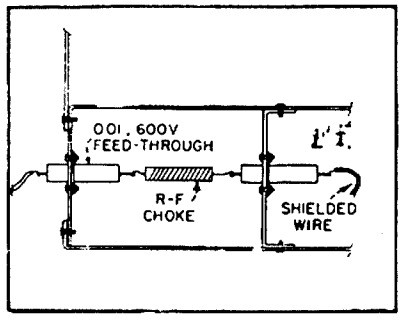


Figure 3 — The correct way of separating RF from supply power sources.

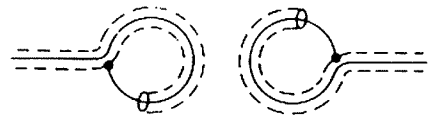


Figure 4 — Coaxial braid separating transformer.
The two coaxial cable loops are to be placed on top of one another and held together by insulating tape. The left cable goes to the television antenna and the braid is earthed near the set on this side. The right cable goes to the television antenna terminal.

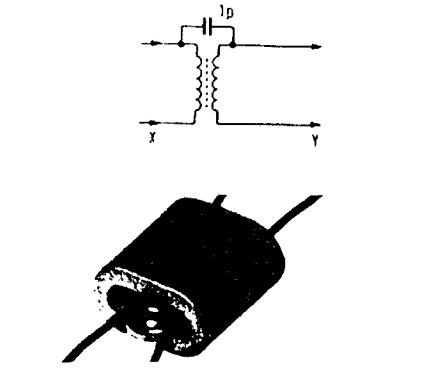


Figure 5 — The ferrite double-hole core separating transformer is connected between the television antenna cable and the television antenna terminal. The 1 pF capacitor reduces losses at 400 MHz and higher television channels.

QSP

INFORMATION FOR ALL MODEM USERS

USING A MODEM not authorised by Telecom could cause electric shocks — to both yourself and Telecom workers on the lines.

It could damage the telephone network and interfere with other people's conversations.

So look for the Telecom authorisation number on any modem you buy.

For example: C86/37/2134
— C shows authorisation by Telecom.
— 86 is the year of issue.
— 37 is the type of modem.
— 2134 is the identification number.

Using an authorised modem could lead to a fine, possible disconnection of your service and you may be liable for damages.

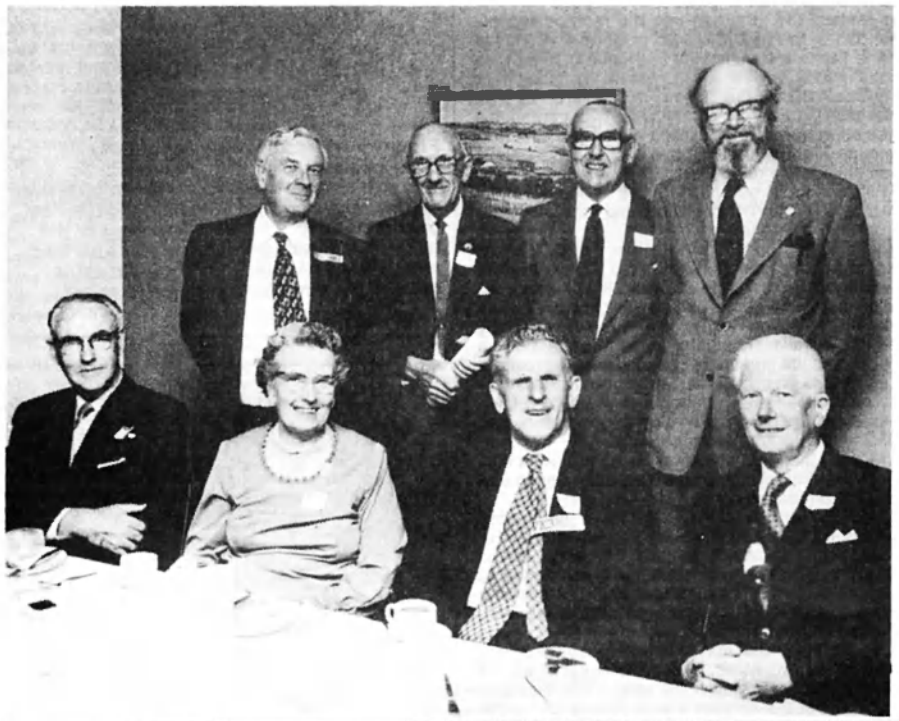
If you are unsure whether your modem is authorised, first contact your supplier. If further information is needed, phone Telecom on:

NSW	(02) 265 1804	SA	(08) 217 9292
VIC	(03) 606 5770	TAS	(002) 20 8800
QLD	(07) 835 8249	ACT	(062) 45 5555
WA	(09) 420 7477	NT	(089) 89 3233

—From *Telecom Topics* 4300/4151

Radio Amateur Old Timers Club

Kevin Duff VK3CV
PUBLICITY OFFICER
Radio Amateur Old Timers Club



A group of Old Timers who attended the 1976 Dinner of the RAOTC at the Sciences Club. From left (back): Bob Cunningham VK3ML, Founder of RAOTC; Gil Miles VK2KI (SK), early experimenter with facsimile and television; Bill Butement VK3AD, associated with the design of military and wartime communications equipment in the UK; Alex Stewart VK3BMS, well-known in AWA engineering circles.
Front: Will Henry, OM of first Australian YL; Austine Henry VK3YL, Australia's first lady amateur; "Snow" Campbell VK3MR, one of the oldest of the Old Timers and still active; Vaughan Marshall VK3UK, rose to Group-Captain in the RAAF during World War II after being an original leading member of the WIA Wireless Reserve.

The RAOTC monthly news bulletin and call-back takes place on the first Monday of each month and, for the Eastern States, commences at 2300 UTC. Three frequencies are used, 3.624 MHz, 7.060 MHz and 145.700 MHz FM, for Melbourne members. The call-back takes place on all of these frequencies.

At 0100 UTC, the long-haul net from VK6 commences on 14.150 MHz.

All members are welcome on both of these nets.

The January 5, Eastern States News Bulletin and Call-Back was well attended with a total of 60 station in the call-back. Despite poor 80 metres conditions on a hot summer morning, there were 15 call-backs on this frequency, 42 on 40 metres and 12 on two metres. A feature of the news bulletin was a tape from Alf Chandler VK3LC, who was the Intruder Watch Co-ordinator for a very long time. Alf spoke for 15 minutes about his life with amateur radio and this was enjoyed by everyone.

We have had a number of these tapes included in our news bulletins but we do need more of them. I am sure that there are many of our members who could recall memories of earlier days. The subjects need not be concerned with radio and should be no longer than 15 minutes. They will need to be recorded on a normal cassette tape and forwarded to "Mac" McConnell, 23 Stewart Street, Ormond, Vic. 3204. So how about it members? We look forward to hearing from you.

Members of the RAOTC are reminded that the Victorian Annual General Meeting and Dinner is to be held on Thursday, March 5, at the usual venue, the City and Overseas Club, 291 Dandenong Road, Windsor. If you have not already accepted, you can telephone your booking to Harvey Utber VK3AHV on (03) 534 4616. Cost of the dinner is $20 and members pay for their own drink. The dinner fee can be paid at the venue.

Members are cordially invited to bring a friend who may be interested in our Club. The evening begins about 6.30 pm, dinner at 7.00 pm. See you there!

HELLO 'OLE TIMER

When you lose the thrill of a QSO
With a W-one or two,
When the fact that you're heard in some far distant land
Just don't mean a thing to you.

When sending a card is a burdensome task
And a "listeners'" card is taboo.
It's time you pulled switches and closed up you shack
For there's nothing in this game for you.

When you snub a beginner, when a "chirp" is a crime,
And a "QRS" plea you abhor,
You better get out of Ham Radio, friend,
For there's no fun for you any more.

I just love to be told, "You're my first VE2,"
If he only lives over the line.
The pleasure of working a Chirpy DC
Is a thrill, boy, to me anytime.

I like to "pipe down," send slow to a kid.
Sure — tell him his keying is fine.
And when he comes out with that "Pse QSL,"
Believe me, the pleasure's all mine.

If you would enjoy this old Radio Game
Just pause and hark back o'er the years
When you hooked a "seven" you thought you'd done fine,
And to lose him just almost brought tears.

You've got to think back to your lid days again
And remember that this is quite true,
You must do unto others in this Amateur World
As you'd have them do unto you.

—From *QST*, January 1936, by D R Sheehan VE2DG

EXTRACT ON AMALGAMATED WIRELESS (AUSTRALASIA) LIMITED

Amalgamated Wireless (Aust) Ltd

This reference is from particulars of the leading Companies of the world engaged in the commercial development of Wireless Telegraphy listed on page 687 of the 1913 issue of *The Year Book of Wireless Telegraphy and Telephony.*

Incorporated — July 11, 1913, in the State of New South Wales.

Head Office — Culwulla Chambers, Castlereagh Street, Sydney.

New Zealand Office — Australasian Chambers, Wellington.

Directors — Hugh Robert Denison, Chairman and Managing Director; John Macallum Jolly, Charles P Bartholomew, Ernest T Fisk, Technical Director; John H Forrest.

Secretary — John H Forrest.

Capital — 140 000 pounds in 140 000 shares of one pound each. Issued 140 000 shares of one pound each, fully paid up. The financial year of the Company ends at November 30.

The Company owns a perpetual license to use and exploit the Marconi & Telefunken patents in the Commonwealth of Australia and the Dominion of New Zealand and in that part of the Pacific and Indian Oceans bounded by the 20 degrees norht and 60 degrees south latitude and the 110 degrees west and 110 degrees east longitude.

RAOTC QSO PARTIES FOR 1987

Three parties will again be held this year — on the second Monday in March and the first and second Mondays of August.

March 9 — 14 MHz: 0200 to 0500 UTC. CW 14.050 MHz, SSB 14.150 MHz.
August 3 — 7 MHz: 0800 to 1100 UTC. CW 7.035 MHz, SSB 7.100 MHz.
August 10 — 3.5 MHz: 0800 to 1100 UTC. CW 3.520 MHz, SSB 3.650 MHz.

Contest Exchange: Club number, date of first licence, name, age; eg A256 1951 Bill 56.
Scoring: Five points per completed contact on CW or SSB, but not both.
Multiplier: The total of VK, ZL and overseas call areas contacted.
Final Score: Contact points times multiplier.
Entries: Claimed scores showing mode (CW, SSB or CW/SSB), number of QSOs, and multiplier areas to: John Tutton VK3ZC, 11 Cooloongatta Road, Camberwell, Vic. 3124 as soon as possible after the first and third parties.

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COMPUTER DISCOUNTS

O Strong competition in the personal computer industry is giving Australian consumers their best ever opportunity to buy computer hardware at discount prices.

But industry sources warn while the price may seem right, many dealer outlets and backyarders cannot guarantee adequate after sales service.

They estimate that at the moment PCs are probably underpriced by about 15- 20 percent, due to discounting.

Awards

Ken Hall VK5AKH
FEDERAL AWARDS MANAGER
St George's Rectory, Alberton, SA. 5014

AWARDS ISSUED RECENTLY

HAVKCA
120 S A Fedorovich UB5-066-286
121 Igor I Slakva UB5-073-3135
122 Iskrich Aleksandr UB5-078-870
123 Romanly Viktor UB5-060-896
124 Rukshenas Vladas UP2-038-1623

WAVKCA
1508 Anton Iriawan YB5QZ
1509 Ryoji Kobayashi JA8LN
1510 Oleg A Safronov UA0FBO
1511 Valdas J Zalnerauskas UP2NV
1512 Vladimir Mazanov UA4CGP
1513 Valery A Makarov UA0ZC
1514 Furdul Anatoly UT5RH
1515 Pavlovo-Pusad Club Station UZ3DXW
1516 Laimonis Stepans UQ2PQ
1517 Gorobec Boris Georg UD6DC
1518 A P Nazarow UA3GBI
1519 Ken Keenan K4ADN

DXCC Phone
351 Jim Baxter VK3DBQ

DXCC CW
128 Fred Beusch VK2BAC

ISLAMIC SUMMIT CONFERENCE AWARD

This award, sponsored by the Kuwait ARS, arrived too late for prior notice in AR.

However, if you worked the required stations during the Conference, January 26-29, the award may be claimed by sending a certified log extract, together with five IRCs, to the Awards Manager, PO Box 5240, Safat 13053, Kuwait.

Requirement: Work two different Kuwait stations and one station in any of the participating Muslim countries, any band, any mode, between 1200 UTC, January 25 and 2359 UTC, January 30, 1987. Applications must be received no later than March 30, 1987.

RUMANIAN AWARD

Any band or mixed.
Any mode or mixed.

Applications require a GCR and seven IRCs sent to Rumanian Radioamateur Federation, PO Box, R-76.100 Bucuresti 05-50, Rumania.

Applicants require 30 different YO counties, plus Bucarest. All YO districts (YO2 to YO9) must also be represented.

Counties are:

AB	Alba	YO5	IL	Ialomita	YO9
AR	Arad	YO2	IS	Iasi	YO8
AG	Arges	YO7	IF	Ilfov	YO8
BC	Bacau	YO8	MM	Maramures	YO5
BH	Bihor	YO5	MH	Mehedinti	YO5
BN	Bistrita- Nasaud	YO5	MS	Mures	YO6
BT	Botosani	YO8	NT	Neamt	YO8
BV	Brasov	YO6	OT	Olt	YO7
BR	Braila	YO4	PH	Prahova	YO8
BZ	Buzau	YO9	SJ	Salaj	YO5
CS	Caras- Severin	YO2	SB	Sibiu	YO6
CJ	Cluj	YO5	SV	Suceava	YO8
CT	Constanta	YO4	TR	Teleorman	YO9
CV	Covasna	YO6	TM	Timis	YO2
DB	Dimbovita	YO9	TL	Tulcea	?
DJ	Dolj	YO7	VS	Vaslui	?
GL	Gelati	YO4	VL	Vilcea	YO7
GJ	Gorj	YO7	SM	Satu Mare	YO5
HR	Harchita	YO6	VN	Vrancea	YO4
HD	Hunedoapa	YO2		Bucuresti	YO3

THE CORNISH AWARD

This award, in the form of a certificate, is issued by the Cornish Radio Amateur Club, for working Cornish stations, whether resident or visiting the county (as /A, /P, or /M) at the date of the QSO. It is issued in three classes, in three groups. Any or all amateur bands may be used, and while there is no time limit, it is expected that contacts are made after January 1, 1946.

There is one point per QSO and Certificates are issued for:

NON-EUROPE
— Amateur bands 1.8 MHz to 146 MHz.
Class 1 — 15 points. Class 2 — 15 points. Class 3 — 10 points.
— Amateur Bands 432 MHz and Higher.
Class 1 — 9 points. Class 2 — 6 points. Class 3 — 3 points.
—RTTY.
Class 1 — 20 points. Class 2 — 15 points. Class 3 — 10 points.

All contacts must be made from the same call sign but can be /A, /P or /M. Claims are welcomed for multiple certificates; ie single band, single mode, all /M, etc, but claims can be mixed. Only one point can be claimed for contacts made through a repeater on VHF or UHF.

Award fees are — 50 pence, $US1, or five IRCs.

The claim should be certified by an officer of a radio club or by two licensed amateurs, that the log book has been inspected and agrees with the contact claimed. The certificate is free to blind or handicapped operators. There is a similar Certificate for shortwave listeners, but SWL cards or reports do not count for a "Stations Worked" claim. Applicants should check during a QSO that the station is located in the county of Cornwall at the time of the contact.

Claims and accompanying Certificate with the appropriate fee should be sent to: J E Bowden G2AYQ, 22 Whites Close, Polbreen, St Agnes, Cornwall, TR5 0TU.

—Thanks to Joy VK2EBX, ALARA Publicity Officer

CITY OF WAGGA WAGGA AWARD

This certificate will be presented by the *Wagga Amateur Radio Club* (WARC) and is open to all amateurs and shortwave listeners world-wide, on 80 metres.

As late 1986 to late 1987, is the 40th Anniversary of Wagga Wagga becoming a city, the award is appropriately called *The City of Wagga Wagga Award.*

Wagga Wagga is situated approximately half-way between Sydney and Melbourne by the banks of the Murrumbidgee River on the Sturt Highway in the Riverina Region of New South Wales. It was discovered in December 1829, by Captain Charles Sturt. Wagga is an aboriginal term for crow, thus Wagga Wagga is the plural for many crows.

The city is 185 metres above sea level and is rural in its setting.

To become eligible for the award, each participating station will have made contact with club station VK2WG (two-points) and with other club member stations (one-point), making a total of 10 points. A station previously contacted can be worked again after seven days for an extra point. Shortwave listeners and amateur stations simply need to prepare a log extract of the contacts made showing date, time, station and signal report.

Applications to: Awards Manager WARC, Barry Gilmour VK2MUZ, 58 Tobruk Street, Wagga Wagga, NSW. 2650.

Award Meeting Nets are held on Tuesday evenings at 1030 UTC on 80 metres, 3.605 ±QRM.

Conditions for awards:
Two points for contact with VK2WG.
One point for contact with club members.
Seven days between contacts with each station to gain points for continuation of award.
Cost of the award is $3 and 10 points are required.
VK2WG can only be worked once. Log must be sent to verify contacts.

QSP

THUNDERSTORM WARNING

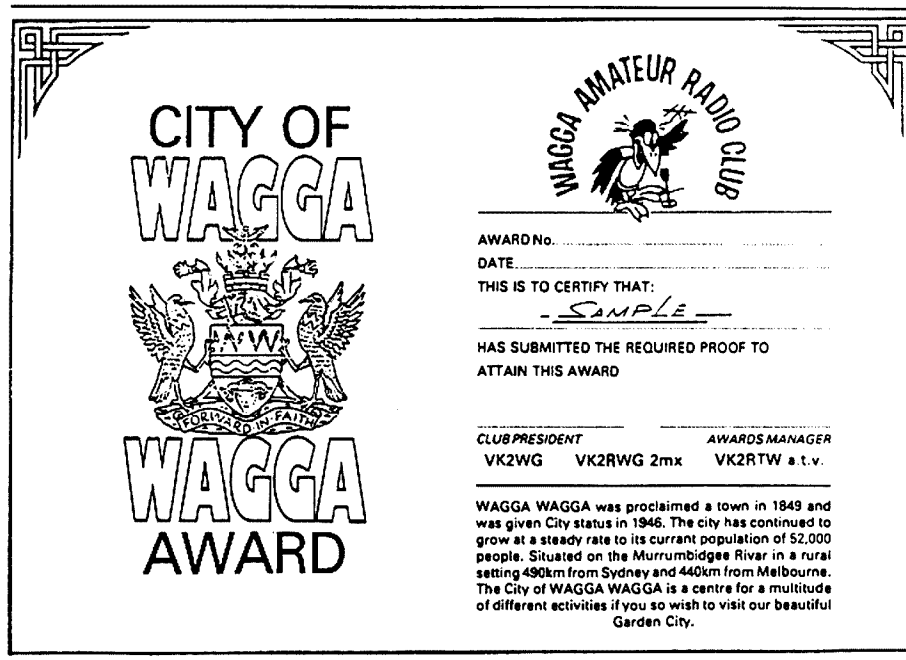
DURING A THUNDERSTORM, the telephone, in common with electrical appliances, can be a source of electric shock. The likelihood of this happening is remote, however it is possible. During a thunderstorm keep these simple precautions in mind.

- Don't use the telephone unless the call is urgent and keep the call as brief as possible.

If you must use your telephone

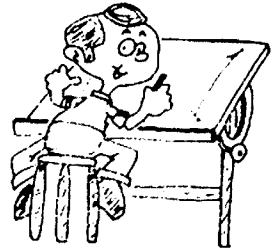
- Keep clear of electrical appliances and metal fixtures such as stoves, air-conditioning, refrigerators, sinks or window frames.
- Avoid standing in bare feet on uncovered concrete floors, or touching brick or concrete walls.

—From *Telecom Topics* 4300/4151



CLUB PORTRAIT

Jim Linton VK3PC
4 Ansett Crescent, Forest Hill, Vic. 3131



EASTERN & MOUNTAIN DISTRICT RADIO CLUB

The Eastern and Mountain District Radio Club, centred in Melbourne's eastern suburbs, is one of Australia's greatest radio clubs.

The *Hillbillies* as it is affectionately known, is now in its 21st year — the inaugural meeting was held in March 1967.

The Club was founded by a group of limited licensees who had been involved in emergency communications. Through their amateur experience they were convinced VHF could be used in the heavily timbered and bushfire-prone Dandenong Ranges on Melbourne's eastern fringe.

In 1962, the group provided two metre AM communications for the Country Fire Authority (CFA) during a bushfire. The CFA has earlier considered that VHF would not get through the hilly terrain and had persevered with its noisy HF system.

An observer of those times says it was the so-called "Z-call rebels" who convinced the CFA on the merits of VHF — the CFA later switched to 163 MHz, which it now uses throughout the State.

The Z-call rebels were John Beckett VK3ZCB (now VK3FE/VK7FI), John Wilson VK3ZOQ (now VK3LM) and Jack Gutcher VK3ZPG (later VK3APU, now Silent Key). Working with others on a roster system, they assisted the Civil Defence (now SES), the CFA and police with emergency communications during the 1960s.

A WICEN-type centre was set-up at John Beckett's Olinda QTH, using repeaters and other talk-through devices which were advanced for their time. There were also direct telephone lines to police D24 and Civil Defense headquarters.

It wasn't until 1966 that someone suggested forming a radio club and the Z- call rebels and friends decided to personally approach every radio amateur in the Call Book in the eastern suburbs, and duly all amateurs within a designated radius received a letter of invitation to join the Club.

Ken McLachlan VK3AH (then VK3ZDK), well remembers the meetings held in the kitchen of his Mooroolbark home attempting the mammoth task of formulating the Club.

The response from the letters, on-air and personal approaches throughout the district resulted in an inaugural meeting at the Mooroolbark Technical School, in March 1967, attracting 60 radio enthusiasts. (Using a school as a meeting place of this nature was not as commonplace in those days as it is now, but John Beckett, a teacher at Mooroolbark Tech, convinced the Education Department of the worthiness of its usage and the EMDRC were granted access for 50 cents a meeting). The EMDRC's future was assured and, under a hard- working leadership, it became an active club.

In the late 1960s, the Club tapped sources of cheap solid state components (there were no chain stores for electronic hobbyists in those days). One company, in particular, Fairchild made many components which were not readily available, accessible to club members.

As the years passed, some Club projects were evolved to encourage interest and participation. One was a Barlow Wadley Loop receiver — rather advanced for its time — and a logic probe, however neither project could be described as being highly successful.

Much later, another ambitious project — a home-brew computer — was also not the success it was hoped to be but those participating certainly built on their knowledge about the technology.

In a bid to inject some kit-building activity into the Club thought was given, in 1986, to suitable projects — the first a computerised SWR meter — other kits are planned.

Finding the necessary bits and pieces for home-brewing can be difficult and for that reason the Club has a components group which attempts to source parts locally or overseas.

At the time of the Annual Meeting, March 26, 1971, the Club had 234 members. Fees were $3 for adults (of which $1 was set aside for a proposed building fund) and $1 for pensioners and juniors. To promote the interest of juniors, "Teach-ins" were held once a month.

During 1971, the Club was honoured when the Right Honourable Lord Casey, accepted an invitation to become Patron of the Club.

The EMDRC had an excellent relationship with the local councils of both Croydon and Lilydale. It participated in the Proclamation Ceremony when the Shire of Croydon was declared a City and provided a radio communications display for the Shire of Lillydale when it celebrated 100 years of local government (1872-1972).

When Croydon became a city, EMDRC members installed their equipment in the Croydon Youth Club, a few hundred metres from where the Governor of Victoria declared the shire a city, and were able to broadcast the news world-wide. Congratulations were received from every state in the US and from some European countries. The mayor of Croydon, in the UK, sent his congratulations, which were taped and played during the ceremony at the council chambers.

World-wide congratulations were also received for the Lillydale Centenary and visitors to the EMDRC demonstration were entertained by a slow-scan television display and were able to inspect a new communications vehicle, the first of its kind designed for use in bushfire or disaster, where conventional means of communication were out of action. News of the Centenary was also relayed on two metres from an aeroplane above Lilydale.

So warm was EMDRC's relationship with both councils, it was hoped to build its own club rooms on a 99-year lease of council land. (In 1969, the Club had a building fund with $10 000 — but the goal of having its own rooms was not achieved).

A club milestone was its move to Nunawading. This was carefully engineered by setting up an EMDRC Nunawading branch, which took out its own call sign, VK3BNW. (The Club already had the call sign VK3ER).

The plush Willis Room at the Nunawading Civic Centre was a welcome change to the cramped school desks at Mooroolbark — the "branch" grew and the Club moved to Nunawading.

For seven years EMDRC ran carefully structured classes targetted at the examination paper questions. Their success saw an influx of new radio amateurs — many who today display a loyalty and sense of obligation to EMDRC for assisting them to get their ticket.

Past success for EMDRC can be attributed to the calibre of committee members such as John Beckett, John Wilson, Jack Gutcher, Ken Nesbit, Ken McLachlan, Tony King, Keith Nicholls, Reg Durrant, Neville Sleep, Max Dawkins, Bob Duckworth, Errol Stodden, John Hutchison — just to name a few.

Bob VK3AIC — dubbed Super Duck — was (and still is) a ball of fire and probably the club's best meeting chairman. Described by a close associate as "the supreme optimist" Bob has the philosophy that you organise something, if only five turned and all enjoy themselves — then the event is a success.

EMDRC has been considered by some to be invincible. "You can't do much to harm the EMDRC — It will go from strength to strength" was a phrase which summed up a belief held for many years. It was the Club's leaders projecting a display of strength and progress.

But in recent years, that image has been tarnished by some in-fighting and squabbles.

Official membership peaked at 470 in 1982-83, but has since declined to about half. This is due, in

After the Croydon Proclamation Ceremony, Sir Rohan Delacombe and Lady Delacombe, ware most interested in the EMDRC display. From left (standing): Sir Rohan Delacombe, Mayor Frank Kennedy (partially hidden), Lady Delacombe, Lady Mayoress Carmel Kennedy, Ken Palliser, Ken McLachlan VK3AH (EMDRC President 1971-72), Keith Nicholls ex-VK3ANI (EMDRC Treasurer 1971-72), Bruce Pimblett VK3PIM. (Committee Member 1971) and his son. Seated: Bett McLachlan (Logkeeper) and Jack Gutcher VK3APU (now SK).
—Photograph courtesy Bob Gatherum

City of Croydon

The Council meets on the 1st and 3rd Monday in each month. All communications to be addressed to: The Town Clerk.

City Offices: Foch Avenue, Croydon, Vic. 3136
P.O. Box 206, Phone 723-0371

Mr. K. J. McLachlan,
The President,
Eastern & Mountain District Radio Club,
5 Masefield Avenue,
MOOROOLBARK. Vic. 3138

Dear Mr. McLachlan,

We have pleasure, on behalf of the Mayor, Councillors and Citizens of the City of Croydon, in expressing our deep appreciation of the part you and your Club members played in the Proclamation Ceremony on Saturday, 22nd May, 1971. The technical ability and enthusiasm displayed was of great help in both the Ceremony and the Special Meeting of Council.

Your Radio contact throughout Australia and the world would be unique on such an occasion, and gained this municipality very happy publicity.

We extend our thanks to all who so readily identified themselves with this historic and forward move in the progress of the City. We are very grateful for your assistance.

The Common Seal of the Mayor, Councillors and Citizens of the City of Croydon was hereto affixed this 7th day of June, 1971.

Mayor
Councillor
Town Clerk

VK3ER

SHIRE OF LILLYDALE
1872-1972

EASTERN AND MOUNTAIN DISTRICT RADIO CLUB

PATRON: THE RIGHT HONOURABLE LORD CASEY, P.C., G.C.M., G.H., D.S.O., M.C., E.D.

part, to a downturn being felt generally by the hobby, and the disenchanted dropping out.

Club highlights include:

- Helping test some of the earlier OSCAR satellite packages.
- The patronage of the Right Honourable Lord Casey, statesman, politician, humanitarian, and Governor General of Australia from 1965-69.
- Leading the way be donating $1000 for the WIA WARC 79 delegation.
- Sponsoring the immigration of Mirak Rozbicki (now VK3DXI) in 1962. Mirak was a Polish national living in a refugee camp in Austria.
- Commissioning RTTY repeater, VK3RTY, in 1982.
- Commissioning voice repeater, VK3REC, in 1983.
- Communications Expo 83 held as part of World Communications Year in 1983.

A weekly teletype broadcast with call sign VK3TTY has been run under the auspices of the EMDRC for many years.

In recent years popular EMDRC calendar events are its white elephant sales held at Mitcham, and the Christmas barbeque in the Wesburn RSL Club grounds.

The Hillbillies club has made a worthy contribution to the hobby of amateur radio — congratulations on the last 20 years.

The EMDRC's postal address is PO Box 87, Mitcham, Vic. 3132.

WALKABOUT PHONES

THE ERA OF HAND-HELD telephones has begun in Australia with Telecom's new Cellular Mobile Telephone System called *Mobilenet*. The service is available in Sydney, and by the end of this year in Melbourne, Brisbane, Adelaide and Hobart.

Telecom expects within the next eight years there will be at least 150 000 mobile phone users throughout Australia.

Club Corner

AUSTRALIAN AMATEUR PACKET RADIO ASSOCIATION

The Association is currently supplying printed circuit boards for the TAPR designed TNC2 and the C64 software package.

There have been 100 of the C64 packages distributed and development is still continuing. The latest version is an EPROM cartridge which enables amateurs without disc drives on their Commodore 64s to enter packet radio with a minimum outlay. The cartridge version supports all the facilities of the disc version, including disc operations.

Also under development is a software package version of the WORLI Bulletin Board for the C64. This is a development of the C64 package and is intended to be an economical way for small groups of amateurs to be able to set up a WORLI compatible system for a reasonable price. It will require discs, of course, to store messages and files for down-loading. The system has reached the stage of testing the message forwarding facility. For those not familiar with the WORLI BBSs, they are an automatic message forwarding system that enable the user to place a message on his local bulletin board with an indication that it be forwarded to another amateur on another BBS in another city or town. For example, in Sydney a message can be placed on VK2XY's BBS and, if it is addressed to a VK4 that uses the bulletin board VK4BBS, in Brisbane, it will be automatically forwarded to the VK2AHX bulletin board, Gosford, and then onto the VK4BBS board, via 20 metres. All this is done automatically at pre- arranged times each day. Messages have been forwarded to other countries by this method.

When it is completed, the Association will place information in AR and the newsletter, *Digipeat*.

The Association's membership reached 200 at Christmas 1986, and another successful year was completed. A number of projects are in progress and it is hoped that they will be completed this year.

For readers interested in packet radio, the association sells the following items which include postage:

Commodore 64 package of a blank modem PCB, program on disc and manual for $50.

Blank PCB, manual and cartridge for the C64, $75.

For the TNC2, the blank PCB, manual and EPROMs, $150.

Further information and the above items may be obtained by writing to the Association at 59 Westbrook Avenue, Wahroonga, NSW. 2076.

—Contributed by Barry White VK2AAB

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AMATEUR RADIO CLUB FOR CENTRAL HIGHLANDS

In early December 1986, amateur radio operators from Moranbah, Clermont, Dysart, Middlemount, Tieri and Glendon, Queensland, held on-air discussions about forming a radio club with the object of establishing a repeater to service the Central Highlands area of Queensland.

On December 21, a meeting was held and the club was officially formed. Elected office bearers for 1987 are:

President
Peter Sampson
VK4MKT, Middlemount

Vice-Presidents
Mal Lees VK4FPL, Clermont
Mark Robinson
VK4KMR, Saraji Mine

Secretary
Richie Chappel
VK4RR, Moranbah

Treasurer
Richard Burden
VK4FKB, Clermont

The *Central Highlands Amateur Radio Club* will be different from most other radio clubs in the fact that the monthly meetings will have to be held on-air due to the distances between members.

Meetings are held on the third Wednesday of each month, at 0700 UTC on 3.620 MHz, or lower, depending on QRM.

It is hoped that all members will meet in a central location for the Annual General Meeting. Membership is open to all licenced amateur radio operators, as well as any person interested in amateur radio.

Richie VK4RR, has donated a repeater to the club and, in the near future, members will be busy looking for a suitable location, and erecting the equipment. It is hoped that the two metre repeater will be operational within six months and should service the area from Blackwater/Emerald in the south to Moranbah/Glendon in the north.

For further information, contact Peter Sampson VK4MKT, PO Box 3, Middlemount, Qld. 4746.

—Contributed by Peter Sampson VK4MKT, President

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SYDNEY AMATEUR DIGITAL COMMUNICATIONS GROUP

The Sydney Amateur Digital Communications Group held its AGM on December 14, 1986. One of the main items discussed was the new DOC regulations, particularly the sections concerning amateur packet radio. It was agreed at the meeting that, since the Vancouver V2 protocol could no longer meet the DOC regulations and could not be used after March 1987, that all V2 services in the Sydney area, such as bulletin boards and digital repeater facilities, would change to AX.25 protocol.

This has the advantage of providing more facilities to the AX.25 users in the Sydney area, allowing better dispersion of information, (which is the primary function of amateur packet radio) and also bring the packeteers and packet groups around Sydney into closer co-operation. With the change over to AX.25, there will be a revision of the SADCG Digital Repeater software, which will provide various facilities for AX.25 users, such as Time, Status, Dump commands, which were previously available to V2 users.

Also discussed at the meeting was the release of various packet equipment during 1986, such as the VADCG TNC+, the HAPN IBM PC packet adaptor and a review of the HAPN 4800 baud PSK radio modem and the network implementation of Vancouver V3 protocol, both of which are due for release in the first half of 1987.

Following is a list of common amateur packet radio frequencies and modes of operation in use, as of January 1987.

HF (International)
14.103 MHz, LSB, general calling channel, AX.25, 300 baud.
14.105 MHz, LSB, bulletin boards, mailboxes, AX.25, 300 baud.
14.107 MHz, LSB, bulletin boards, mailboxes, AX.25, 300 baud.

VHF (Australia)
144.800 MHz, FM, general purpose packet, multi-protocol, 1200 baud.
147.575 MHz, FM, general purpose packet, AX.25 only, 1200 baud.
147.600 MHz, FM, general purpose packet, multi-protocol, 1200 baud.

NOTE:
300 baud is 200 Hz shift, 1600-1800 Hz (TAPR standard).
1200 baud is 1 kHz shift, 1200-2200 Hz (Bell 202). (Some areas use the 1200 baud CCITT V.23 standard).

News from New Zealand packeteers indicates that two protocols are in use there. These are AX.25 and Cambridge protocols and they are used on 147.575 and 147.600 MHz. It appears the Cambridge protocol is popular due to the high use of BBC computers in ZL. There is also much home-brew packeting due to the high cost of imports from North America.

During December 1986 and January 1987, Dave VK2YME and Wayne ZL2BKC, exchanged packets on six metres SSB using AX.25 at 1200 baud, which is a considerably large distance for VHF packeting and probably the first of many VK-ZL VHF packet contacts.

On a historical note, February 1987 marked four years of amateur packet radio in Australia. In February 1983, VK2ZXQ, Gosford, and VK2KFJ, Sydney, made the first Australian amateur packet radio contact.

—Contributed by Steven Blanche VK2KFJ, Secretary, SADCG

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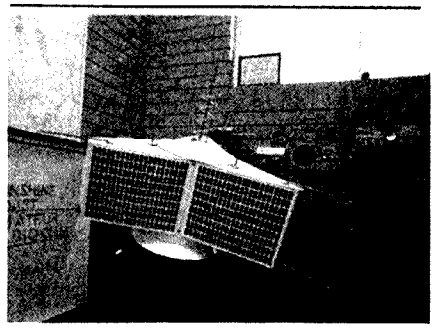

Spacecraft Modal OSCAR-10 nearing completion at the QTH of VK4AGL.

MODELLING AMATEUR RADIO SATELLITES

During 1986, a decision to promote Orbiting Satellites Carrying Amateur Radio (OSCAR), was made by several members of the Sunshine Coast Amateur Radio Club. It was thought that a model would be supportive of any talks given on the subject and assistance was sought from *AMSAT-Australia*. Graham VK5AGR, National Co-ordinator of AMSAT, responded quickly with a set of drawings from *AMSAT-Deutschland*, University of Marburg. These appeared to be preliminary design drawings of OSCAR-10, but there was enough detail for members to commence the project.

Models of satellites had previously been constructed in Queensland, notably by Ken VK4KD, of the Gold Coast Radio Society, but were made of cardboard.

SCARC's decision was to make a permanent replica and the material chosen was colour-bonded aluminium. The model was constructed to half-scale, as a full- scale version would be too cumbersome to transport.

The model was fitted with antennas, to scale, made of brass rod and the simulated solar panels were produced by a local sign company using a computer- driven machine.

This model has been an effective support to talks given at the Gympie Hamfest, the Sunshine Coast's own radio club, and to local youth groups and Rotary-Probus clubs.

OSCAR-10, the first of the Phase-3 satellites, is in the last days of its operational life due to damage from cosmic radiation and the Club submits this article as a tribute to a spacecraft that has given a great deal of pleasure to Australian radio amateurs during its three-year lifetime.

—Contributed by Joe Ellis VK4AGL, Special Project Officer, SCARC

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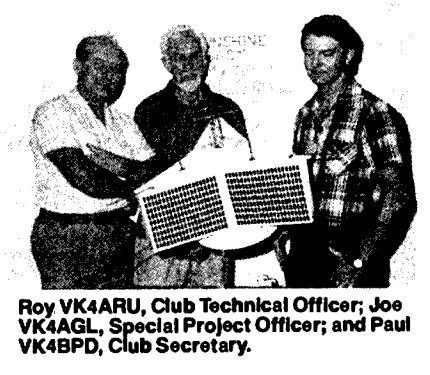


Roy VK4ARU, Club Technical Officer; Joe VK4AGL, Special Project Officer; and Paul VK4BPD, Club Secretary.

VK2 Mini-Bulletin

Tim Mills VK2ZTM
VK2 MINI BULLETIN EDITOR
Box 1066, Parramatta, NSW 2150

Members are reminded that, as outlined in the February notes, the Division's Annual General Meeting will be held at 2 pm on Saturday, March 28, at the Granville RSL. A separate posting of material for this meeting will be made early this month. Please take part in the meeting if at all possible. Allow sufficient time if you have to post back anything like a proxy form or ballot paper. In past years, a number of replies arrived days, or even weeks, after the closing date. The expense of conducting the AGM is considerable, some thousands, so it is pleasing to receive a good attendance.

Members are reminded that the Federal Convention will be held in Melbourne during early May. If you, or a group you are associated with have any matter which you feel should be raised, it should be submitted, in writing, with supporting material to reach the Divisional Office by March 13. All agenda items for the Convention will be discussed at the April Conference of Clubs. Agenda items will also be covered briefly in the Sunday Broadcasts.

Clubs and groups are reminded to give a good lead-time for their field days so that it can receive maximum print publicity. Mark your calendar with the Oxley Region ARC at Port Macquarie, June holiday weekend and the South West Zone, most likely at Wagga around the end of October. Watch the *Club Corner* column for program details nearer the time Clubs need to submit copy to the AR Editor about three months before the event. Copy closes on about the 20th each month — see page one in each issue for the exact date.

From time to time Council receives a letter from a member concerned about the behaviour on some part of the amateur bands. Council is concerned about this problem and has it under constant review. It must be remembered however, that the Department of Communications is the only authority able to act on these matters. Although the Amateur Radio Service has been deregulated during recent years to become — self-regulating — it is difficult with the few who become mavericks. If they prefer not to fit in with the general harmony of a particular band or mode, their antisocial behaviour has to be addressed by the authorities. The Division has quite clear policies on these matters, often formed at the AGMs. These are publicised from time to time on Broadcasts or in these notes. One will often hear on-air comments or quotes claimed to be from the WIA. Frequently these are incorrect and if in doubt, question the person making the statement. If doubt continues please refer the matter to Council's attention. When looking at the problem and then having a look at the six points in the *Amateur's Code* it is apparent what has happened. Too many have forgotten, never knew, or do not follow the spirit of the aims. If they did, then many of the problems would not exist. Have a look at your ARRL Handbook for the full text. Briefly they are:

"The radio amateur is . . . Considerate . . . Loyal . . . Progressive . . . Friendly . . . Balanced . . . Patriotic."

NEW MEMBERS

The Division would like to welcome the following who joined as members at the start of the year. F W Baker VK2YZU, West Epping; M D Barker VK2NNI, Penrith; P J Corrigan VK2PLL, Sylvania Heights; T G Cook VK2UTC, St Clair; C G Cottle VK2MGC, Wagga Wagga; G Elijzen VK2XMM, St Marys; C H Field VK2NCF, Narwee; B J Gilmore VK2MUZ, Wagga Wagga; B J Hammond VK2NNH, Mortdale; R T Hichin Assoc, Springwood; A K Horspool VK2XBM, Orange; A P Keir VK2AAK, Seven Hills; J E Lawler VK2ALJ, Gladesville; R A Lynch VK2KAQ, Bonnyrigg; M E Maguire VK2MBD, Forestville; K C Muller VK2ACL, Penrith; J R O'Shea VK2ATU, Revesby; W J Plant VK2AMM, Maitland; S Pullan VK2TSO, Hornsby; M Van Leeuwen VK2FVL, Berkeley Vale; G A Vielhauer VK2NGA, Tighes Hill; W E Watterson Assoc, Nowra.

ar

JOIN A NEW MEMBER

VK4 WIA Notes

Bud Pounsett VK4QY
Box 638, GPO, Brisbane, Qld. 4001

Bruce Mackey VK4AMV and Theo Marks VK4MU, were no doubt talking about the Sunday Morning News Relays!

Photograph courtesy VK2YL

Some of the visitors with Queensland Divisional Councillors, Paul Newman VK4APN, David Jerome VK4YAN and Ross Mutzelberg VK4IY, in the centre of the photograph.

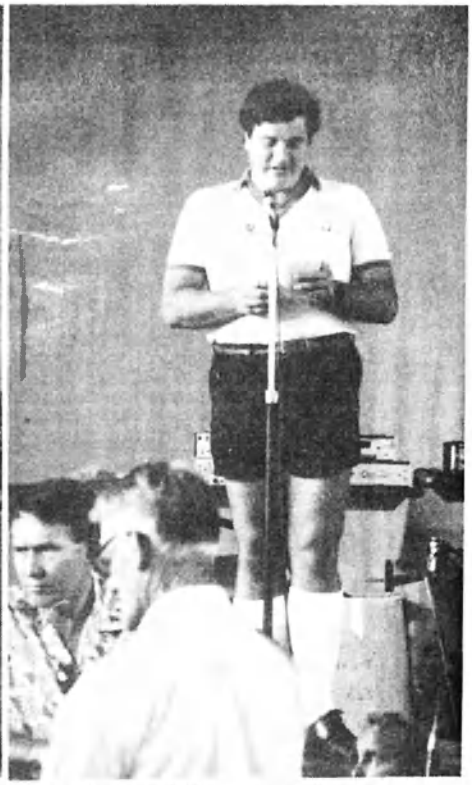
Photograph courtesy VK4QA

Theo Marks VK4MU, Divisional Secretary and Bud Pounsett VK4QY, News Editor, were seen discussing photography during the Hamfest.

Photograph courtesy VK2YL

President of the Gold Coast Amateur Radio Society, Bill Daniel VK4AWD, addresses the large crowd who participated in the Gold Coast Hamfest in November 1986.

Photograph courtesy VK4QA



The Hamfest official opening was conducted by David Jerome VK4YAN, President of WIAQ.

Photograph courtesy VK4QA

Five-Eighth Wave

Jennifer Warrington VK5ANW
59 Albert Street, Clarence Gardens, SA. 5039

Over the Summer Holiday Period, we have had our usual influx of tourists. Many interstate call signs have been heard on the repeater and a few VK ones who happened to be visitors. Adelaide was host to 900 Rover Scouts, from 14 different countries at a Scout Rover Moot, at Woodhouse, in the Adelaide Hills, for two weeks from December 26. Amateur radio was one of the activities provided and during the course of the fortnight at least 10 overseas amateur call signs were discovered amongst the participants. The local amateur radio team included such well-known identities as Don VK5ADD, Bob VK5ADR, Peter Koen, Tony VK5AH and Alister VK5ATX. The equipment in the shack had to be seen to be believed (it looked as though they had opened a new branch of "you know who's"!) and on the Tuesday afternoon, when I visited, the air conditioning was very much appreciated. I won't steal Don's thunder, as I understand he is going to write an eight-page article on it — and if you have just fainted Don, I am sure Peter can fill most of that with photographs! — but I would like to say how pleased I was to be invited to attend and my only disappointment was that I was unable to attend on the Wednesday evening when they were going to try to get all the amateurs together for an informal meeting.

However, I was pleased to meet Mick VK8KMA, from Alice Springs, Lasse (pronounced Larser) SM0KAK/VK5ALO, and especially (sorry if my prejudices are showing) Tuti YD0TTK, the only YL Peter had discovered at the time of my visit.

Another 'foreign' call sign was that of Martin G4THT/VK5AMV, who was not at the Rover Moot, but was in town to spend a month with his mother and two sisters, who live in Adelaide. I spoke by phone to Martin, who was enjoying the hospitality of Ian VK5QX, and using Ian's HF equipment to try and talk to his wife Jenny G4THU, back in the UK.

THE AMATEUR IS COURTEOUS . . .

. . . well, that's what the code says, isn't it? But it doesn't only mean being nice to all these interstate and overseas visitors. I have heard a couple of sad instances of late when repeaters users were less than courteous to local people who were doing tests of various sorts.

We, none of us, own the repeater or the frequency and "do as you would be done by" is a good maxim to live by! And, since WIA members are now obvious in the Call Book, there seems to be some "anti" feeling emerging about *them* using *our* repeater. Let us remember that it was an *amateur* frequency before the WIA (or whoever) put their repeater on it. Many amateurs are not WIA members from choice, but many more have genuine reasons, like finances, for not being a member. Some even give us a donation every now and again towards the repeaters' upkeep. Just remember next time you feel like being discourteous to someone, he might be just about to join the WIA!

On the other side of the coin, this next story has to be one of the most 'heart-warming' of our Jubilee Year, (and I hope those involved will not be embarrassed by my telling of it).

Ray VK5BRS, whom I thank sincerely for the information, was one of the staunch supporters of the Jubilee 150 Nets, as was Ron VK3AEO, in Berwick, Victoria. During one of their many contacts, Ron mentioned that Cyril VK3AUM, also from Berwick, was a white stick operator, and that he (Ron) did all of Cyril's logs for him. Ray thought it would be a nice idea to see if they could get a J150 Certificate printed in Braille for Cyril and Ron agreed. Ray then phoned Rowland VK5OU, who thought that the idea had some merit and promised to see what he could do when he received Cyril's *next* certificate application. (I don't know how many Cyril actually achieved).

A few days before Christmas Ray was delighted to hear from Ron that Cyril had indeed received his Braille Certificate and was, needless to say, thrilled with it. Those involved probably don't want thanks for what they did, but as Ray says, it shows that the Jubilee Nets were for *all*, and those involved (especially Rowland and John VK5SJ), really did go to a lot of trouble to make sure that all amateurs were recognised and catered for. Thanks anyway, to all concerned.

MATRICULATION DUX

One young man who cannot be accused of letting amateur radio interfere with his studies is Jeremy Matson VK5AY. Jeremy, whose father is Bernie VK5ABM, topped the State in the recent Matriculation Examinations. Congratulations Jeremy and good luck in your obviously bright future.

POSITION VACANT — TREASURER

I should have mentioned last month, before the nominations for Council closed, that this year we will unfortunately be losing the services of Graham VK5AGR, as Treasurer. Graham was co-opted onto Council to fill a mid- term vacancy about six years ago and, after a period as Education Officer, took up the post of Treasurer. Never one to "mince" words, Graham sometimes treads on a toe or two, but, at least you know where you stand with him. I have been grateful for his foresight and decisive thinking on many occasions and shall greatly miss working with him. Although he will be a hard act to follow, we must have a new Treasurer and, although nominations for Council have closed, we are empowered by our Constitution to co-opt a Treasurer onto Council especially for that purpose.

So, if you feel you are capable and in a position to help, please let Graham or a member of Council know!

CLUB NEWS

Just before *Christmas*, I was pleased to be invited to attend both the SA ATV Group's Christmas Social and the Christmas meeting of the Adelaide Hills ARS. The ATVers met at the QTH of Charlie VK5ACF, and a very pleasant evening was enjoyed by all. (Thanks also to Greg VK5ZBD, for getting me onto the ATV two metre liaison frequency after the last Broadcast before Christmas to wish them all, and have them wish me, Season's Greetings. As they couldn't actually get me on camera they did the next best thing(?) and put up the cover of December's AR in case anyone didn't know what the 'voice' looked like!

Incidentally, credit for that photo should have gone to Doug Head VK5NDH, not Peter Koen, this time.

The Adelaide Hills ARS meeting had Gordon Ragless as its Guest Speaker. Gordon was the original, but now ex-VK5GR. Although no longer active, Gordon still takes a keen interest in radio and gave us an informative and often witty look at the early days in radio and his own involvement.

Gordon was one of the founder members of the Blackwood ARC (the forerunner of the Adelaide Hills ARS). As a special surprise, the Club had gained permission from the Telecommunications Museum to borrow Gordon's original rig, which now belongs to the Museum, a gesture which I am sure both touched and delighted Gordon.

Another special guest at the same meeting was Paul Caboche 3B8AD, (and if like me you are not an avid DXer and are still wondering where 3B8 is, I will tell you that Paul is the President of the Mauritius Amateur Radio Society). I was delighted to meet Paul and learn a little about Mauritius, and some of the problems of being an amateur there. Paul has sons in Australia so hopefully we might meet again on a future visit.

DIARY DATES

Tuesday, March 24	**General Meeting — 7.45 pm.**
Tuesday, March 31	**Buy and Sell Night — 7.30 pm.**
April 24-26	**Clubs' Convention Weekend.**
Tuesday April 28	**Annual General Meeting.**

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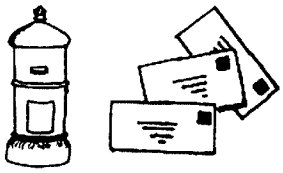
Courtesy "The Propagator"



Over to You!

Any opinion expressed under this heading is the individual opinion of the writer and does not necessarily coincide with that of the publisher.

COALS ARE KINDLED BY IT!

I thought readers might be interested in the following information concerning a *Third Party Traffic* message I recently passed to a mutual acquaintance in VK5, on behalf of a VK2 operator with whom I conduct regular scheds.

The cryptic message from my VK2 friend was:

"Thanks a million. *Psalms 18:8.*"

The originator of the message explained that the message had a humorous association and was also connected with something which had been sent to him. The recipient was sure to understand the meaning of the message.

Upon making the necessary telephone call to pass the massage along, I learned that my two friends had recently enjoyed dinner together at a Sydney restaurant where they served pizza. During the evening the VK2 amateur made it known that he liked his pizzas *really hot.*

My Adelaide connection then told how, just before leaving Sydney, he arranged for a pizza to be delivered to the hungry amateur. In ordering same, he asked that it be made as hot as a pizza could possibly be made.

The resultant message, to my mind, becomes one of the most effective messages of a scriptural reference that I have ever encountered.

To save you reaching for your copy of the Bible, I quote:

Psalms 18:8. "There went up a smoke out of his nostrils; and fire out of his mouth devoured: coals were kindled by it."

Yours faithfully,

Ian Hunt VK5QX,
8 Dexter Drive,
Salisbury East, SA. 5109.
ar

BACK TO THE STONE AGE

The thought provoking article by Danny VK3NG, on the Education page of December AR, posed a marketing solution to an arithmetical approach to membership based on WIA and population demographics.

Danny's ideas to get people interested are neat and well-founded, but I fear, not based on a person's wants and needs, which is really what the graphs address. In my work I see all kinds of outcomes from the mix of wants and needs. In my opinion, it is not money or the lack of it which is the problem, nor is it wholly the type of social interaction of the young either. Let me explain.

First, when a young person (in employment) puts up $10 000 for a share in a Sailing Yacht, $2000 for a computer, $2500 into a Hi-Fi or $6000 plus into a motor car, as many of then do — they are investing in their wants. They are "things" or peer group artifacts in their communication with one another. Talking about rock stars and television shows comes cheaper, but they are essentially the same. When (say) matrimony supervenes, their wants change to real estate and furnishings, as do their social needs.

Second, as to those social needs, my 24 year old son (who helps me a lot with my hobby) put it succinctly by saying; "If I wanted to make a contact like you do, I'd make a random 'phone call." In our mature years our social wants and needs change as we recognise the importance of and satisfaction we get from inter-personal contacts with others, including fellow hobbyists. What the graph says is that, at about age 40, we amateurs have some spare cash and our wants are satisfied by both the social and skill side of our hobby.

Third, I disagree with Danny on stepping back into the Stone Age by CWing on 80 metres. I haven't met anyone yet who was not "switched on" by acquiring a new skill. By all means let us encourage the young by the means he suggests.

Our future, for which I do not hold any fears, lies in making a high impact on as many impressionable teenagers as we can, so that, after they get all their fads, fancies and family responsibilities out of their system, they will turn naturally to amateur radio for a satisfying hobby — which will satisfy their wants and needs.

Yours faithfully,

Alan Smith VK2BHI;
10 Banool Avenue,
St ives, NSW. 2075.
ar

WICEN NEUROTICS

I see that WICEN's most vociferous member has started the year with a full set of "Exocets" (see Jan AR, p61).

Over the years I have noticed Mr Gabriel's (VK4YG) continuous psychological attack on a group of Australian amateurs who choose to call themselves the *Australian Traffic Net.*

The members of the ATN have tried unsuccessfully to present their views: unsuccessfully because, Mr Gabriel's mission is pure seek and destroy!

If Mr Gabriel is allowed to seek and destroy a legitimate amateur net, a group who cause no interference to others, perhaps he will next turn his attention to DX nets — "Look out Jim Smith!"

The Australian Traffic Net is just a group of dedicated Australian amateurs who offer their time and equipment free to ensure that Australia has an established system to work other International Traffic Networks. Any amateur or group may operate such a system or net for what-so-ever reason providing it is within the licence conditions. No doubt the Department of Communications is indeed most grateful to have an unpaid moral policeman on their staff!

I am sure that most WICEN members wish their upstanding and dedicated organisation did not have to be associated with Gabriel's problems.

It is obvious that the publicity the ATN is able to obtain through its excellent service and dedicated members is driving him out of his mind.

Australia is, so far, a democratic country. Freedom of the press is everyone's democratic right!

A D Tregale VK3QQ
Ex G3LMT, DL2AH, MP4BDN, 9L1AT
73 Nepean Street,
Watsonia, Vic. 3087.
ar

VK4 WICEN CO-ORDINATOR'S REPLY TO PREVIOUS LETTER

Receipt is acknowledged, with thanks, of your letter dated January 2, 1987, under the heading *WICEN Neurotics.*

It is considered that the heading is rather inapt as the views expressed at various times in AR by My Gabriel VK4YG, are his own personal views and not necessarily those of the WICEN organisation.

(A letter from me, dated September 10, 1982, was addressed to Mr Gabriel expressing the wish that such criticisms of the ATN should be purely on a personal basis.)

Queensland WICEN acknowledges the existence of the ATN networks and consider that Mr Voron VK2BVS, is a dedicated amateur doing a very useful service in his particular sphere. We have, in fact, given him as much assistance as possible in explaining to the amateurs of Queensland the difference between WICEN and ATN, this is evident from the WICEN column in the Queensland Newsletter headed "WICEN in a Nutshell" (see WICEN column this issue of AR for a re-print of this article), which was distributed in quantity to all Queensland radio clubs, all WICEN officers and was also distributed at two major Hamfests.

Further, Queensland has exchanged training manuals so that both organisations are familiar with the two different formats, but it should be again emphasised that WICEN in Queensland will only use the accepted format of message handling as laid down by the Federal WICEN Co-ordinators, similar to the Civil Defence. Any traffic accepted by the ATN from overseas, if of an urgent nature, for Queensland would be accepted by WICEN provided the format was transposed to agree with ours, and that a recognised disaster or emergency was in force.

As you are doubtless aware, our prime aim is to provide back-up communications for the authorities during a disaster or emergency and to have a point of contact into, or out of, every town or city in Queensland.

To achieve this, we have some 50 towns which have a WICEN officer whose duty is to provide that essential function should other communications fail. He is also responsible to see that a local group is formed to assist the authorities as required.

Again, the third party organisation does not fill an important gap providing welfare traffic facilities for individuals and does not encroach on WICEN which is concerned more with official emergency traffic for the authorities.

Thank you for your interest,

Kind regards and 73,

Ken Ayres VK4KD,
State WICEN Co-ordinator,
WIA (Queensland Division),
Box 638, GPO,
Brisbane, Qld. 4001.
ar

GIVE ATN BASHING A REST

I've followed with increasing concern the many letters on the operation and purpose of the Australian Traffic Net. I note that many of the adverse comments appear to come from WICEN members, and/or "old timers" who seem to think the 30 years in radio is the prerequisite that makes them a VK authority on all facets of amateur radio.

For those that would now question my "experience", I was a military telegraphist for a mere 25 years and have the distinction of being told recently that my six year In AR makes me a newcomer to radio. I am neither involved in the ATN or WICEN.

Both the ATN and WICEN provide a useful service, the former handling third party traffic both within VK and overseas, and the latter in providing emergency links when activated by the relevant authority. The two organisations are distinctly different in purpose and to suggest that one should leave the ATN and join WICEN to learn anything is patently ridiculous. To lambaste the ATN for providing third party traffic communications during international disasters because it has the temerity to use the words "emergency traffic" is ridiculous in the extreme. If nothing else, the ATN allows the message writer to know that they have done everything possible to communicate with their loved ones when disaster disrupts civil links and that must count for something.

The ATN has, on several occasions in recent years, gained favourable national media coverage and thus provided mush needed publicity for AR. I do not see other facets of our hobby, with the exception of the Jubilee of South Australia Awards Program, gaining that much needed publicity regardless of how experienced they see themselves. I can only surmise that they are green with envy!

I, for one, would like to see ATN bashing given a rest and your erstwhile correspondents focus their attention on some other facet of AR like packet radio, ATV, award hunters, RTTY, or even that sacred cow, WICEN.

Yours sincerely,

Grahame Parsons VK2DUP,
6 Eagle Place,
Sanctuary Point, NSW. 2540.
ar

CONGRATULATIONS

Congratulations on *Amateur Radio.* It is a fine magazine and of world standard. I believe it to be better than *QST* and *CQ* to which I subscribe.

73,

Frank Doherty VK1XE,
30 Lumeah Street,
Narrabundah, ACT. 2604.
ar

ANTI-TECHNICAL

I am writing in response to a letter from Ross Cummins VK2CRJ, published on page 61 of the December issue of AR.

I have followed with interest the various articles and letters proposing changes to the system of amateur licensing in Australia. Some of the proposals put forward are, in my opinion, sensible and feasible whilst other, I feel, are blatantly silly. Mr Cummins' letter however takes the cake!

There is certainly a consensus that something must be done to arrest the apparent decline in the number of people entering the hobby of amateur radio but I cannot help feeling that some of the opinions expressed are based on purely selfish motives. Too many amateurs are looking at how changes will affect them personally and ignoring the fact that if the hobby continues to decline they will be in danger of losing their coveted spectrum to non-amateur interests.

It is, in part, this short-sighted attitude which has prompted me to reply to Mr Cummins but I am most annoyed and concerned with his "anti-technical" attitude.

Not too long ago the limited licensee was regarded as the technical "whiz- kid" of amateur radio. These were the people experimenting with the new modes and difficult frequencies and who often had no interest in the familiar technology of HF.

In more recent times some amateurs have come to regard the limited licensee as a second class operator who doesn't have the ability or strength of character to achieve a full call. Nothing could be further from the truth. Some of the most technically competent amateurs I know are satisfied with the scope provided by the limited licence. They have developed their operating skills through their interest in weak signal VHF and UHF DX, satellite and EME operation and the like. Many now use CW as an extra mode since this has been allowed but still few see the need to obtain a full call.

How dare Mr Cummins suggest that a "technician" class licence or, as he puts it, "an up-market limited operator" is something undesirable on the amateur bands. I have recently upgraded from a limited licence (November 1986) and I object to the intimation that 10 words per minute Morse has elevated me to the exalted heights of which Mr Cummins sees himself. Considering that it took "years of study" for Mr Cummins to obtain his "zenith" in the form of a full licence I would suggest that most limited licensees that I know have forgotten more about radio theory than he will ever know!

I would remind Mr Cummins that amateur radio is essentially a technical hobby. I could take an equally narrow view and state that anyone who simply wants to operate a radio with no particular interest in the technicalities should stick to CB, but I believe that there is, or should be, a place for every type of interest within the amateur service.

For Mr Cummins to state that those whose interest is in the technical area should operate QRP into a dummy load for the betterment of the hobby and to save his precious spectrum is both abhorrent and totally at odds with my perception of what amateur is about. It would be equally as stupid for me to suggest that anyone who only wanted to improve his operating skills should forget about radio and operate into a tape recorder.

I believe that amateur radio has a future provided as many people from as many different interest groups as possible can gain access to the hobby from a wide number of entry points. I also believe there will be problems as long as there are people like Mr Cummins who, with his "I, me, mine" attitude, wish to blow their trumpet about their full call and impeccable operating skills by writing ill-conceived letters to magazines.

Andrew Kelr VK2AAK ex VK2XKK,
174 Frederick Street,
Seven Hills, NSW. 2147.

ar

NO RESPONSE?

I had hoped that there would be more response to my letter printed in AR last June. It would be really helpful to me if somebody could come up with some real, factual information about the Psychology of Teaching and Learning Morse Code.

Many people hold strong beliefs on this subject based on their own experience but they tend to denigrate those whose experience doesn't agree with their own. It is fine to hold strong views but if you cannot back them up with valid arguments they may have little value. The suggestion was made recently that the only requirement necessary for learning Morse code is regular daily practice. The *only* requirement?

Another recent comment was to the effect that the idea of starting newcomers with simple CW gear shows "conservative and backward thinking". Maybe he is right, especially if aiming at 16 year olds as mentioned. He would also find some difficulty in getting schools to introduce a course on amateur radio into their curriculum, especially at year 12 level. But maybe he is wrong.

Let's take another tack. If we believe that our hobby is interesting, fun and a way of meeting with people who are good to know then let's think about starting to introduce it to kids before they are too heavily burdened with school work or already set in their interest patterns and the allied peer groups which go with those interests.

I was introduced to things electrical at the age of 10 because a garage mechanic cared enough to wind me a low voltage transformer to experiment with. Nowadays, we can start with a battery or two and some transistors, etc — much safer too. Science teachers in schools are finding that often the lack of interest in science as a profession is because we have not fired the imagination of kids early enough; ie in our primary schools.

Another point, kids of eight to 10 are possibly quite interested in the idea of having their own "special" language — Morse. We're back there again. But do we really know how best to teach Morse? If we do, why are there so many amateurs who don't use it? Let's leave the name calling and adjectives aside for a while. Just suppose that people who refrain from using Morse are not all lazy or stupid. Let's not bring in comparisons like learning to walk etc, unless we can demonstrate valid experimental connection between that and learning Morse code.

Education has made many valid strides in recent years and it seems easy to believe that there may be more effective ways of teaching Morse code if we look for them. Although many kids may not have useful computers at home, most primary and other schools do and this could be a basis for more useful courses.

Morse code and low cost simple equipment go hand in hand. Perhaps we could even look at a special licence with a QRP transmitter — say five watts total DC input (easily measured) with crystal control (VXO). That, with a simple direct conversion receiver could be the starting point for a life-long interest.

One final plea. If anyone has access to modern experimentally derived information on the *Psychology of Learning and Teaching Morse Code* will they please get in touch with me.

Nell Tralnor VK3IJ,
133 Bladin Street,
Laverton, Vic. 3028.

ar

VISITING FROM OVERSEAS

Visiting relatives in Australia, I was surprised to notice on a board, while visiting the Telecom Museum in Adelaide, one of my QSL cards, VQ8AS, amongst a batch donated by V R P Cook VK5AC, to the museum. The QSO took place 49 years ago on December 10, 1932. I was, at that time, 17 years old and working for a company on one of the islands forming part of the Chagos Archipelago — Solomon Islands. The Chagos is positioned on the map about 72 degrees east and five degrees south in the middle of the Indian Ocean. I was using a TPTG transmitter with an Osram valve, PX4, supplied from a bank of 110 volt batteries. The input power was four watts into a modified Zepp antenna.

It was the very good old days where I used to have a regular sched with Ron Mitchell VK2AGJ and Ramsay VK4AB, on 20 metres (do any readers know if these two gentlemen are still alive?). Unfortunately, VK5AC passed away about four years ago, according to information given to me by the OM in attendance at the museum, whom I sincerely thank for the help given to me and for allowing me to take photographs of the board and equipment used by VK5AC at that time.

I returned to Mauritius in 1938 and, when war broke out, I was called-up to the Navy and sent back to the Chagos, this time to the island of Diego Garcia, where I was in charge of telecommunications.

I had the opportunity of meeting some Australians in the RAF/RAAF and also aboard the auxiliary Australian ship *Kanimbla*. (I was most interested to read the article by Joe VK2BJX in *Listening Around*, December AR about the above ship).

Diego Garcia is now an American base and many American amateurs are stationed there using the prefix VQ9. . .

I would also like to thank, through the pages of AR, the members of the South Australian Blackwood Amateur Radio Club for their kind hospitality.

73 to all.

Paul Caboche 3B8AD ex-VQ8AS,
PO Box 462,
Port Louis,
Mauritius.

ar

CALL BOOK CONGRATULATIONS

I wish to express my congratulations on the production of the latest Call Book, particularly the innovation of indicating membership of the WIA against an operator's call sign.

Apart from allowing me to be aware of the fact that I am speaking to a fellow member, I now have the benefit when checking the listings of knowing which of the details are more likely to be correct and accurate.

I am aware that the Institute's membership listing is the source for this information in the Call Book and as members virtually have communication with the Institute on a monthly basis (by virtue of the receipt of *Amateur Radio*), this constant communication must result in records being updated on a regular basis.

It is not my intention to criticise the balance of the listings supplied by DOC, however I doubt that the Department has such regular communication with individuals as does the WIA.

The listing as currently presented also has the advantage that knowing that the person you are talking to is a member and in receipt of *Amateur Radio* you can probably assume that he is more correctly informed as to amateur radio matters than would otherwise be the case.

After some years of discussion regarding implementing this format I am glad to see that it has been effected. Once again congratulations on an excellent production.

73,

Ian Hunt VK5QX,
8 Dexter Drive,
Salisbury East, SA. 5109.

ar

REMEMBRANCE DAY CONTEST SCORING

The publication of the RD Contest results and discussions I have had with Ian Hunt VK5QX, over the last two years, together with a recent conversation with Ron Henderson VK1RH, has motivated me to put together some ideas I have had on how the contest is scored.

This contest is called the "friendly contest" and one aim is to get a lot of amateurs on the air. Two factors are therefore important — participation and activity. A third — a weighting factor — is necessary to try to give each state or territory a fair chance of winning.

The present scheme measures:

a participation by dividing the number of contestants from each area by the total number of licenses issued in that area; and

b activity by dividing total points from an area by the number of contestants from that area.

Each of these on its own is a good measure of either participation or activity but when you put them together you lose the effect of the number of contestants,

ie gross score = participation x activity =

$$\frac{\text{Number of Contestants}}{\text{Number of Licenses}} \times \frac{\text{Total Points}}{\text{Number of Contestants}} = \frac{\text{Total Points}}{\text{Number of Licenses}}$$

This arises because number of contestants is used twice. I feel it best to use participation as presently defined, but use total points as a measure of activity. In this way many contestants with high scores is a sure way to get a high gross score.

The third factor, to even out the states differing amateur population, is a weighting factor and is worked out in advance by looking at previous years results. This has the effect of giving a better chance to states who greatly increase their gross scores over previous years. The present prediction uses a 10 year linear fit and requires some higher mathematics to calculate. I feel we should use a simpler method and only look at the last four or five years data, a simple average of the last four years actually achieved weighting factors should do quite well.

In order to show how this would all work out, I have taken data from the article by VK1RH on the RD Contest Scoring System in AR of August 1986, and calculated weighting factors using a four year average. In the Table, P is points scored, P/F participation factor and G/S is gross score.

If these weighting factors had been used in the 1986 contest, the results would have been:

VK1 502974; VK2 401571; VK3 155874; VK4 321475; VK5 106338; VK6 187750; VK7 140239; VK8 256620.

Well, think it over and let your Division have your reaction.

Colwyn Low VK5UE,
34 Hawker Crescent,
Elizabeth East, SA. 5112.
ar

		82	83	84	85	86
VK1	P	9881	6510	5440	5346	6324
	P/F	11.6	9.3	10.8	17.6	18.2
	G/S	114619	60543	58752	94090	115097
VK2	P	1716	12236	14964	12638	13798
	P/F	2.8	2.1	1.9	1.8	2.72
	G/S	48048	25695	28432	22748	37530
VK3	P	23111	17510	15240	14157	10252
	P/F	2.6	2.1	2.9	2.7	2.03
	G/S	60088	36771	44196	38224	20811
VK4	P	12444	10010	9555	6624	9788
	P/F	4.8	3.3	2.7	2.8	3.4
	G/S	59731	33033	25799	18547	33279
VK5	P	42350	36284	24320	16616	15638
	P/F	13.8	11.9	9.4	7.7	6.8
	G/S	584430	431780	228608	127943	106338
VK6	P	33360	21432	13824	12870	13400
	P/F	11.8	11.5	7.3	8.2	8.34
	G/S	393648	246468	100915	105534	111756
VK7	P	11840	7392	4847	2860	3719
	P/F	13.7	9.2	6.8	4.5	5.62
	G/S	162208	68006	32960	12870	20900
VK8	P	1287	1910	450	122	263
	P/F	5.4	6.0	3.8	1.2	3.46
	G/S	6949	11460	1710	146.4	910

Table 1 — Points Scored, Participation Factor and Gross Score.

	82	83	84	85	86
VK1	5.10	7.13	3.89	1.36	1.00
VK2	12.20	16.80	8.04	5.62	3.07
VK3	9.73	11.7	5.17	3.35	5.53
VK4	9.78	13.10	8.86	6.90	3.46
VK5	1.00	1.00	1.00	1.00	1.08
VK6	1.48	1.75	2.27	1.21	1.03
VK7	3.60	6.35	6.94	9.94	5.51
VK8	84.10	37.70	134	874	126

Table 2 — Achieved Weighting Factors.

	To be applied in 1986	To be applied in 1987
VK1	4.37	3.35
VK2	10.70	8.38
VK3	7.49	6.44
VK4	9.66	8.08
VK5	1.00	1.02
VK6	1.68	1.56
VK7	6.71	7.19
VK8	282	292

Table 3 — Four Year Averaged Weighting Factors.

Silent Keys

It is with deep regret we record the passing of —

MR R V BARRINGER	VK2RR
MR A K BRADFORD	VK4KK
MR E M CLYNE	VK3HZ
MR DAVE DUFF	VK2EO
MR C J FOWLER	VK3ACF

Obituaries

GEOFFREY CLAY VK2ECA

The sudden death on Wednesday, November 26, of Geoff VK2ECA, aged 61, came as a great shock to his many amateur radio friends.

Although he had been in indifferent health for some months, Geoff had still been his cheerful self right up to the day of his passing.

Geoff Clay had spent most of his life in Cessnock and Paxton, and was closely associated with the mining industry. During the war, he was a telegraphist aboard the ill fated HMAS *Arunta* during the Pacific Campaign. Although he suffered extensive injuries in this encounter he returned to the work force at the cessation of hostilities. A mine accident caused his early retirement from work and left him with serious disabilities about which he never complained.

Geoff took up amateur radio in the late 70s and became licensed as VK2PBN in 1981. He later held the call sign VK2KLA, and soon afterwards VK2ECA. He was a keen CW operator and had many DX awards to his credit. Meticulous attention to detail in his model shack and his efficient antenna farm assured him of a clean and big signal using moderate power.

He was an idealist with strong views but a very kind nature. He had keen interests in gardening and reading and his wide knowledge on a variety of subjects was evident in his informed conversation.

The quiet funeral service at Cessnock was attended by former ship-mates and a large number of his radio amateur friends, young and old alike.

Geoff Clay leaves his wife Dot, and a vast circle of amateur radio friends, all of whom greatly mourn his loss.

Keith Howard VK2AKX
ar

HEINZ FRANZ PADBERG VK2DGK

Members throughout the Hunter area, as well as his many German speaking friends all over Australia were saddened to hear of the passing of Heinz VK2DGK. He had been admitted to hospital for observation and had only been in intensive care for a short time when a complication in his condition on December 18, brought about his sudden death as the age of just 66.

No doubt Heinz will be remembered by most of his Australia-wide radio amateur friends because of his activities in the Saturday morning German speaking net which he commenced in about 1980. However, many of those whose early careers took them to the BHP works in Newcastle will remember Heinz and value his help when he worked in a supervisory capacity in the electrical apprentice school for many years following his arrival in Australia as a migrant.

Heinz had been associated with radio and electronics since his school-days in Germany and it is believed that he held a DL-licence at the time that he was working for the US air force during the days of the restoration of his country following the war.

It was his youngest son who prompted him to become a full call licensee here. He had first qualified as a novice with the call sign VK2VME, and he upgraded to VK2DGK in 1979. He was a keen computer operator and was responsible for many original ideas in this field. He lectured for some time at the Maitland Radio Club and helped many gain their licenses. Heinz was a talented musician and, being a very practical man, could turn his hand to almost anything associated with radio.

A large gathering of relatives and friends, many of them radio amateurs, attended the funeral held at Beresfield on December 22, 1986.

Heinz is survived by his sons Detleef (Pat) VK2KEX and Ulrich (Don) VK5PPD, and daughter Joyce. His cheery voice and helpful counsel will be sadly missed by his many friends both on and off air.

L Kentish VK2CFK
ar

HARRY RAYMOND CARTER VK2HC

It is with deep regret that we record the passing of Harry Raymond Carter MBE, VK2HC, on November 27, 1986. aged 75 years.

Ray was born in Quirindi on October 13, 1911. He obtained his experimental licence while still at school in Armidale, in September 1926. His call sign OA2HC, was used to work F8GM with 20 watts — his first European QSO.

His age and isolation, 56 km from town, did not deter his interest with Morse code being learned from Coastal Shipping. He was very active on CW with many firsts and awards to his credit.

Harry was released from rural work and joined the RAAE He continued training in Morse at Bradfield Park and Richmond Air Base, attaining the rank of Flight Lieutenant by the end of hostilities.

He was instrumental in introducing Field Radio into Bush-Fire Brigades and was a member of the Tamarang Shire Council for over 20 years (17 as Shire President). He was a member of the Cunningham and Central Northern County Councils and was also a participant of the Quirindi Historical Society, to which he made a large contribution by writing and printing a book on local history.

For his community work, Harry was awarded an MBE.

His country property, *Amaroo* was his greatest interest and he was involved in running it right up to the end.

He will be sorely missed by his son Tony, daughters Elsie and Leonie and all of their respective families, not to mention amateur radio.

Peter Ritchie VK2ESP
ar

PIETER VAN LOUWERSEN VK2BDL

My late husband, Pieter, was a very keen member of the WIA. He spent many happy hours contacting friends and people all over the world and received over 53 certificates for contests in various states and countries. He also has over 5000 QSL cards from world-wide radio contacts.

Pieter attended the Dutch Naval College and became a fully qualified radio telegraphy officer. He had just finished his National Service in the Dutch Navy when war was declared. He travelled to England and joined firstly an English vessel then a French one, prior to the Dutch forming their Navy.

He then joined the *Heemskerk* and did convoy duty through the mine- fields in the North Atlantic. His next posting was to the Middle East and the Indian Ocean. He served with the Australian forces at Post 6, Mauroke in the Secret Service before receiving his honourable discharge at the end of hostilities.

He was a very clever and intellectual man — he attended University after his discharge and attained his Bachelor of Engineering Degree. He joined the WC and IC, where he became head of the materials testing laboratory and was held in high esteem by those who worked under him, helping and coaching his staff in his own time.

Not only brave during the war, he bravely fought his last battle with cancer for the past two years, finally succumbing to his illness on November 9, 1986.

Pieter lives on in his son Karl and his clever little grand-daughter, Tanya. He is sadly missed by his wife after 43 years of marriage, and by Karl, Diane and Tanya.

Contributed by (Mrs) Veda van Louwersen
ar

WILL COLLIS VK2VJC

Our son, Will VK2VJC, passed away on December 22, 1986, as a result of a freak accident. He was 33 years old and worked for Telecom.

Will's interest in amateur radio began in 1978 when we passed the Novice examination together. Although not very active on-air due to other commitments, Will had many friends in the amateur fraternity, and was always available with help and advice.

He assisted with JOTA in Wellington for a number of years, and was Secretary of the Yeoval Radio Social Club, VK2CYR. The Club was designed to create an interest in amateur radio.

Will was a wonderful son, loving husband and good father who is sadly missed by his wife Jenny, children Jonathan (6), Benjamin (3) and Natasha (2), also his own family, workmates and many friends.

Contributed by Joy Collis VK2EBX

COMPUTER SERVICE BOOM

O Fixing broken computers, repairing medical equipment, industrial robots and a wide range of high technology gear is a growing area in the United States.

According to a study by a research and consulting firm, the high-tech servicing industry will grow at least 13 percent a year compared with computer sales at around seven percent.

The proliferation of personal computers throughout the workplace and corporate networking has increased the demands for maintenance and repair.

Equipment makers and independent service companies are gearing up to exploit the growing opportunities.

Service personnel are finding it vital to keep abreast of a dizzying array of technology an products, requiring them to undergo advanced training and education.

SOVIETS GO STATESIDE?

O The United States is considering giving the Soviet Union access to the medium wave broadcast band within its own country in return for Voice of America shortwave Russian-language broadcasts being free from jamming.

The director of the US Information Agency, which runs VOA, says response from several US commercial broadcasters has been encouraging.

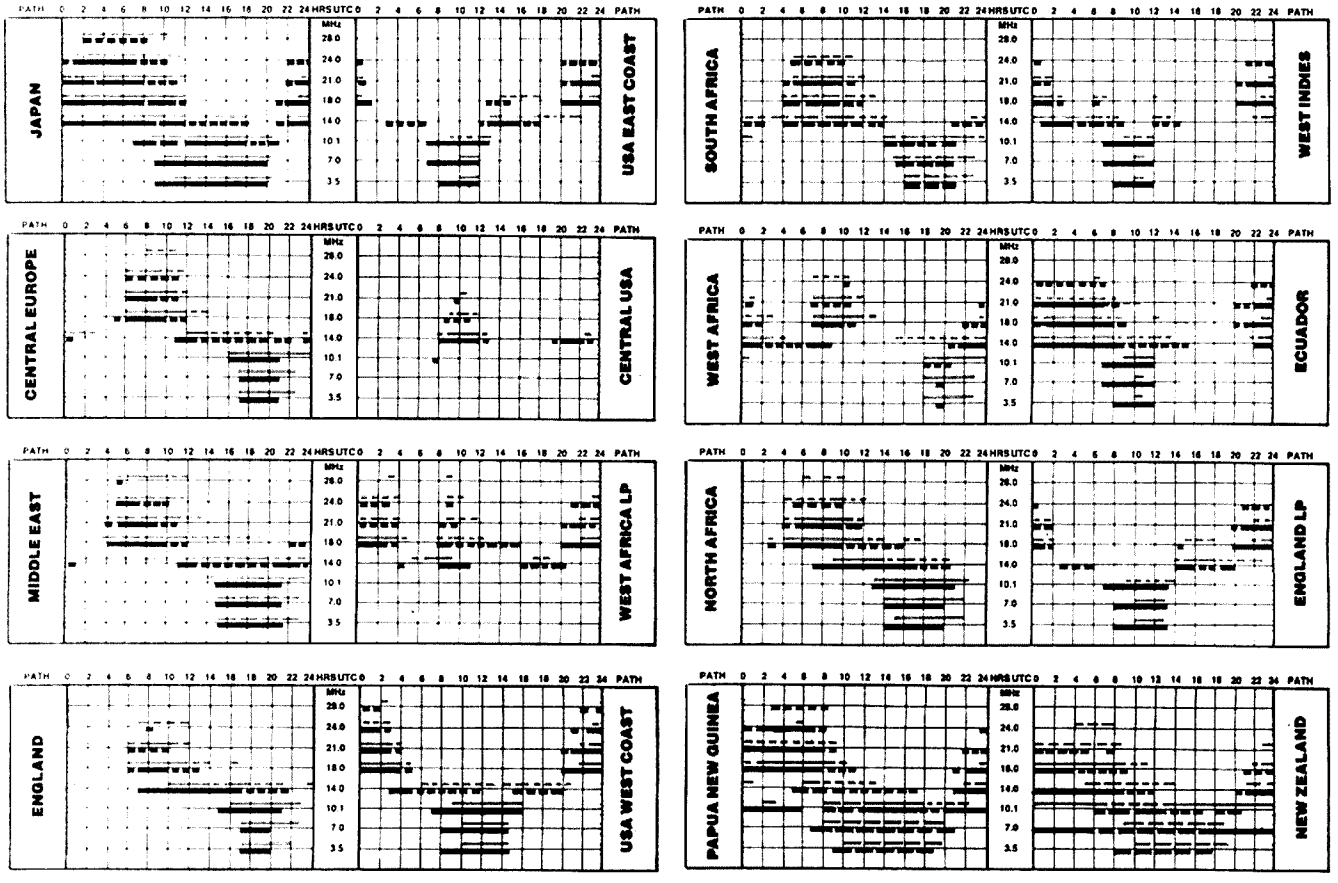
He says the idea was discussed with the Russians during September's summit meeting between the US President and the Soviet Leader.

The Kremlin chief in a television broadcast later said he had offered President Reagan an end to jamming of VOA transmissions to the Soviet Union in return for broadcast facilities on, or near US territory.

Moscow wants medium wave band outlets because few Americans have shortwave receivers.

Ionospheric Predictions

Len Poynter VK3BYE
14 Esther Court, Fawkner, Vic. 3060



LEGEND
From Western Australia (Perth)
From Eastern Australia (Canberra)

Mixed mode dependent on angle of radiation (long broken lines).

Better than 50% of the month, but not every day (continuous lines)

All paths unless otherwise indicated; lie LP = Long Path) are Short Path.

Less than 50% of the month (short broken lines).

Predictions are presented courtesy of the Department of Science, IPS Radio and Space Services, Sydney.

Thumbnail Sketches

Vic Joyce VK2EVJ
17 Prescott Avenue, Dee Why, NSW. 2099.

JACK PICKLES VK2YK
A legend in his own lifetime

Jack has earned the friendship and high regard of hundreds of CW operators through monitoring and QSOs on 7.025 MHz. You could always depend on him for a QSO or to pass a message to other *customers*. When Jack and Peter VK2PA, got together for their daily sessions everyone was treated to a tremendous example of top-class QSK CW operating and the opportunity to practice copying high speeds — 50 WPM was common, with excursions higher!!!

Jack was educated at a private school in Newcastle and subsequently at Avondale Adventist College. He had in mind to become a missionary, but could not resist meat pies! He then did the Marconi School's correspondence course and commenced his career as a Radio Officer on a Red Funnel trawler.

At one stage, Jack was employed on a Norwegian Whaler and journeyed to the Antarctic where he also flew their Walrus flying boat scout plane.

During World War II, he served in a special unit and suffered badly at the hands of the enemy.

After the war, Jack joined DCA and, during 20 years in their employ, served in the Northern Territory, Queensland and New South Wales. He was also an active sharebroker during the mineral boom.

Jack was first licenced as VK2QV, in 1934. He became VK5QV whilst in the Northern Territory, then VK2AAR upon returning to New South Wales prior to receiving his present call sign. He used a *bug* and became known as *Piccolo Pete* because of the few extra dots he would throw into his transmissions. Eventually, he got a keyboard from Alan VK2BF, and never looked back.

During his 20 years on 7.025 MHz, he became an institution and provided thousands of contacts and has been a source of company for all and sundry looking for a CW contact. There were many occasions when he was able to help yachts in difficulty.

Jack is very appreciative of all who have made amateur radio such a satisfying hobby for him.

Recently, Jack has been having a rough time with his health and, as a result, has been sorely missed on 7.025. The main business on the frequency has been the state of Jack's health as all inquire after him.

Jack has been in the good hands of Dick VK2BKH, who lives nearby and has been a tower of strength to him.

I know I speak for many people when I say: "Thanks Jack" and wish him a good recovery and a lot more pleasure on 7.025. It would be great for him to win some pies back from Peter VK2PA!

STOLEN EQUIPMENT REGISTER

Peter Gamble VK3YRP
6 Bath Road, Burwood, Vic. 3125

In accordance with the 1984 Federal Convention Motion (84:17:01), a *Stolen Equipment Register* was established at the Federal Office. Periodically lists were printed in AR, however, it is some time since a consolidated list was printed.

The register has now been set up by the Federal Office as a data base. The list has been sorted according to three keys:

Date Stolen
Manufacturer
Owner

and copies of all three lists have been distributed to each Division. Updates will be distributed to the Divisions and printed in AR as they come to hand.

Members wishing to take advantage of this register, either to publicise their loss or to check equipment offered to them, may write or telephone the Federal Office. Telephone reports of stolen equipment should be followed up with confirmation in writing giving the manufacturers name, type of equipment, serial number, date stolen, owners name, address and call sign. Also a note of any distinguishing characteristics or modifications.

Would you also please ensure that the Federal Office is notified promptly when equipment is recovered. If you have equipment on the following list, please check the details and advise the Federal Office if there is any errors in the following list.

MODEL	SERIAL NO	OWNER	DATE STOLEN	COMMENTS
ICOM				
IC2A	04484	VK1MX	*21.01.85*	Vinyl Case
IC2A	09665	VK4NME	*29.01.86*	
IC2A	12213830	VK3YOD	*02.12.83*	Spare battery pack
IC2A	12215146	VK3CRH	*21.06.83*	
IC02A	29901052	VK2CKD	*05.02.86*	
IC4E	18103021	VK3YOD	*02.12.83*	Spare battery pack
IC22	12266	VK3BLC	*29.04.85*	
IC22A	1914	VK4ZSH	*03.09.85*	
IC22A	8853	VK3ZU	*03.05.84*	
IC22S	14727	VK3ME	*14.08.85*	Extensive modifications
IC22S	14957	VK3DYZ	*11.09.84*	
IC22S	62014533	VK3KAW	*23.12.85*	
IC25A	03831	VK2DPM	*04.11.84*	VFO modified
IC45A	01876	VK2DPM	*04.11.84*	
IC45A	18351005	VK3KJC	*22.02.84*	Memory b/u unit
IC202	41013616	VK3ZBI	*00.10.85*	
IC202	5144	VK4ZSH	*03.09.85*	
IC211	6804309	VK3BRV	*17.10.84*	
IC215	05156	VK2AMX	*20.11.84*	
IC251	01106	VK4ZSH	*03.09.85*	
IC290H	17701965	VK3ZBI	*00.10.85*	
IC290H	17703342	Emtronics	*17.02.86*	
IC490A	16101192	VK3BVO	*00.03.83*	
IC551	01273	VK4ZSH	*03.09.85*	Includes FM, VOX
IC551	9401253	VK3ZBI	*00.10.85*	
IC551-D	99003878	VK3YSG	*01.01.84*	
IC720A	06242	VK4ZSH	*03.09.85*	
IC730	13806798	Mel Unl	*18.09.85*	Home-brew power supply
IC735	36304455	Emtronics	*17.02.86*	
ICPS20	10101966	VK3YSG	*01.01.84*	
KENWOOD				
AT-200	820049	VK2DCB	*16.08.84*	
DG5	730475	VK2DCB	*16.08.84*	
SP520		VK2OCB	*16.08.84*	
TR2400	0061926	VK2PJ	*20.04.85*	Call sign engraved
TR2400	0061950	VK2DPM	*28.08.84*	
TR2500	3040009	VK2ZQC	*29.05.85*	Also mic, charger
TR2800A	7030631	VK5AAR	*03.10.86*	
TR7850	1111125	VK2CCK	*07.02.86*	
TR7850	202080	VK2DED	*06.03.84*	"N" antenna connector
TR7950	4010747	VK2TVG	*08.08.85*	
TR9000	1020527	VK2KAH	*03.01.87*	Has mods
TR9000	1050780	VK3YSG	*01.01.84*	
TS120V	0081224600	VK2VWN	*03.05.85*	MC35 mic
TS130SE	2060697	VK2KAH	*03.01.87*	Includes WARC bands
TS43CS	4010322	VK2XJC	*15.05.85*	Includes FM, filter
TS520S	820972	VK2DCB	*16.08.84*	
TS930S	3050176	VK7JG	*13.01.83*	
VFO-520		VK2DCB	*16.08.84*	
YAESU				
FC707	11140775	VK2OBB	*28.04.86*	
FRG7	299L26099	VK3ZLY	*28.07.83*	
FT101	34224	VK2DC	*18.08.85*	
FT101E	8G350283	VK2SS	*29.06.84*	
FT101E	8L370414	VK3DYZ	*11.09.84*	
FT200	2K332252	VK3DYZ	*11.09.84*	
FT203R	4H081794	DSE Vic	*13.05.85*	
FT207R	10132725	VK2EMC	*04.03.85*	Batt cover missing
FT208R	3N350964	VK2CBA	*30.07.85*	
FT209R	4E360554	VK3KGH	*00.06.85*	Vinyl case
FT209R	4L06245	DSE Vic	*13.05.85*	
FT209RH	4K050838	VK3CE	*00.00.85*	Blue vinyl case
FT209RH	5K190401	VK2HW	*21.02.86*	Leather case
FT290R	1L081321	VK3KJC	*22.02.84*	
FT290R	1M081340	VK2VE	*04.01.87*	With carry case & nicads. Owners name on front of unit as well as inside case
FT290R	3C260713	VK2EGD	*12.11.86*	
FT480R	1H12069	VK1ZUR	*29.05.84*	
FT620	010489	VK4ZSH	*03.09.85*	
FT680R	3H080202	VK2XJC	*15.05.85*	
FT7	81090839	VK3BYK	*28.06.83*	
FT7	8I090728	VK2KSY	*16.09.85*	
FT708R	1H010948	VK2PJ	*20.04.85*	Call sign engraved
FT757GX	3N040371	VK2DBB	*28.04.86*	Call sign engraved
FT780R	1J061616	VK3ZBI	*00.10.85*	
FT780R	3F070521	VK2XJC	*15.05.85*	
Y-901-P	9L030072	VK1ZVR	*15.12.84*	Includes modules
YP150	81090469	VK2DCB	*16.08.84*	
MISCELLANEOUS				
Dick Smith Audio Generator		VK2XJC	*15.05.85*	
DSE Explorer 70 cm FM Tcvr		VK2KUR	*24.09.84*	Extensive mods
Drake SPR4	3089	VK4ZSH	*03.09.85*	Incl 100 kHz cal
Dressier EVV2000 2m pre amp	1027	VK2XJC	*15.05.85*	
Kyouto FM144-10 2m FM Tcvr	5027	VK2KUR	*24.09.84*	Call sign engraved
Leader LSG-16 Signal Generator	1081098	VK3YSG	*01.01.84*	Misc bits also
Mirage B1016 2m 160W Power Amp	550779	VK3KAW	*23.12.85*	
Regency HX2000 Hand-Held		DSE Vic	*13.05.85*	
Saiko SC7000 Scanner		VK2XJC	*15.05.85*	BNC ant socket
Thorn B&W TV	107512	VK2XJC	*15.05.85*	Mod for computer
Tokyo HL160V 2m Power Amp	829331	VK2XJC	*15.05.85*	
Tokyo HL86V 6m Power Amp	819595	VK2XJC	*15.05.85*	
Tokyo HL90U 70 cm Power Amp	8304246	VK2XJC	*15.05.85*	
Trio CS-1560A2 CRO	10-20171	VK3YSG	*01.01.84*	
Uniden 2020	50806009	VK2KSY	*16.09.85*	
Welz SP200 SWR/PWR Meter	600384	VK2XJC	*15.05.85*	

The above list represents the best information available to the Federal Office of the Wireless Institute of Australia at the time of going to press, errors and omissions excepted.

ar

RADIODES

ANT IS DIPOLE

Some have dipoles, some have quads,
Some have lengths of wire.
But whether tubes or wires or rods,
It's good to put them higher.

Antenna towers are rather scarce,
Materials are expensive,
So propagating Megahertz
Makes amateurs quite pensive.

A natural solution
Was one that came to me,
By thoughtful evolution
Whilst looking at a tree.

Removing all the branches
From apex down to bole,
Without expending riches
Produced a lengthy pole.

The tree was then equipped with guys.
'Twas rigid then though thin.
Another tree processed likewise
Produced a perfect twin.

A simple dipole in the air
The passer-by now sees.
Because I have a perfect pair
Of half-wave garden trees.

—"Hambard" (Originally printed in the Nigerian ARS Newsletter 1970s)

DEADLINE

All copy for inclusion in the **May 1987** issue of *Amateur Radio*, including regular columns and Hamads, must arrive at **PO Box 300, Caulfield South, Vic. 3162**, at the latest, by **9 am, March 18, 1987.**

Hamads

PLEASE NOTE: If you are advertising items FOR SALE and WANTED please write ***each*** on a separate sheet of paper, and include all details; eg Name, Address, Telephone Number, on both sheets. Please write copy for your Hamad as clearly as possible. ***Please do not use scraps of paper.***

- Please remember your STD code with telephone numbers
- Eight lines free to all WIA members. $9.00 per 10 words minimum for non-members
- Copy in typescript, or block letters — double-spaced to ***Box 300, Caulfield South, Vic. 3162***
- Repeats may be charged at full rates
- QTHR means address is correct as set out in the WIA current Call Book

Ordinary Hamads submitted from members who are deemed to be in the general electronics retail and wholesale distributive trades should be certified as referring only to private articles not being re-sold for merchandising purposes.

Conditions for commercial advertising are as follows: **$22.50 for four lines, plus $2.00 per line (or part thereof)**
Minimum charge — $22.50 pre-payable
Copy is required by the Deadline as indicated on page 1 of each issue.

TRADE ADS

AMIDON FERROMAGNETIC CORES: Large range for all receiver and Transmitting Applications. For data and price list send 105 x 220mm SASE to: RJ & US IMPORTS, Box 157, Mortdale, NSW. 2223. (No inquiries at office . . . 11 Macken Street, Oakley). Agencies at: Geoff Wood Electronics, Lane Cove, NSW. Webb Electronics, Albury, NSW. Truscott Electronics, Croydon, Vic. Willis Trading Co, Perth, WA. Electronic Components, Fishwick, Plaza. ACT.

WANTED — NSW

AMATEUR (VK2JGR ex-L50072): looking for OTH to share with single or family. Must have access to trains to Milsons Point. Clean living, can cook. Present QTH restricts QRV HF Have own gear. Inquiries L50072, QTHR. HELP?

LARGE CERAMIC ROTARY SWITCH: for ATU of approx 6 positions. Allan VK2EFM, PO Box J221, Coffs Harbour Jetty, NSW. 2451. Ph:(066) 53 2463.

MEMORY UNIT: required for Yaesu FRG-7700. VK2QC, QTHR. Ph:(044) 76 7927.

NEW CHUM: needs to purchase air-variable capacitors suitable for ATUs. All VK2NXK/VK2API. Ph:(044) 71 1381.

RF SIGNAL GENERATOR: audio oscillator, with manuals. Laurie VK2AQW, QTHR. Ph:(02) 969 2160.

XITEX SCT-100 RTTY BOARD: at reasonable price. Paul VK2AHB. Ph:(02) 240 4163 BH or (02) 449 9212 AH.

WANTED — VIC

CIRCUIT DETAILS: for Marconi CR100 Rx, and any further information. Will pay costs, etc. Bryan VK3BNO. Ph:(03) 817 1204.

CIRCUIT DIAGRAM: of Palec Valve & circuit tester, Model VCT- 2. Will pay photocopy costs, postage. VK3RN, QTHR. Ph:(03) 551 5639.

COIL FORMER: one air cored, 12 mm by 30 mm. As needed for SW/RXer ETI-718 published in the Radio Experimenters Handbook, Volume 1. Also the planetary drive for aforementioned kit with 5 to 1 reduction. Ph:(058) 21 0846.

COLLINS S-LINE: or KWM2 equipment & associated items. Original condition only. VK3BFB. Ph:(03) 587 1593.

COMMUNICATIONS RECEIVER: General coverage up to 30 MHz. Prefer older type with valves or transistors such as Eddystone model EC10 or earlier. Tony VK3ZMP, QTHR. Ph:(03) 700 5447.

TO GIVE AWAY: large collection of QST, 73 & AR magazines from 50s, 60s. Kevin VK3CV, QTHR. Ph:(03) 882 6431.

METAL FILING CABINET: 2 drawer. Old wireless sets & parts. Don't dump them, donate them to the Geelong Radio & Electronics Society Museum. Genuine collection. Contact Bill VK3BWS, QTHR. Ph:(052) 9 3337

VEHICULAR CONTROL UNIT: Type 1P59653 or Type P59653, for AWA MR-10C. Must be in good condition. J Nairn, PO Box 443, Leongatha, Vic. 3953.

WANTED — QLD

EARLY WIRE & WIRELESS TELEGRAPHY EQUIPMENT: Also copy of 73 Wire and Dipole Ant. Contact Fred VK4NMA, QTHR. Ph:(07) 396 3521.

TS120/130: or fully transistorised transceiver for pensioner. VK4MAP, QTHR. Ph:(071) 72 8107 reverse charge okay.

WANTED — SA

OPERATING INSTRUCTIONS: circuits, any information at all for Marconi "Test Set Deviation FM No 2, ZD00193." This is a valve unit, circa 1959, with frequency range of 2.5 MHz to 100 MHz. Ivan VK5QV, QTHR. Ph:(087) 25 5514.

FOR SALE — ACT

PORTABLE COMPUTER: Tandy Model 100. 32 kB internal RAM. Built–in communications, word processing & database ROM software. Perfect for portable Packet Radio terminal. $500 ONO. Portable disk drive for Tandy Model 100, 102 or 200 computers. Battery powered. 3.5" discs. With spreadsheet, database, word processing & AR software on discs. $200 or both for $650. Contact Ray VK1ZJR, QTHR. Ph:(062) 88 0027 AH.

100 WATTS: 430-440 MHz Amplifier. GaAsFET Dreamplifier Corona HP 12OUDX. $550. 6m transceiver, Icom IC-501, 10W SSB $250. AM & CW 50-54 MHz. Ralph VK1RK, QTHR. Ph:(062) 81 0203 AH.

FOR SALE — NSW

MICROWAVE MODULES: 2m/70cm transverter, ideal for use with Yaesu FT-290R or similar radio. $200. IBM PC with RTTY software & many options including expansion interface, price negotiable around $3000. AEM direct connect modem 1200/75 & 300 Baud. $100. Telefunken (JVC) Video porta- pack with lots of accessories. $1400 ONO. VK2HL. Ph:(02) 981 4762.

TELETYPES: Iwo M15. 2 Tape dist, Model 14. 1 Tape Reperf Model 14. 110V Transformer, plus manuals. $110 the lot. VK2KGZ. Ph:(046) 77 2425.

VIBROPLEX CHROME DELUXE BUG: $70. Transformer 2500V a side, 800 mA plus matching auto transformer 1.6 kVA. Taps 110, 150, 190, 230V. $200. Will not separate. Eimac 4CX1500B. New in vacuum pack. $300. (New price $1100). Used Eimac 4CX1500B. 2 tor $100. All plus postage. Allan VK2AGR, QTHR. Ph:(044) 71 1059.

FOR SALE — VIC

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SX155 SCANNER: with charger. As new $350. FT-209R, 2m transceiver with charger. Excellent condition. $280. FT-7 transceiver, never been mobile. As new condition. $500. Stan. Ph:(03) 743 6708.

YAESU FRG7 COMMUNICATIONS RECEIVER: in mint condition. Factory fitted fine tune control. No mods. 0.5-29.9 MHz. $250. Yaesu FRV7700B VHF converter. 50-60 MHz, 118-130 MHz, 140-150 MHz. IF freq 18-30 MHz. $100. Bob L30174, QTHR. Ph:(03) 758 6768 AH.

YAESU FT-7: mobile HF transceiver. Covers 80, 40, 20, 15 & 10m (28.0-29.0) bands. Complete with manual & mobile bracket. This unit runs 20W DC input & would be ideal for novice operator. $325 or best offer. Ph:(03) 374 1389.

70 cm ALL-MODE: IC-451A with Icom low noise preamp in excellent condition. 110V/12V power supply. Best offer. Commodore 64 cartridge MAP64-2 tx & rx RTTY. CW, AMTOR & ASCII all included. Ready to run on Icom rig. $300. Andy VK3DTO. Ph:(053) 48 3003.

FOR SALE — QLD

IC25E 2M FM: scan, memories, A/B VFOs, M/bkt, h/book, CW Electrophone model PSE 126, 13.8V 6A reg p/supply. New. $475. VK4OX, QTHR. Ph:(071) 47 3143.

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ISOLATING TRANSFORMER: (National) 240V to 100 V. 15A continuous 1500 kVA rating. Weight 26 kg. $100 + freight. Andrew VK7ZHA, QTHR. Ph:(004) 24 3780.

FOR SALE — NT

PACKET RADIO: AEA PK-80 TNC. Standard terminal RS-232 interfacing TNC. TAPR TNC-II board. Like new. Original packing & manuals. $425 post paid. Rick VK8RP. Ph:(089) 52 2730 Alice Springs.

Advertiser's Index

KENWOOD

pacesetter in Amateur radio

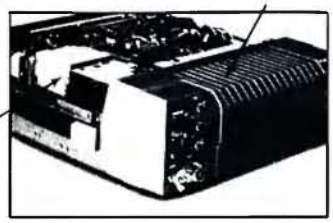
All New Compact HF!

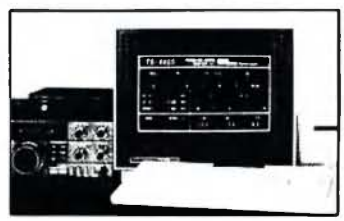
"DX-citing!"

TS-440S Compact high performance HF transceiver with general coverage receiver

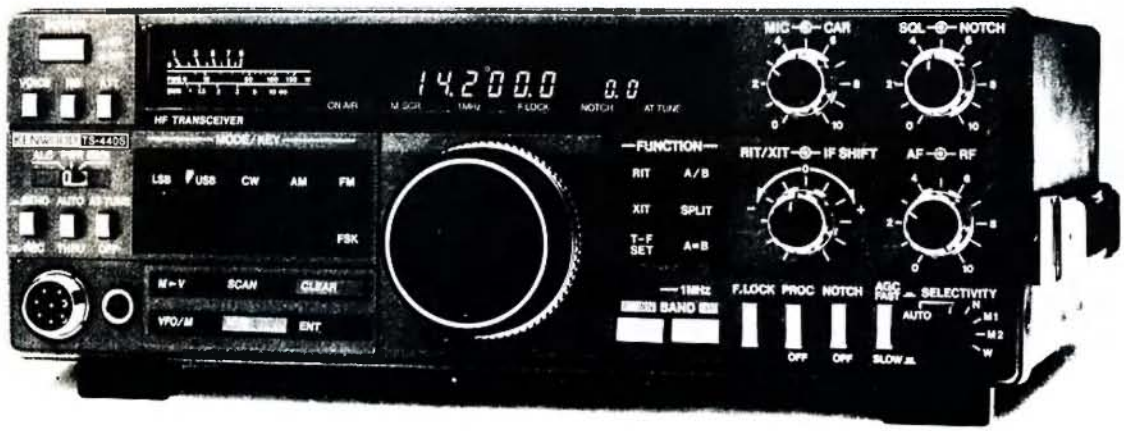
Kenwood's advanced digital know-how brings Amateurs world-wide "big-rig" performance in a compact package. We call it "Digital DX-citement"—that special feeling you get every time you turn the power on!

- **Covers All Amateur bands**
  General coverage receiver tunes from 150 kHz - 30 MHz. Easily modified for HF MARS operation.
- **Direct keyboard entry of frequency**
- **All modes built-in**
  USB, LSB, CW, AM, FM and AFSK. Mode selection is verified in Morse Code.
- **Built-in automatic antenna tuner**
  Covers 80-10 meters.
- **VS-1 voice synthesizer (optional)**
- **Superior receiver dynamic range**
  Kenwood DynaMix™ high sensitivity direct mixing system ensures true 102 dB receiver dynamic range.
- **100% duty cycle transmitter**
  Super efficient cooling permits continuous key-down for periods exceeding one hour. RF input power is rated at 200 W PEP on SSB, 200 W DC on CW, AFSK, FM, and 110 W DC AM. (The heavy duty PS-50 power supply is needed for continuous duty.)





- **100 memory channels**
  Frequency and mode may be stored in 10 groups of 10 channels each. Split frequencies may be stored in 10 channels for repeater operation.
- **TU-8 CTCSS unit (optional)**
  Subtone is memorized when TU-8 is installed.
- **Superb interference reduction**
  IF shift, tuneable notch filter, noise blanker, all-mode squelch, RF attenuator, RIT/XIT, and optional filters fight QRM in today's crowded bands.
- **MC-42S UP/DOWN mic. included**
- **Computer interface port**
- **5 IF filter functions**
- **Dual SSB IF filtering**
  A built-in SSB filter is standard. When an optional SSB filter (YK-88S or YK-88SN) is installed, **dual** filtering is provided.
- **Full or semi break-in CW; AMTOR compatible.**



KENWOOD ELECTRONICS AUSTRALIA PTY. LTD.

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NEW RELEASE

The ham burger with the lot – IC-751A

LOUD & CLEAR

- **All HF Band Transceiver/General Coverage Receiver**
- **100% Duty Cycle Transmitter**
- **New Design**
- **105dB Dynamic Range**
- **12 Volt Operation**
- **All Modes Built-in USB, LSB, AM, FM, CW, RTTY**

The new IC-751A top-of-the-line HF base station transceiver is designed for the ham operator who demands high performance.
Whether entering contests or QSY'ing for pleasure, the 100 watt IC-751A incorporates the best features of the IC-751, and brings you to the forefront of technology with the following most-requested additions.
More CW Control. For the CW enthusiast, the new IC-751A includes an electronic keyer unit, QSK rated at up to 40WPM, standard FL-32A 9MHz/500Hz CW filter and CW sidetone to monitor your code in RX or TX modes ... great for practice!
All Amateur Band Coverage. Includes general coverage reception from 100kHz to 30MHz, and may be easily modified for MARS operation.

Improved Smooth Tuning. The IC-751A features a newly designed tuning control for velvet smooth tuning.
Added LED Annunciator. For easy identification if you're using the tuning speed, dial, or band switching functions.
32 Memories. Mode and frequency data may be stored in any of 32 memories ... all the memory capability that you'll ever need.
More Stable. Even in the receive mode, the IC-751A has a sophisticated thermal sensor to monitor the internal temperature. The sensor automatically activates the cooling fan which gives maximum stability ... critical for optimum performance during contests.
Newly Designed Features. The IC-751A boasts a number of newly designed features for better performance ... a new 9MHz notch filter that drastically reduces QRM, a new AGC system, a new compressor for better audio clarity, and a new AF gain control system that improves control of the CW sidetone volume.
Options Available. Options for the IC-751A include the IC-PS30 external AC system power supply, IC-PS35 internal AC power supply, IC-AT500 antenna tuner, IC-EX309 microprocessor interface connector, SM-8 or SM-10 desk mics, IC-2KL linear amplifier, RC-10 remote controller, SP-7 or SP-3 speakers, IC-EX310 voice synthesizer and GC-5 world clock.
Optional Filters. FL-52A CW 455kHz at 500Hz, FL-53A CW-N 455kHz at 250Hz, FL-63A CW-N 9.0106MHz at 250Hz, FL-33 AM 9.010MHz at 6000Hz, and CR-64 high stability 30.72MHz crystal filter.

Please send me details on:

☐ IC-751A ☐ ICOM's full range of communications equipment.
Senders details:

Name _____

Address _____

_____ Postcode _____

Phone: (Business) (Home)

All stated specifications are approximate and subject to change without notice or obligation
ICOM customers should be aware of equipment not purchased at authorized ICOM Australia Agents
This equipment is not covered by our parts and labour warranty.
POST TO: ICOM, 7 DUKE STREET, WINDSOR, VICTORIA 3181, OR PHONE (03) 51 2284 OR 529 7582

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ICOM

The Frequency of Ideas.

Amateur Radio

JOURNAL OF THE
WIRELESS INSTITUTE
OF AUSTRALIA

VOL 55, No 4, APRIL 1987

A new triangular aluminium tower manufactured in Australia!

SPECIAL INTRODUCTION

A special introductory price of $1250 for 3x5.5 metre sections when placed together giving a tower height of 16.5m (54 feet) complete with hinged base, freight and insurance delivered anywhere within mainland Australia. The only extra cost one can incur is for ground guy anchors, turn-buckles and associated hardware.

Two levels of guys are recommended at 120 degree spacing on the 8 and 16 metre point above ground. Alternatively, a bracket could be used from a building in lieu of the lower set.

The 16.5 metre triangular towers that are 32cm across each side will be most popular with amateurs as they come complete with hinged plate, top plate with weather proofed bearing, two metres of scaffold tube masting, stainless steel hardware, assembly tool kit, galvanised base bolts and hardware, tower guy anchors, thimbles, winch steel cable pulleys and hardware for easy erection and lowering of your tower plus easy to follow assembly and installation instructions. The packaged weight is a mere 70kg.

A typical installation would have the hinged base adjacent to the highest point of a house or building to which a pulley is attached. A steel cable from the winch (mounted on 1 metre of 38 mm vertical water pipe which is in the same concrete block as the base bolts) runs over the pulley and out to a point on the tower approximately 8 metres above ground. (The house is acting as a gin-pole).

This tower is self supporting and can be used without guys to support an omni-directional antenna which presents very little extra wind load, however guying with preferably Debeglass® or Paraphil® is mandatory with the larger beam type antennas.

These towers can handle a vertical load of 6000 kg and be made to a maximum height of 99 metres, the 16.5 metre version as with other versions have a tremendous safety factor incorporated in their design.

CONSULT US FIRST for your requirements from our extensive range of HF, VHF and UHF antennas, Power Transistors and high tensile non conductive guying materials.

Don't delay, write or ring for a free catalogue NOW!

ATN ANTENNAS

56 CAMPBELL STREET, BIRCHIP, VIC. 3483.

PHONE: (054) 92 2224

Amateur Radio

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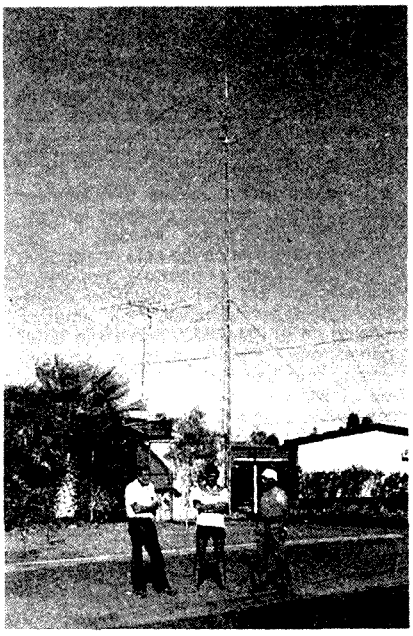
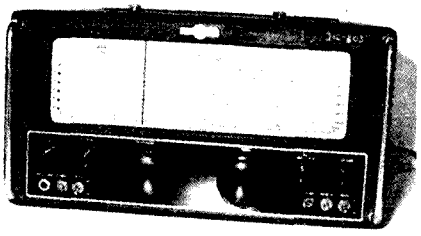
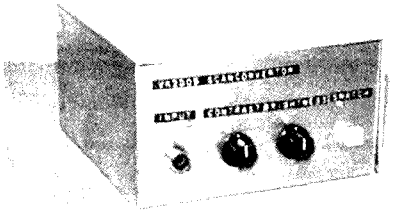


From left: VK3DOJ, VK6YA and VK3SS inspect Dave's antenna system.

Technical Features





Regular Features

DEADLINE

All copy for inclusion in the June 1987 issue of Amateur Radio, including regular columns and Hamads, must arrive at PO Box 300, Caulfield South, Vic. 3162, at the latest, by 9 am, April 21, 1987.

Amateur Radio

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Inquiries and material to:
The Editor,
PO Box 300,
Caulfield South, Vic. 3162.

Material should be sent direct to PO Box 300, Caulfield South, Vic. 3162, by the 20th day of the second month preceding publication. Note: Some months are a few days earlier due to the way the days fall. Check page 1 for deadline dates. bfPhone: (03) 528 5962.

HAMADS should be sent direct to the same address, by the same date.

Acknowledgment may not be made unless specifically requested. All important items should be sent by Certified Mail. The Editor reserves the right to edit all material, including Letters to the Editor and Hamads, and reserves the right to refuse acceptance of any material, without specifying a reason.

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Editor's Comment

DEVOLVEMENT

A new "buzzword" has appeared on the political scene over the last few years. Perhaps, as "devolution", it first became prominent in Britain in connection with responsibility for the government of Northern Ireland. Some people encountering it for the first time seem to imagine it is a misprint for "development", from which it only differs by one letter (give or take a slightly dyslexic reshuffle!) But it does have a rather different meaning, essentially being a contraction of "dis- involvement". Surprisingly, the verb "to devolve" has been listed in dictionaries for many years, with definitions such as "to cast responsibility or duty on to another", and particularly "to delegate political responsibility".

In matters which involve the Amateur Service, devolvement is a topic of fast-developing significance. Already, in the USA, the system (once the sole prerogative of the FCC) by which operators' proficiency standards are set and candidates examined, has been "devolved" for amateur licensing on to the ARRL and some other organisations. Before this, commercial licensing had been passed to representatives of the various communications services. Australia is well along the same path, and the Amateur Service is one of few for which DOC still has examination responsibility. To quote a few more "buzzwords" the trend is to "smaller government", "deregulation", and "user pays". Why? Because no one likes paying taxes, particularly to support something not seen as benefiting everyone equally. Those who are especially benefited should pay the price; perhaps those who have complained about Government inefficiency now have a chance to show how they can do it better, or cheaper, or both.

I am not going to attempt to suggest how this should be done. Much is yet to be discussed. Obviously the WIA has a great interest in the situation, particularly on behalf of those yet to become licensed amateurs, and perhaps join the WIA, rather than those of you who are already members. Even so, many members with Novice or Limited licences or SWL members will wish to upgrade in time, so there is a direct responsibility to at least half our members.

What is the WIA doing about it? You have seen the insert in January's AR, outlining the Department's intentions. Executive has been discussing the pros and cons of a multitude of possibilities for several months. Most Divisions have held meetings to discuss the topic. At Clubs and Club Conferences everyone is (or will be) talking about it. It must be a major item on the agenda for the Federal Convention early next month. Out of all this will emerge (we hope) a plan which satisfies all requirements. If you want to participate in this evolution of devolution, please tell your Divisional or Federal Councillors what you think.

So sometime in the next year or two the exam devolvement problems will be solved, and we can all relax. Can we? Already, in the UK, there is a proposal to devolve spectrum management. Here we go again!

Bill Rice VK3ABP
Editor

Try This!

Ivan Huser VK5QV
7 Bond Street, Mount Gambier, SA 5290

A BEVERAGE CW RESONATOR

This device has nothing to do with the well-known Beverage Antenna, but is a CW resonator intended to improve CW reception.

Take a large tumbler of your favourite beverage — be it scotch, vodka, gin, cold tea or water. Strategically suspend a two inch (50 mm) loudspeaker connected to a rig across the tumbler as shown in the diagram.

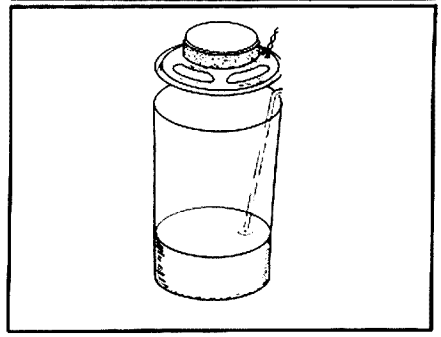
Beverage CW Resonator.

Tune your receiver to give a beat-note of around 800 Hz with a carrier and slowly reduce the amount of liquid in the tumbler until it resonates with the tone. When close to resonance, minor adjustment to the distance between the speaker and the top of the tumbler may be needed to obtain exact resonance.

The resultant effect on the perceived tone will depend to some extent on the type of beverage used for the exercise, the amount of beverage left in the tumbler at resonance and, of course, the method of extracting the beverage from the tumbler.

Try this — if it does not improve the reception of CW, then it may well give you a nice inner warmth.

or



AMATEUR OPERATOR EXAMINATIONS — ACCREDITATION OF EXTERNAL BODIES WIRELESS INSTITUTE OF AUSTRALIA INTERIM SUBMISSION FEBRUARY 1987

The Wireless Institute of Australia (WIA) acknowledges receipt of the Department of Communications (DOC) Draft Accreditation Package.

Consultation with the membership has been undertaken by means of:

a an insert in the January edition of *Amateur Radio*.
b an article in the *Education Notes* in the February edition of *Amateur Radio*.
c a Federal audio tape circulated for Divisional news broadcasts.
d circulars to Divisions, clubs and members known to be concerned in education affairs.
e extensive discussion on air and at club and Divisional meetings.

Responses from a range of sources have been received and collated.

Because of the time constraints it has not been possible for the matter to be debated fully. Accordingly, arrangements are being made for full discussion at the Federal Convention of the Institute to be held on May 1-3, after which a further submission will be made.

The Institute is deeply concerned that the broad development suggested in the package may lead to the erosion of accepted standards and a variation between standards established by different examining bodies.

To avoid this risk, it is seen an essential that the production of amateur operator examination papers be restricted to one body only.

The Institute, after due consultation with its Divisions and members, offers the following arrangements in order of preference.

1 That the DOC reconsider the proposal to devolve responsibility for examinations and maintain the present examination arrangements.

2 That the DOC continue to produce examination papers at the current rate, but make the papers available on request to the Institute, colleges, clubs, or groups desiring to arrange examinations for candidates at time determined by the group concerned.

3 That the DOC accredit the Federal body of the WIA as the sole organisation to produce examination papers, those papers to be distributed under security conditions to groups desiring to conduct examinations.

If the proposal to devolve totally is the outcome of the current consultative process, we request that, as an interim measure, option 2 be implemented until at least the end of 1988. This would allow the phasing in of the new system, giving clubs and groups experience in organising local examinations and allow time for the Institute to establish an examinations section.

Further, we request that the DOC question bank as well as copies of all past multi-choice papers and the computer program for generating Morse code exams be made available for WIA use at least 18 months prior to total devolvement.

We note that if either the second or third option (or similar) is finally selected, considerable discussion will need to take place between the Department and the Institute to ensure a smooth transition takes place.

A number of other requests have arisen from discussion with members.

These include:

i that the DOC continue to administer examinations to candidates who, because of some disability, are unable to attempt the standard multi-choice paper.

ii that the DOC consider abolishing the Morse code sending exam on the grounds that:

(a) demonstrated competence in receiving usually is accompanied by competence in sending at that speed.

(b) candidates in the USA are no longer examined in Morse code sending.

iii that DOC give some recompense to the WIA for the costs involved in establishing an Examinations Section — by either single or annual subsidy, by donation of office equipment, or by a significant reduction in the level of amateur operator licence fees, of which, at present, a percentage is dedicated to examination costs.

We appreciate the opportunities the Institute has had to discuss these matters with officers of the Department of Communications and look forward to further consultation before the Department's final recommendations are made.

Signed: D A WARDLAW
FEDERAL PRESIDENT
WIRELESS INSTITUTE OF AUSTRALIA

The above is a letter sent to the Manager, Regulations, Radio Frequency Division, DOC, in reference to devolvement of AOCP examinations.

FEDERAL CONVENTION AGENDA ITEM

The following is a Draft Agenda Item for discussion at the 1987 Federal Convention (May 1-3 1987).

MOTION THAT

Progress on "The Future of Amateur Radio" be reviewed, Divisional presentations by received and guide lines be established.

MOVED BY (Initiated by Executive)

PROPOSER'S COMMENTS

The 1986 Federal Convention set up "The Future of Amateur Radio" Working Party to report on its terms of Reference to the 1987 Convention. As it is unlikely the Working Party will be able to meet that time scale it is prudent the matter be reviewed, Divisional attitudes established and clear guide lines provided for the next year.

To this end Divisions are requested to provide presentations addressing the issues in the following guidance paper and such other matters as are deemed relevant. Presentations should be timed for 15 minutes duration (followed by up to 10 minutes for clarifying questions). The Federal Council, acting in committee, will then produce guidelines based upon divisional inputs. It would be advantageous if Divisions could circulate their papers prior to the Convention.

THE FUTURE OF AMATEUR RADIO

Introduction

The Future of Amateur Radio Working Party was set up as a result of Federal Convention 1986 to report to the 1987 Convention. Its Terms of Reference follow. As it is unlikely the Working Party can meet that time scale it is considered essential Federal Councillors attending the 1987 Federal Convention be prepared to present their members views. To achieve that aim in an efficient manner a structured approach is highly desirable, consequently this paper sets out a framework of talking points, with allied issues for Divisional consideration.

The Approach

The following talking point sequence has been identified:

a Identify the problem in general, then in particular with allied limitations, both real and apparent.
b Identify the need, in the broad and then in specifics with associated constraints, problems and limitations.
c List the options; a comprehensive list, with merits and faults, should arise.
d Identify feasible options.
e Recommend a course of action.

Each of these points will be developed further in the following paragraphs, not so much to guide your solutions as to expose a range of factors that should be considered. This approach will take the general format of statements accompanied by a series of related but unanswered questions.

Identify The Problem

After a post CB boom, recruitment to amateur radio is falling off, and the age profile shows few "young" amateurs.

Q1 Is this observed profile *significantly* different from the national age profile?
Q2 Were there ever many "young" amateurs?
Q3 Is amateur radio a "young" persons pursuits/hobby?
Q4 Is this only a temporary or cyclic situation of about 10-11 years duration?

Consequences

The perceived consequence of a fall in amateur numbers is a possible loss of privileges and/or frequencies.

Q5 Is this perceived loss of privileges real or likely? Should we worry?
Q6 Could a contracting amateur regime be established; ie, can we adapt to decline?

Limitations

The current constraints on entry to amateur radio limit recruitment.

Q7 Are these constraints real or perceived?
Q8 What is the feeling on Morse code versus no Morse code licences?
Q9 Do new entrants wish to use amateur radio for personal communications (see definition of amateur radio) or as "data bearers"?
Q10 Have entrance standards drifted up or education levels come down? Is there a mismatch arising?
Q11 Has amateur radio priced itself out as a popular hobby through equipment costs?

Identify The Need

In the broad; to sustain the amateur population on a relative basis and offer amateur radio to a community with Increasing leisure time and skills (but not comensurately increasing disposable income)!

In detail; to identify the many aspects of amateur radio and ensure entry for potential practitioners of each is not unduly constrained or unbalanced.

Q12 What are these varied aspects?
Q13 What are the corresponding entry modes now available? Identify the mismatches.
Q14 What are the educational skills associated with the aspects?

Constraints

There are current constraints such as escalating entry standards and associated increases in course durations, more technically complex equipment, increasing costs of new equipment and a decline in supportive help (the Elmer approach).

Q15 Do we want more entry points to the hobby?
Q16 Do we affirm WIA policy that Novice remains the lowest licence level?
Q17 Can we demonstrate to DOC's satisfaction that Novice examination levels in particular have risen unnecessarily over the years?
Q18 Do we accept the lowest examination level (current Novice) as an entrance test or a hobby membership control regulator? That is; do we pass all who are qualified, or only a set percentage of applicants?
Q19 Seriously, will less complicated equipment ever return to the amateur scene? Or will it just appear less complicated through use of LSI/VLSI components?
Q20 Can use of LSI/VLSI components bring down relative costs of equipment?
Q21 Is the decline in supportive help real? Are Elmers dying out and can we/should we revive them?

List The Options

Consideration of this talking point can be general, establishing desirable principles, or expansive providing a comprehensive list of options together with their merits and faults. It is essential these qualifying properties be identified in order to discard all unworkable options.

Some general principles could include:

a entrance examinations available at several levels giving a band or operating privileges, but no more difficult than at present or we will not expand)!
b No more examinations than at present, die to costs and range already offered. Changes must be by re-arrangement not by addition.
c International commonality, for reciprocal licensing purposes, should not be neglected.
d Consider introducing a single exam with graded pass levels for differing licences.

Q22 Can this be achieved with differing scope syllabi?

e Consider introducing an advanced class certificate and licence.

Q23 What differentiates this proposed advanced class from the current AOCP? CW speed or theory level difficulty (or both) and would this lead to disaffection?
Q24 If introduced what happens to current full licence holders? Are they "demoted"?

f Introduction of a common band for all licence classes.

Q25 What band and emission modes?

Identify Feasible Options

Be ruthless in culling questionable options. Take heed of earlier limitations such as "user pays" for DOC (and others) services and reduce complexity to a minimum. Ask yourself if you would be willing to administer much of your newly proposed ideas, without EDP and in an unpaid volunteer capacity?

Recommended Course of Action

The recommended course of action should be clearly and simply spelled out. It has to be convincing when read by the average amateur who has not kept up with these developments and is inclined to *go off* half-cocked and ill-informed.

Furthermore it must give clear guidance, without being either over- constraining on the one hand or lacking broad direction on the other, for the Executive to implement it without continual recourse to the originator and Federal Council.

Ron Henderson VK1RH
February 8, 1987

Underwater Radio Communication

Lloyd Butler VK5BR
18 Ottawa Avenue, Panorama, SA. 5041

How far can we communicate underwater in the sea or in a lake? How large is the signal attenuation and what frequency can be used? Could we use 1.8 MHz?

In the following paragraphs, we attempt to answer some of these questions.

One could ask why a radio amateur enthusiast might be interested in underwater communications. Well, he could be interested in skin-diving and wish to set up a communications link with the surface, or perhaps he might be interested in radio controlled boats and wish to try his hand at model submarines! On the other hand, he might just be interested in another area of experimentation because here is a field, relatively untouched by the amateur fraternity, involving different transmission techniques, different antenna designs and different equipment environmental problems.

The scope of this article concerns the transmission characteristics of radio waves underwater and the extent to which the radio amateur might make use of these characteristics.

WATER CONDUCTIVITY

Water in its pure form is an insulator, but as found in its natural state, it contains dissolved salts and other matter which makes it a partial conductor. The higher its conductivity, the greater the the attenuation of radio signals which pass through it.

Conductivity (σ) varies with both salinity and temperature. Sea water has a high salt content and high conductivity varying from 2 mhos per metre in the cold arctic region to 8 mhos per metre in the warm and highly saline Red Sea. Average conductivity of the sea is normally considered to be about 4 mhos per metre. What this means is that one metre cube of sea water has a conductivity of 4 mhos or a resistance of 0.25 ohm, it reciprocal.

So called fresh water has lower conductivity and as a guide to this, a sample analysis of Adelaide water taken in 1983 has been used. This sample was taken from an area principally supplied by the Barossa reservoir and the analysis shows total dissolved salts as approximately 300 mg/litre and a conductivity of 0.0546 mhos per metre. How close this is to the average waters in lakes and rivers in Australia is not known, but as it is the only water on hand, it has been used as a reference.

ATTENUATION

Attenuation of radio waves in water (and, in fact, in any conducting medium) increases both with increase in conductivity and increase in frequency. It can be calculated from the follow formula:

Attenuation (α) in dB/metre

$$= 0.0173\sqrt{(f\sigma)}$$

where f = frequency in hertz
σ = conductivity in mhos/metre

Figure 1 illustrates attenuation as a function of frequency for sea water and Adelaide water. Attenuation in sea water is very high and to communicate at any depth at all, it is necessary to use very low frequencies (10 to 30 kHz) where attenuation is in the order of 3.5 to 5 dB per metre. Operation in the lowest frequency amateur band (1.8 MHz) is out of the question at 46 dB per metre.

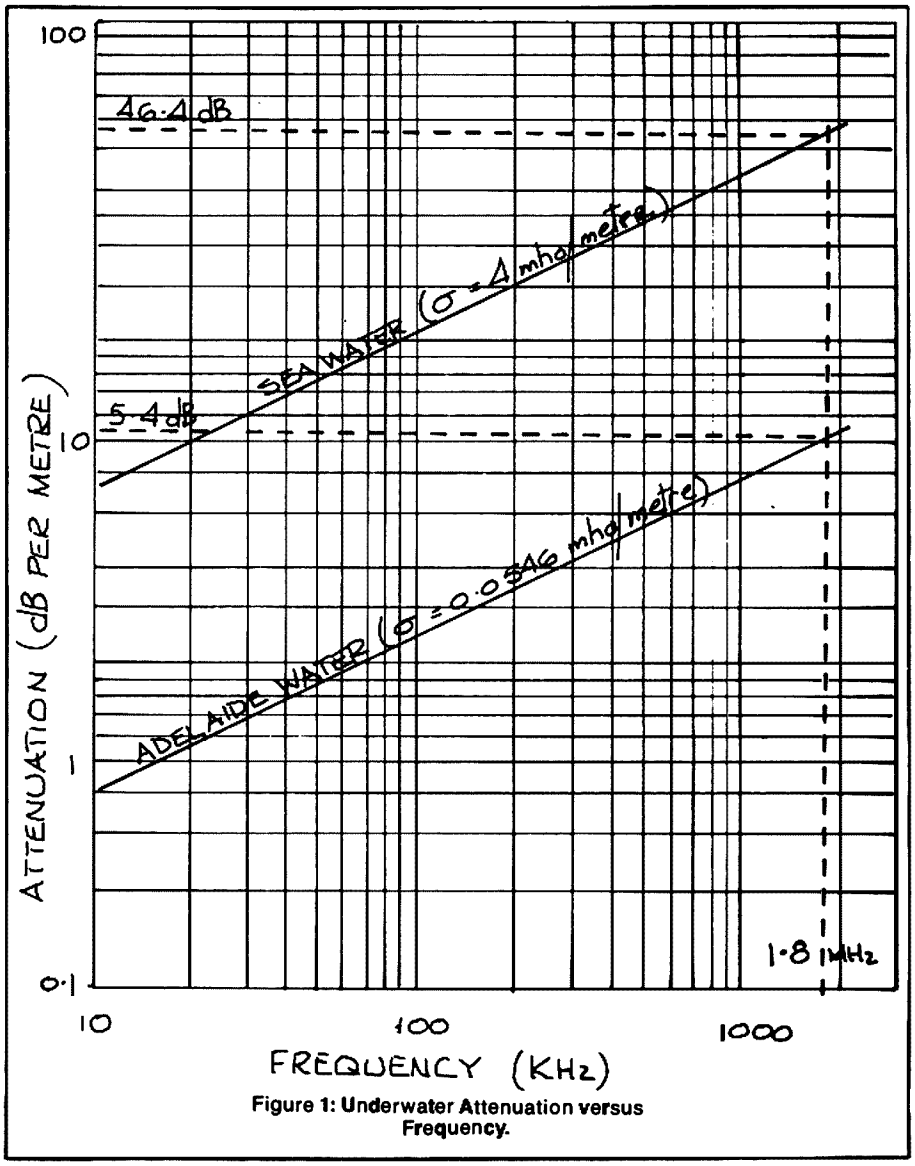


Figure 1: Underwater Attenuation versus Frequency.

The potential for operation in fresh water is much better. Using the Adelaide water sample, attenuation at 10 kHz is only 0.4 dB per metre rising to 5.4 dB per metre at 1.8 MHz.

REFRACTION OR INTERFACE LOSS AT THE SURFACE

When EM waves travel from air to water or water to air, there is a refraction loss due to the change in the medium. This loss can be calculated from the following formula:

Refraction loss (dB) =

$$20 \log \left(\frac{7.4586}{10^6} \left(\frac{f}{\sigma} \right)^{1/2} \right)$$

In sea water, this loss is quite high and in the vicinity of 60 dB for the low frequencies normally used. If communication is required from surface to underwater, path loss can be reduced by connecting the surface equipment to an antenna under the surface so that the refraction loss is eliminated.

Figure 2 illustrates refraction loss as a function of frequency for sea water and Adelaide water. It can be seen that refraction loss falls with an increase in frequency and in

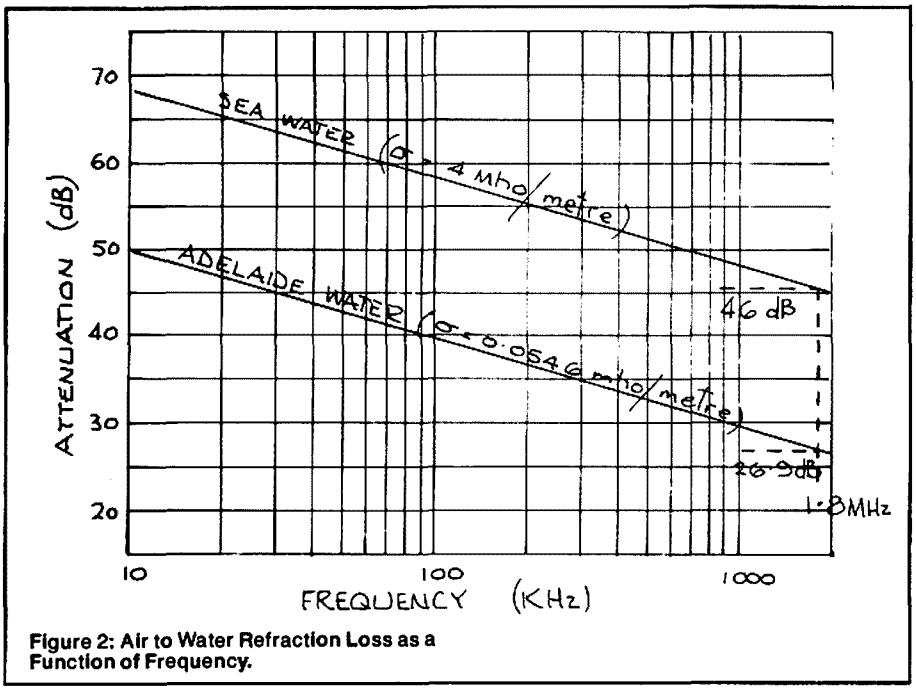


Figure 2: Air to Water Refraction Loss as a Function of Frequency.

the case of the fresh water, this loss is down to 27 dB at 1.8 MHz which is quite attractive from an amateur radio point of view.

WAVELENGTH IN WATER

The wavelength in water is but a fraction of that in space and is calculated from the following formula:

$$\text{Wavelength } (\lambda) \text{ in metres} = \frac{1000}{\sqrt{\left(\frac{10}{f\sigma}\right)}}$$

Figure 3 plots wavelength versus frequency. In sea water, wavelength at 10 kHz is only 15.8 metres compared to 30 km in space. In fresh water the reduction in wavelength is not so dramatic but still quite considerable. At 1.8 MHz, wavelength is 10.1 metres compared to 167 metres in space. This reduction is wavelength leads to some considerable differences in antenna engineering with an underwater dipole at 1.8 MHz being only a few metres long.

TRANSMISSION OPTIONS

The lower the frequency, the lower the attenuation in water and the better the potential for communications. Unless a band of frequencies could be approved for amateur use in the VLF region, the options for amateur radio are restricted to 1.8 MHz and communication in fresh water. A few transmission examples for this application will be discussed and these will be based on the following assumptions:

1 Radiated power is 0 dBW (referred to one watt developed in a half wave dipole). All other measurements are in decibels referred to that level.
2 Receiver bandwidth = 3 kHz.
3 Minimum discernible receive level at receive antenna = 10 dB above thermal noise (KTB) ie -153 dBW (for 3 kHz bandwidth).
4 Atmospheric noise at 1.8 MHz = 35 dB above KTB (taken from published noise charts) ie -128 dBW for 3 kHz bandwidth.
5 Attenuation in fresh water = 5.4 dB/metre (from Figure 1 at 1.8 MHz).
6 Water/air refraction loss = 27 dB (from Figure 2).

Figure 3: Wavelength versus Frequency.

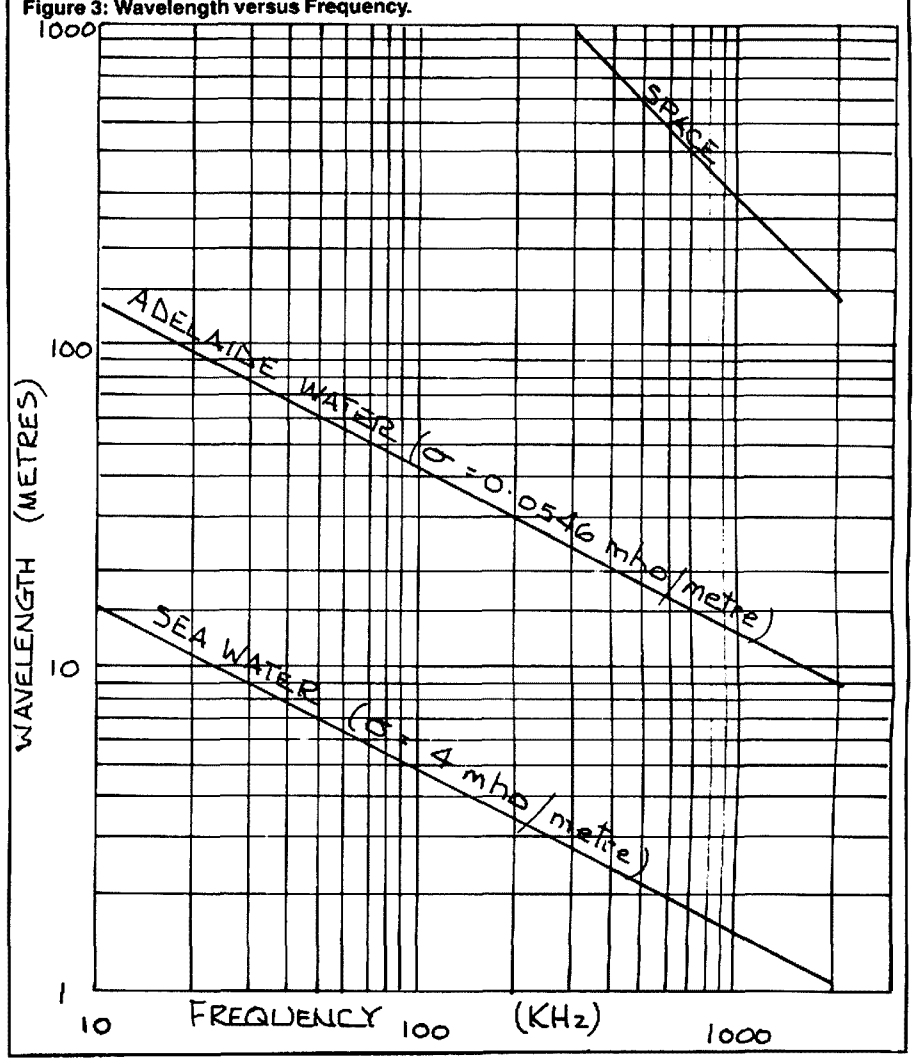


Figure 4 shows the receiver submerged and the transmitter above the surface. The signal path is subject to 27 dB air/water interface loss. Atmospheric noise is also attenuated by the interface and path loss and minimum receive level is set by the sensitivity of the receive system (not affected by atmospheric noise). Maximum length of the water transmission path works out to 23 metres.

Figure 5 reverses transmission direction so that the transmitter is submerged and the receiver is above the surface. In this case the minimum receive level is set by the atmospheric noise (well above the receive system sensitivity). Because of this, the maximum length of water transmission path is reduced to 18.7 metres.

Figure 6 submerges both transmitter and receiver, eliminating the air to water interface loss of 27 dB. This extends the maximum length of water transmission path to 26 metres.

We now turn our attention to transmission in space. Beyond one wavelength from the transmitting antenna, field strength in space varies inversely with distance; ie the signal is attenuated 6 dB each time the distance is doubled and attenuation from a point one wavelength from the antenna to a distance d is equal to 20 log (d/λ).

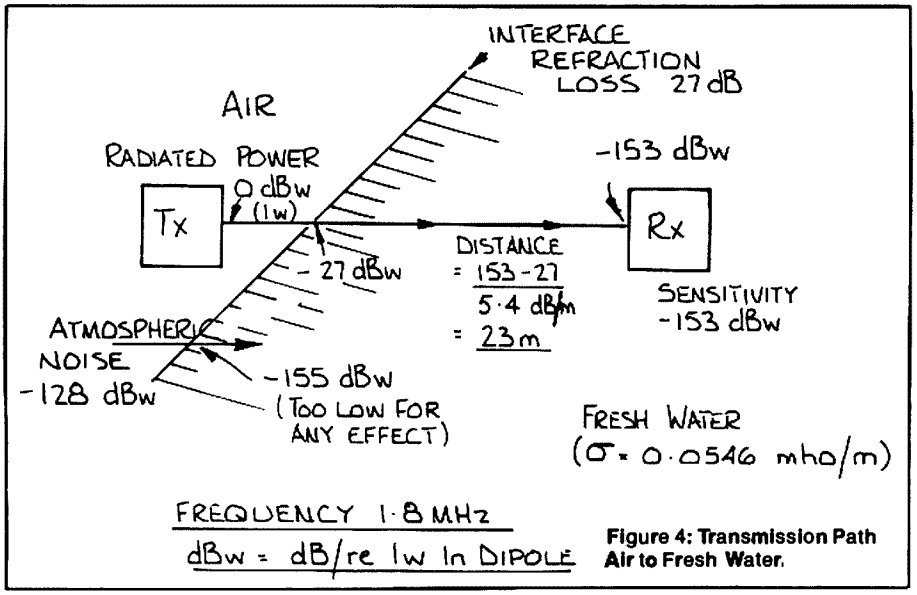


Figure 4: Transmission Path Air to Fresh Water.

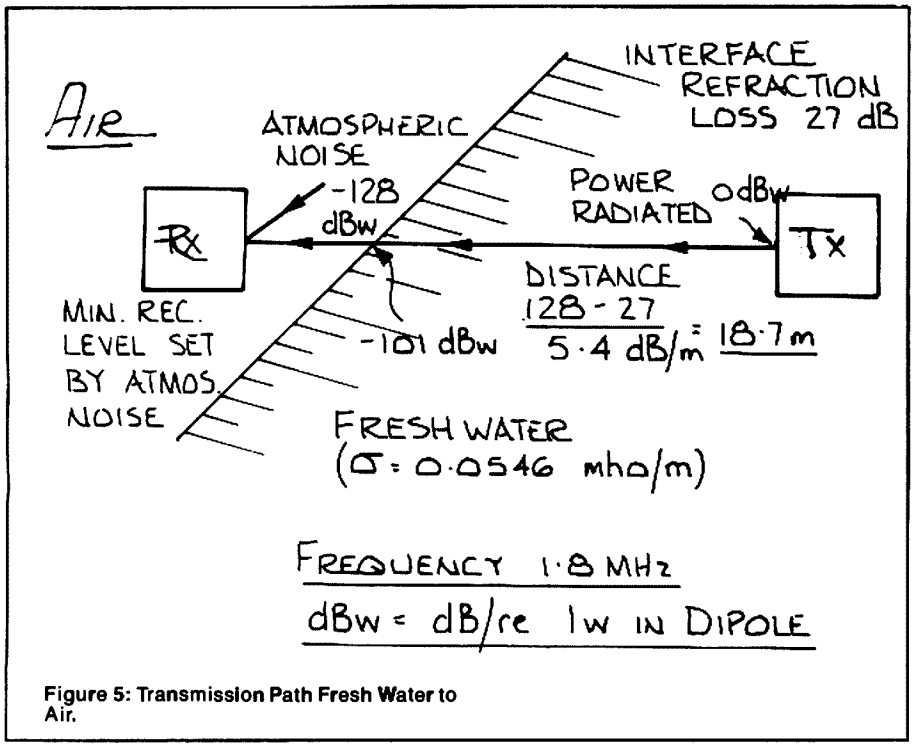


Figure 5: Transmission Path Fresh Water to Air.

Referring now to Figure 7, we have a transmitter with a reference power 0 dBW at one wavelength and this point is 1000 metres (or six wavelengths) from the water surface. Power level at the air/water interface is -20 log 6 = -15.6 dBW and transmission for a further 20 metres underwater is still possible.

Taking this type of transmission a little further, we now examine Figure 8. Here we have both transmitter and receiver below the water surface but 1000 metres apart. Communication over this distance via the water path is impossible but the signal can leave the water near the transmitter, travel via the air path and re-enter the water near the receiver. The signal suffers the interface loss twice (ie 54 dB) but attenuation over the 1000 metres is limited to that of the air path. So here is another technique by which two underwater stations might communicate over quite a large distance, limited essentially by the depth in water at which the stations are based.

In the examples given, actual transmission distance underwater is limited from 18 to 30 metres. This distance can be increased by increasing power or decreasing frequency. Increasing the radiated power to 100 watts would give 20 dB gain or an extra underwater distance of 3.7 metres (not a large increase). If a frequency of 100 kHz were available, attenuation would be 1.28 dB/metre and taking the example of Figure 6, distance would recalculate to the greater value of 120 metres. At this frequency, however, interface loss increases to 40 dB and in the example of Figure 4 (which includes interface loss) the distance would be a lesser 88 metres, but still greater than for 1.8 MHz.

Another point to consider, is that Adelaide water is not renowned for its purity of dissolved (or undissolved) matter and it is possible that water in lakes and rivers elsewhere might have lower conductivity than that of the Adelaide sample.

ANTENNAS

Design of underwater antennas is beyond the scope of this article, but a few interesting details can be discussed. Published references indicate that loop antennas, long wires and dipoles have been successfully used underwater at very low frequencies, their physical dimensions, in terms of a space wavelength, being much less than their equivalent in space.

Antenna conductors are insulated from the water to prevent leakage current direct to the conducting medium, but there is still coupled conduction into the medium which causes the radiation resistance to be considerably lower than that of the equivalent antenna in space. A radiation resistance of a few ohms can be expected for a halfwave dipole.

There is also the question of polarisation and directivity. According to Moore[2], a submerged horizontal electric dipole is equivalent in its field to a weaker vertical antenna at the surface. Most of the energy, radiated upwards from the antenna, is refracted at the surface into a vertically polarised, almost horizontally travelling wave, above the surface. This phenomenon helps to explain the technique used in Figure 8 to transmit signals horizontally above the water surface and to receive them in the reverse process.

Moore also points out that attenuation between one side of the submerged antenna and the other, is so great that a major contribution to the field at any point is primarily due to the nearest point on the antenna. Thus coordinates on an antenna pattern in a conducting medium are meaningless. There is, of course, a null off the end of a dipole and hence horizontal dipoles are more satisfactory than vertical dipoles for communication via the surface.

Antennas used in the sea have made use of the conducting sea as the actual radiating element. The signal is either coupled to the sea via connecting electrodes or by inductive coupling from an insulated loop. These techniques are possibly impractical for fresh water with much lower conductivity.

SEA WATER

As discussed earlier, attenuation of radio signals in sea water is so great that communication further than just below the surface is not possible unless very low frequencies (10 to 30 kHz) are used. Even if permission could be obtained to use frequencies in this band, there are other difficulties facing the amateur enthusiast:

1. Air to water refraction loss in this band is in the order of 60 to 70 dB.
2. Massive antenna dimensions are required, particularly for the above the surface antenna. (Even at 30 kHz, a wavelength is 10 km). Large transmitter powers are usually required to compensate for the high antenna losses inherent in the shortened low frequency antenna.
3. Atmospheric noise peaks to about 160 dB above thermal noise (KTB) at 10 kHz, limiting the minimum discernible receive level.

OTHER CONDUCTING MEDIUMS

Whilst the discussion has concentrated on transmission through water, the theories outlined can equally be applied to other conducting mediums such as the earth's crust. Typical applications include radio communications in underground shafts and caves.

The conductivity of the earth's crust varies widely with conductive over- burden between

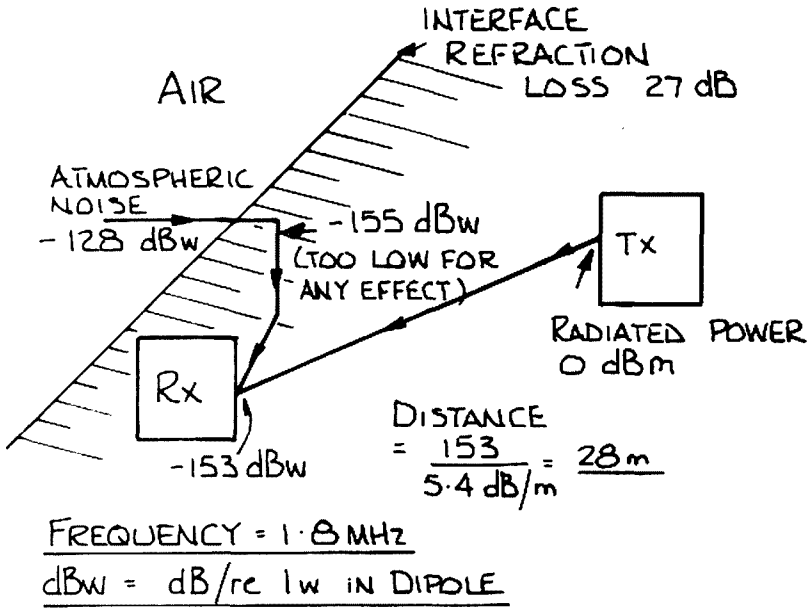


Figure 6: Transmission Path — Fresh Water Transmitter and Receiver Both Submerged.

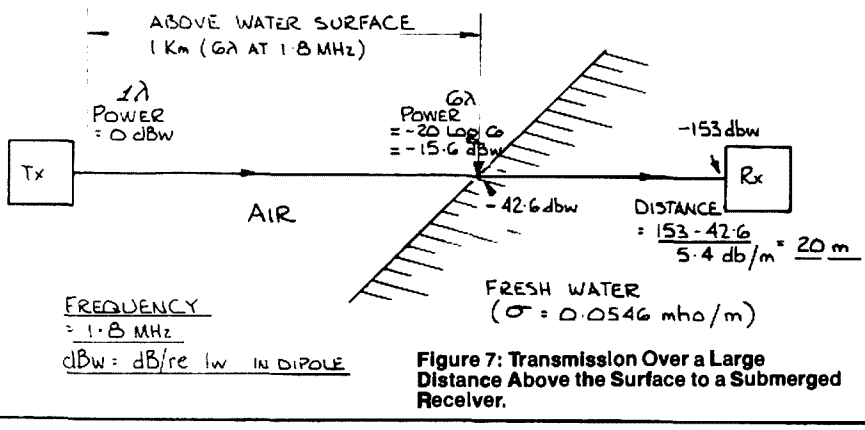


Figure 7: Transmission Over a Large Distance Above the Surface to a Submerged Receiver.

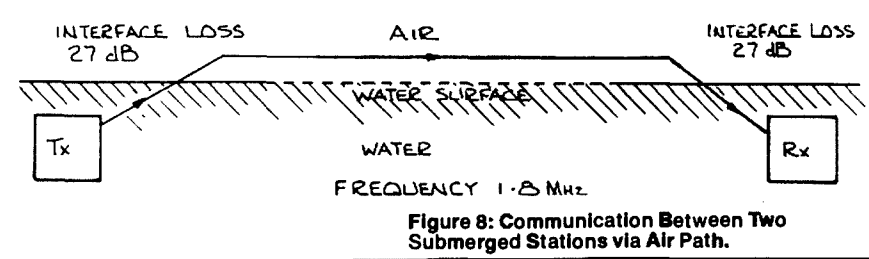


Figure 8: Communication Between Two Submerged Stations via Air Path.

10^{-4} and nearly 1 mho per metre and low conductivity rock less than 10^{-5} ohms per metre. Quite clearly, the success of the underground communications depends on the geological make up of the surrounding terrain.

CONCLUSIONS

Radio communication under the sea is not an attractive option for experiment by the radio amateur as it requires the use of very low frequencies, large antenna systems and very high powers.

Fresh water lakes and rivers have much lower electrical conductivity than the sea and underwater transmission distances (or depths) up to 30 metres appear feasible using the lowest frequency amateur band of 1.8 MHz. Even larger distances (or depths) could be achieved if a lower frequency band allocation were made available.

Communication between underwater stations or between a surface station and an underwater station could be achieved over much larger distances by utilising a transmission path above the surface and tolerating the air to water refraction loss.

Similar communications could be carried out from underground depending on the conductivity of the surrounding over-burden or rock.

References:

1 Reference data for radio engineers, ITT Chapter 27. Radio noise and interference.

2 MOORE, RICHARD R. *Radio Communications in the Sea*, IEE Spectrum, Vol 4, Nov 1967, pp 42-51.

3 HANSEN, R C. *Radiation and Reception with Buried and Submerged Antennas*, IEEE Transactions on Antennas and Propagation, May 1963.

4 WATT, LEYDORF and SMITH. Notes regarding possible field strength versus distance in earth crust wave guides.

Symbols used in Text

σ (Sigma)	Electrical conductivity (mhos/metre).
f	Frequency (Hertz).
λ (Lambda)	Wavelength (metres).
dB	Decibels.
dBW	Decibels reference one watt.
∝ (Alpha)	Attenuation constant (dB/metre).
d	Distance (metres).

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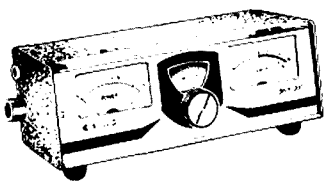

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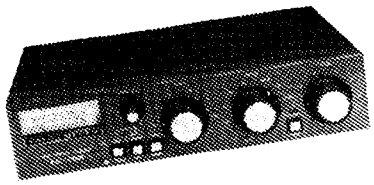

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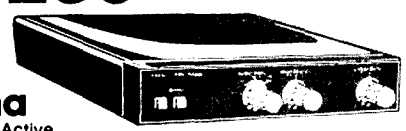

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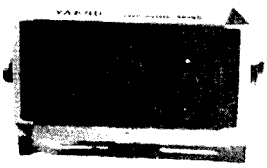

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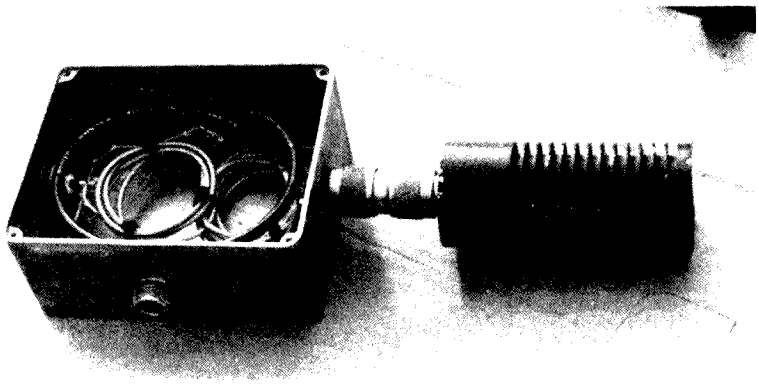
6 Pretoria Street, Caulfield South, Vic. 3162



Monitoring of more than one two metre FM channel at a time can be a problem even when using the triumph of modern amateur technology, the scanning transceiver.

Overall construction. A similar load to the one shown is available from Dick Smith (Cat D-7025).

Obviously, depending on the number of channels you are scanning and the traffic on each, you may miss *that important call* from a friend. The author usually monitors two channels at once on some obscure portion of the band. This then means that another aerial is required and, to prevent the house sprouting aerials (it is bad enough now according to my wife), I opted for the power divider approach. This relies on having one highly efficient aerial, then splitting the feeder through a four port divider to feed two transceivers. This divider must have high isolation between the opposite ports to which the transceivers are connected. If you are transmitting on one rig you certainly do not want 10 watts appearing on the aerial socket of the other set with, what would be, some rather catastrophic results!

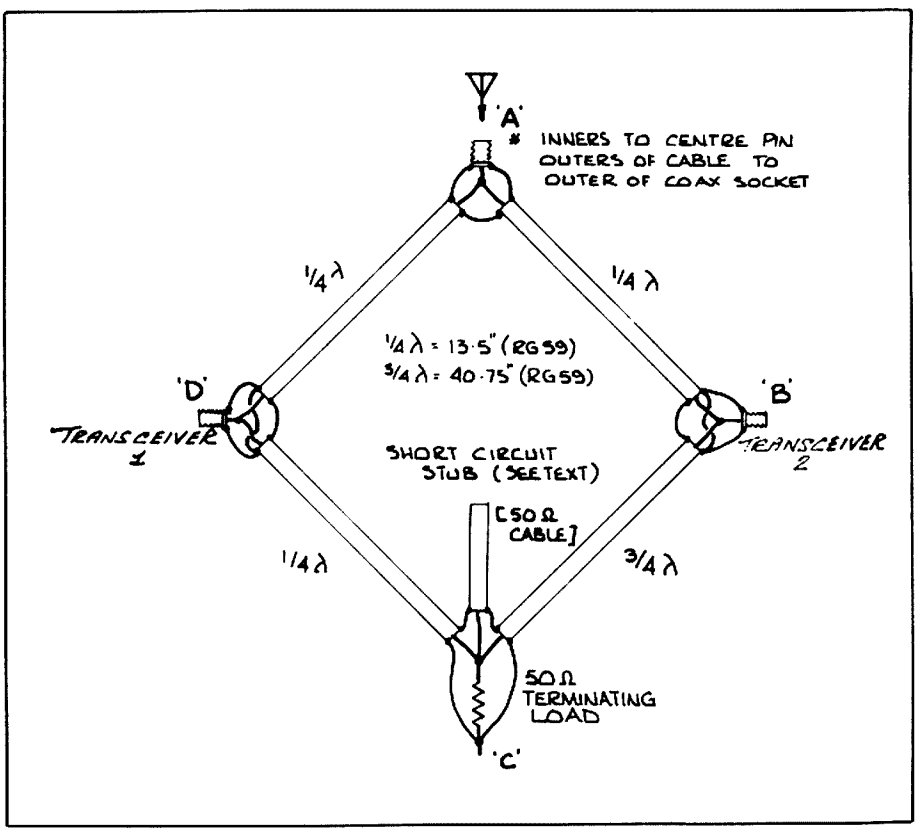
This divider will provide about 47 dB of isolation when tuned. This amount of isolation is sufficient, providing no more than about 10 watts is used.

It could be said that this is possibly more isolation than you would get using two aerials on the average mast in the back yard. As a rule of thumb, approximately 10 to 20 feet (3 to 6 metres) apart and similarly polarised, may exhibit about 20 dB of isolation. This obviously decreases if the antennas are closer or in the same plane where the coupling between them can be much greater. This divider does have one immediate disadvantage which is discussed later.

OPERATION

The hybrid power divider is a four port device made out of 70 ohm coaxial cable with electrical lengths as shown in Figure 1. With RF power applied at point D it splits two ways, one to aerial and the other to the load.

The power also continues around to Point B (from aerial and load directions) but, because of the electrical lengths of the coaxial cables, there is a 180 degrees phase relationship between the two, causing a cancellation at B. Operation of the same when power is applied to point B (there is then a phase cancellation at D). Because the power splits two ways when applied to D or B there is a power loss to the aerial (half the power goes to the load, the other half to the aerial). Some amateurs, by tradition, have the habit of worrying about the last milliwatt they can get out of their radio, but it should be kept in mind that, by using a good quality feeder and a gain-type aerial, these losses can be compensated for. These days, modern commercial equipment seems to have excellent receive sensitivity, and because stations usually work across town, signals are usually quite large. In short, one should not be concerned about this insertion loss which, in practice, is about 3.5 dB.



CONSTRUCTION

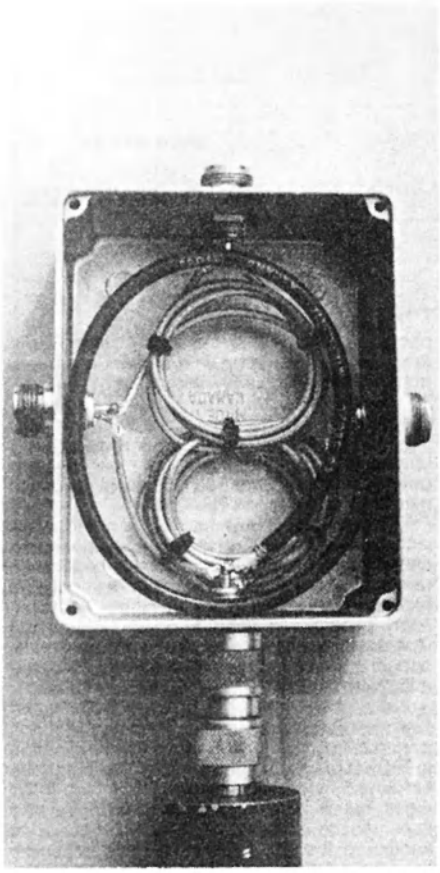
The divider was built into a 4.75 x 3.75 x 2 inch (120 x 95 x 50 mm) diecast box. I used RG179 coaxial cable for the tuned cable lengths because it is physically smaller and easier to handle than other types of cable. RG59 could also be used and is more readily available. The load resistance should be rated at about five watts for a 10 watt transmitter. The short circuit stub is made from RG58. If the power divider is to be used for receive applications only, the load can be reduced to a half watt carbon resistor and the stub omitted as isolation is then not so critical.

TUNING THE HYBRID DIVIDER

Connect an aerial to the unit (this should have a VSWR of 1.5:1 or less). Attach a sensitive 50 ohm RF indicating device, to either port B or D (see Figure 1). A suitable indicating device would be a VTVM connected across a 50 ohm resistor or, if you are lucky enough to have access to one, a spectrum analyser.

Now apply RF power from the opposite port. Starting off with about 15 inches (380 mm) of stub, pierce the coaxial cable at small intervals with a pin to form a short circuit.

Working from the end towards the load, watch the RF indicator for minimum indication. At this point, remove the pin, cut the cable at that point and solder the inner of the cable to the outer. Swap the RF power source and indicating ports and check that the minimum reading is the same in both directions.



Tuned lengths of coaxial and short circuit tuning stub (RG58).

Tape the end of the stub and place it in the box. Connect the two transceivers to ports B and D and connect a power meter in the aerial circuit. With 10 watts out of either transceiver, about 4.5 watts should be measured at the aerial, port A.

I found that receiving on one transceiver and transmitting from the other produced desensitisation in the receiver to an incoming signal (depending on strength). However, with no incoming signal present (muted) no overload was noticed.

This type of power divider can be scaled up or down for any band that one may care to use it. Despite its disadvantages, the divider has proved useful in reducing the number of aerials in the antenna farm at my location!

TECHNICAL EDITOR'S NOTE

To ensure maximum isolation between ports B and D, the 70 ohm cable lengths should be cut as close to 90 ($\lambda/4$) and 270 ($3\lambda/4$) electrical degrees as is physically possible.

When testing the unit, it would be a good idea to determine (if possible) the absolute isolation between ports B and D after tuning for a minimum. This is to make sure that the available isolation does not result in excessive power being delivered to either front end. This isolation should also be checked over the full frequency range that it is desired to operate the hybrid.

For 10 watt transmitters, an isolation of greater than 40 dB is desirable. This will result in less than one milliwatt being delivered into the opposing front end.

At this power level, it is unlikely that any damage will be done to the front end.

—Photographs courtesy Bill Trenwith VK3ATW

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IMPROVED ANTENNA FOR HAND-HELDS

Ian Nance VK2BIN
22 Truscott Street, North Ryde, NSW. 2148

An antenna mounted on a safety hat is more convenient for WICEN activities.

ON WICEN ACTIVITIES, when using a two metre hand- held, I find it is more convenient to clip the rig to my belt and hold an external microphone/speaker in the hand, or leave the hands free by using a boom headset.

However, a disadvantage of siting the transceiver there is the resultant attenuation of the radiated signal due to absorption by the body, particularly if using a shortened antenna in lieu of a quarter-wave.

Recalling the success experienced by Morton VK2DEX, with a helmet-mounted quarter-wave, I decided to build an antenna capable of being mounted on my safety helmet without the need to depend on a compromise ground plane or drill holes in the helmet, as WICEN helmets always remain the property of the Volunteer Rescue Association. I decided on a coaxial dipole and this is how I built and mounted it.

Materials needed are:

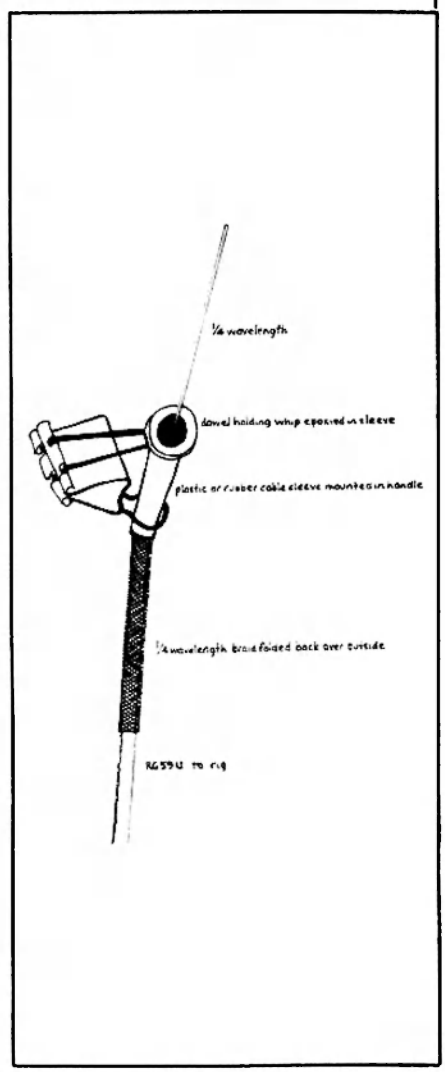
a quarter-wavelength of suitable springy wire for the radiating element
a spring paper-clip with wire handles
a tapered cable sleeve from a two-pin mains appliance socket
approximately one metre of RG59U
a piece of wooden dowel
suitable antenna plug for the rig

Remove the PVC insulation from one end of the coaxial cable for about 560 mm (22 inches), exposing the braided shield which is then rolled back carefully over the remaining PVC. It will help if the braid is pushed gently so that it teases out to a larger diameter and is then folded gradually over itself so that ultimately it lies over the cable back from the point where the PVC was removed. The reason for stripping at least 560 mm of insulation is that the braid, when rolled back, does not occupy the same length as originally exposed, so it is preferable to begin with more braid than needed and trim it back to a quarter-wavelength when it is finally positioned.

Tin the end of the braid to prevent unmeshing, then cut a piece of 10 mm (⅜") dowel to about 25 mm (1") length, drill a hole longitudinally in the centre to accept the radiating element. Cut this radiator to a quarter-wavelength and solder the coaxial inner to the bottom end. Seat the dowel in the tapered cable sleeve and epoxy resin into place.

Next wrap the exposed braid (the "earthy" element of the antenna) with insulating tape, support the cable sleeve in one handle of the paper clip using the other handle to steady the lower end of the sleeve and solder the antenna plug on the free end of the coaxial cable.

This antenna may be clipped anywhere on the rim of the helmet, but I prefer to wear it at the rear and allow the feedline to connect to the rig across my back (it is out of the way there). If the helmet rim is pushed well home into the jaws of the clip, the antenna will remain in position.



The coaxial dipole antenna has a lower angle of radiation than a quarter- wave ground plane and gives better performance at marginal distances. It is well worth using if you are committed to obtaining reliable communications with a low power hand-held over a path favouring lower angle of radiation. Where higher radiation angles are needed, such as from the floor of a valley to a high adjacent cliff-top or to a search aircraft, then the standard ground plane is probably a better choice. I am sure that WICEN operators will find this helmet-mounted antenna a decided advantage.

TECHNICAL EDITOR'S NOTE

The tip of the radiator should have a protective covering. A small cork or plastic bead ***firmly*** anchored to the tip will prevent the tip of the antenna sticking into a fellow worker when you bend your head down!

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PHOTOPHONES REVISITED

A review of amateur optical communications

The following article began as a short article and finished with a life of its own!

Mike Groth VK5AMG
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APART FROM LIMITED military applications, optical telephony remained a relatively impractical form of communication from the invention of the photophone in 1880, to the development of semiconductor light sources and detectors in the 1960s. While optical fibres have become a major component of modern telecommunications, and infra-red remote controls are incorporated in many domestic appliances, optical communication has been largely ignored by radio amateurs.

Construction projects for photophones have been published from time to time over the last 60 years, but there have been few reviews of optical communication and its potential as a medium for amateur voice and data communication. This article is a mixture of history, theory and personal experience, written with the intention of introducing optical communication to the general body of radio amateurs and possibly stimulating further experimentation in the oldest branch of wireless.

HISTORICAL DEVELOPMENT

Early Developments, 1878-1918

The invention of the selenium cell in 1872 and the telephone in 1876, made it possible to detect modulated light, and Mr A C Brown, of London, is generally credited with the first transmission of articulate speech over a light beam in 1878. Much of the pioneer work in optical telephony was carried out by Alexander Graham Bell and Sumner Tainter during 1879 and 1880, which was presented in a paper[1], read by Bell to the American Association for the Advancement of Science in August 1880.

The Bell Photophone (Figure 1), used a flexible plane mirror mounted at the end of a speaking tube, so that the sound pressure caused the mirror to change shape, modulating the beam intensity of the reflected light. The receiver was a selenium cell mounted at the focus of a parabolic reflector, and coupled to a battery and telephone receiver. Using this apparatus, Bell transmitted speech over a distance of 213 metres using sunlight, and shorter ranges were covered using various lamps as a light source.

Interest in photophones appears to have been dormant until the turn of the century, when German and Austrian experiments with current modulated carbon arc lamps, led to the production of a military photophone by the Siemens- Halske company in 1917. This unit used a current modulated carbon arc transmitter and a selenium cell receiver to give a night range of about eight kilometres. The German Navy was reported to have used voice modulated searchlights for ship to ship communication up to a distance of seven miles (11 km).

The British were also active in photophone research during the First World War, and the vibrating mirror modulator was developed by Rankine as part of a research project for the Admiralty in 1916[2]. Other methods of producing modulated light including current modulation of carbon arcs and fine filament lamps were found to have very poor modulation characteristics.

The selenium cell was the only photoelectric detector available until the development of the thalofide (oxidised thallous sulphide) and molybdenite detectors in 1917. These had a lower noise level than selenium and a faster response to infra-red radiation.

An experimental photophone was developed in the USA by the Case Research Laboratories in 1918, which used a pressure modulated acetylene lamp (Figure 4) in the transmitter, and a thalofide cell with a valve amplifier in the receiver. A clear night range of eight kilometres was claimed with 24 inch (600 mm) reflectors at each end.

1919-1935

Improvements were made to optical modulators and detectors in the 1920s, by motion picture engineers developing the optical sound tracks on movie films. Photophones became a technical novelty for display at industrial exhibitions and science fairs, with the occasional construction project in the popular radio magazines.

Military Photophones, 1939-1950

There was renewed military interest in optical telephony in the 1930s and the German Army introduced the Zeiss Lichtsprecher infra-red photophones in 1935. The light source was a tungsten filament lamp with an infra-red transmitting filter, which was modulated by a vibrating mirror (or prism in the Li80). The receiver used a lead sulphide detector with an infra-red filter and a valve amplifier. They were virtually unaffected by daylight, with a clear weather range of three kilometres for the Li 50/60, to nearly 14 km for the Li 250/130.

The Japanese Army visible light photophone incorporated a vibrating mirror modulator and a caesium photocell detector, with an operating range of about one kilometre in daylight and two and a half kilometres at night. An Italian Army photophone used a current modulated filament lamp as the light source but few details appear to have been published outside of the military reports.

Both German and American Navies used high pressure vapour lamps as modulated infra-red sources for navigation, identification and short range communication. The Germans employed mercury arc lamps of 500 to 2000 watts, while the Americans developed the caesium arc lamp. Some military laboratories continued the development of high pressure arc lamps for optical communication until the 1950s.

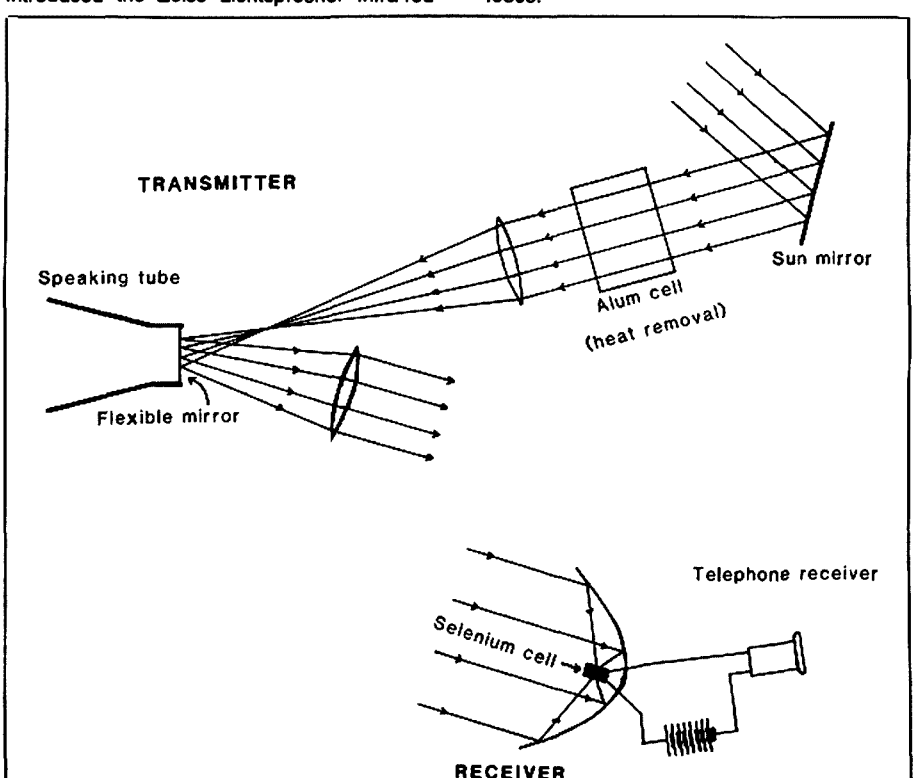


Figure 1: Schematic of the Bell Photophone.

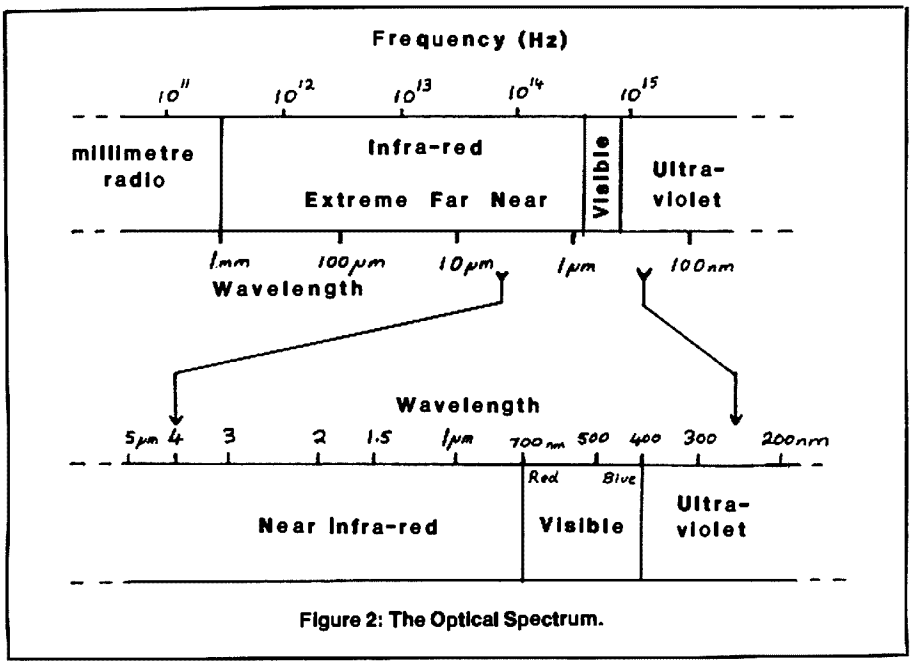


Figure 2: The Optical Spectrum.

Post War Amateur Developments

From 1945, the occasional letter appeared in the amateur journals describing experiments with current modulated light globes, but with the development of transistors and photodiodes there was a small but scattered group of amateurs experimenting with photophones in the 1960s. Most equipment used current modulated torch globes and phototransistors to transmit distorted speech, but some optical links using gas discharge tubes could transmit high fidelity speech and music.

Following the invention of the laser and infra-red light emitting diodes, there was an increased amateur interest in optical transmission between about 1966 and 1972, when several speech and video contacts were made over distances of 100 km or more. Despite the rapid advances in the commercial application of optical communication since 1970, there has been little serious interest in extending amateur radio into the optical part of the electromagnetic spectrum.

OPTICAL THEORY

It has been assumed that the readers of this article have a basic understanding of optics including the properties of lenses and mirrors. A simple description of some more advanced optical concepts has been included to assist in the later discussion of light sources, detectors, and optical systems.

Light may be loosely defined as electromagnetic radiation having a wavelength between 300 nm (3×10^{-7}m) and 3μm (3×10^{-6}m) which corresponds to a frequency range of 10^{14} to 10^{15} Hz. This definition includes visible light with a wavelength between 400 nm and 700 nm as well as the long wavelength ultra-violet and near infra-red parts of the optical spectrum as shown in Figure 2. Optical communication systems usually operate in the visible or near infra-red.

Light is emitted and absorbed in small discrete energy quanta called *photons*. The energy carried by each photon is determined by its frequency or wavelength according to the formula;

$E = h.f$ OR $E = h.c/\lambda$

where E = photon energy (Joules)
f = frequency (Hertz)
h = Planck's constant (6.63×10^{-34} j.s)
c = velocity of light (3.00×10^{8} m/s)
λ = wavelength (m)

The spectrum of a light source reflects the energy of the excited electrons. The thermal electrons in a hot body emit broadband radiation whose dominant wavelength is a function of the absolute temperature as shown in Figure 3. The 2500 degree K curve is representative of the spectrum of the white light from a filament lamp or incandescent gas mantle.

The monochromatic light from a sodium vapour lamp, neon globe or LED has most of its radiant energy concentrated into a limited range of wavelengths determined by the differences in the atomic energy levels in the source. A monochromatic light source has some advantages in an optical communications system as it allows the receiver to be tuned to the transmitter's wavelength.

The short wavelength limit for an optical link is set by atmospheric absorption of ultra-violet wavelengths below 300 nm. The long wavelength limit is set at about 3 μm by thermal background radiation and rising detector noise. Glass lenses and windows are transparent to wavelengths from 350 nm to nearly 2.5 μm while quartz will transmit infra-red to 3.5 μm. Most transparent plastics are suitable for infra-red operation out to a wavelength of 2 μm (2000 nm).

OPTICAL TRANSMITTERS

Optical Intensity

An optical transmitter generates a beam of intensity modulated light either by modulating the intensity of a light source or by passing the light from an unmodulated source through an optical modulator. In either case, the effectiveness of the transmitter is a function of the transmitter's beam intensity and the depth of modulation.

Because light sources have a finite size and do not radiate equally in all directions four parameters (see Figure 4) are used to describe optical brightness and intensity. These are;

FLUX (F)	The optical power (watts).
INTENSITY (I)	The power radiated per unit solid angle in a given direction (watts.steradian^{-1}).
ILLUMINATION (E)	The optical power per unit area (watts.metre^{-2}).
LUMINANCE (L)	The intensity per unit source area (watts.metre^{-2}.steradian^{-1}).

For a point of intensity, I, radiating equally in all directions the total flux radiated is 4πI watts.

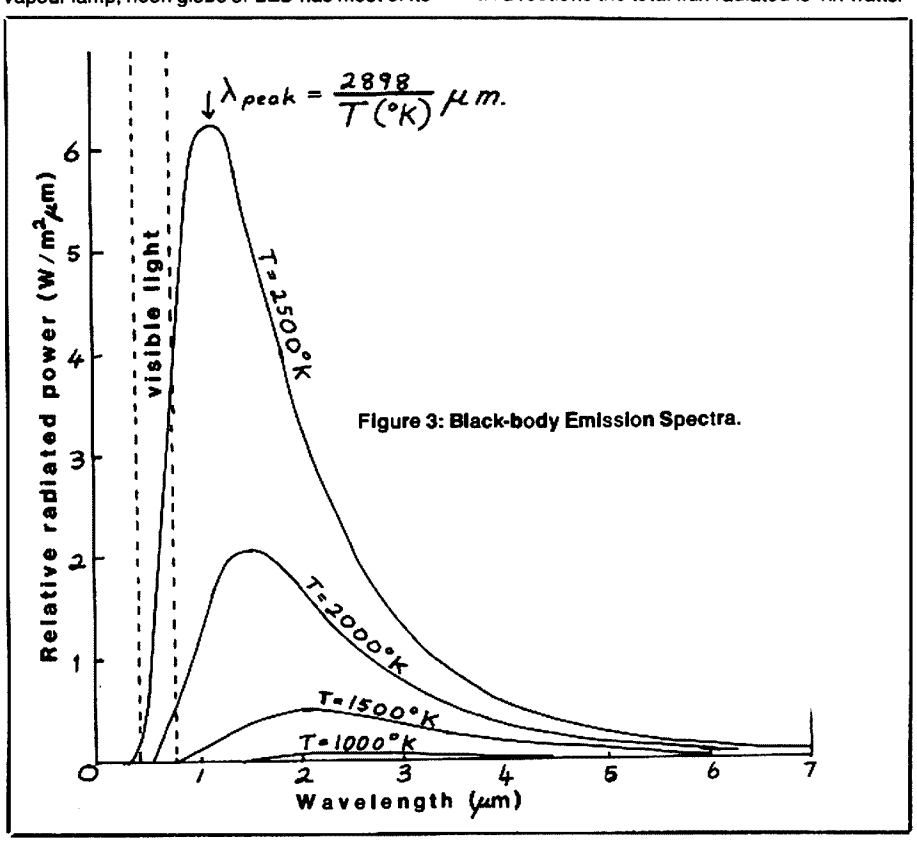


Figure 3: Black-body Emission Spectra.

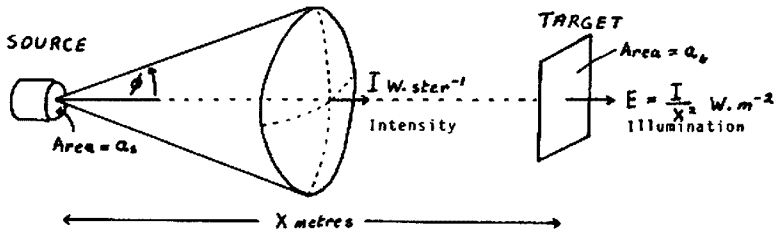


Figure 4: Optical Power Parameters.

Luminance of the source: L = I/a_s watts.m^{-2}.steradian

Solid angle in cone = $2\pi(1 - \cos\phi)$

Optical Flux emitted into cone: F = $2\pi(1 - \cos\phi)$ watts

Optical Flux falling on the target: F_t = E.a_t watts

Visible light photometry is based on a white light standard, the candela, and visual brightness comparisons between light sources. The unit of luminous flux is the lumen, and a light source with a luminous intensity of one candela is emitting one lumen of visible light per steradian. The candela replaces the older unit of the candle-power originally based on the intensity of a sperm wax candle.

A watt of green light at the wavelength of peak response of the human eye (555 nm) is equivalent to a luminous flux of 682 lumens. The luminous efficiency for light of other wavelengths is reproduced in Figure 5, which may be used to estimate the radiant power from luminous flux measurements.

Transmitter Optics

The simplest form of optical transmitter consists of a modulated light source mounted at the focus of a lens or mirror as illustrated in Figure 6. The intensity of the transmitter beam is given by;

$$I_{beam} = \frac{G \cdot D^2}{d_s^2} \quad I_{source}$$

Where G is a geometric correction factor for the f/D ratio of the optical system (Figure 7). Provided the focal length is not too short, the output lens (or mirror) will have the same luminance as the source, and the beam intensity will be a function of the source luminance and the lens area.

The divergence of the transmitter beam (θ_b) is determined by the ratio of the source diameter and the focal length. The use of a more intense source with the same luminance will increase both the power and divergence of the transmitter beam but the beam intensity will remain unaltered. An optical system with a very low f/D ratio such as a deep parabolic reflector will give a very high beam power. But it can be seen from Figure 7 that the beam intensity will be less than that produced by a lens or mirror of the same diameter and moderate focal length. This apparent contradiction arises because the beam divergence increases at a greater rate than the total beam power as the focal length is reduced.

A very narrow beam can make the transmitter difficult to align, especially in an infra-red system where the beam is invisible. For an optical transceiver the transmitter beamwidth should be wider than the receiver's field of view so that the transmitter will be correctly aligned when the receiver is aimed for the maximum signal.

Modulated Filament Lamps

A tungsten filament lamp has a high luminance in the visible and near infra-red (typically 10^5 W.m^{-2}.sterad^{-1}), but the poor modulation of the light output (Figure 8) reduces the effective modulated luminance to the order of 100 W.m^{-2}.sterad^{-1}. Despite the low depth of modu-

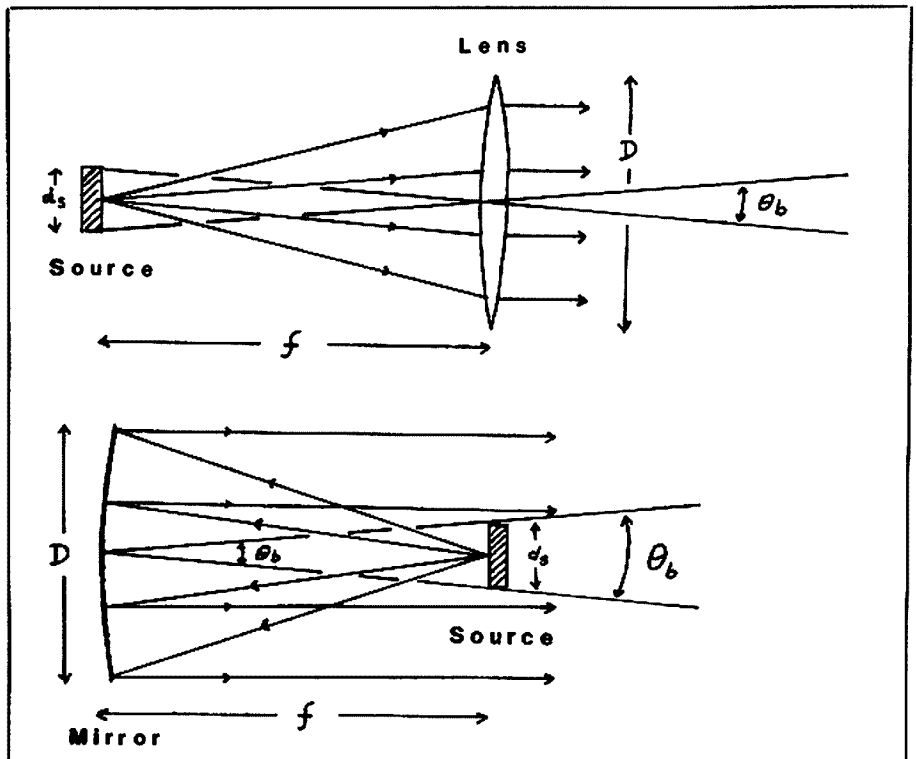


Figure 6: Transmitter Optics.

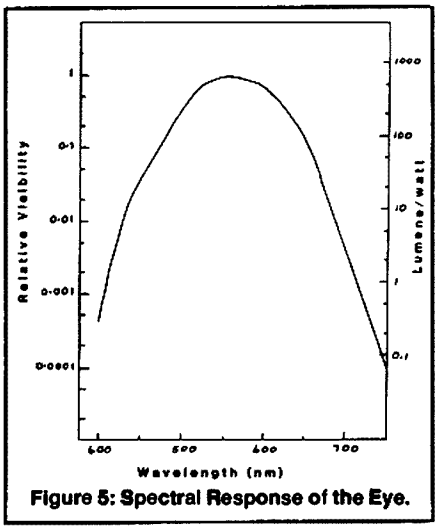


Figure 5: Spectral Response of the Eye.

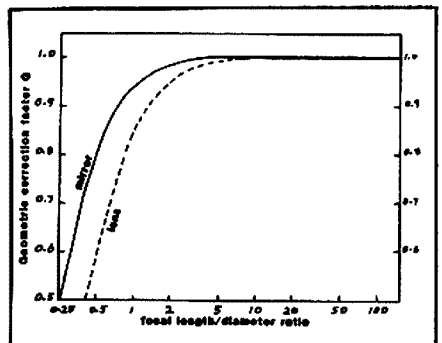


Figure 7: Geometric Correction Factor.

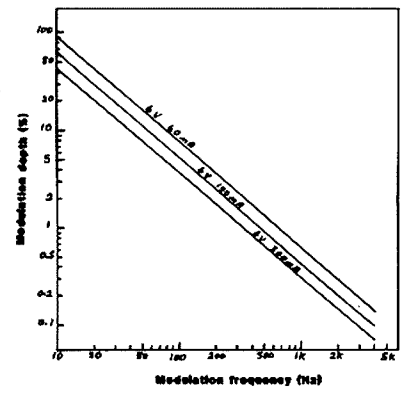


Figure 8: Frequency Response of Current Modulated Filament Lamps.

lation and considerable distortion current modulated torch globes were widely used in amateur photophones for voice communication over distances up to a kilometre on a clear night.

Gas Discharge Lamps

Low pressure gas discharge lamps including neon bulbs and fluorescent lamps can be modulated to 10 kHz or more, but their luminance is very low (typically 10 - 20 $W.m^{-2}.sterad^{-1}$). A gas discharge has a non-linear relationship between voltage, current and light output, but speech and music can be reproduced with reasonable fidelity using pulse width modulation, or a high frequency bias signal as in a tape recorder.

High pressure sodium and mercury vapour lamps are widely used for floodlighting, factories and street lighting. They are readily available with power ratings from 70 to 2000 watts. The luminance, typically $6000W.m^{-2}.sterad^{-1}$), is almost independent of the wattage rating and lamps of the 100 watt size would be suitable for amateur experimentation. The audio modulation characteristics of these lamps is not known but published data indicate that better than 50 percent modulation of the light output could be expected for frequencies up to five kilohertz.

The main disadvantages of high pressure lamps are the relatively high cost, limited life (500 to 2000 hours), and the long warm-up time. Sodium and mercury vapour lamps require at least 10 minutes operation to evaporate the metal in the lamp and produce their full light output. An optical transceiver with a high pressure vapour lamp would have to run its transmitter continuously with a shutter to cut the beam off during reception.

Light Emitting Diodes

Light emitting diodes are junction diodes made from compounds of gallium, aluminium, arsenic and phosphorus, which emit nearly monochromatic light when forward biased. The emission wavelength depends on the chemical composition of the diode crystal and ranges from 930 nm in the near infra- red for gallium arsenide (GaAs), to blue light at 500 nm for aluminium phosphide diodes.

The light emitting diode is the most convenient light source currently available for amateur optical communication. The output is proportional to the forward current and may be modulated to frequencies exceeding one megahertz. The optical properties of several common light emitting diodes are summarised in Table 1.

Table 1: Optical Properties of Common LEDs.

LED Type	Emission wavelength (nm)	Maximum current (mA)	Luminous Intensity (mcd)	Radiant Intensity (mW/ster)	Luminance @ I_{max} ($W/m^2.ster$)
Green diffused	565	40	12	0.02	1.0
Bright Green Yellow	565	40	140	0.23	11.0
diffused Orange	585	40	12	0.02	1.0
diffused	635	40	18	0.10	5.0
Red diffused	697	40	8	0.77	40.0
Bright Red GaAlAs IR	660	50	500	15.00	750.0
(XC 880)	880	60	—	25.00	1250.0
GaAs IR (CQY89)	930	120	—	20.00	1000.0

It can be seen that the efficiency and power output of a LED decreases with the emission wavelength, and an infra- red emitting diode has much greater output flux than a green LED for the same drive current. A high intensity red LED is a suitable modulated light source for demonstrations and experiments as the visible radiation simplifies the optical adjustments.

High powered GaAs and GaAlAs infra-red emitting diodes are available with peak output powers of several watts but the luminance of the source is probably not significantly higher than for smaller diodes. The efficiency and power output of a LED is temperature dependent (Figure 9) and some form of heat sinking is necessary if operating a diode near its maximum current.

Most light small emitting diodes are supplied in a transparent plastic package with a domed top which acts as a lens and increases the intensity of the light along the diode axis. The lens does not increase the source luminance but generates a bright halo as illustrated in Figure 10. The effective luminance may be estimated by assuming the source diameter is equal to the diameter of the diode.

Mechanical Modulators

A variety of mechanical devices have been devised over the past 108 years to impress voice modulation on a beam of light. As it is impossible to cover these in detail this review has been restricted to the basic principles of some of the more successful designs.

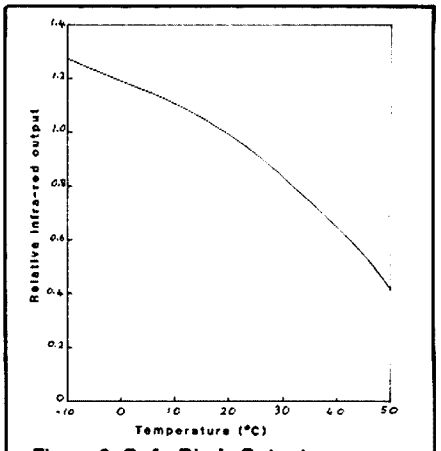


Figure 9: GaAs Diode Output versus Temperature.

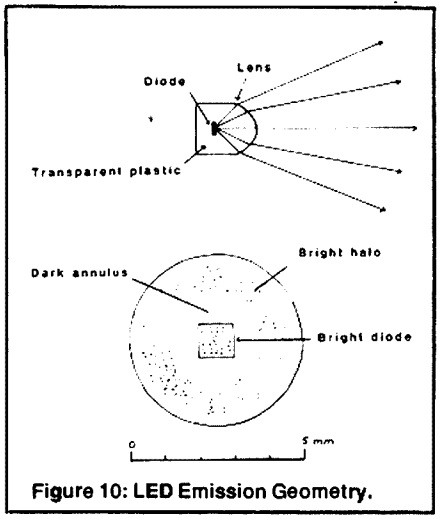


Figure 10: LED Emission Geometry.

The intensity of a light beam may be modulated by altering the optical flux in the beam with a variable transmission device or by changing the divergence of the beam. The latter approach was adopted by Bell in his 1880 photophone (Figure 1) which used a flexible mirror to vary the divergence of the reflected beam in sympathy with the sound pressure.

A modern version of the Bell modulator may be constructed by mounting a sheet of aluminised plastic or a thin glass mirror in front of a loudspeaker as shown in Figure 11. There should be a good seal between the loudspeaker rim and the mirror to achieve a tight acoustic coupling.

A simple modulator for use with a small filament lamp is drawn in Figure 12 where the flexible mirror and the lens form an optical system of variable focal length. The optical path from the lamp to the lens should be slightly shorter than the focal length so that the filament will be in focus at the maximum concave curvature of the mirror. This modulator is most effective with a torch globe having a short narrow filament.

The flexible mirror is not a linear modulator and the distortion rises rapidly with increasing modulation depth. Up to 30 percent modulation is possible with a very flexible mirror but a transmitter using a glass mirror is unlikely to achieve more than about five percent modulation of the beam intensity.

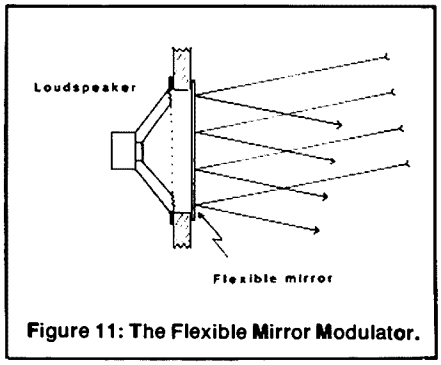


Figure 11: The Flexible Mirror Modulator.

The vibrating grid modulator is constructed from a pair of identical grids, each having equal transparent and opaque strips. One of the grids is fixed and the other is attached to the voice coil of a loudspeaker driver as shown in Figure 13. The two grids have a static displacement of half a strip width. Driving the voice coil with an audio signal will modulate the transmitted light power about its quiescent value of a quarter of the incident optical flux.

The performance of the system will depend on the fineness and accuracy of the grids as well as the mass and frequency response of the moving grid. The grids with strips about one millimetre wide could be a pair of photographic transparencies or etched from a thin sheet of metal. The vibrating grid concept was independently suggested by Alexander Graham Bell in 1880, and by Sir William Bragg in 1915, but it was impractical with the acoustic drive systems available at the time.

The problems associated with the moving grids were overcome by Rankine in 1915 by using fixed grids and an optical lever as illustrated in Figure 14. The grids were located at the radius of curvature of the concave mirror which formed an image of the first grid in the plane of the second. A small rotation of the mirror will move this image over the second grid and modulate the luminance of the image formed by the second lens. The light from this image is collimated by the output lens to produce the main transmitter beam.

The rotation of the mirror may be produced by a high speed galvanometer or a loudspeaker voice coil via a lever and fulcrum. Despite its greater complexity the oscillating mirror modulator was the most successful mechanical design. It was used by the Japanese and Germans in their military photophones during the 1930s.

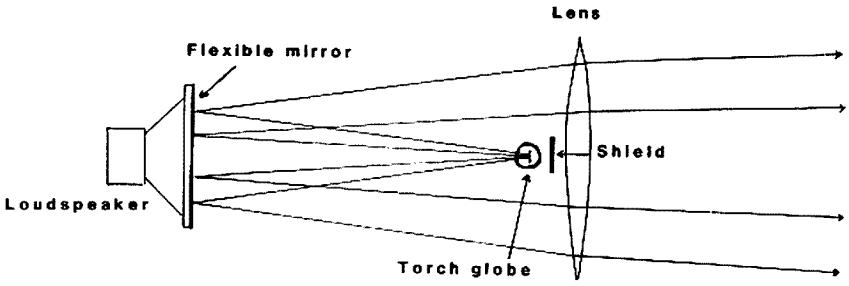


Figure 12: Flexible Mirror Optical Transmitter.

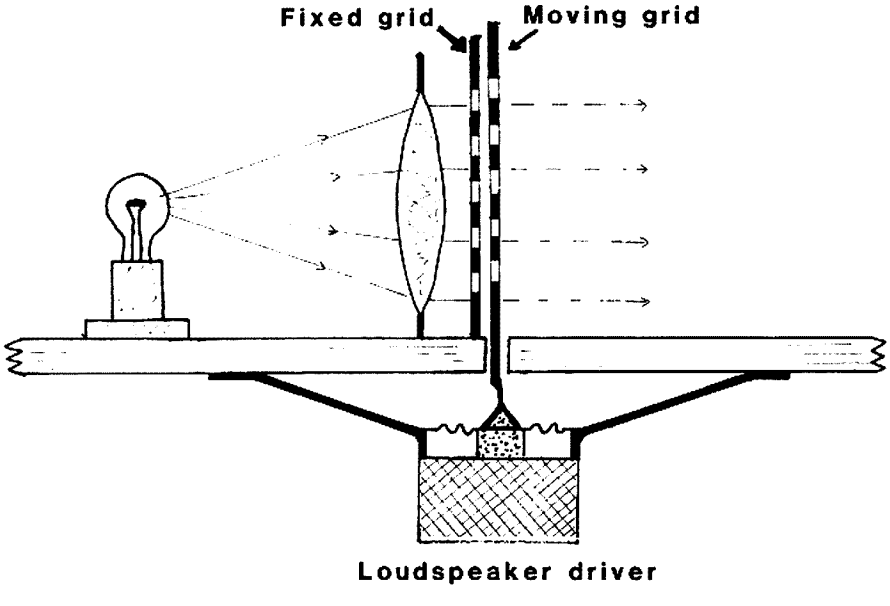


Figure 13: The Vibrating Grid Modulator.

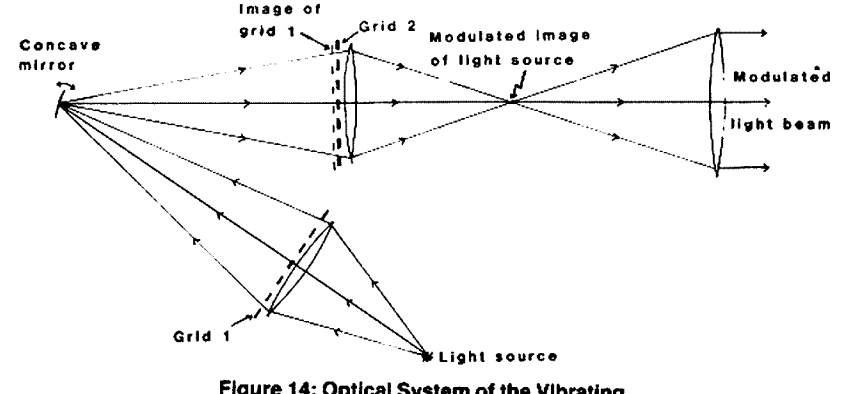


Figure 14: Optical System of the Vibrating Mirror Modulator.

Several other mechanical modulators have been developed using internally reflecting prisms or interferometers with movable plates. They have not been included in this review as they are precision devices which would not be suitable for amateur construction.

Electrical and Magnetic Modulators

The Kerr Cell is a glass cell fitted with parallel electrodes and filled with nitrobenzine which becomes doubly refracting in an electric field. The cell is mounted between a pair of crossed polarisers (Figure 15) whose planes of polarisation are at 45 degrees to the electric axis of the Kerr Cell. In the absence of an electric field no light is transmitted by the second polariser. When a voltage is applied to the electrodes the Kerr Cell becomes doubly refracting. The light emerging from the cell is elliptically polarised. As this now has a polarisation component aligned with the second polariser some will be transmitted.

The optical path difference between the two polarisation components in the cell is proportional to the square of the applied voltage with a response time of less than one nanoseconds. Very strong electric fields are required to open the shutter. A Kerr Cell is often operated with an RF drive. The light will be chopped at twice the excitation frequency.

Caution must be exercised when experimenting with Kerr Cells, as very high voltages are involved and nitrobenzine is very poisonous. It is also a powerful solvent. It will attack most plastics. A fatal dose can be absorbed through the skin.

A magneto-optic modulator (Figure 16) utilises the Faraday rotation of a beam of polarised light shining along a magnetic field. Most transparent materials exhibit a very small Faraday rotation. The effect is strongest in ferro-magnetic materials. An experimental voice modulator was developed in the 1960s using a thin section of yttrium-iron-gamet, which is transparent to near infra-red and exhibits a large Faraday rotation.

Lasers

A laser is a monochromatic light source in which the electron transitions have been synchronised by optical feedback so that the photons are in phase with each other and the light is coherent. Coherent light has the properties of a continuous wave, with a very narrow spectral bandwidth.

Lasers are best known for their high optical power output. Gas lasers producing over a kilowatt of optical flux are in regular use in industry for cutting cloth, wood and metals. The argon laser is widely employed for surgical procedures and solid state lasers with peak output powers of a terawatt (10^{12}W) or more, probe the atmosphere and measure distances to satellites.

The most common laser for optical communications is the semiconductor or diode laser which is a modified infra-red emitting diode that generates coherent radiation. The luminance is much higher than a normal infra-red emitting diode with a very narrow spectral spread. The infra-red is emitted with a divergence of about 10 degrees and can be current modulated to several megahertz.

The other common laser to which amateurs are likely to have reasonable access is the helium-neon gas laser which emits up to 20 mW of red light with a wavelength of 632.8 nm. The light is emitted in a thin parallel beam. The He-Ne laser is widely used in teaching, science, engineering and surveying. The gas discharge may be powered by a DC current or an RF signal, and a 10 metre AM transmitter can be used as a exciter for photophone experiments.

The parallel beam of light emitted by a laser will start to diverge after a short distance as a result of diffraction but this can be reduced by expanding the beam through an astronomical telescope as depicted in Figure 17. The diffraction spreading for a 100 mm diameter beam of coherent red light is about 15 microradians. But an expanded laser beam is observed to diverge at nearly 200 microradians (200 mm/km or 1 foot/mile) probably as a result of atmospheric turbulence and imperfections in the telescope.

OPTICAL RECEIVERS

An optical transmitter generates a beam of intensity modulated light, which is received by a photodetector and converted directly to an audio frequency electric current. This is similar to the early days of amateur radio when incoherent signals from spark transmitters were received by crystal sets. Experimental coherent fibre-optic receivers have been demonstrated in several research laboratories but a coherent optical communication system for

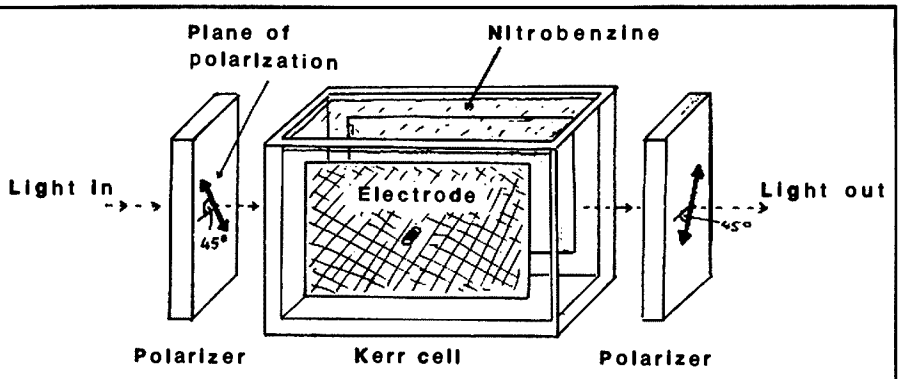


Figure 15: The Kerr Cell Electro-Optic Shutter.

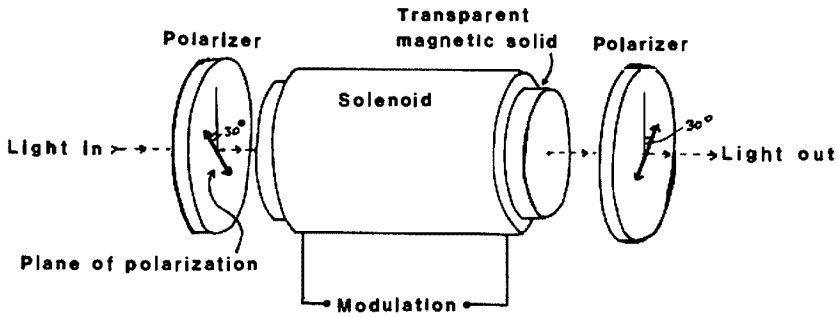


Figure 16: A Magneto-Optic Modulator.

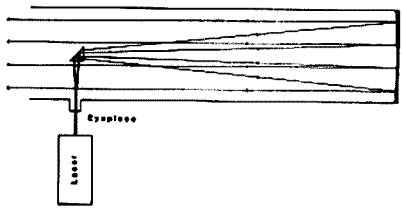


Figure 17: Laser Beam Expansion.

atmospheric transmission is not likely to be available for some time.

Detector Theory

A photodetector is a quantum device which uses the photon energy of the light to excite electrons and generate a current proportional to the energetic photon flux. All photon detectors have a cut-off wavelength λ_c which corresponds to the minimum photon energy required to excite an electron in the detector. In an ideal detector each incident photon with a wavelength less than λ_c will liberate an electron but the quantum efficiency of a real detector ranges from 0.03 to 0.5 electrons/photon.

The sensitivity of a photon detector is the detector current generated per watt of incident optical flux. It is inherently wavelength dependent (Figure 18) with the maximum sensitivity at a wavelength slightly shorter than λ_c. Radiation with a wavelength longer than λ_c will not be detected. The short wavelength limit is usually determined by absorption in the detector windows.

A detector will generate white noise from electrical leakage, thermal excitation and background light. The dark current is proportional to the square root of the detector area and increases rapidly with the temperature and cut-off wavelength. The thermal noise contribution from a detector with a cut-off wavelength in the visible part of the optical spectrum will generally be less than the amplifier noise. Detectors sensitive to far infra-red radiation have a very high thermal noise level at room temperatures and are not particularly suitable for optical communications.

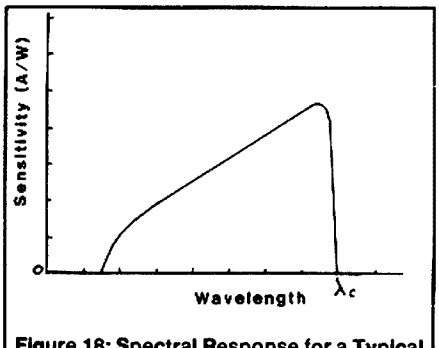


Figure 18: Spectral Response for a Typical Detector.

Unmodulated light falling on a detector will generate white noise from statistical fluctuations in the photon flux. The light noise is proportional to the square root of the detector current and is a function of the total light flux. Background light may be the main noise contribution in an atmospheric optical link operating during the day or on a moon lit night.

Receiver Optics

In a typical amateur photophone receiver, the light from the transmitter is concentrated on the sensitive area of the detector by a lens as illustrated in Figure 20 although mirrors become more convenient if a large collector is required. The lens or mirror should have a focal length longer than its diameter for efficient light collection. Magnifying glasses or magnifying sheets make suitable receiving lenses up to a diameter of 250 mm for visible or near infra-red signals.

The lens or mirror will form an image of the transmitter output aperture at the focal plane which for a lens of reasonable focal length will have a diameter of less than one millimetre. As this is smaller than the sensitive area of a practical detector all the transmitter light falling on the receiving lens will fall within the active area of the detector. The detector current will therefore be proportional to the area of the lens or mirror and independent of the focal length or the detector area.

A receiver will detect light arriving within a conical field of view whose angular diameter is defined by the focal length and detector diameter. This field of view may include unmodulated light from scattered sunlight or moonlight as well as modulated light from street lighting and other sources. The unmodulated light will generate white noise in the detector while street lights and house lights will produce a strong 100 Hz interference.

As the noise and interference produced by the background light will increase with the receiver beamwidth the receiver's field of view should be reasonably narrow. However, a very narrow field of view will make the receiver difficult to align and may require some form of optical tracking system to compensate for changes in atmospheric refraction.

A detector about two millimetres in diameter will give a beamwidth between three and 10 milliradians (0.2°-0.6°) with typical receiver lenses which appears to be a reasonable compromise between interference suppression and ease of aiming. Larger detectors should have their effective diameter reduced with a focal plane aperture plate.

To be continued next month . . .

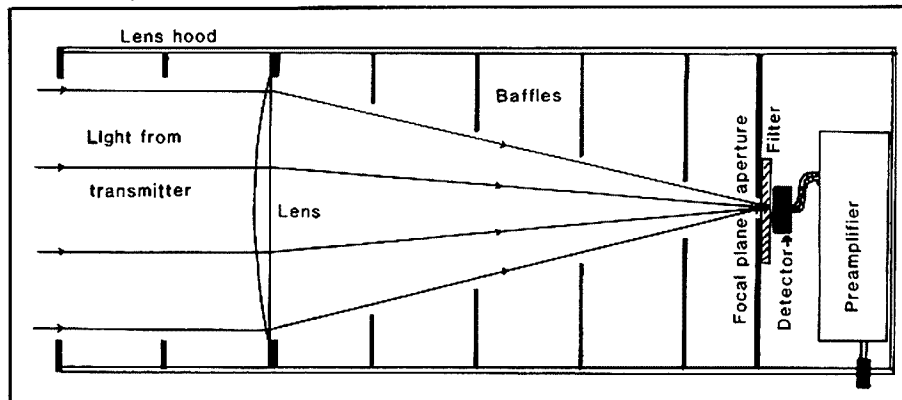
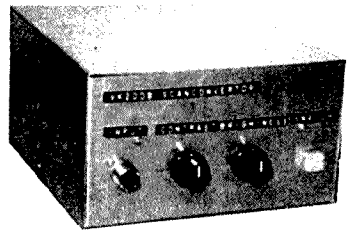


Figure 20: An Amateur Optical Receiver.

SCANCONVERTOR

This scanconvertor was developed as a companion to a receive-only scan-converter. It allows operators who have a dedicated receive unit or a computer interface to store a picture from a video camera and transmit it at a slow scan rate independent of their receive memory. It uses readily obtainable parts, and this model was built from new parts for around $100.

Leon Williams VK2DOB
14 Powell Street, Bungendore, NSW. 2621



CONCEPT

To store a picture from a camera, the analogue signal must be digitised and stored in memory.

This scanconvertor samples a portion of 128 lines which is every second line in a block of 256 lines.

Each portion is converted into 128 pixels where each pixel's voltage level is represented by a binary value between 0000 for black and 1111 for white. Once the conversion has taken place the data is written into RAM. From here it is read at a slower rate and converted from the digital value to a frequency ranging between 1500 Hz for black and 2300 Hz for white. It is combined with 1200 Hz synchronised pulses to enable correct reception at the distant end.

SPECIFICATIONS

Input:	1V P-P (nominal) 70 Ohms negative synchronisation.
Conversion time:	1 frame (20 MS)
Controls:	Front — brightness and contrast (allows for wide variations in input signal). Front— snatch switch. Rear — Power switch.
Format:	128 pixels x 128 lines.
Shades:	16 (including black and white).
Slow Scan Line Period:	60 MS = 55 MS (can be varied) + 5 MS horizontal synchronised signal.
Slow Scan Frame Period:	7.73 S = 128 x line period + 50 MS vertical synchronised signal.
White Frequency:	2300 Hz.
Black Frequency:	1500 Hz.
Horizontal Sync:	1200 Hz 5 MS.
Vertical Sync:	1200 Hz 50 MS.

ANALOGUE TO DIGITAL CONVERTER BOARD

Q1 amplifies the video signal and is coupled to the contrast control and synchronous separator.

The synchronous separator accepts the now inverted signal and, because of Q4's biasing, conducts only on the synchronised tips.

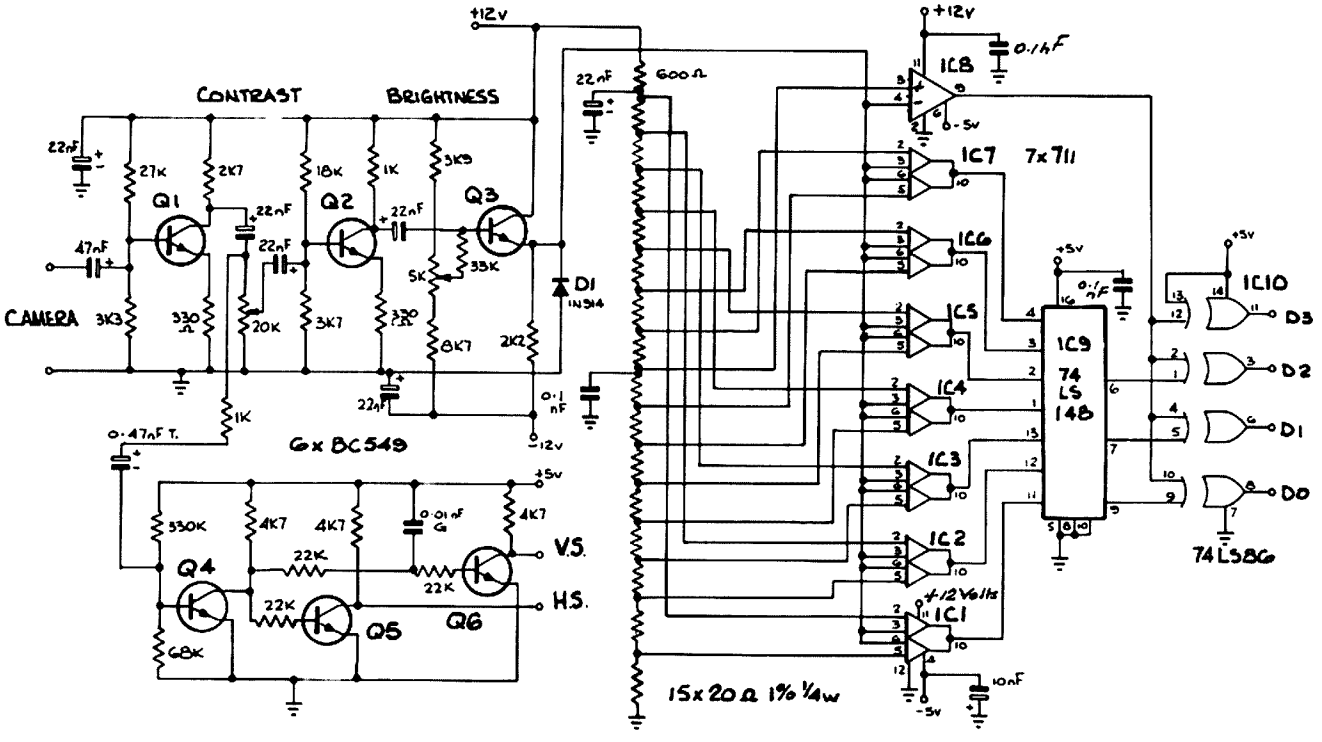
The separated synchronous pulses are buffered for horizontal synchronisation and integrated before buffering to give vertical synchronisation.

The recovered synchronised pulses are positive going.

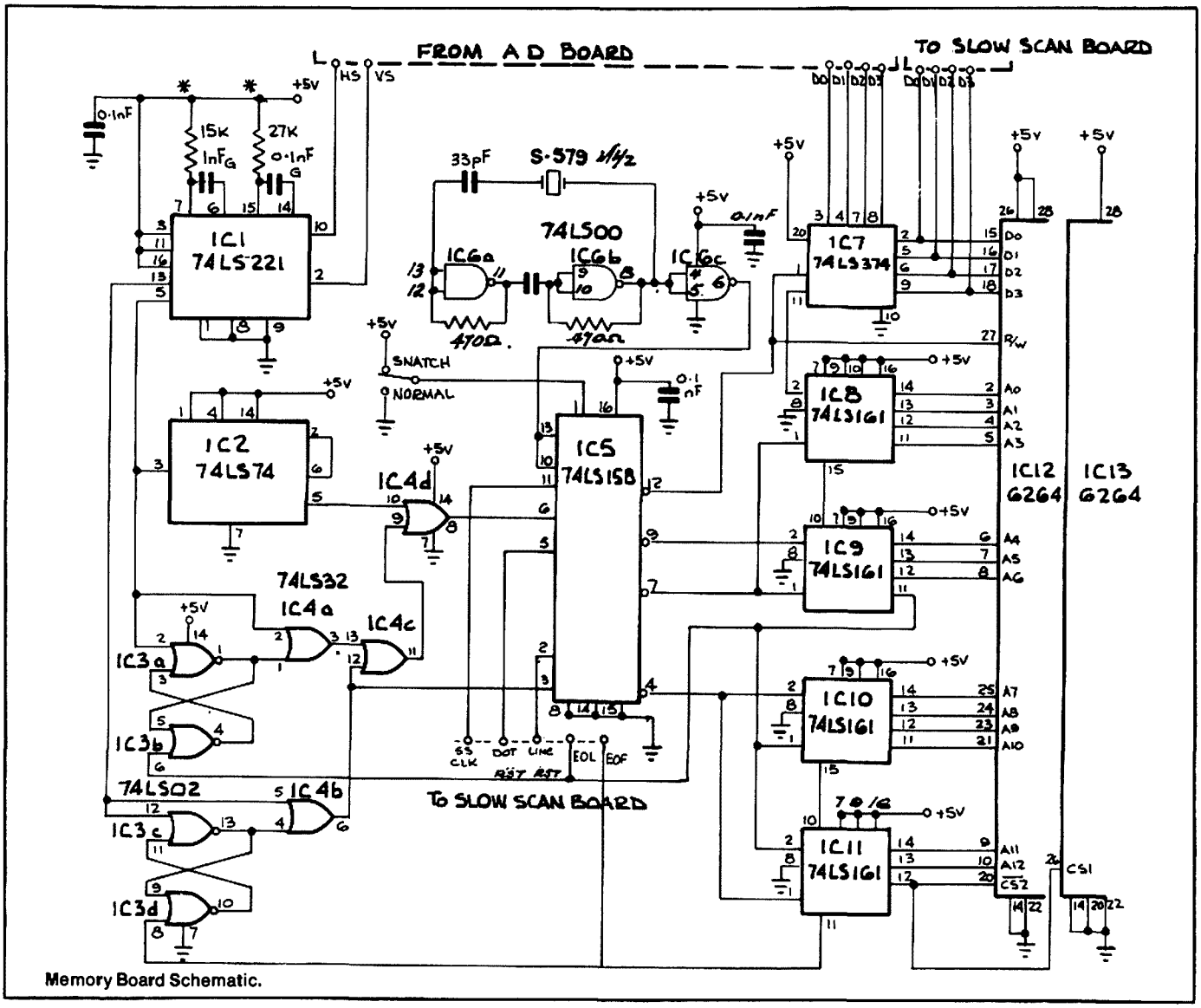
After the contrast control the signal is further amplified by Q2, another common emitter circuit and, at its collector, the signal is in phase with the camera signal.

This is followed by an emitter follower and has variable biasing provided by the brightness control.

Q3 provides a low output impedance signal where correct setting of the contrast and brightness controls give a black level of 0 volts and a white level of 4 volts.



Analogue to Digital Board Schematic.



Memory Board Schematic.

The synchronised tips are below 0 volts and diode D1 clips the signal below 0.6 volts. The analogue to digital converter employs discrete comparators which are inexpensive and easy to obtain.

While they perform adequately, they are noisy and complicate board layout. They are, however, still much less expensive than single chip video flash converters.

A ladder of one percent resistors form 16 discrete voltage levels between 0 volts and 4 volts. The video signal is compared with these levels by eight high speed comparators. Their outputs are encoded by a priority encoder and an exclusive IC.

With an input of 0 volts all comparator outputs are high resulting in all data outputs being low.

As the input level increases, the lowest comparators output (IC1) goes low, then the second and so on. When the output of IC7 goes low, D0, D1 and D2 outputs are all high and if the input increases further the output of IC8 goes low. This causes D3 to go high and D0, D1 and D2 to go low.

As the input increases further, the output of IC7 goes high, then IC6 and so on, causing the encoder to decrement.

Because its outputs are now inverted, D0, D1 and D2 begin to increment, and when the input is at 4 volts, D0, D1, D2 and D3 are high.

MEMORY BOARD

Circuit Description

This board contains the memory ICs, IC12 and IC13. Each chip contains half the picture. It is possible to store one whole picture in only one IC, thus saving one IC, but this requires extra circuitry to store two pixels in one memory location, and was not thought to be worth the effort. Anyway, one extra memory IC does not add greatly to the overall cost.

IC8 and IC9 are the dot (or pixel) address counters, while IC10 and IC11 are the line address counters. IC7 is a tri-state latch which latches the data from the Analogue/Digital board on the positive transition of the clock signal, and writes data into the memory when the clock is low. IC5 is a quad two input selector, that selects fast scan clock and counter resets when pin one is high. When pin one is low, IC5 selects the slow scan clock and counter resets. When in the slow scan mode IC7 is disabled and the memory is held permanently in read.

IC6 is the fast scan clock oscillator, the frequency selected results in a near 1:1 aspect picture.

IC1 is a dual monostable. One half triggered from the separated horizontal synchronised pulse and produces a delay at pin five to delay the start of the picture horizontally.

The other half produces a delay at pin 13 triggered by the vertical synchronised pulse to delay the start of the picture vertically.

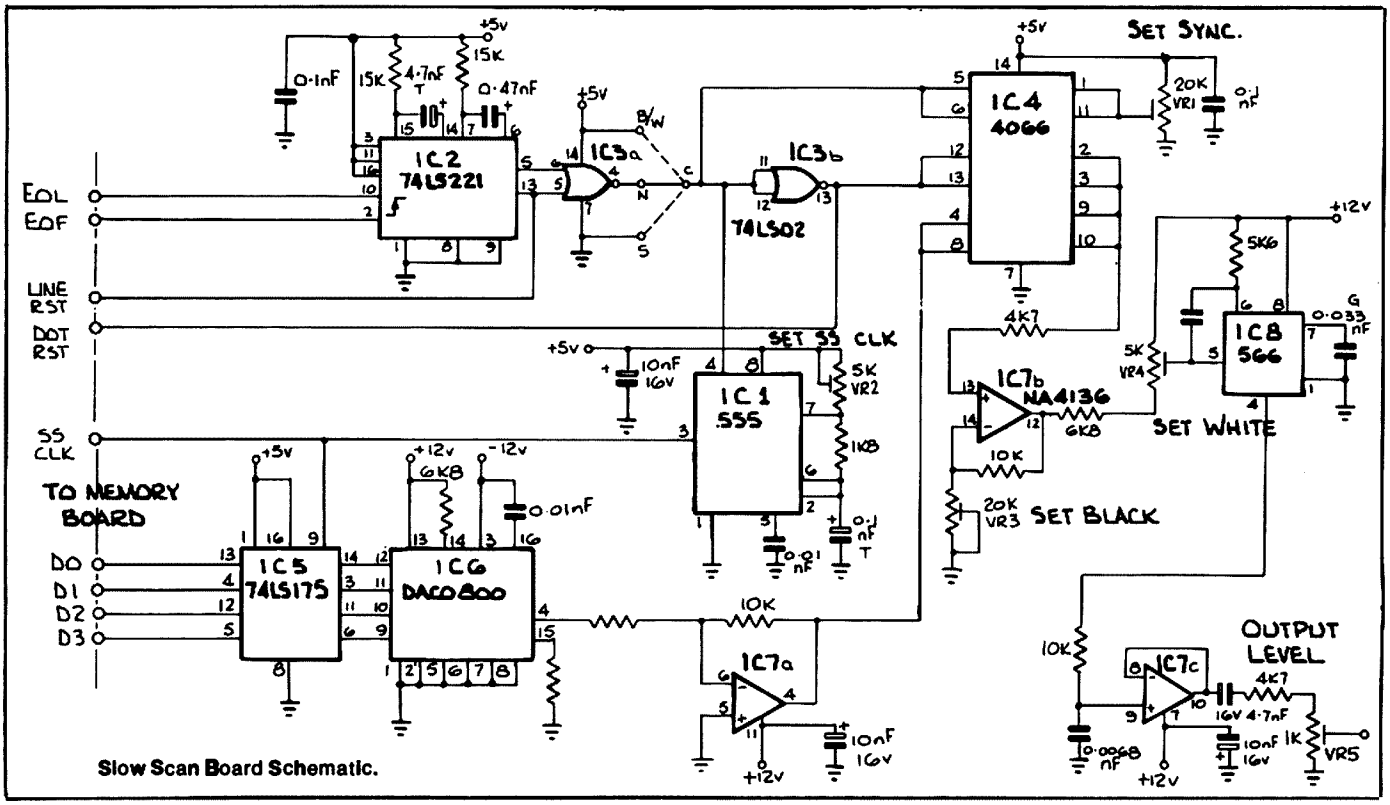
IC2 is connected as a divide by two, which allows only every second line to be stored. The delay pulse from IC1 and pin five resets IC3A and IC3B, causing IC3A pin one to go low. However, IC4A pin three is still high due to the high delay pulse. This high is passed through IC4C, IC4D and IC5 to reset IC8 and IC9.

Once the delay has ended, IC8 and IC9 are clocked by the fast scan clock.

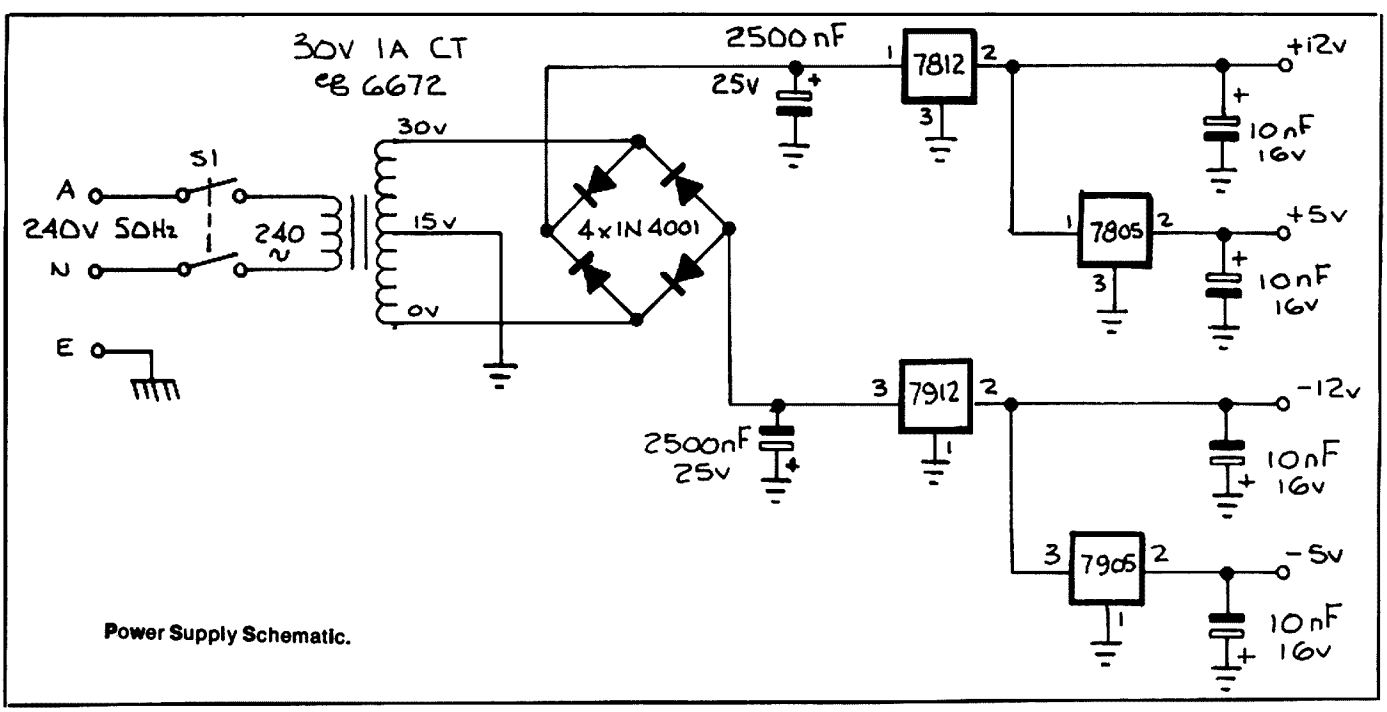
After 128 locations have been addressed, IC9 pin 11 goes high and clocks the line counters. It also sets IC3A and IC3B, causing the dot counters to reset. They stay reset until another horizontal delay has finished. This process repeats until 128 lines have been addressed, where IC11, pin 11 goes high. This resets all counters, until the vertical synchronised delay has elapsed. This process repeats itself as long as the snatch button is pressed.

ADJUSTMENTS

The only adjustment needed on this board is to



Slow Scan Board Schematic.



Power Supply Schematic.

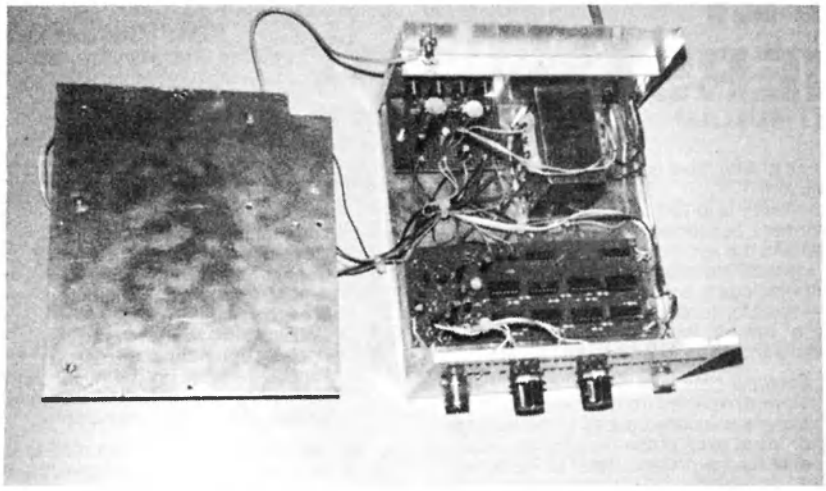
the resistors connected to IC1. This will need to be done once the scanconvertor is built, and the output displayed on a receive scan-converter. With the camera pointed at a subject and a picture snatched, it can be seen on the receive converter, if the captured picture is centred in respect to the picture from the camera displayed on a fast scan monitor. Decreasing the resistor values will shorten the delays and move the picture closer to the top and left. Increasing the values will have the opposite effect.

SLOW SCAN BOARD

Circuit Description

IC2 is a dual monostable. One half is triggered at the end of line, producing a 5 MS pulse at pin 13 (horizontal synchronisation). The other half is triggered at the end of frame, producing a 50 MS pulse at pin five (vertical synchronisation). The horizontal synchronised pulse resets the dot counter, while the vertical synchronised pulse resets both dot and line counters. As well, both synchronised pulses are zeroed by IC3 to reset the 555 clock and selects the synchronised trimpot via the 4066 IC4.

IC5 latches the data from memory on the positive transition of the clock, while the address counters are incremented on the negative transition. IC5 provides inverted data to IC6, a digital to analogue converter. Only four of the eight data lines are used and, along with IC7A, produces an output at IC7A pin four of 0 volts for white and about 1.1 volts for black. This analogue voltage is passed through IC4



A divider separates top and bottom.

when a synchronised pulse is not active. IC7B and trimpots VR3 and VR4 provide level shifting of the signal for correct control of the VCO (IC8).

The output of IC8 at pin four is a triangular wave and is filtered before being buffered by IC7C.

Alignment

Connect all the power supply lines, and set all trimpots to halfway. Solder a common wire to the data inputs and connect it to +5 volts. Solder a wire between pins marked B/W and C. Using a frequency counter, adjust VR2 for a clock frequency of 2327 Hz at IC1 pin three. Connect the counter to the output of IC7C, and adjust VR4 for a reading of 2300 Hz.

Next, connect the common wire soldered to the data lines to 0 volts. Adjust VR3 until the counter reads 1500 Hz. Some interaction may occur, so check each reading until you have them right. Now, remove the wire between C and B/W and connect it between C and S. Adjust VR1 for a counter reading of 1200 Hz. Once this is done, remove the wire and solder it between N and C. The output level may be adjusted by VR5. The board is now fully aligned and ready for connection to the memory board.

POWER SUPPLY BOARD

Circuit Description

The power supply follows conventional lines.

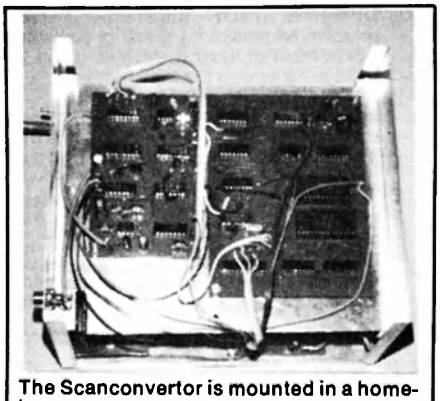
The 30 volt, one amp, centre tap transformer supplies about 20 volts to the 12 volt regulators. The five volt regulators are fed from the 12 volt outputs to reduce heat dissipation in the five volt devices.

Construction

The scanconvertor is housed in a home-brew case bent from 0.8 mm aluminium sheet, measuring 180 mm wide, 100 mm high and 200 mm deep. It is made of three pieces — a U-shaped section forming the base, a U-shaped section for the cover and a flat piece that forms a divider between top and bottom.

The divider is held in place by aluminium angle screwed to the inside, front and back. The power supply and the Analogue/Digital board are mounted in the bottom section.

The transformer is mounted to the right rear, near the power switch and the voltage regulations are bolted to the left rear along with insulating washers.



The Scanconvertor is mounted in a home-brew case.

The front panel has the camera socket, brightness and contrast controls together with the snatch switch mounted below the level of the divider.

The divider has the memory and slow scan boards mounted on it. The RCA output socket is mounted at the rear.

Capacitors marked on the circuits with a **T** should be tantalums, whilst capacitors marked **G** should be greencaps. Other polarised capacitors can be 16 volt electrolytics apart from those labelled otherwise. Non-polarised capacitors can be ceramic discs. The printed circuit boards were made using a resist pen and as a result, no photographic artwork was made. If, however, intending constructors require assistance, the author can provide a guide to the board layouts. He would also be pleased to hear from any reader's general comments or improvements to the circuits.

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FCC FINES COMPANIES

THE FCC OFFICE in San Diego, CA, (Dennis Connor Territory), has notified two companies that they are apparently liable for civil fines of $2000 each for the unlawful marketing of long-range cordless telephones. The companies violated FCC regulations which require that cordless telephones be certified by the FCC before sale. This particular could not be certified due to its design. The advertised range of the device was 60 km and certified cordless telephones generally have a range of less than 200 metres.

—From *The ARRL Letter* January 13, 1987

ET CHIP

IF THERE ARE ANY extra-terrestrials beaming radio signals to earth, NASA will have a better chance of detecting them thanks to a computer chip designed by Stanford University graduate students.

It will be used in the Search for Extra-Terrestrial Intelligence (SETI) program, which is trying to identify radio signals amid natural noises from gaseous clouds, cosmic debris and stars.

The new chip is a 40 to 1 improvements over current technology, and will be put in a system that reads information from an antenna in the Mojave Desert.

It was developed to increase the number of radio channels received by the antenna.

Each chip contains 34 000 transistors and can perform 80 million arithmetic operations per second.

The SETI program is focusing on an area of about 1000 stars, listening to them through the microwave portion of the radio spectrum for any sign of intelligence.

50 cm ATV ALLOCATION

THERE WAS A brief paragraph in the December issue of AR (page 15, *Special Condition*) which indicates that frequency assignments in the 576-585 MHz band (frequently used as an ATV repeater downlink) are under review. Also, new licences for repeaters in this band are being endorsed to this effect.

An article appeared in the October 1985 issue of *Amateur Radio* (page 5, *UHF ATV — 50 cm*) which gives the background and details of an agreement between the WIA and DOC on this matter. The important points of that agreement are that the DOC Broadcasting Services Division accepted the principle of amateur television in the 50 cm band, but that alternative channel allocations may be necessary in specific geographic areas.

—Contributed by Peter Gamble VK3YRP, Chairman of FTAC

POWER SUPPLY TRANSFORMERS

Geoff Switzer VK2SR
53 Turf Street, Grafton, NSW, 2460

Regulators, pass transistors, ex-computer capacitors and bridge rectifiers can be had at bargain prices.

Building up 13.8 volt power supplies has become a common past-time for the current amateur fraternity. Regulators, pass transistors, ex-computer capacitors and bridge rectifiers can be had at bargain prices. But what of the heavy duty transformers? New ones cost an arm and a leg and become the major proportion of cost of any prospective power supply.

Setting up the shack these days is a daunting prospect for the new amateur and the cost of a commercial power supply, added to the cost of the basic rig, borders on the prohibitive. So let us go back to the days when the amateur was resourceful and use some of the initiative that was the pride of many old timers.

Power transformers ex black and white televisions are still about for the taking but never seem to turn up as the ideal single transformer for the heavy duty supply. But for those of us prepared to wrestle with a stack of laminations and have the patience to lay on a few turns of wire there is a ready and economical solution.

The answer is to use two, three or even four transformers connected with the primaries in parallel and the secondaries in series. Indeed, three identical transformers, each with heavy 6.3 volt windings in series can provide about 19 volts — ideal for connection to the bridge.

For a rewind job the following general procedure should be followed:

1 Select a gauge of wire suitable to the current expected from the supply.
2 Make a calculated guess at the wattage or VA of each of the transformers available for the project. Refer to Paragraph 7.
3 Connect each transformer to the 240 volt mains and measure the voltage of the heavy winding, say 6.3 volts.
4 Dismantle each transformer, then remove the measured winding, counting the number of turns. Later this count is used to determine the turns per volt.
5 Remove the high voltage secondary — a hacksaw is a useful expedient. Be careful not to damage the primary winding, invariably the one immediately on the core.
6 Add a couple of layers of appropriate insulation to that already covering the primary winding.
7 Wind on the new heavy gauge secondary to as many turns as calculated from the turns per volt and VA capacity of the core to realise the desired output voltage. Tape over the finished winding. Remember that the core laminations must be replaced with clearance to the finished winding.
8 Connect each transformer to the mains supply and measure the output voltage of each secondary.
9 Connect secondaries in series.
10 Connect primaries in parallel to the supply, transposing the connections as necessary to produce the total required voltage of the series secondaries.

The use of this system assumes that the constructor will observe the regular practices conforming to mains connected devices. Give particular attention to making an earthing connection to the transformer cores and electrostatic shields. The bracket of transformers may be mounted on a separate assembly to the rest of the power supply. Ventilation is imperative.

The wire gauges used can be calculated from the *ARRL Handbook* or ascertained from the friendly supplier of your requirements.

If you have been sufficiently interested to read this article I have one final word of recommendation. Never pass up a transformer of any type or dimensions. Soon they will be history and consequently very expensive. There are no transformers to be found in modern televisions and it seems that the 'live chassis' principle is back with a vengeance . . . and probably forever.

ar

Try This!

Paul Jenner ZL1TZA
Box 241, Mata Mata, NZ

NOISE BLANKERS

Following is a circuit for a Noise Pulse Generator, usable for two metre frequencies, at least.

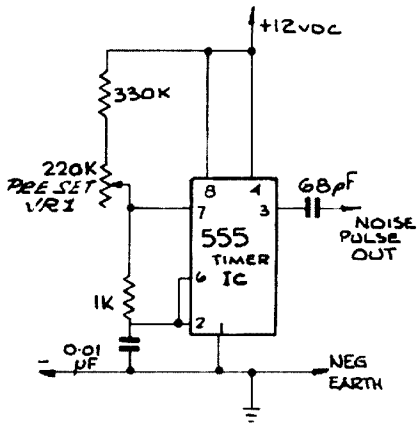


Figure 1: Noise Pulse Generator.
The circuit emits a noise pulse via the 68 pF capacitor. Timing of the pulse can be varied by the VR1 preset potentiometer.

The Noise Pulse Generator has helped repair the intermittent or defective noise blanker in my TR9000 rig, also in my TS670. The TS670 noise blanker has never worked since new. The agent however, said it was alright.

I constructed the following circuit on some veroboard as shown in Figure 1.

My TR9000 was intermittent in the noise blanker circuitry — the noise blanker was not always working! The covers of the rig were removed and the noise pulse was injected into the aerial socket or any other convenient point. Checking the boards by tapping components I found a bypass capacitor in the noise blanker circuitry was intermittent. This capacitor was replaced and everything then worked well.

Incidentally, the noise blanker was turned on for the testing.

This method of operation is far quieter to use than the electric drill method as outlined in AR, page 38, November 1986.

The TS670 noise blanker, which was useless since new, had this noise pulse generator fed into the TPI or the RF board, with the noise blanker switched on. All components in the noise blanker circuitry checked okay, incidentally, and they were thoroughly tested.

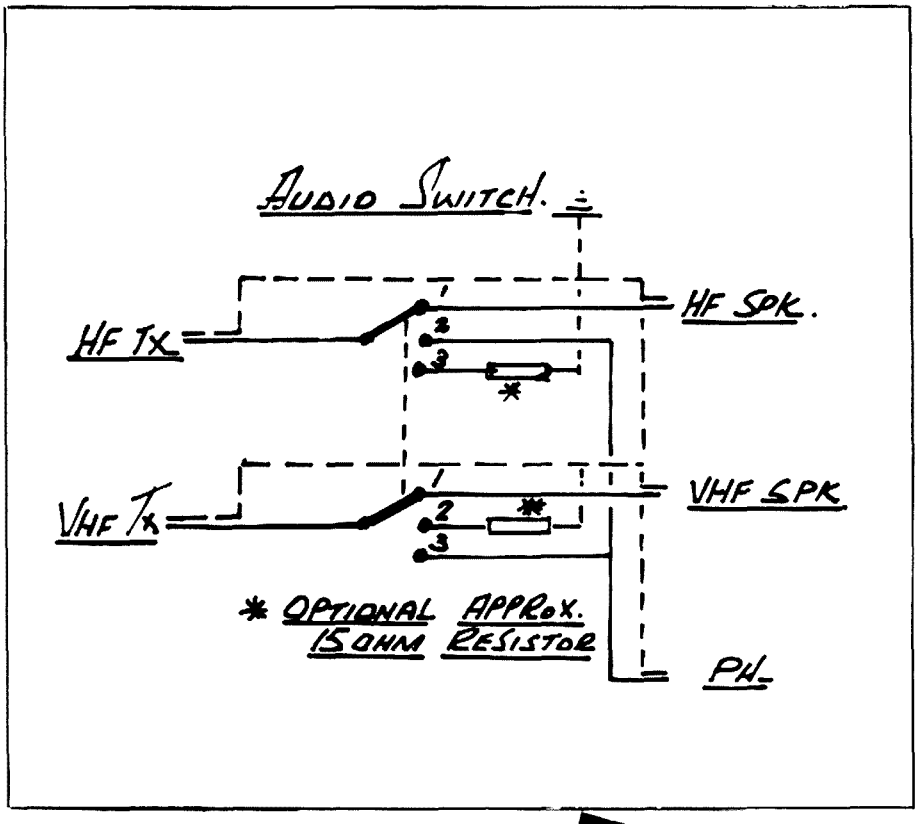
Next the noise blanker IF was checked for alignment, adjusting T26 and T27 for maximum rejection of noise. In my case, the S meter deflection due to noise fell from S9 to less than S1 after alignment.

Hopefully, this information and circuit may be useful to anyone checking noise blanker circuitry.

Try This!

GADGETRY

George Cranby VK3GI
Box 22, Woodend, Vic. 3442.



A little gadget for amateurs who work HF and VHF (or even UHF) and live within a family environment.

I use HF and VHF equipment, both with external speakers. In order not to interfere with other members of the household, and also due to some slight deafness, I often prefer to use head phones. However, I always found it inconvenient to plug them in and out, and switching sets on and off, whenever I wanted to change from one rig to the other.

I have now installed a three-position switch, fitted into a very small A1- box (6 x 4 x 2 cm), together with a phone plug receptacle. The wiring is shown in Figure 1.

Position 1	Both speakers connected to their respective transceivers.
Position 2	Both speakers disconnected, phones switched to the HF rig.
Position 3	Both speakers disconnected, phones switched to the VHF rig.

A fourth position could be used for a UHF rig. The resistors shown are for the perfectionist who cannot bear the thought of an open- circuit secondary winding at the audio transformer.

I can now listen to whichever rig is used, either on its own speaker or on the headphones. I also can have both rigs ON and switch the headphones from one to the other, without disturbance to others. The headphones remain permanently plugged into the switch box now.

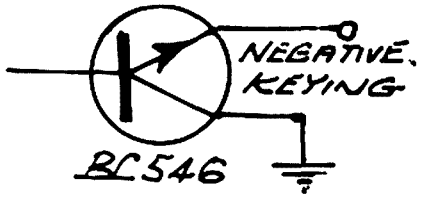
If no external speakers are in use, the system can still be installed but will involve breaking into the transceiver audio circuits.

or

CORRECTION

Unfortunately the schematic of the BC546 was incorrectly marked in the main circuit diagram of the Iambic Touch Keyer, AR, February 1987, page 6.

Please amend your copy.



GOLDEN JUBILEE DXCC AWARD

THE FIRST FOUR applicants for the DXCC Golden Jubilee Award were received at ARRL HQ on January 5, 1987. AA2Z and W6GO worked 100 countries in the first three days! As of January 9, a total of 18 applicants had been received.

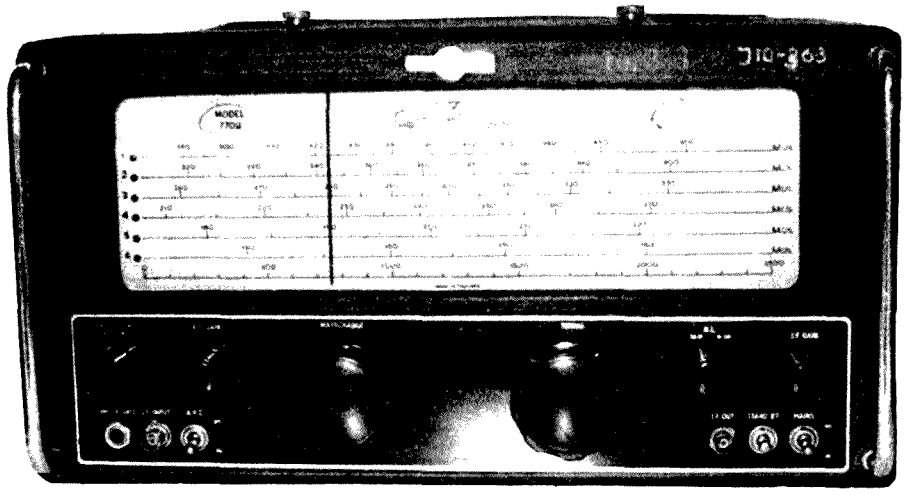
—From *The ARRL Letter* January 13, 1987

CLASSIC COMMUNICATIONS EQUIPMENT

Colin MacKinnon VK2DYM
52 Mills Road, Glenhaven, NSW. 2154

The EDDYSTONE 770U UHF RECEIVER

This month's Classic Communications Equipment looks at the Eddystone 770U UHF receiver, the companion unit to the previously described 770R.



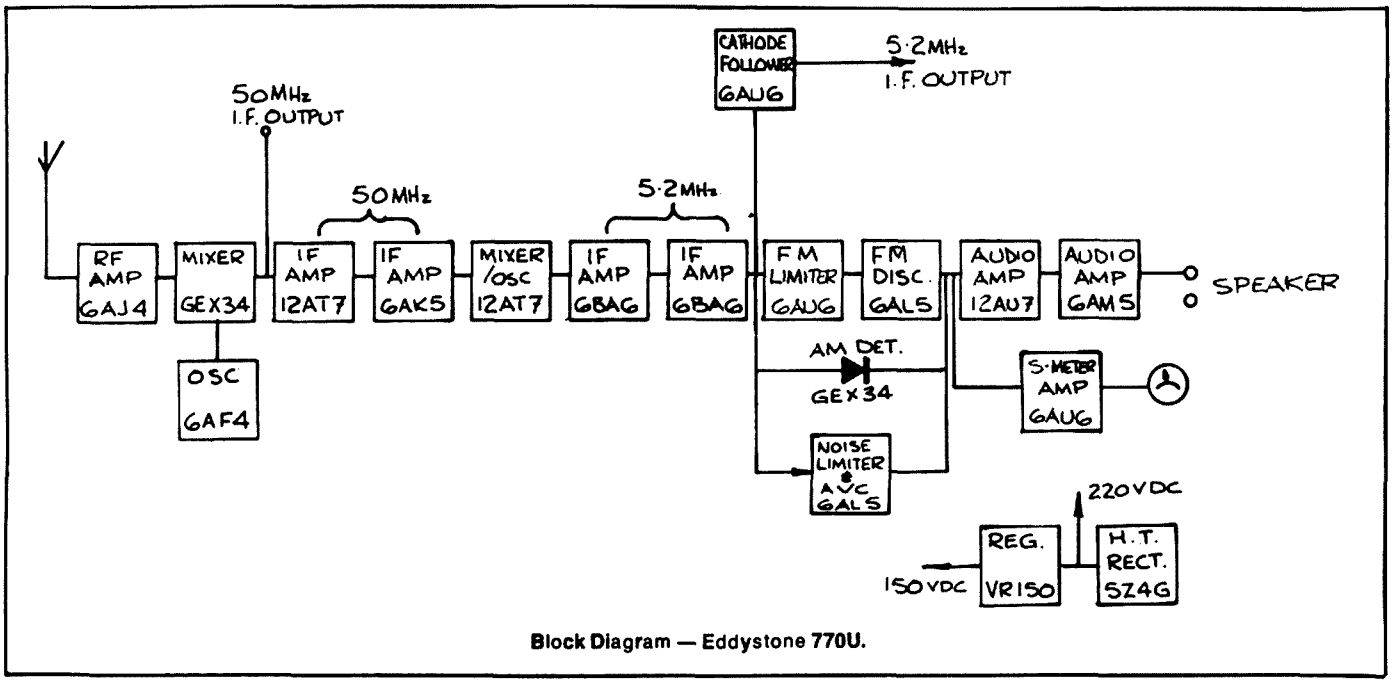
The 770U is a 16 valve, general coverage receiver also designed in 1953-54 and it gives continuous coverage from 150 MHz to 500 MHz in six bands. It receives only AM and narrow band FM. The same large Eddystone horizontal dial is employed with the reduction ratio of approximately 140:1. Like the others of the series, the front panel is a die-casting attached to a solid steel chassis, and the sheet steel case slides on, but has a lift-up lid for minor access.

Internally the power supply is on the right (looking from the front), the RF and band-switching in the centre, and the IF and audio stages on the left side. To minimise variations to the input, the antenna socket is mounted inside the set, directly on the RF turret. Access to plug in an antenna is awkward.

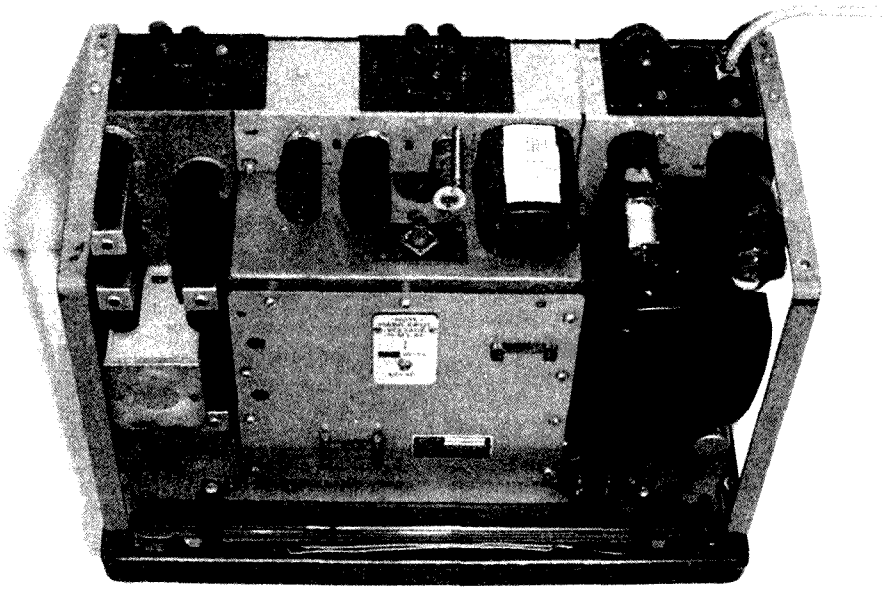
The block diagram shows the antenna input at 72 ohms, unbalanced, switched via a television type tuning turret for the six different bands to tuning coils and then to the RF amplifier, in this instance a 6AJ4. The tuning gang is three sections of only 2-8 pF The RF amplifier, mixer and oscillator are all mounted right on the turret to minimise lead capacitance, etc. A germanium diode is the mixer and the oscillator is a 6AF4, operating at 50 MHz above the signal on bands three to six, and 50 MHz below on bands one and two. The resultant first IF is at 50 MHz and passes through a cascade amplifier to a 6AK5 IF amp. A 12AT7 acts as a mixer/oscillator to produce a second IF frequency of 5.2 MHz. After two stages of IF amplification, the signal is fed to the detectors. There is a limiter and discriminator for FM, whilst in the AM mode the signal goes to a germanium detector diode. A cathode follower allows the 5.2 MHz IF to be fed to a CRO or analyser, via a coaxial socket on the right-hand side of the front panel. As in the VHF version, additional valves provide noise limiting and AVC, and control the S-meter for signal strength or centre tuning for FM. The audio feeds a 12AU7 push-pull driver and is boosted to 0.5 watts to the 2.5 ohm speaker output by one-only 6AM5.

The power supply is almost identical to the 770R, comprising a tapped transformer allowing inputs between 110 and 250 volts and utilising a 5Z4G rectifier and a VR150/30 regulator.

The control layout on the front panel is very similar to the previously described set. The 0 to 100 vernier disc rotates 25 times from edge to edge of the dial, giving a scale length of 10.36 metres. The meter at the top- right functions as an S-meter on AM, and a centre tune meter on FM. Whereas the band-switch on the 770R was numbered one to six, this one is not — but instead there are small lights down the left edge of the tuning dial, the appropriate one lighting for each band.



Block Diagram — Eddystone 770U.



Top internal view of the 770U.

impedance headphone jack on the left side panel, which effectively prevents any other equipment being positioned alongside that end.

Below the tuning scale, on the left, there is a two-position mode switch for AM and FM. Below this switch is a jack into which can be plugged a lead to a "limiter grid current" meter, (useful for alignment and measuring strength of FM signals). Next there is an AF gain control with an AVC On/Off switch below it. Between the jack and AVC switch is a BNC socket to permit a signal at 50 MHz and 75 ohm impedance to be directly fed to the first IF chain; eg a special converter for other frequencies with the output at 50 MHz could be added.

Next is the six position band switch, rotating a turret and arranged so that it is locked in position when the contacts are correctly aligned. The flywheel tuning knob rotates the vernier disc and moves the dial pointer across the dial. There is a 0 to 2500 logging scale at the bottom of the dial which is used in conjunction with the vernier disc.

At the right end of the front panel there is a noise limiter On/Off switch (only effective on AM), then an IF gain control. Below these are a socket for the 5.2 MHz IF output via the cathode follower, a standby switch and lastly the mains On/Off switch. The standby switch desensitises the set but leaves the oscillators operative to avoid drift.

For some unfathomable reason there is a high

The rear panel has, from the left, two fuses in the mains input lines, then a plug to allow battery operation (using "A" and "B" batteries); terminals for a 600 ohm output with a centre tap if desired. Below these are terminals for the 2.5 ohm speaker output; and over on the right are terminals for a pick-up input direct into the audio amplifier.

Technical specifications of the 770U are as follows:

FREQUENCY RANGE:
Band 1 ... 400 to 500 MHz
Band 2 ... 330 to 400 MHz
Band 3 ... 270 to 330 MHz
Band 4 ... 220 to 270 MHz
Band 5 ... 180 to 220 MHz
Band 6 ... 150 to 220 MHz

INTERMEDIATE FREQUENCY:
First IF: 52 MHz
Second IF: 5.2 MHz

SENSITIVITY: better than ten microvolts for 15 dB S/N ratio and 50 milliwatts output on all ranges.

SELECTIVITY: AM and FM
3 dB down — 15 kHz off resonance
6 dB down — 20 kHz off resonance
20 dB down — 50 kHz off resonance
40 dB down — 100 kHz off resonance

FM DEVIATION:
Narrow — 15 kHz

DIAL CALIBRATION: within 0.2 percent on all bands.

DIMENSIONS: approximately 432 by 229 by 356 mm (WHD).

WEIGHT: 25.4 kilograms (56 pounds) — the size and weight match the 770R!

For quite some time the 770U was the only reasonably available, full tunable UHF receiver on the market. It performs well and is easy to operate, although it has not many controls to worry about anyway. I would guess that it's main market was to commercial broadcasters and communication monitors; where it would be useful for casual monitoring over it's very wide frequency ranges.

Both the 770R and 770U are prone to intermittent faults in the turret head if any of the small and fragile contacts fail to touch the contact fingers or if they have dirt, etc on them.

As an overall summation of the 770R and 770U, the mechanical execution is good but the electronic features are unexciting. It should be remembered though, that in 1954 they were state-of-the-art — in the UK anyway.

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Thumbnail Sketches

Alan Shawsmith VK4SS
35 Whynot Street, West End, Qld. 4101

MERVYN J WRATTEN VK4MW
AOCP Ipswich, 1937

Cricket fever and 'bodyline bowling' were responsible for Merv's lifelong interest in wireless; a crystal set was built so that he could obtain the 'instant' score. That is where it all began and Merv is still active, with his original call sign, a half-century later.

A close friend in those days was Ramsay Bruce VK4AB (SK) and they received code instruction from Leon Woolley VK4FW (SK). Together they sat for the AOCP and were told to bring their own code oscillator. Ramsay was tested first at 14 WPM and Merv attempted to eavesdrop outside the door, knowing he'd get the same text. He was caught. To do his written examination paper, Merv sat behind the main Ipswich Post Office front counter. As he knew many of the locals, he was continually asked; "What are you doing there?" Despite the interruptions he passed at the first attempt.

Like many of his pre-war contemporaries, home-brewing was the big thing and Merv turned out some precision gear. Post-war, he built an exact replica of the *Swan 400* transceiver and used it for many years.

Outside amateur radio, VK4MW's life has been varied indeed. He began work as Manager of the Electrical and Radio Section at Cribb and Foote Emporium, then moved to Tillers Vacuum Cleaners (industrial). In 1963, Merv entered the Ipswich Railway Workshops as a fitter and turner on steam locomotives and retired 15 years later, in 1978. He was also part owner of the Avon Picture Theatre, and now remains active running a printing business. His spare time interests are photography, world travel and a continued association with *Hunting Lions of the Air* — the amateur radio Chapter of Lions International.

VK4MW is a long term member of the WIA and Ipswich Radio Club, also Pacific DX Net member No 343 and 10-10 International member No 14829. He has worked plenty of rare DX down through the years, but still admits to a sentimental interest in crystal sets.

ar

Janice Wooler VK4VFY/MM, N2GQN/AA/MM, KD2XT/MM
28 Jamieson Street, Bulimba, Qld. 4171

AMATEUR RADIO RESPONSIBLE FOR RECOVERING STOLEN YACHT

Whilst on a voyage on board our yacht *Yawarra* between Fiji and Tuvalu, (formerly the Ellice Islands) at the end of October 1986, I was reporting our position and weather conditions daily to *Tony's Net*, a popular Maritime Mobile Net in the SW Pacific (14.315 MHz, 2100 UTC daily). On October 26, John P29JM, from Bougainville, asked all vessels on the net to watch for a yacht which had been stolen from its mooring at Kieta two days previously. The information given at the time was that the vessel was a 30 foot fibreglass yacht, cream with four red horizontal stripes including a red gunnel stripe and named *High Noon*. The name was in large lettering on both sides with the Os painted to look like eyes. It had a fractional rig, outhung rudder, centre-board, sail number of 1589, red and yellow spinnaker and an outboard motor.

The owners name and telephone number were given with a request to call him, reverse charges, with any information about the vessel.

For each of the following days this information was repeated on the net with additional information being given that the man believed responsible for the theft was wanted by *Interpol* for similar crimes. Also, the registration papers for the yacht *Colomba* had been stolen from Kieta at approximately the same time. As *Colomba* was about the same size as *High Noon* it was believed that a name change may have taken place on the stolen yacht. Authorities in the countries around the Pacific were also notified.

Having had our own yacht burgled in Fiji only a few weeks before, my husband, Nick, and I felt very sympathetic for *High Noon*'s owner. Several times we discussed the theft and the likely whereabouts of the yacht. We both felt Tuvalu and Kiribati (formerly the Gilbert Islands) were likely destinations as they were both small, out-of-the-way countries with very little yacht traffic.

Because of this, we discussed the theft with the Chief of Customs in Funafuti, Tuvalu, and gave him the details when we checked in a few days later.

Even so, we were still caught by surprise when, a month later, in Kiribati, we recognised the new yacht that had arrived three days earlier (while we were anchored at a small island several miles away), as the *High Noon*. The name had indeed been removed from the sides but otherwise the paintwork was unchanged. The name *Colomba* was roughly applied with tape in small lettering on the side.

Fortunately, *Tony's Net* was in progress at the time we made our discovery. I contacted Terry ZL1MA, Net Control, and asked him to check the *High Noon*'s information, which I then copied down to take to Customs and Police. We were now 99 percent sure that it was indeed the stolen yacht.

We then spent a frustrating one and a half hours trying to convince the authorities (who had no record of the theft). Finally we spoke with the Police Commissioner, a Scotsman, who rapidly confirmed our story with the PNG authorities. A man was arrested and the vessel placed under police guard that afternoon. (He has since been tried and found guilty of stealing the yacht).

The owner of *High Noon* was notified that it had been found and was able to liaise through John P29JM, to obtain details from me as to the condition of his vessel, etc and we were able to meet him at the airport when he flew into Tarawa eight days later.

From left: Nick, Jan VK4VFY and Tom VK4OD.

If it had not been for the amateur radio network, the vessel would never have been found as the only other yacht in Kiribati at the time did not have amateur radio equipment and had not heard of the theft. The robber had already surmounted his greatest hurdle before we discovered him as he had been given Customs and Immigration clearance into Kiribati, using false registration papers and a forged port clearance paper (from Costa Rica).

We also discovered he had arranged for *High Noon* to be slipped on the small marine railway in Tarawa and had been inquiring about paint. Large stencils for the name *Colomba* were found on board *High Noon*. It appears that in another week *High Noon* would have had a colour change and the new name and home-port applied in a professional manner. He would have then only needed to spend a few more weeks in one of Kiribati's outer lagoons for the "heat" to have died down and have completely committed the perfect crime.

High Noon's owner, Ian Worth, was so impressed by his contact with amateur radio — not only the recovery of his boat — but also with communication between Tarawa and Kieta, before he arrived in Kiribati and afterwards with his wife, that he has already obtained the books and tapes so that he can start studying for his license!

ABOUT THE AUTHOR:
Jan and *her* OM, Nick, crossed the Tasman in mid-1984. During the voyage they were in touch with amateurs Harry VK4VKS, Geoff VK4VLI, Horace ZL3WE, and Tom VK4OD ex VK4NUN.
Jan and Nick have been cruising the Pacific ever since.
Jan, VK4 Very Fine Yachtie received her American call sign, N2 Great Queensland Navigator in late 1986, and her full call from January 26, 1987 is KD2XT (no special phonetics have be thought of for this call sign yet!). In February 1987, Nick and Jan were in Ponape, East Caroline Islands en route to Japan.

—Contributed by Tom Dowling VK4OD
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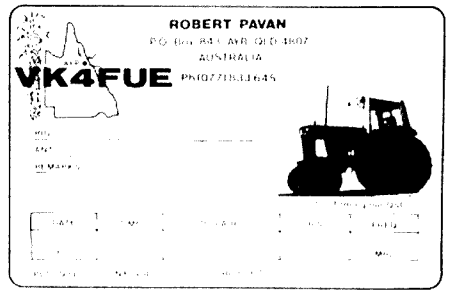
TRACTOR MOBILE

Robert Pavan VK4FUE
PO Box 843, Ayr, Old. 4807



Why not combine work with some pleasure?

For most of September, October and November, the majority of my time at work is spent on a tractor. My job, along with two other chaps, is to grow sugar cane — 20 000 to 24 000 tonnes per year. Contractors do the harvesting and planting whilst my job involves ground preparation, irrigation, weed control (both mechanical), with herbicides and the application of fertilizer.

The tractor is an *International 1086*, 135 horsepower turbo with air-conditioned cab — quite a comfortable unit but the hours spent can become very boring. Approximately 600 hours during the season, June to Christmas, are spent on the tractor, hence the thought; why not combine work with some pleasure? So the two metre rig was installed, with a quarter-wave antenna on top of the cab.

It was possible to access the Townsville repeater (100 km north) and on occasions the Cairns repeater (500 km north), but most of the time two metres is relatively quiet in this area so the next step was to try the 430, and a half inch commercial base, spring and antenna which would operate on 3.5, 7, 10 and 14 MHz, simply by shifting a banana plug which was strong and robust to handle the rough terrain and vibration.

When the 430 was first tried in the tractor there were some problems with a hot microphone and RF bites. The antenna is a little over two metres from the rig and on the same plane with only the windscreen between the two. A very heavy braid strap was used to earth the rig to the tractor and an AT130 fitted. All now works well!

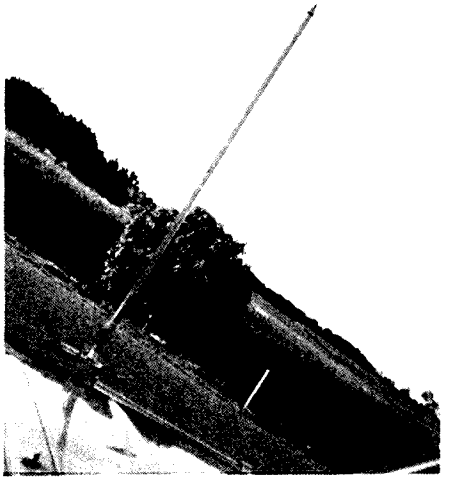
The 430 is mounted on a 9 x 18 x ¾ inch (230 x 460 x 19 mm) piece of plywood. A bracket made to mount the 430 towards one end and in a near upright manner with the AT130 on the underside and a speaker on the right. The six inches (152 mm) of plywood to the left of the rig without anything on it has a bolt through it to hold the rig, tuner and speaker in place.

When the rig is in my landcruiser, everything sits on the centre seat and the extra piece of plywood slips under the backrest of the seat with the centre seat belt holding all in place.

Ear plugs are always worn for the tractor noise and the volume control of the rig is cranked up so that it can be heard. (One day I think a set of headphones and a boom microphone would make it much easier).

The rig mounted in the tractor cabin using a piece of plywood.

VK4FUE/Tractor Mobile.



Tractor Mobile Antenna.

On transmit, I have had good reports and many stations do not even realise that I am mobile, however it is a mistake to use the processor whilst mobile as it brings up the background noise level on transmit. Most operation is on 14 MHz as it is usually the most active band. If things are quiet the rig is put on scan between 14.100 and 14.300 MHz in search of strong signals. It was also possible to keep twice weekly scheds with my father, VK4QL in Yandina, on the Sunshine Coast (1000 km south). These were held on the 30 metre band at midday and were 100 percent reliable with signals between S3- 9.

The best DX day this season, while Tractor Mobile, was when I worked Ed W6SHW and George N6GDS, on 28 MHz in the morning and, with some help from Peter VK2EVE, of Sydney, worked a Russian station in the Ukraine and a station in Puerto Rico on 14 MHz in the afternoon. Not bad — this Tractor Mobile and to get paid to do it! I

The thing I enjoy most is to say Hi to some stations from time to time and I hope to catch some more new stations this coming season when I will have my new home-brew mobile antenna on air. It can be tuned anywhere from 3.4 to 30 MHz whilst mobile. It is 8'3" (about 2.5 metres) long on 3.4 MHz and 6'6" (about 2 metres) long on 30 MHz. It is similar in design to a Webster Bandspanner but has a motor drive to tune the loading coil. Initial tests indicate it to work well.

Listen for me next season — VK4FUE.

Mention was made of Robert being /Tractor Mobile in December's How's DX column, see page 30.

THE SAGA OF THE SUPER ANTENNA WAX

E C Brockbank VK2EZB
115 Myall Road, Cardiff, NSW. 2285

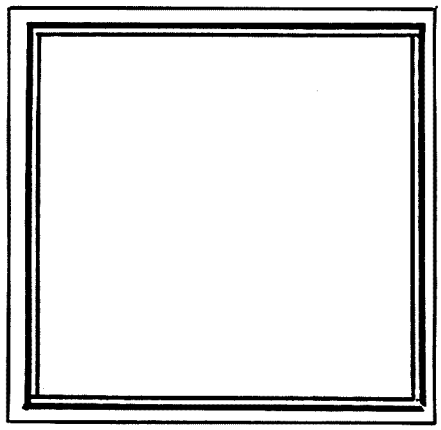
Obviously; all that is needed is a constant and consistent increase in the efficiency of an antenna system. This would mean unlimited power whilst staying comfortably within the limits of the licence. Anything to do with antennas has always been towards the great God: gain.

It seems that this idea must be completely overlooked when it comes to the characteristics of the individual radiator. Something is needed to increase the actual signal emitted from a given dipole radiator. If an intermediate material could be imposed, then this would have the effect of encouraging the outgoing signal to depart from the radiator. Something to minimise friction might be the answer!

Pouring over a formidable array of knowledge yielded a likely formula. When the ingredients were properly mixed and the compound stood ready for use — it looked a rather unpresumptous mess. Now to work out the best method to test this new-found discovery. A few hours work with a bout of mathematics quickly showed that the mixture could be applied in a rather thin layer coating directly to the element of a Yagi antenna. One Yagi was treated with *Super Antenna Wax* and the other Yagi left in an untreated state. Now for the big test! !

After a casual scan across the band the *Super Antenna Wax* was ready for its first trial. The band appeared to be as dead as a dodo. A short CQ never hurt anybody. The band, previously dead, exploded in a flurry of activity. Three thousand — give or take a few hundred — were calling on the frequency. After the storm subsided a signal was selected and contact established. The S-meter at the other end was running the limit, even on a dead band. Everything was wound back except the power supply and the signal still bent the S-meter. Switching to the untreated Yagi once again resulted in the band being as dead as a dodo. My new discovery — *Super Antenna Wax* — was functioning extremely well. The signal was slipping off the radiator and into the etner so well that almost infinite gain was being approached. What a happy development.

The field of antennas and associated improvements are limitless indeed.



FREE SAMPLE: Rub on your antenna and notice an otherwise dead band come alive! (Caution — use sparingly).

Additional thinking made it appear that, if it were possible to enhance the ability of the radiator to transfer a signal to the ether, it should be possible to retard this same operation. Out came the "musty tomes" and other rudimentary data. Devising a test for the new product was easy. It was simply a matter of applying it to the reverse side of a vertical dipole. The other half of the side was coated with Super Antenna Wax. Reversing the dipole until the new "goo" faced the incoming signal, resulted in a total blackout. The front to back ratio of the single dipole was fantastic. These new "goos" in a twin pack, would be called *Superior Etherial Glue*. Several sized radiators were tried and a true Yagi effect was found by coating both sides of a length of 18 gauge wire antenna. What would happen if the two products were mixed?

My Chinese Abacus revealed that these two materials would respond to a variation in an electro-magnetic field, by effectively varying their resistance and conductivity. It followed that the feedline and antenna could be made infinitely variable. Now I had a system where a signal automatically adjusted the antenna and feedlines for resonance. This made possible an auto-tuned antenna with infinite gain, resonant over the entire radio frequency spectrum and so small that it could sit atop the transceiver.

Eager to help my amateur radio friends, I sold the patent and rights to commercial interests. Unknown to me at the time they had huge interests in the coppc. and aluminium markets. They did assure me, just last week, that *Superior Etherial Glue* would be obsolete now that the satellites were in! They think high gain antennas are a thing of the past. Maybe, one day!

KENWOOD

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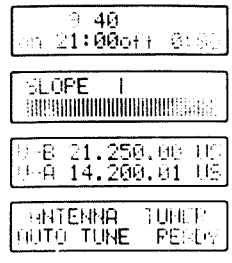
TS-940S

The new TS-940S is a serious radio for the serious operator. Superb interference reduction circuits and high dynamic range receive combine with superior transmitter design to give you no-nonsense, no compromise performance that gets your signals through! The exclusive multi-function LCD sub display graphically illustrates VBT, SSB slope, and other features.

- **100% duty cycle transmitter.** Super efficient cooling system using special air ducting works with the internal heavy-duty power supply to allow continuous transmission at full power output for periods exceeding one hour
- **Programmable scanning.**
- **Semi or full break-in (QSK) CW.**
- **Low distortion transmitter.** Kenwood's unique transmitter design delivers top "quality Kenwood" sound.
- **Keyboard entry frequency selection.** Operating frequencies may be directly entered into the TS-940S without using the VFO knob.
- **Graphic display of operating features.** Exclusive multi-function LCD sub-display panel shows CW VBT, SSB slope tuning, as well as frequency, time, and AT-940 antenna tuner status.
- **QRM lighting features** Remove "rotten QRM" with the SSB slope tuning, CW VBT, notch filter, AF tune, and CW pitch controls.



- **Built in FM plus SSB, CW, AM, FSK.**
- **High stability, dual digital VFOs.** An optical encoder and the flywheel VFO knob give the TS-940S a positive tuning "feel".
- **40 memory channels.** Mode and frequency may be stored in 4 groups of 10 channels each.
- **General coverage receiver.** Tunes from 150 kHz to 30 MHz.
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TWO AMATEURS GO WEST

COVER STORY:

Keith Scott VK3SS
34 Henry Street, Maffra, Vic. 3860

Not wishing to make AR a travel magazine, this is an abbreviated account of a trip to the west.

Dolphins at Monkey Mia.

JOCK VK3DOJ, and the writer left Melbourne in four- wheel drive vehicles, on August 1, 1986 to continue the travels previously documented in AR. Jock was accompanied by a teenage granddaughter and two grandsons, aged 12 and nine years, whilst the writer's co-driver and assistant cook was a much-travelled friend, Victor.

After enduring three cold, wet days in southern Victoria, the entourage reached the opal town of Coober Pedy — a town which looks as though it never rains — and at last everyone was warm!

Three more days of travel and the group reached the new tourist and camping resort of Yulara, situated near Ayers Rock. The boys clambered up and down the Rock eagerly giving a running description on a hand-held UHF Citizen's Band radio.

(This reminded me of the one and only time I climbed the wretched rock with George VK3HV, as co-traveller. George took a hand-held 27 MHz amateur radio up and called CQ (27 MHz was an amateur allocation then). This caused a pile-up of Japanese amateurs calling him. George could speak Japanese rather fluently so was conversing with the JAs in their own language. Several girls were on the Rock at the time, including a Japanese exchange student. She almost became overcome with excitement to hear her language emitting from a small hand-held.)

Next stop was Alice Springs to replenish supplies, then onwards to the north-west over the Tanami Desert Track, eventually arriving at Halls Creek. There, a Cessna plane was hired to fly over the Bungle Bungle Ranges. The Bungle Bungle Ranges have always been guarded by the Aboriginal owners, however, lately they have allowed a few visitors to pass through their sacred ranges. Three days were spent walking and driving along rough tracks, little creeks, gorges and canyons.

These ranges are of unusual formation. They consist mainly of hundreds of high minaret or rounded masses consisting of stratus of various colours — extremely difficult to describe. On the ground, or even up on the rocky walls, ancient species of palms are growing. Rock holes, with perhaps permanent water, gorges, and crevices are everywhere — one could easily become lost.

All of the group were noticeably affected by the grandeur of the area — so quiet and lonely yet so beautiful. One could begin to understand why the aboriginals regard and value such places. (Let us hope the spray-can artists never find their way there!).

After a quick look at the huge Argyle Dam (nine times the size of Sydney Harbour) it was onward along the four-wheel track from Wyndham to Derby. This is a very scenic route, called the Gibb River Track, and time was taken to look at some of the gorges along the way.

A visit was made to John VK6GU and his wife Hope, at Derby. John and Hope run the Royal Flying Doctor Service base in Derby and always welcome visitors.

Then it was on to Broome and Marble Bar to photograph the coloured Jasper (not marble) rocks in the area. The Jasper rocks are particularly plentiful in the creek.

About a week was spent inspecting the iron ore mines and their workings and the now accessible beautiful gorges in the Hammersley ranges and Pilbara region.

Heading towards the west coast, a stop-over was made at an unusually lovely place called Millstream. Here large quantities of good fresh water keep rising above ground to form streams and very large pools, all surrounded by a green tropical-type growth, including date palms which are believed to have been planted years ago by Afghan camel drivers who rested and watered their camels in the area.

Nearing the coast, a visit was made to Dave Holt VK6YA, at Wickham. Dave was very welcoming and produced refreshments prior to a guided inspection of the radio shack and antennas. Dave works a lot of VHF DX and satellite communications with his enviable antenna arrays.

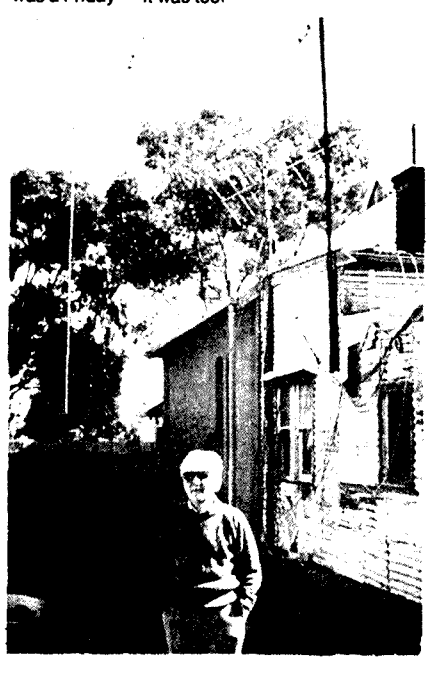
Then it was onward again along the coast to the North West Cape to marvel at the huge antenna network. This network is like a giant spider web, 300 or so metres in the air. An American amateur, Scottie VK6VZ, took the visitors in hand to make the visit friendly and interesting.

Each day, at 0300 UTC, the entourage made contact with the Twenty Metre Travellers Net so that Arthur VK6ART, could chart the progress made. (Jock and I had arranged for amateur friends to go to our home QTHs so that our wives were kept in touch with our health and well-being. My contact was my son, VK3DY, who kept the home receiver tuned to 14.106 MHz for Mrs Scott to monitor.)

We followed the coast as closely as possible and the next most interesting call was Monkey Mia, where several dolphins patrolled the shallows of the beach and entertained the tourists by coming into ankle-deep water to accept fish, pats and rubs along their sides, and generally frolic with the humans. They are lovely creatures and, although they have large mouths with many teeth, they were quite harmless and friendly. Cameras worked overtime here!

Turning east at Geraldton, we passed through old abandoned gold mining areas and villages, arriving at Kalgoorlie, then across the Nullabor and up to Broken Hill.

Whilst travelling, contact had been made on the net with Richard VK5ARM, who was able to reserve sites at the local caravan park — next to him. Upon meeting Richard, we were urged to visit a local amateur, VK2ZI. This we did and met Frank who is a White Cane *Operator.* He is a remarkable and wonderful OM. Frank lives alone although he has a lady visit to clean and help him with meals. He gave us a warm welcome and naturally adjourned to the shack. Franks walls are covered with QSL cards, which Frank can identify. His equipment is remarkable. Verbal frequency readouts are used, otherwise Frank handles all the equipment with very little effort. His talking pocket calculator is amazing. He asked it what day (date supplied) I was born on (and that's a long time back), and it promptly replied that the day was a Friday — it was too!



Frank VK2ZI, at his Broken Hill QTH.

Frank has UHF and VHF beams with which he can track and work satellites. He also has the cards to verify it. This rewarding visit filled us with admiration for one who accepts his disability and derives obvious pleasure from amateur radio.

Inquiring about our return route via Menindee, Frank said we would pass a hotel which is owned by two friends of his and urged us to call in — which we did. The hotel was small, old and quite isolated. We called in to pass along Frank's greetings and to our mutual delight discovered it was possible to work Frank on two metres. It was then possible for Frank to speak with his friend, Ann. Meanwhile, a small pony joined the party and Ann suggested the boys may like to have a ride — something new to them! Promptly, the pony set off to the bar door which it entered and thrust its head across the small bar counter. It was rewarded with a bag of potato crisps which it chewed with obvious pleasure. After separating the plastic bag from the crisps it made signs for more! (The writer has a very interesting movie of one small pony with two boys on its back, eating potato crisps across a bar counter). This added to other phenomenal oddities filmed over the years like — one alcoholic goat at Rawlinna, WA, who picks up stubbies unaided, tilts its head back, drinks the contents, smiles and looks for more! Then there are the Currawongs raiding the food supplies in my vehicle, Dolphins at Monkey Mia, a camel at Silverton picking up cans of soft drink, crunching the can and drinking the contents, kangaroos sitting beside me at Carnarvon Gorge, sharing breakfast and goannas eating out of my hand at Wingan Inlet. And many more.)

Oh, the nostalgia!

ar

DID YOU KNOW ? ? ?

. . .the famous Slim Jim™ is much easier to tune when connected via a ¼ λ balun?

Apparently this is a balanced antenna, which would explain many of the anomalies observed when tuning them — coaxial length, feed-point, polarity, etc. Refer to any good handbook for details on ¼ λ baluns.

—Contributed by David Horsfall VK2KFU

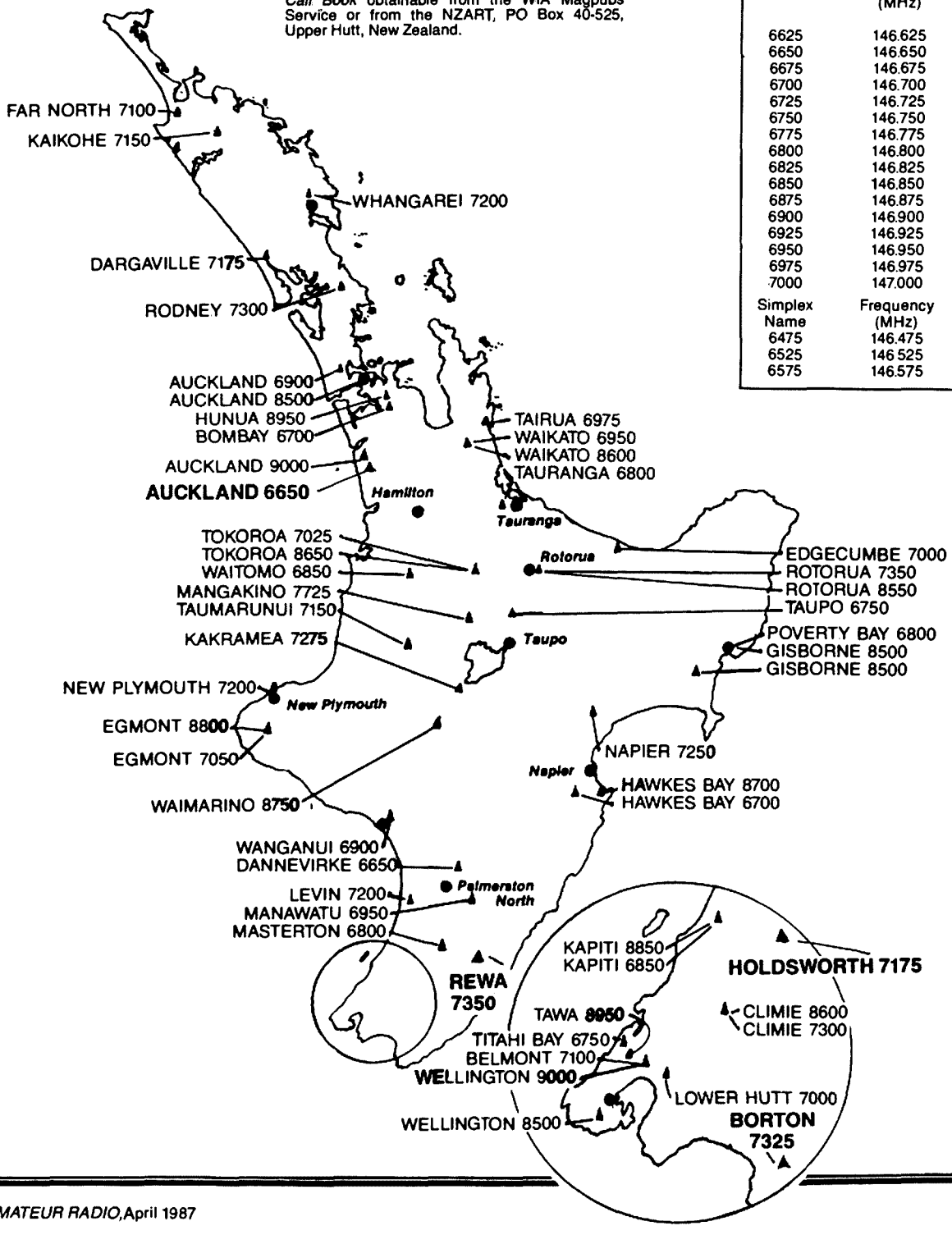
New Zealand Two Metre &

These maps have been prepared from information recently supplied by Jamie Pye ZL2NN, Secretary of the NZART Frequency Management Working Group.

Full details are published in the *NZART 1986 Call Book* obtainable from the WIA Magpubs Service or from the NZART, PO Box 40-525, Upper Hutt, New Zealand.

TWO METRE

Repeater Name	Repeater Output Freq. (MHz)	Input Freq. (MHz)
6625	146.625	146.025
6650	146.650	146.050
6675	146.675	146.075
6700	146.700	146.100
6725	146.725	146.125
6750	146.750	146.150
6775	146.775	146.175
6800	146.800	146.200
6825	146.825	146.225
6850	146.850	146.250
6875	146.875	146.275
6900	146.900	146.300
6925	146.925	146.325
6950	146.950	146.350
6975	146.975	146.375
7000	147.000	146.400
Simplex Name	Frequency (MHz)	
6475	146.475	calling
6525	146.525	
6575	146.575	

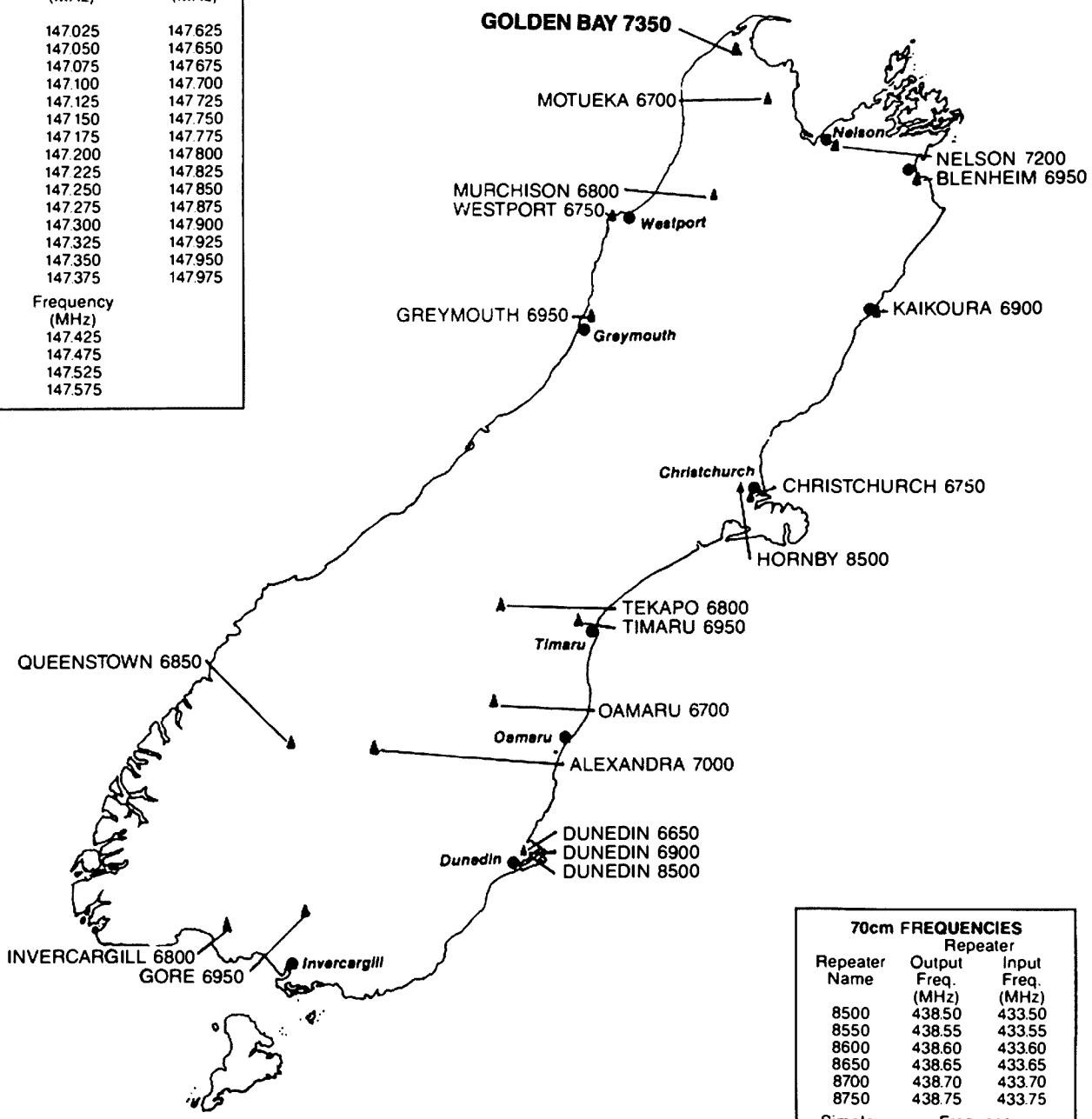


70 Centimetre FM Repeaters

FREQUENCIES

Repealer Name	Repeater Output Freq (MHz)	Repeater Input Freq (MHz)
7025	147.025	147.625
7050	147.050	147.650
7075	147.075	147.675
7100	147.100	147.700
7125	147.125	147.725
7150	147.150	147.750
7175	147.175	147.775
7200	147.200	147.800
7225	147.225	147.825
7250	147.250	147.850
7275	147.275	147.875
7300	147.300	147.900
7325	147.325	147.925
7350	147.350	147.950
7375	147.375	147.975

Simplex Name	Frequency (MHz)
7425	147.425
7475	147.475
7525	147.525
7575	147.575



70cm FREQUENCIES

Repeater Name	Repeater Output Freq. (MHz)	Repeater Input Freq. (MHz)
8500	438.50	433.50
8550	438.55	433.55
8600	438.60	433.60
8650	438.65	433.65
8700	438.70	433.70
8750	438.75	433.75

Simplex Name	Frequency (MHz)
3300	433.30
3350	433.35
3400	433.40
3450	433.45

VHF UHF — an expanding world

Eric Jamieson VK5LP
1 Quinns Road, Forreston, SA. 5233

All times are Universal Co-ordinated Time and indicated as UTC

AMATEUR BANDS BEACONS

FREQUENCY	CALL SIGN	LOCATION
50.010	JA2IGY	*Mie*
50.060	KH6EQH	*Honolulu*
50.075	VS6SIX	*Hong Kong*
50.109	JD1YAA	*Minami Tori-shima*
52.013	P29BPL	*Loloata Island*
52.020	FK8AB	*Noumea*
52.100	ZK2SIX	*Niue*
52.150	VK0DS	*Macquarie Island*
52.200	VK8VF	*Darwin*
52.250	ZL2VHM	*Manawatu*
52.310	ZL3MHF	*Hornby*
52.320	VK6RTT	*Wickham*
52.325	VK2RHV	*Newcastle*
52.345	VK4ABP	*Rockhampton*
52.350	VK6RTU	*Kalgoorlie*
52.370	VK7RST	*Hobart*
52.420	VK2RSY	*Sydney*
52.425	VK2RGB	*Gunnedah*
52.435	VK3RMV	*Hamilton*
52.440	VK4RTL	*Townsville*
52.450	VK5VF	*Mount Lofty*
52.460	VK6RPH	*Perth*
52.465	VK6RTW	*Albany*
52.470	VK7RNT	*Launceston*
52.485	VK8RAS	*Alice Springs*
144.019	VK6RBS	*Busselton*
144.400	VK4RTT	*Mount Mowbullan*
144.410	VK1RCC	*Canberra*
144.420	VK2RSY	*Sydney*
144.430	VK3RTG	*Glen Waverley*
144.465	VK6HTW	*Albany*
144.470	VK7RMC	*Launceston*
144.480	VK8VF	*Darwin*
144.485	VK8RAS	*Alice Springs*
144.550	VK5RSE	*Mount Gambier*
144.565	VK6RPB	*Port Hedland*
144.600	VK6RTT	*Wickham*
144.800	VK5VF	*Mount Lofty*
144.950	VK2RCW	*Sydney*
145.000	VK6RPH	*Perth*
432.057	VK6RBS	*Busselton*
432.160	VK6RPR	*Nedlands*
432.410	VK6RTT	*Wickham*
432.420	VK2RSY	*Sydney*
432.440	VK4RBB	*Brisbane*
432.445	VK4RIK	*Cairns*
432.450	VK3RAI	*MacLeod*
432.535	VK3RMB	*Mount Buninyong*
432.540	VK4RAR	*Rockhampton*
1296.171	VK6RBS	*Busselton*
1296.420	VK2RSY	*Sydney*
1296.480	VK6RPR	*Nedlands*
10300.000	VK8RVF	*Roleystone*

Firstly, to deal with the carry over of a few letters from last month when there seemed so many other matters to report. One letter from Peter VK3DU, pointed out that the six metre "season" appeared to open at the same time as the previous year, on 6/11 with an opening to ZL warning of which was given by the ZL television sound on 50.750 MHz. Commencing at 0645, ZL1AON, ZL1TZA, ZL1UDI, ZL1AK, ZL1AKT and ZL3NE/1, who mentioned he had worked FK8, VK2, 4 and 5, during the day, ZL1UKQ and finishing at 0810 with ZL2UBG. Kerry ZL2TPY, was working VK5NC and indicated he was also working into Sydney on 70 cm. At 0835, ZL2AQR worked VK5ZDR. The band closed at 1030 after being open for nearly four hours. Peter made all his contacts with 10 watts and a three element beam.

Peter VK3DU, also inquired if anyone knew whether ZL8HV has six metre equipment as he would possibly be the only station to work since Chris ZL8OY, had left Kermadec? I do not remember hearing ZL8HV at any time on six metres through December/January.

Neville VK2QF, wrote to say he found the six metre DX from his location at Hargraves, some 30 km south-west of Mudgee, in Central New South Wales, was decidedly lacking! He had very little activity in November and only sporadic paths after 24/12. He spent a lot of time trying to find 5W1GA, but it seemed the propagation was not reaching him. His location is poor when looking north, south and east, but okay to the west. Hence, it was rather galling to hear the Sydney stations working all and sundry, but unable to share in the contacts himself. He believes the lower angle stations from a long distance don't reach him behind the hills and this was so during former F2 openings across the Pacific to USA and Mexico.

Apart from the VK contacts he had, Neville worked on 5/12 at 0811 VK0SJ, 12/12 at 2135 FK1TK, 13/12 at 0332 FK25A, 19/12 at 0426 3D2ER (new prefix for him), 21/12 at 0622 ZK2RD, 26/12 at 0227 P29ZEF, 3/1/87 at 2153 3D2ER, 4/1 at 0427 3D2ER. The ZK2 beacon was heard regularly through mid-December around 2100 about 519. 4/1 was one of the best days again with the ZK2 beacon in for hours.

Nev would like to thank VK4ZNC, for going into the Pacific area and providing so many contacts from hard to get places, and commends his operating practices.

Neville apparently has a location much like mine, and could possibly benefit from the stacking of antennas on six metres. I found myself hopelessly outclassed years ago with the single six element wide-spaced (26 foot boom) Yagi when trying to compete with the stations in the clear on the Adelaide Plains or wide open country areas. In desperation, I erected two eight-element LP Yagis stacked vertically with instant success. For the first time I could hear JAs at S9 and as the peak of the cycle approached found I could mix it with most of the other operators and have my share of contacts. These days of mainly Es contacts, they still perform so well that many long distance contacts are a dream. Most of my contacts are made with about 40 watts of power but this can be talked up to 200 watts if the occasion arises, which is so rare these days!

As a final comment, Neville mentioned having largely lost interest in the Ross Hull Contest, but would be prepared to support a six metres only contest of short duration, say two to five days, and suggests others would do the same.

OPERATING FROM NEW ZEALAND AND FIJI

Steve VK4KHQ, from Mount Isa, writes to say he recently operated as ZL0ABE in New Zealand and 3D2SJ in Fiji, using his FT-208R two- metre handheld. The ZL licence was $NZ6 and took about five weeks to obtain. The 3D2 licence was F$10 and took eight weeks, and had to be collected from the Suva P&T Office on arrival and is a 12 months renewable licence.

In New Zealand he spent two weeks in Invercargill (right at the bottom) where they have access to 6800, 6950, 6750 and 6850 plus an AM repeater at Bluff (144.650 in 145.775 out), which accepts FM quite okay!

While visiting Malcolm ZL4NO, the Dunedin repeater came up to S9 +40 dB on his two element ZMX quad and stations as far north as Oamaru would be worked. Some VKs had been worked during December. A new repeater on 6750 has been on test at Clinton and the new regional repeater (7250) at Christchurch, is giving excellent coverage.

On 5/1/87, he operated "train mobile" and contacted as many stations as his two nicads would allow during another spectacular lift. He also managed to work ZL4NO via five repeaters which he believes might almost be some sort of record for a hand-held.

There are 34 amateurs in Fiji and the two metre population seems to consist of two TR2400 handhelds. He met Raj 3D2ER in Suva, who is very active on six metres and HF He monitors Channel 0 sound and calls on 52.050 MHz SSB. During the visit, a contact was made with ZL1TWR on 52.050 who was the only contact during a solid opening on 12/1.

Raj recently retired from a career in Electronic Engineering with the Fijian Government and now enjoys playing RTTY, AMTOR, etc on his C64 keyboard and can be found on 14.309 MHz, 0200 to 0400 UTC Mondays to Friday and on 14.280 MHz at 0330 UTC on Thursdays and Saturdays talking to friends. (This could be worth noting is six metres appears to be open across the Pacific).

Steve now has six metres, two metres and 70 cm capability and would be interested in scheds with anyone prepared point their beams at Mount Isa. Please contact him if interested.

TASMANIA

Joe VK7JG, sends a list of his two metre workings this season. On 22/12 at 2151 he worked VK4AUK 5 x 6; 2155 VK2DDG 5 x 9; VK4VC 5 x 9; 2201 VK4KHG 5 x 9; 2319 VK4ASB, VK4GC, VK4ARN all 5 x 9; VK2YDC 5 x 5; 2326 VK4LC, VK4KJL, VK4ZSH and VK4GP all 5 x 9; 2330 VK3ZQB/M4 5 x 8. On 23/12 0045, VK4RH 5 x 9; 0050 VK4UX 4 x 5; 0056 VK2CMC 5 x 9; 0058 VK2DVZ 5 x 9. As well, he maintains his numerous contacts to VK3 and can work David VK3AUU when ever he is on.

Joe should be operational on 1296 soon when the two 28 element loop Yagis are erected.

On two metres Joe still needs a VK6 for WAS. Maybe he was successful during the openings around the end of January. The only active stations from Launceston this year were Col VK7LZ, Geoff VK7ZOO, and Joe VK7JG.

EME NEWS

Doug VK3UM, advises he has now added a further eight Yagis to his array to give him a total of 24 with spacing according to K1FO. He is now reading 15.5 to 16 dB of sun noise or about 29 dB gain. The array is being used in conjunction with a 2SK571 preamplifier with a noise figure around 0.4 dB. He is now able to observe Sagittarius at 4.25 dB. He believes the upgrading of the feedlines has also helped to improve the whole structure. With the limited time so far available to check he has found his echoes to be weak due to the wrong Faraday rotation but is looking for better results in the next round of scheds and tests soon.

Lyle VK2ALU, in *The Propagator* reports they are still not completely operable following the damage from the last intruders. A new alarm system is to be installed.

Former problems with the received level of EME signals when compared with their own echoes have been referred to Dick Turrin W2IMU, who advises the receiving system should be connected via the coaxial change-over relay to each of the transmit and receive ports on the W2IMU feed-horn of the dish. It is to be left in this configuration for several months and listening tests carried out from time to time on signals from other stations — to compare their level via the right hand and left hand polarised feed ports on the W2IMU feed-horn. In theory, there should be a large difference in favour of the right hand polarised port.

In the meantime however, the receiving preamplifier and converter units from the EME dish are to be installed for a short period on Lyle's six foot dish at his home (being part of his new 1268-1270 MHz Mode L satellite system), so that Cor Mass VE7BBG, can carry out tests with him on 1296 via the moon. Cor considers his EME

signals may be just copiable when the moon is at perigee.

METEOR SCATTER TESTS

Doug VK3UM, is trying to arouse some more interest in contacts via meteor scatter and suggests a frequency of 144.350 MHz be used with five second sequencing. He says it is most important that, once you have transmitted on what you believe to be 144.350 MHz, that you do not shift your transmit frequency and your clock should be synchronised to the second with UTC, either by using WWV or VNG. You can start transmitting at any time but the following sequences should be in strictly five second intervals; eg transmit 2100.00 to 2100.05, listen 2100.05 to 2100.10, transmit 2100.10 to 2100.15, listen 2100.15 to 2100.20 and so on.

Doug says it can be quite surprising just what you can hear sometimes although initially you will need a high degree of patience, but as more stations try the greater your chances of hearing either scheduled stations or random stations.

THE VK6 SIX METRE BEACON STORY

During a six metre contact with Bob VK6BE, during December, we got to talking about the overall value of beacons. During this conversation, Bob started reminiscing over the old VK6VF beacon and, in response to my request, he has sent the following information which should be of interest to most readers.

"VK6VF was to be the first VHF beacon in Australia and one of the first in the world. It was built following news that the Japanese had put an amateur beacon on 50 MHz, JA1IGY, and a decision was made by the WA VHF Group to attempt to obtain permission to operate an amateur beacon on the 50 MHz band. The Group was told it could operate a beacon provided it was attended at all times it was transmitting.

"As a little background, in 1955/56, Australian amateurs had their 50 MHz amateur band taken from them, and a band from 56 to 60 MHz given in its place. Then, in response to requests from the WIA, which, in turn, was spurred on by some hostile VHF operators who felt, rightly or wrongly, that the WIA had willed away their 50 MHz band without consulting them, the Radio Branch of the PMG's Department agreed to allow Australian amateurs to use the 50 to 54 MHz band during the International Geophysical Year when record high sunspot activity had been predicted.

"Despite the proviso that the beacon has to be attended at all times when transmitting, the Group pressed on with the building of the beacon with parts donated by members. The transmitter was to consist of a 7C5 oscillator/multiplier, followed by another 7C5 as multiplier/driver and 807 final amplifier running 20 or so watts input in Class C. (The 7C5 valve was a loctal base equivalent to the 6V6 power pentode; its chief virtue being that it was freely available in some disposals equipment). The transmitter was cathode keyed to provide CW identification. The transmitter for the beacon was built by the late Don Brown VK6ZAV.

"Next a keyer had to be built and a couple of Group members, including Don Graham VK6HK, set to work to design one. This was no easy task in those days before digital devices. The only feasible method was to use a mechanical contrivance of some sort. A motor was obtained from an old heavy duty power meter (AC mains type), and the drive shaft had a circular disc fitted, into the rim of which were cut slots to leave the outstanding part of the rim forming Morse code for the call sign VK6VF A piece of metal trailed on the rim forming a crude key. On test, problems were found as sparking burned away the keying contacts which were too light. Some other means of forming key contacts had to be found. The second attempt was a keying disc made of heavy bronze plate about four millimetres in thickness and 15 cm in diameter. The keying contacts were made from a set of automotive contact breakers (distributor points), with the shaped rim of the wheel running against the fibre portion of the contact breaker set. This opened and shut the points in the correct sequence and proved to be most successful.

"The beacon was tested and worked well and was put on a shelf in the shack of VK6BE, in Kalamunda, a shack which also doubled as the operator's bedroom! Now for hours of operation. According to the Radio Branch, the operator had to be present at all times. However, the Branch did not stipulate that the operator had to remain awake, so the beacon ran all night, every night. Unfortunately, it had to be shut off during working hours, but as VK6BE was a teacher, there were long hours of operation during school holidays, weekends and the off periods really only observed school hours. According to some rude persons, this only constituted an insignificant portion of the day, anyway!

"The beacon produced results very quickly. ZL and VK9 (Papua-New Guinea in those days) had been worked on Es propagation on six metres many times before, but not on F type propagation such as we were getting into Japan. However, for several days at the peak of the cycle, ZL1DS and others were worked on F type propagation, as also was a VK9 station. Both of these countries were worked in the early morning, and both said the only reason they knew the band was open at all was through the beacon being heard. Second-hand reports came through that the beacon was being heard in Hong Kong, the Philippines, etc but these places had little six metre operation at the time and therefore no contacts took place with them.

"To the operator, VK6BE, this beacon was a cross to bear at times. The keyer portion sounded rather like a train travelling on a railway line — you know the familiar clackety-ciack, clackety-clack sound? The motor was very sensitive to line voltage variations and used to key very slowly when the line voltage was down a bit. The result was that, during the day, the keyer sent at about 12 WPM, but after midnight, when the line voltage rose, the clackety-clacks went at about 40 WPM. Rather insomnia-making, to say the least!"

Thanks for that information Bob. At least your enterprise and that of the support Group was the forerunner of the now outstanding Australia-wide coverage of the VHF/UHF beacon network which probably ranks as one of the best in the world today and has proved to be of inestimable value in promoting many contacts which otherwise might never have been made. Well done!

A parting comment not related to beacons came at the end of Bob's letter when he said that six metres has been available in Albany almost every day for six weeks (to 12/1), and considers these Es openings to be the most extensive he has known In his 32 years of operating on the band. So that is an interesting comment from a VK6.

FURTHER EME NEWS

In the January/February issue of *SERG Newsletter,* from Mount Gambier, is a chart prepared by Chris Skeer VK5MC, showing the 1987 EME windows for the USA. They are:

April 2: 0048; 8: 0552; 29: 2340. May 5: 0348. June 2: 0228; 29: 0024. July 20: 1816. August 16: 1604. September 12: 1352; 18: 1900. October 10: 1240; 15:1700. November 6: 1020; 12: 1532. December 4: 0912; 9: 1328. Window times are start times. During all windows the first two minute period is a transmit period for VK5MC.

The VK5MC transmit frequency is 144.012 MHz and Chris will listen from 144.000 to 144.010 MHz. If signals are strong he may break into one minute sequences so you are asked not to call on his frequency as you will not be heard by Chris and may be causing QRM. His window will peak approximately 10 to 14 minutes after the start time, although he normally hears his own echoes right from the start. Scheds can be difficult to keep at times but Chris will endeavour to be on during all windows.

Those of you with reasonably good antenna systems, preferably with a mast mounted preamplifier, should listen from time to time and, if Chris is strong enough, give him a call. I have not heard Chris so far, but I have heard quite a few other EME stations. During the last ARRL Contest, Chris worked W5UN, WA6MGZ, W7ID, W7FN and K6MYC.

OVERSEAS NEWS

From "The Short Wave Magazine" courtesy Steve VK5AIM, comes a report about a project to try and achieve a two metre contact between Cyprus and England. The distance is about 3200 km which is within Es range. They hope to try during May and June (Northern Hemisphere summer) from suitably located stations.

A recent DXpedition by the Square Bashers Expedition Group, in Scotland, netted 13 QSOs via meteor scatter on six metres, whilst random CW operation on 144.100 via MS often resulted is as many as five stations replying. A lot of effort obviously went into the expedition as they were operational on six, four and two metres, 70, 23 and 13 cm, plus HF operation!

To try to remedy the extreme fall off in activity on six metres after the Es season in the UK, a suggestion has been made to hold "activity nights" between 7 pm and midnight, local time, when operators are invited to come on and call on the hour. Such an idea might be worth trying in VK. It is interesting to note that after about two years of operating on 50 MHz there is talk of waning interest!

I4BXN runs no less than one to two kilowatts to eight 20 element long Yagis. Calculations indicate his signal from Italy should be readable on CW most of the time in the UK.

THIS MONTH ON THE BANDS

Six metres has remained relatively quiet with a few openings to VK2 and VK4, which just seem to appear from nowhere. Late January saw a couple of openings to ZL. On 26/1, Mick VK5ZDR, worked Jim VK9NS, on Norfolk Island 5 x 9 at 0715.

On the two metre scene, I still have to rely on the reports of others as my two metre system is in disarray with the rotator completely rusted out and having to be replaced. Water must have got in the so-called seal around the centre section because the motor assembly under the bell housing is in good condition. So, presently the antennas are down and I am having a lot of trouble finding a suitable rotator.

Trevor VK5NC, advised me that VK6AOM, at Esperance, worked VK7DC, at Burnie, on 8/2 on 144.100 MHz at 1041 and 432.100 MHz at 1207; it is believed to be the first 70 cm contact between VK6 and VK7. Trevor said he was able to liaise and assist the contacts. VK6AOM and VK6BE (Albany) also worked into Melbourne on two metres around the same time.

The conditions at the time were so good that Trevor VK5NC, running one watt, worked VK7DC (10 watts) on 1296 MHz at 1200 UTC with signals 5 x 9+ and he also heard Wally VK6WG, putting in a good signal on 1296. VK5NY and VK3ZBJ, were also on 1296. VK5NC worked VK3AUU on both 144 and 432 at 5 x 9+++, so signals must have been good!

Mick VK5ZDR, filled in some other gaps for me listing the following as his contacts of importance on two metres and 70 cm.

14/1: VK3AOS and VK3NN; 18/1: VK3NN, VK3UM and VK3NM; 22/1: VK3KEG and VK3AUU; all these contacts were on two metres. On 28/1: VK3AOS on two and 70; 30/1 VK3AUU on two; then, between 0941 and 1052, he worked 10 stations in VK4 on two metres with signals to S9. Most were in the Brisbane/Ipswich area. Then, late at night he worked VK3YLV on two and 70 from Horsham.

On 1/2: VK3AUU on two, followed by VK3UM both 5 x 9; VK3YLB on 70; VK3WN on two; VK3DQJ on two and six metres; VK3AZY on two — all these were between 2030 and 2330/ 8/2: VK6AOM on two and VK6WG on two and 70 at 0930.

Mick pointed out that almost all his contacts have been in the mornings starting from around 2030, so it is a case of the early bird catching up with the DX.

Also, into early morning activity is Roger VK5NY, who looks down on the world from his hill-top site at Mount Wilson, not far from Willunga. Regular scheds are kept with VK3AUU and VK3KEG, on 144.100 MHz. Barry VK5BVT, at Aldgate, (another good area) joins in and they start at 2015. Signals vary, but are often up to S9. In addition, daily use is made of two aircraft between Adelaide and Mount Gambier around 2230 to contact VK3AIH, VK3LK and VK3ZQB, in the Portland and Port Fairy areas using aircraft enhancement with satisfactory results. Roger is certain two aircraft are involved.

On 1296 MHz, it appears I may have missed reporting that on 26/12/86 Roger VK5NY, on SSB, worked VK3KAQ/3 on FM at 0633 for a distance of

730 km, which constituted a VK3 distance record.

Roger reports he can have reasonably regular contacts with Trevor VK5NC, in Mount Gambier, on 1296 providing two metres and 70 cm are in good shape. If those bands are not providing good signals then 1296 will be weak.

On 9/2, Roger VK5NY, observed a somewhat unusual weather pattern with two high pressure systems, one either side of Tasmania with an impending cold front in between. This system enabled him to work VK7DC in Burnie at 2222 on 1296 with 5 x 9 reports both ways! Full quieting on FM. It was the first time Roger had ever observed such strong signals from that direction. Eight minutes earlier that had worked on 70 cm, Roger gave 5 x 3 and received 5 x 7, so by comparison, the 70 cm signals were down considerably on the 1296 signals. So, obviously there was no tie up whatever between two metres and 70 cm as giving possible clues to what might be happening on 1296. The day before there had been good contacts with VK6BE in Albany on two metres and 70 cm, so this probably led to the good VK7 conditions anyway.

Overall, Roger believes the late January/early February period enhanced conditions which we often experience in the southern regions were not as good as some years but still good enough to create a quite high degree of interest. Roger would have likes to have been in a position to try 2304 MHz during the big lift on 1296 to Tasmania.

OTHER NEWS

Peter VK3YRP, sent me a copy of his covering letter to the Federal Contest Manager, regarding the Ross Hull Contest, and he obviously found some improvements in the last contest when compared with the previous year. Peter says in one paragraph:

"DX contacts of any "modest" distance were not rewarded over "local" contacts. For instance, the majority of six metre DX contacts were worth only one point, compared to two points for a local contact. Sometimes it is necessary to hang around for 10 to 20 minutes to get an exchange."

On the above matter, I think the reasoning over a quite long period of time has been that six metre contacts over the prime Es distances up to, say, 2000 km are usually not hard to make even with low power, whereas a six metre contact in excess of, say, 200 km may be more difficult hence the increased points for the Intermediate distances. The purely local, across town type of contact also gains from the increased points but it may also ensure that stations do come on and are then around to work the DX when it appears. The alternative would be to cut out all local contacts of, say, less than 100 km or even 200 km as some operators advocated previously, although I tend to think this action could be counter-productive by suppressing overall activity.

Peter sent a sample page of his log with the addition of relevant Locator Squares added and, whilst there does seem a case for the use of squares, one also has to remember that it would virtually mean going back to more complicated log keeping. It would be possible to still have the broad distance boundaries such as exist at the moment with all squares within those distances counting as now, but there would be a need for knowing exactly where a station was when it came to the boundary lines! I am sure it would be necessary to issue a special contest map which all contestants would need to use in determining their points. Numbers could still be exchanged as now, plus the exchange of squares using the first two letters and figures to make a four part exchange of squares information; eg QF68. I would not like to see any signal report or other figures attached to the squares, they should be separate. Anyway, it is all food for thought, so please respond to my request for feedback from last month's issue.

Although somewhat dated now, it is still interesting to note the equinox periods can still provide some enhanced conditions on six metres. From *CQ ham radio*, from Japan, courtesy Graham VK6RO, I note that on 26/10/86, Japanese stations worked VKs 4FXX, 2DDC, 2XJ, 2BQV, 1VP, 2BKL, 6WD, 6IU and 6YA. On 27/10, they worked VKs 8ZMA and 6YA. On 1/11, VK2XJ, on 4/11 VK8AH, on 6/11 ZL2TPY. These were in addition to hearing beacons VKs 2RHV, 2RSY and 6RTT. The coverage therefore extended over four States and five call areas.

As you read this it will be April and another equinox is upon us, so keep an ear on both 50 and 52 MHz, you may be able to work Japan, Hong Kong, Korea or the Philippines.

CLOSURE

My thanks to those people who have helped me fill in while some of my antenna system is at ground level. It may be another month before they can be raised again.

Closing with two thoughts for the month: *Perhaps parents would enjoy their children more if they stopped to realise the film of childhood can never be run through for a second showing* and *The past is really almost as much a work of the imagination as the future.*

—73 *The Voice in the Hills.*

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How's DX?

Ken McLachlan VK3AH
Box 39, Mooroolbark, Vic. 3138

Where have all the true DXers gone? Do they only come out of hibernation when a rare country is scheduled to appear? Are the majority of amateurs in Australia interested in DXing? I know that there are a number of amateurs who, whilst waiting for the day that certain countries will appear and that is when they will be heard, are causing a hiatus on our DX bands.

I wonder at times if this column is read by the majority of WIA members, as when I commenced a "Let us see your shack" competition for this year, with a handsome prize attached for the winner, I have at this time, received only one entry (yet to be published).

On the other hand, I receive a considerable amount of mail, as regards the correct addresses for rare QTHs and the gathering of QSLs and certificates owed to overseas amateurs.

When a station from a rare country appears, calls one hasn't heard for a "coons age" appear out of the woodwork, like magic. It is apparent that there are a lot of listeners, with very few talkers or maybe they are talking on the bands I do not listen on at the present time.

One of the constant contributors to this column, maintains that DXCC can be achieved with very little effort, within a month. I agree and still maintain the stations are there, if one cares to call. So to one and all, please make a resolution that you will work the key or the voice for so many QSOs per week, or the VK mainland will start to climb the wanted list of the newly licenced amateurs in many countries.

SILENT KEYS

It is sad to relate that Don Riebhoff ex-K7ZZ/ CT4AT, XV5AC, XU1DX, 1S1A and the holder of many other calls, was unfortunately killed in a motor vehicle accident recently.

Don, was one of those gentlemen that loved the hobby and, during his service in the American Diplomatic Corps, popped up from many different QTHs. I first met Don on air in 1974, and we started regular QSOs with the boys and girls in Barbados on 14.164 MHz, where such calls as "Woody" 8P6CC, Allan 8P6AH, Jill 8P6CR Ian 8P6FU and many others became an evening ritual, as we entertained them, generally whilst they were having breakfast.

It became so friendly that Ian 8P6FU and Nick 9Y4NP (SK), both commercial airline pilots, used to call in from the Collins equipment when they were airborne, giving all listeners a run down on the weather and views. Nick flew the long distance hauls whilst Ian used to hop around the islands and when coming into land at Barbados could never pick the QTH of Allan and Jill Not to be out done, Allan painted his call sign on tne roof, with the help of others — there were no more problems. Once Ian saw the landmark, he announced he was coming in to land his aeroplane and passengers and went QRT, reappearing after touchdown.

I have a vivid recollection of a QSO with Don in XU land, whilst he was having his swimming pool filled by water carrying cement mixers. Suddenly shelling by the unfriendly neighbours commenced. Don's spontaneous reaction, is not printable but he didn't hesitate in promptly going QRT. Within weeks, he popped up again with his usual massive signal signing from S2, then from CT. He was one of the few to work the last 3Y1 Bouvet Island station on 20 metres, even though his beam was jammed in the wrong direction.

Don's positive organising ability and amiable personality will be missed by all who had the pleasure of contacting him and his sudden death is a sad loss to the hobby of amateur radio, which we are privileged to use.

Another great loss to the hobby is the death of "Buz" Reeves K2GL, who passed away on December 23, in his 80th year. Buz, during his career founded many companies, the best known was Cinerama (the theatre technician's nightmare). Cinerama also developed stereo magnetic recording film. In the 1970s, his company received two Academy Awards for the technical developments. Another of his companies developed the X-ray cutting of crystals during WWII. For this, the company was awarded many citations. Buz, assembled a magnificent amateur station that consisted of 12 operating positions equipped with modern technology feeding an antenna farm of 30 and 60 metre towers, several dozen beams and quads, including a three element 80 metre beam. The station has used the calls K2GL, K2GM, WA2ZAA and N2AA winning many major contests. Buz will be sadly missed by all that knew him.

ACTIVE RTTY STATIONS

For the RTTY enthusiast, it is known that the following overseas stations are QRV on the 20 metre band. 9Y4BK, CT1AUR, GM4LXZ, GW3SON, HI8BG, KX6BU, SP5HL, T77U, UZ6AWF and ZL7DE.

TROMELIN ISLAND

Yoland FR5AI, hoped to be signing /T for the duration of March and the first week of this month as duties permitted. QSL cards to his home call please.

KERGUELEN ISLAND

Reliable sources indicate that considerable activity may be expected from this area in the next year from a number of amateurs assigned to the base. It would be prudent to get confirmations of this area on all bands while the opportunity is there.

ST PETER 1 1SLAND

The boys did a tremendous job and are to be congratulated, even though they received severe criticism regarding their split frequency operation. The criticism was mainly from the self-appointed "policemen," that come to light in such circumstances. The QSLs would not be printed until the group returned home and it is anticipated that QSLing would have begun by the time you read this note.

Einar, Kaare and their associates took enormous risks in providing the world's DXers with another first and the expense bill was horrific, probably more so than the conditions that they worked under with the temperature hovering around the zero degree mark, so please take this into account when you send off for your card to LA6VM.

MARKET REEF

This popular place for DXpeditions will be blessed with another party that will operate all bands on CW and SSB, with a possibility of RTTY from June 25 until July 2.

LIBERIA

To commemorate the 25th Anniversary of the Liberian Amateur Radio Association's assistance to the hobby in that country, the authorities, as well as issuing the special prefix, 5L, will also issue a special stamp to mark the occasion, and are allowing other events to be held, including the special suffix of BSJ for JOTA 1987. Congratulations to the Liberia Amateur Radio Association and please point your antennas down to VK land.

NON-AGREEMENT

Letters from a couple of amateurs do not agree with the remarks made by Jim VK3YJ, about nets. The writers concur that they are not against nets, but stress that any amateur with an ordinary dipole or simple antenna, can work the DX with very little effort on low power. It can be done and the answer, in one word is, "CW! ! !"

THIRTY METRE BAND

Has any amateur worked 100 stations on 10.100 MHz yet? Well, it has been brought to my attention that one OT, has made the grade. I feel OT is the wrong terminology In this case as the perseverance needed to obtain that century, one would have to be very tenacious, patient, understanding and able to place quite a signal in the right direction.

One amateur has achieved this. It is none other than Fred VK4RF, from the "Sunshine State" and included in his score are 10 USSR countries and the mouth-watering prefixes of J26, J78, TK6, 5T5, 9H1 and 9Q7, to name a few.

Thirty metres is not a DXCC band but I believe that Fred deserves recognition for such perseverance and considering that he has held that call sign for over half a century, in my opinion speaks for itself.

Over to you Ken VK5KH. How can fellow amateurs acknowledge the work that this gentleman has done to publicise one of the acquired WARC bands, that our Institute fought so hard for? To the gentlemen that acquired these bands for our enjoyment, take heart, they are being used, and in a very sensible fashion.

MOUNT ATHOS

I am sitting on a "hornets" nest with this one. Have you really worked a legitimate Mount Athos station? It appears that the current Mount Athos Inquiry has many implications. Some of these reflect on previous operations, unfortunately. No one is going to like what I am about to put into print, especially those that have received credit for it, including myself. To the DXCC desk in Newington, to Ken VK5KH and other DXCC custodians, If there is any doubt as to the bonafides of any operation that has been claimed in good faith by an amateur for a new country, please delete ALL previous doubtful operations from the unlucky ones, and start again. But please do not penalise the legitimate operations that were condoned by the Monks and there were quite a few of these, until one particular operation unfortunately changed the Monks thinking on the hobby, we so much enjoy. Amateur radio is a sport or hobby and any accolades or comparisons should be based on a legitimate operation.

RTTY ENTHUSIASTS

Maybe a new country for all the RTTY enthusiasts? Phil VK2BPC, will be QRV from VK9 Norfolk Island, as from the end of last month for an indefinite period. Phil, will be using a newly allocated VK9 prefix on the preferred RTTY frequencies, particularly 20 metres. Phil also hopes to operate on 40, 80 and 160 metres as times and conditions permit. Norfolk Island is not new to Phil, and we hope to hear a lot from him.

NEW QSL MANAGER

Any station that worked 8R1X, in the 1986 CQWW Contest, or has recently worked 8R1Z or TA2C and requires a card, Carol WI4K, their new manager will oblige. Carol's new address is Carol Shrader WI4K, PO Box 5614, Virginia Beach, VA 234555. USA. The current call book address is obsolete.

QUOTABLE QUOTES

Lee KH6BZF has more humour than a Dad and Dave comic. Some can be reproduced, others can't for certain reasons and the law in this country.

Some of Lee's latest efforts are —

. . .If everything seems to be coming your way. . .you are probably in the wrong lane! ! !

. . .To be sure that your money is safe. . .hide it in an empty beer bottle on your lawn. . .no one will pick it up. (Sorry to disillusion you Lee, but in VK they will remove anything! VK3AH)

. . .Projects progress quickly until they become 90 percent complete, then they remain at 90 percent complete forever — it is called the transitional operations and maintenance period (TOM) period. . . (No comment at this QTH).

. . .Everyone relies on committees, because if more than one person is responsible for a miscalculation, no one will be at fault. . . (How true. . . VK3AH).

USSR LOSS

Unfortunately, the USSR lost one of their Antarctic

bases according to media reports. Fortunately it was unmanned and not in use at the time and no lives were lost. The area that went that-a-way was 400 by 600 kilometres. The base will be re-established and one of the amateurs in the reconstruction group is well-known DXer, Slava UA1JJ, who will probably use the call 4K1J.

LOW BAND ACTIVITY

George VE3FXT, hopes to be QRV on 160 metres at the beginning of this month. This will be the first time the 160 band has been activated from A22. Good luck to the low band enthusiasts.

BIG SIGNALS

Phil VS6CT, is moving QTH. This time to a 20 story apartment building with a shack on the roof-top. Well Phil, you always have the knack of making yourself heard and a beam on top of that building will assist. Hope to hear you soon with all the tit-bits and organisation you are doing.

SAO TOME

Luis is still very active, and it is trusted he will look for the multitude of VKs and ZLs that are after his valuable card in confirmation of a contact. He has been heard, scheds have been set up, but no contact. Never despair as propagation may come good and he will be 5 x 9+, with no other stations calling him, giving the VKs a chance.

THE GLOBETROTTERS

My favourite name for the DXing Colvins who really get amongst it and in my book are true-blue amateurs. In 17 days operating from the Comoros as D68QL, they notched up some 9000 contacts from 152 countries and operating as S79KG, they established 130 different countries with 9000 contacts. Who said that propagation was bad? We all know that the sunspot cycle is not in our favour but the stations are there and as I have said before a special or unusual prefix is worth a kilowatt or two and at least five 'S' points. As someone said — it is all in the mind.

Iris and Lloyd hoped to make Kenya their next stop and operate if they could obtain a licence. All QSLs for Iris and Lloyd's operations to the Yasme Foundation.

LORD HOWE ISLAND

Rudi VK9LM, is expected to be operational from the island again. It is hoped that he has not got to visit Ken VK9LK, in a professional capacity this time. Ken who is the local medico is kept busy repairing the tourists mishaps of falling off bicycles and is seldom called upon by the seriousness of what happened to Rudi, necessitating an RAAF airlift to a mainland hospital during his last visit to the island.

SAN MARINO

A number of T7 stations have been active on 80 metres. It is not clear as yet whether they have permission to operate on 160 metres.

FOR SALE

A prime piece of estate has had the FOR SALE sign placed upon it. It is uninhabited, except for winged birds and a few rodents, and is 1600 kilometres south of Hawaii. By now you have established that I am not trying to gain a free advertisement for my QTH. The island of Palmyra has been put up for sale by the Fullard-Leo family, who have had ownership and control for some 60 years. There are beautiful coconut palms, a water catchment and storage equipment, a disused and practically useless 1800 metre airstrip, which could be updated.

With all the media takeovers in this country of late, surely one of the mega-magnates could afford a luxurious hideaway allowing only amateurs to visit for an occasional DXpedition. Personal feelings are that an oriental consortium will purchase the prime piece of estate, and turn the area into a resort that will leave "Fantasy Island" to be considered as only a daydream. There must be some lucky people somewhere!

NICARAGUAN CALL AREAS

It appears there could be some changes in the structure of this country's prefixes. According to overseas publications YN1 becomes YN3, YN2:YN4, YN3:YN2, YN4:YN7/YN8, YN5:YN4, YN6:YN2, YN7:YN4, YN8:YN1 and YN9:YN5/YN6. If it is true, it is going to be very confusing for all and sundry.

LUXEMBOURG

During this year, LX stations will be appending /50 to their suffix, such as LX1AA/50. This is to commemorate the 50th anniversary of the Luxembourg Amateur Radio Society. The club station will sign LX50RL, which will be a must for prefix hunters.

SPECIAL EVENT STATIONS

The USSR, over the past few years, have had quite a few special event stations. If you have not received a card, the following may be of some assistance to you. Alexander Rubtsov is handling the QSL arrangements for the following special event stations —

UJ50A-1972, 4J50R-1974, R8D-1974, UJ30DU-1975, UK8JBD/U8R-1982, UK8XBD/U8K-1982, RJ8WCY-1983, RJ6R-1984, RJ6K-1984, EU9J-1985 and EK8R.

Now your problems start with how do you recompense Alexander for forwarding the cards back to you. Please, under no circumstances, send any money of any denomination, photographs or anything else but the cards you require, as this can cause the recipient considerable trouble. It is thought that you could send a self addressed envelope, with IRCs, and some mint and used postage stamps to Alexander Rubtsov, PO Box 1102, Dushanbe 734032, Tadzhik SSR, USSR.

IRCs are not recognised in the USSR, but they may assist Alex in sending for awards and other cards he may want. Good luck, but please be careful.

BITS AND PIECES

The credentials of **Herbert 5A0A** have been accepted by the ARRL, yet he is still getting very few takers, even after he calls CQ! ** **Pete N5TP** was QRV from the **Cayman Islands** as **ZF2KD** in February. ** **RA4HA** will resume his net on 14.175 MHz this month. ** **TV6CNA** was a special call to commemorate the **70th Anniversary** of the **WWI Battle of Vimy.** ** **9K2YA/IC5** was a special call for the **Fifth Islamic Conference** held in **Kuwait.** ** **George VE3FXT** hoped to be active from **Swaziland (3D6)** on **160 metres** last month. ** **Joe W3HNK** can get cards for QSOs with **UZ1PWA** in the **Arctic Circle,** but he is NOT the QSL Manager for any USSR station. If you want a card from a special USSR station, write to Joe, enclosing adequate funds and if he can, he will oblige. ** **HV3SJ** (generally termed "strawberry jam") has been quite QRV of late on 20 metres. ** **YU3KI** is signing **9Q5KI** and hopes to be active on 160 metres before he leaves probably at the end of July. ** The prefix of **H20** could have been used from **Cyprus** last month. ** There is a rumour that well-known DXer **Rudi F5RV,** became a Silent Key recently. I trust the rumour is incorrect and that the French readers of this column can deny the stories going around the bands. If it is true, it will be a very sad loss to the hobby.

NEW QSL MANAGER

Mary Ann WA3HUP, has taken on the duties of doing the QSLing for Khalid A61AB. Khalid hopes to improve his antenna system and obtain a linear in the near future. With Mary Ann doing his paperwork, he will not have a worry that no one will receive his cards and will be able to spend more time on air.

ANDAMAN AND NICOBAR ISLANDS

VU4APR/RBI commenced operations on February 20, with Bharathi VU2APR, doing an excellent job handling the pile up for this much wanted area and to the best of my knowledge, the first YL to operate from these islands. All QSLs to VU2APR, either via the bureau or direct.

PLEASE NOTE: It is an offence for Indian nationals to receive money as donations from international areas. This includes "Green Stamps", so please only IRCs for that much wanted card.

A lot of credit for the expedition must go to Bharathi for her personal representations to Rajiv VU2RG, Prime Minister of India. Bharithi pointed out to Rajiv the importance of the DXpedition and as it had been cleared by both the Ministrys' of Defence and Communications, release of the promised government assistance for NIAR's 20 member team would be appreciated. Rajiv, gave the final approval for the DXpedition to proceed.

Incidently Bharathi, passed her Grade 1 licence examination in December. Congratulations Bharathi from the DX fraternity.

CUSTOMS DUTY

Indian amateurs have had the imported Customs Duty exemption on wireless apparatus, accessories and components, extended until December 31, 1987.

HOSPITALISED

Late news is that Iris W6QL, accidently fell, whilst in the Maldives and broke her hip. She was flown out to a hospital in Colombo, where she underwent surgery to have it pinned. It is believed that her progress is quite good and she is in such good spirits, that Lloyd and Iris will continue their trip, when she recuperates.

Every good wish Iris, from your friends in Australia.

ST PETER AND ST PAUL'S ROCKS

At deadline time for these notes, it was anticipated that this country would be active towards the end of February. Ronaldo PY1BVY, hoped to be in the CW team.

Ronaldo PY1BVY, in his "second shack" at Friburgo.

WORKED ON THE WEST COAST

160 METRES CW

4X4NJ, 8Q7CH, DK6AS, DL1YD, G3MX, JAs, K0DD, K6HNZ, KM1H, KG6DX, KH6CC, KH9AC, KM1H, KP4AM, ON4UN, P29PR, RA9YG, SM7BIC, UA9MS, UA9UZC, VE1Z, VK9YS, VS6DO, W0ZV, W9AZ and ZS5LB.

40 METRES CW

3B8CF, 5B4FN, 8P9DX, 8Q7CH, 9Q5KI, BV2FA, CE0ZIG, CE2LZS, CM2QN, CO2LA, EA6N, EA5YU/EA8, EA8BEX, EA9KD, FM5ES, FK0AT/FW, IS0LDT, KC6R, KP2J, KX6DS, LX1BJ, PZ1DV, RZ1OWA*, TA1C, TA4A, UA1OO*, UA1OT*, UD6DZ, UG6GM, UH8BBQ, VE2EDK (Zona 2), VS6UN, N6RA/V44, WP4D, XE2AH and XF4DX.

40 METRES SSB

5B4SA, 5Z4BP, 5N4BP, 5N4BFD, 6Y5JH, 9H1EU, 9X5SP, CM2HR, CM6D, CO7KR, CT3DL, CT3DZ, HK1HHK, HK0HEU, HP3FL, KH9AC, KP9AM, KP4FI, KP4WI, S79LJ, TA1E, TI5FBP, TZ6VV, UF6VR, UO5GQ and VP9JY.

20 METRES CW

3Y1EE and 5A0A.

HEARD AND WORKED ON THE EAST COAST (SSB & CW)

Good reports on all bands from all continents, including some nice six metre openings.

*NOTE: * denotes Franz Josef Land.*

THANKS

Sincere thanks to the Editors of weekly, bi-weekly and monthly publications such as: *ARRL Newsletter; BARG; CQ-QSO; The DX Family Foundation Newsletter; Inside DX; KH6BZF Reports; Long Island DX Bulletin; NIAR News Letter; Papakura Radio Club Bulletin; RSGB DX News; QRZ DX, RSGB DX News* and *The W6GO/K6HHD QSL Manager List.*

Magazines including *Break In; cqDX; DX Post; JA CQ; JARL News; KARL News; Meteorological News; QST; Police Life; RadCom; Veron; Weather News* and *Worldradio,* to mention but a few.

Individual contributors this month include VKs, 2PS, 2BPT, 3YJ, 3YL, 3DYL, 4RF, 6NE, L30042, WI4K, ON7WW and assistance from the staff of the Lillydale Municipal Library.

Sincere thanks to one and all and good DXing.

ar

THE BEACON PAPER

Ron Henderson VK1RH
Peter Gamble VK3YRP
FTAC

At the 1986 Federal Convention the Federal Technical Advisory Committee was requested to produce a paper on beacons for the 1987 Convention. Over the past nine months, Tim Mills VK2ZTM, has published material in AR inviting submissions and comments on this subject. A number of comments have been received, including a very detailed submission from Eric Jamieson VK5LP. Research on past WIA policies has also been undertaken.

A paper by Roger Harrison, entitled "Beacon Manifesto" and published in his *6UP* magazine is also of interest as it contains comments on the philosophy of beacons and suggestions on the technical specifications for beacons.

The first draft of the "Beacon Paper" has now been completed, and is reproduced here for your information. By the time the convention comes around at the beginning of May, this paper will have been revised a number of times! It will also have added to it some appendices, which set out previous WIA policies, current band plans and relevant IARU material.

Finally, the paper will contain a number of recommendations for debate at the 1987 Convention. It is hoped that these will address such subjects as the future strategies for HF and VHF beacons and the associated band planning considerations. If you have any comments to make on the subject of beacons, please write as soon as possible to the Chairman, FTAC, c/o the Federal Office, so that your ideas can be taken into account in the final drafts of the paper.

AMATEUR RADIO BEACONS

Background

The Federal Council of the WIA has been concerned over the past few years about the un-co-ordinated growth of amateur radio beacons on both the HF and VHF/UHF amateur bands.

Matters raised at the 1985 Federal Convention guided the attitude of the WIA delegation at the IARU Region 3 Conference, in Auckland, November 1985. Further matters arising from that venue were considered at the 1986 Federal Convention giving rise to a motion directing FTAC to prepare a position paper on Amateur Radio Beacons for consideration by, and adoption if thought fit, at the 1987 Federal Convention.

Definitions

"Beacon station" means a station in the amateur service established on a fixed frequency for the purposes of radio propagation studies (DOC Draft Handbook).

"International Beacon Project" means a project planned to provide a time sharing world-wide beacon service on selected amateur HF bands. The project is co-ordinated by the IARU International Beacon Project Co-ordinator.

"Time Sharing Beacons" means a series of beacons established world-wide operating through time-sharing on the one designated frequency.

Purpose of Beacons

Amateur radio beacons provide a two-fold service; primarily they provide a reliable identified signal of about average amateur station EIRP to permit identification of propagation paths. Their secondary use is as a known frequency signal source for equipment calibration purposes as to frequency, sensitivity and location. This secondary usage assumes more importance as new amateur bands are "opened up" to popular operation.

DOC Regulations and Requirements

Proposed DOC regulations and requirements (4.13, 4.14 and 5.12) cover licence applications, unattended operation, transmitting conditions and modulation modes.

Policy Guidance

Policy guidance for amateur radio beacons comes from two sources, WIA policies made at Federal Conventions and IARU resolutions to which the WIA subscribes.

Extant WIA policies generally cover band planning, a desire that only authorised beacons be recognised and adoption of IARU beacon plans.

The current IARU policy is contained in Administrative Council Resolution concerning 28 MHz Beacons, adopted in Melbourne, November 1985 are also relevant.

The HF Requirement

The broad HF requirement is a series of beacons located about the world in all amateur bands which provide world-wide propagation on a regular basis to indicate when intercontinental propagation is possible.

Because of the frequency spectrum demands should each continent (or heaven forbid, each nation), demand a discrete beacon frequency and associated guard band, the IARU Administrative Council resolved to adopt a time sharing common frequency beacon plan modelled on the successful Northern California DX Foundation 14.1 MHz program. An added advantage of the time-shared beacon project is the capability of stepping the radiated power of each beacon by known decrements during its transmitting time period.

HF Band by Band Requirements

Taking the amateur HF bands in turn, there has been little interest expressed in 1.8 MHz band beacons, perhaps because the experimental nature of this band vis, via the communications employment made of the traditional DX bands.

Similarly, the limited amount of DX working on the 3.5 MHz band suggests beacons are not required at this stage on this band. This is not to decry the local value of pseudo beacons sending CW.

It is likely there will be a push to establish beacons in the 7 MHz band although one would have thought the current sunspot cycle low would have given that impetus. Extension of the IARU beacon project to this band could be anticipated, however international amateur frequency allocations may determine constraints.

Ten MHz is a narrow secondary service band, these factors will influence any beacon proposals as will the near universal decision by the amateur community to use only narrow band modes on the band.

Fourteen MHz was the first band being an international DX band to have time- sharing single frequency world-wide beacon service established therein. This project has allowed the scheme to be evaluated and the number and location of beacons to be determined. To date, there has been no adverse comment on these factors although the Administrative Council saw fit to provide for secondary regional shared beacon frequencies in their 28 MHz deliberations.

During their band planning, the Region 3 Conference, in Auckland, acknowledged that a time-sharing beacon project would come to 21 MHz in due course and consequently they allocated a beacon sub-band at 21.150 MHz. We should be prepared for this proposal and consider the need for regional secondary beacon frequencies.

Little practical beacon activity can be established in the two WARC 79 exclusive amateur bands at 18 and 24 MHz until these become genuinely exclusive in 1989. Nevertheless, the need for beacons can still be debated, for by then the time-sharing scheme will have had a reasonable trial on other DX bands.

The IARU Administrative Council resolution on the 28 MHz band set up a world-wide network on 28.200 MHz and regional networks encompassing a continent each at integral kilohertz between 28.190 and 28.199 MHz. Australia should bid to the IARU International Beacon Project Co-ordinator for a time slot on the world-wide network and a continental frequency for a regional network. The WIA will need to designate one of the existing beacons to become the world-wide network member and allocate time slots to the remaining existing beacons to establish our regional network. FTAC should be tasked with these actions at the '87 Convention.

Listening Around

Joe Baker VK2BJX
Box 2121, Mildura, Vic. 3500

I have just recently returned from a trip to Melbourne. After 13 months at Buronga without a break, during which time Buronga began to grow on me — that old shut-in feeling — I welcomed the opportunity to get away for a short visit.

I left Mildura by train on Sunday night, December 21, arriving at Spencer Street Station at 7 am the next morning. After booking into my motel I fell asleep with the intention of waking prior to dinner time, however it was just in time for tea when I awoke. (The *Vinelander* journey, stopping at every little whistle-stop station during the nine hour overnight trip, is very tiring!).

The following day, John VK3PBX, had arranged to pick me up at the motel and take me to his Sunbury OTH for a few hours, however, due to his work commitments, he was unable to do this and suggested that I might like to have a look around the dock-side area of Melbourne. As I don't know the area very well it is impossible to explain the streets we traversed but one of them came to a dead-end, right by the river-side. There was a factory of sorts, which straddled the road, with formidable looking gates and unfriendly-looking guards. So we did an about-turn and shortly the masts of *Polly Woodside* and the *Westgate Bridge* came into view. As it was late evening, there wasn't time for John to take me to see *Polly Woodside* at close quarters, so John asked if I had ever been across the *Westgate Bridge*, which was some distance in front of us.

We tried to find a road approach to the bridge, but as the area was unfamiliar to John we couldn't locate it and decided to make our way back towards the city.

As we proceeded along one road we soon saw, to our left, a small hill and the unmistakable shape of a satellite dish. As we rounded the hill we saw another smaller dish beside it and atop a nearby building what appeared to be several UHF antennas. We stopped by the roadside for closer inspection.

We clambered out of John's car and walked a short distance across a paddock towards a low-roofed building and the satellite dishes which were all surrounded by a strong wire fence, gates secured with padlocks and a notice stating that the installation was protected by a security firm. As the gate was open we entered, presented ourselves at the door of the building and introduced ourselves as two curious radio amateurs who would like a look at the installation.

The two technical officers on duty, Gary O'Donahoo and Marco Pantazi, were not radio amateurs but immediately volunteered to tell us as much as we wanted to know about the place.

Inside the building was a large amounted of equipment associated with the dishes and video monitors everywhere. It is a pity that I did not have my tape recorder with me for the two were so helpful and I could have taken down more detail than I could with my small note book.

However, we were told that both antennas work in the gigahertz range, their foundations are firmly set in concrete and they both work through the AUSSAT satellite. The larger one, 7.13 metres in diameter, is part of the HSV7 links with Sydney and elsewhere and the smaller one, 1.2 metres diameter, is used by AAP-Reuter, to link-up newspapers in Sydney, Adelaide, Brisbane and Perth (Sydney is the main control centre of this network).

The satellite in use for HSV7 is the A1 at 160 degrees longitude and the A2 at 156 degrees longitude, is the AAP one. When it is launched, the A3 will be at 164 degrees longitude making a separation of four degrees between each. We were told that there is a similar system of dishes at Highbury Road, Glen Waverley.

When I expressed regret at not having my camera with me, Gary produced a colour photograph which he said I could have to use in this article which I proposed to write for AR. John was out of luck as there was only one photograph!

Gary explained that he had relatives in Mildura (O'Donahoo and Harris, who are in business in Mildura) but I do not know them personally. Gary said he expects to be visiting Mildura soon to install satellite equipment on the roof of a Mildura newspaper — all part of the AAP-Reuter set-up we were looking at.

Although John and I stumbled upon this installation by accident, it was well worth looking at it and for others who would also like to see it, you will find it at Lot 7, Todd Road, Port Melbourne.

Gary said that others who might like to find out more about the installation should contact the Victorian State Manager for AAP, David Blanks. David is the Public Relations Officer for AAP and his address is in the Melbourne Telephone Book.

A few months before my visit to Melbourne, I had been speaking with Ron Fisher VK3OM, who works in the Control Room of the ABC, Lonsdale Street, Melbourne and is the Equipment Reviewer for AR. Ron was kind enough to say; "call me up when you are next in Melbourne, and I'll show you what I do on the job" (or words to that effect). So, the day after the Port Melbourne trip I gave Ron a ring at his work-place.

Upon finding the ABC building, I presented myself to the receptionist and asked for Ron. She picked up a phone and within minutes Ron emerged up some stairs from an installation which appeared to be beneath the footpath in front of the building. However, undaunted I followed Ron down under the footpath into what appeared like Thomas Edison's Menlow Park Laboratory. Although this was not a laboratory (it only seemed like it), it was an enormous switching installation with rack and panel equipment and patch- cords connected everywhere — it also resembled the inside of a manual telephone exchange. From this switching centre all ABC stations can be linked together.

Whilst I was there, the *Country Hour* was on-air and the many stations on the hook-up were indicated by scores of red indicators on a panel. Stan Edwards, Ron's off-sider, was on duty at the time while Ron attempted to explain the functions of all the equipment to me. Ron and Stan are the *master control operators* in charge of this system, which also involves ABC satellite links to other State capitals. In fact, while I was there, I heard a voice, via the satellite link from Sydney, telling Melbourne to get their tapes rolling to take a trailer for an ABC science show. I also heard Adelaide talking to Stan about another matter of programming.

The satellite voices came through very clearly indeed.

Ron said that the ABC's satellites are well used and they are rapidly replacing the phased-out land-line relays. Even so, satellite links are not trouble-free. For example, in adverse weather conditions the satellite signals cannot penetrate rain drops.

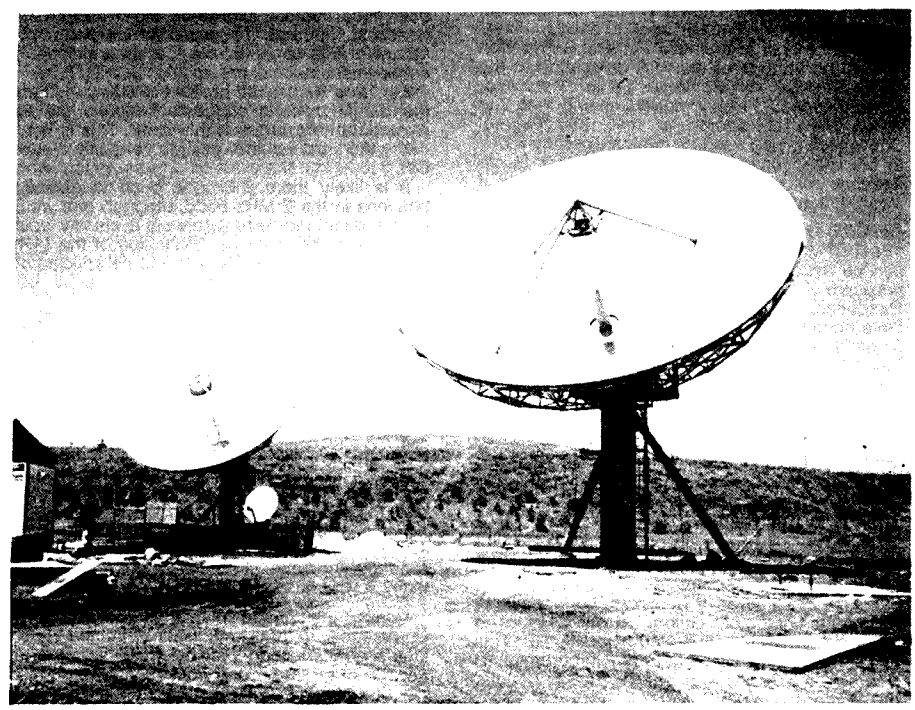
I reminded Ron that the ABC was still using a 49 metre transmitter at Lyndhurst to relay the ABC to the outback. Ron explained that the ABC was using, or was about to use, high-powered transmitters in Central Australia which would transmit their programs from capital cities by satellite, it was only a matter of time before the Lyndhurst Shortwave Relay site would become obsolete.

The "boys" at this ABC installation made me very welcome and my two and a half hour stay with them very enjoyable. It is not their fault that my description of the job they do is by no means a *full cover story*. Perhaps the next time I visit them I will have my tape recorder with me.

Since returning from Melbourne and my visit to the ABC, I have been invited to visit the Adelaide installation by Graeme VK5JD, at Rosstrevor. Graeme does a similar job with the ABC in Adelaide.

Being a amateur radio operator opens many doors as they say!

ar



The satellite dish installation in Port Melbourne.

SYDNEY — MELBOURNE — BRISBANE

NEW

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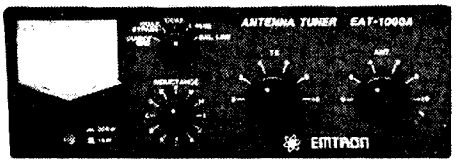

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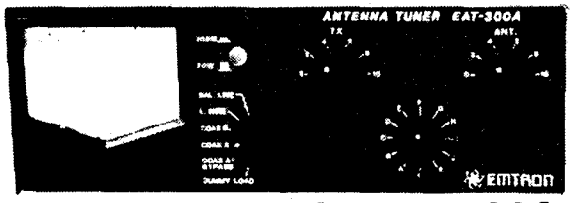

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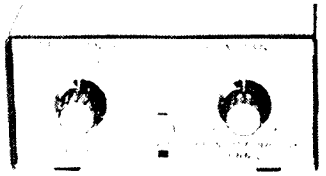

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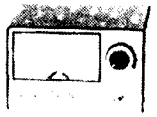

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152 Lytton Road, Gisborne, New Zealand

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	PHONE		CW		PHONE		CW	
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VI5SJ	658080	VK2APK	715068	ZL1AIZ	221550	ZL1AIZ	406192	
VK2KL	398093	VK4XA	602095	ZL1AXB	174984	ZL2SQ	390370	
VK5QX	210887	VK2AYO	384132	ZL1AAS	59580	ZL2AGY	325140	
160 METRES								
VK3BEE	12600	VK3BEE	9860	ZL1AIZ	1540	ZL1AIZ	1400	
VK2PS	5280	VK3CGG	1600	ZL1MQ	1060	ZL1MQ	700	
VK2BQS	900	VK2PS	1200	—	—	ZL1BGT	40	
VK2OPY	900	—	—	—	—	ZL1BGT	40	
80 METRES								
VI5SJ	39260	VK3X8	39780	ZL3KR	29750	ZL1AIH	75240	
VK5QX	4700	VK2APK	39200	ZL1BVK	13770	ZL3KR	70110	
VK2PS	2430	VK5GZ	7920	ZL2AFY	11760	ZL1AIZ	27060	
40 METRES								
VK2EKY	103050	VK2EKY	290460	ZL1AIZ	83160	ZL2SQ	390370	
VK2KL	42840	VK2APK	213200	ZL1AGO	55680	ZL2AGY	325240	
VK5QX	28090	VK2AYD	123200	ZL2ALF	2400	ZL1AIZ	110175	
20 METRES								
VK4PJ	27398	VK2APK	17568	ZL1AXB	174984	ZL3AGI	10220	
VK5QX	24090	VK4XA	13746	ZL1IM	1715	ZL1BSG	4785	
VK2KL	15190	VK3KS	9840	ZL1MQ	1500	ZL1AIZ	2948	
15 METRES								
VK2PS	14632	VK4XA	21320	ZL1AAS	59580	ZL1BGT	2842	
VI5SJ	14062	VK2AYO	7462	ZL1IM	14520	ZL1BSG	1824	
VK2KL	14022	VK3CGG	6348	ZL1MQ	4440	ZL1MQ	1240	
10 METRES								
VK4AOO	4956	VK4XA	2100	ZL1IM	1296	—	—	
VK2KL	1488	VK2BQQ	27	ZL2ALF	252	—	—	
VK2PS	1200	—	—	ZL1MQ	9	—	—	

ZL PHONE

CALL	160	80	40	20	15	10	TOTAL
ZL1AIZ	1540	8360	83160	450	48	—	221550
ZL1AXB	—	—	174984	—	—	—	174984
ZL1AAS	—	—	—	—	58580	—	58580
ZL1AGO	—	—	55680	—	—	—	55680
ZL1MQ	1080	—	1800	1500	4440	9	43146
ZL1IM	—	2420	1105	1715	14520	1296	21056
ZL1BVK	—	13770	—	210	—	—	13980
ZL2AFY	—	11760	—	—	—	—	11760
ZL2ALF	—	—	2400	216	216	252	9984
ZL2BDC	—	—	—	—	1120	—	1120
ZL2IG	—	10	—	144	280	—	1080
ZL3KR	—	29750	—	—	—	—	29750
ZL3HT	—	2790	350	16	—	—	7280

ZL CW

ZL1AIZ	1400	27060	110175	2848	98	—	406192
ZL1AIH	—	75240	—	—	—	—	75240
ZL1BSG	—	660	5510	4785	1824	—	52782
ZL1BGT	40	3740	4340	80	2842	—	49511
ZL1MQ	700	1440	2500	1472	1240	—	45838
ZL1HV	—	2160	5460	2622	—	—	37800
ZL2SQ	—	—	390370	—	—	—	390370
ZL2AGY	—	—	325240	—	—	—	325240
ZL3KR	—	70110	—	—	—	—	70110
ZL3AGI	—	—	—	10220	—	—	10220
ZL4QY	—	—	—	—	—	—	check

VK CW

VK2APK	160	39200	213200	17568	5852	—	715068
VK2AYD	—	2200	123200	8400	7462	—	384132
VK2EKY	—	—	290460	—	—	—	290460
VK2BQQ	—	1600	116025	240	—	27	171570
VK2PS	1200	4810	—	6741	3132	—	86437
VK2DID	—	4680	360	2898	2064	—	50414
VK2BQS	40	550	—	88	162	—	4117
VK2AIC	—	—	—	—	—	—	check
VK2CWS	—	—	—	—	—	—	check
VK3CGG	1600	5000	6825	1269	6348	—	140000
VK3AUQ	20	1840	11925	1575	6006	—	93696
VK3XB	—	39780	—	—	—	—	39780
VK3NI	—	1050	—	1560	3844	—	21376
VK3BEE	9860	—	—	—	—	—	9860
VK3KS	—	—	—	9840	—	—	9840
VK3XF	—	1140	—	520	64	—	7956
VK3CQP	—	3200	—	—	—	—	3200
VK3CGE	—	1600	—	—	—	—	1600
VK3AJG	—	—	—	—	—	—	check
VK4XA	600	5940	101760	13746	21320	2100	602095
VK4SF	—	—	22120	—	—	—	22120
VK4TT	—	—	—	2419	—	—	2419
VK4BKM	—	—	—	—	—	—	check
VK5GZ	—	7920	17500	750	1824	—	104832
VK5ADX	840	120	12390	6240	—	—	66326
VK5AGX	—	600	315	4482	4556	—	38200
VK5BS	—	—	5	588	—	—	726
VK7RY	—	200	45	418	84	—	4192
VK8BE	—	—	—	1600	—	—	1600

VK PHONE

VK1LF	—	2070	—	192	2310	—	17064
VK2KL	560	320	42840	15190	14022	1488	398093
VK2PS	5280	2430	—	897	14632	1200	127568
VK2EKY	—	—	103050	—	—	—	103050
VK2BQS	900	1680	—	98	11016	—	44992
VK2DPY	900	450	1200	96	—	—	11946
VK2CWS	—	40	80	—	—	—	240
VK2AIC	—	—	—	—	—	—	check
VK3SM	—	300	175	910	2072	—	13056
VK38EE	12600	—	—	—	—	—	12600
VK3CQP	—	840	440	384	600	—	11655
VK3VQ	—	—	—	—	—	—	check
VK3XB	—	—	—	—	—	—	check
VK4AQO	—	1050	45	713	9558	4956	62167
VK4PJ	—	—	—	27398	—	—	27398
VK4KWO	—	—	—	—	13570	—	13570
VK4KHZ	—	2340	—	—	—	—	2340
VK4BJO	—	2226	—	—	—	—	2226
VK4SF	—	—	—	651	—	—	651
VK4BKM	—	—	—	—	—	—	check
VK4OX	—	—	—	—	—	—	check
VI5SJ	—	39260	23800	1056	14062	—	658080
VK5QX	—	4700	28090	24090	—	—	210887
VI5OU	80	600	1020	1408	4680	—	35399
VK6RG	—	120	—	3285	6956	—	26414
VK8BE	—	—	—	437	—	—	437

THE CONTEST MANAGER SPEAKS. . .

It is hitting hard — the realisation that these are the last VK/ZL results for which I'll be responsible. My first association with this activity was some 50 years ago as a contestant while, for the past 40 or so, I have been an administrator (contestant too at times — and still great fun!). During this time, so many wonderful friendships have been formed in all continents — and with some — receipt of a log does much to rekindle happy memories of "contest battles" / correspondence / and general contest discussion. Just how many letters have been exchanged in an endeavour to overcome apparent weaknesses in rules could not be checked even with a wild guess. *But* this went on year after year and gratitude must be expressed to those who so readily co-operated.

Are the rules fulfilling all requirements? Of course not! In spite of professional training which told me attempts to achieve such a state would end in failure — the effort was made — over and over again. I doubt if the ideal set of rules will ever be achieved but the target is inspiring! The major point of achievement is to ensure that the rules are fair to all concerned and this has been an over-riding factor. I well recall a very close ZL friend (now deceased) whose ridicule because of alleged "loaded" rules was almost vitriolic! We were friends to the last. Such are the relationships associated with VK/ZL.

Comments have often been made about logs. As an "old contester", I hate the re-writing of logs and eventually avoided this by adequate preparation / a little care / and use of carbon paper. "Copy book" material is not expected by an administrator but it is essential that entries be clear and free from ambiguity — and carefully checked for dupes. Finally — the mathematics of scoring must make sense! Think about that.

I make a plea. ***Read the rules!*** This might sound strange but it is so often assumed that rules will be the same — as last year — as when last entered — as whenever! Words fail me on this. The thought of an athlete entering a marathon/triathlon, etc without checking rules "boggles the mind."

I make no excuses for being utterly forthright at times. I believe this is necessary and I have never appreciated weakness in leadership. Yes — negative criticism has hurt from time to time and hurt badly, but that is part of the game. Nothing could ever replace the friendships made — thanks fellas. I envy those carrying on. May your measure of enjoyment be bountiful.

From an oblique aspect, the 1986 contest could be considered a gigantic flop — but — with prevailing conditions — was it? Possibly more effort and more planning than usual was necessary. That much planning was done is evident — that much more should have been done is also evident! Without doubt, the 12 hour duration (with one notable exception) was well accepted. I believe this is a good compromise in providing adequate competition while avoiding the marathon effect. Scoring will always be debatable but the basis of differential band scoring is the fairest system possible.

Missing from these results is the call sign of WIA Life Member and long time contest enthusiast, L30042/BERS 195, Eric Trebilcock, whose friendship and helpful comment over many years has been most acceptable. I've already commented on logs, but a "final" one is necessary because of two others whose logs — year after year — have always been a delight to handle — thank you VK4XA and VK3XB.

—73, ZL2GX

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NEWS FROM LONDON

RRD REPORT

The Radio Regulatory Division (now renamed Radiocommunications Division) of Britain's Department of Trade and Industry, issued its first ever annual report on December 18. Geoffrey Pattie, Minister of State for Industry and Information Technology, introduces it as part of the Division's efforts to improve openness and consultation. The change of name, he says, is intended to reflect a new approach, aimed at less regulation — a phrase suggesting heavy-handed bureaucracy — and more at a service to responsible users.

The report is for the financial year ended March 31, 1986, and fills 53 thick glossy pages. It is free this time, but there is a suggestion that readers will have to pay up to £5 for the next report. It covers the whole range of the Division's activities of which amateur radio is, of course, only a part.

Traditionally, says the report, radio has been regulated in immense detail, but it is now becoming apparent that the spectrum can be safeguarded with fewer controls, provided there is vigorous enforcement of those which remain. The aims of radio regulation in the UK are to make radio more readily and widely available, and to eliminate licensing altogether where this can be done without damage to licensed use — for example it is proposed to exempt a wide range of low power devices.

Phase III of the DTI's Spectrum Pricing Study (which presumably includes amateur radio) was due for completion by the end of 1986. Phrases in the RRD report like *increasing pressure of demand* and *pricing (as a resource rationing mechanism)*, are alarming to the radio hobbyist. The government is to announce its views on the findings of the study at a later stage and amateurs, amongst others, will be anxiously waiting to hear them.

For amateurs, the report records three major events in the year under review — the allocation of 50 MHz, the decision to allow the RSGB to run the amateur Morse test, and the decision to allow Class B licensees to use Morse permanently on the VHF bands. Mention is also made that during 1985 agreements were concluded with the USA, Canada and the Falkland Islands to enable international greetings messages to be passed from Special Event Stations in time for Jamboree-on-the-Air that year. (But whatever happened to the proposed similar agreement with Australia? T S).

Regular meetings are held with the RSGB, says the report, at which a wide range of subjects are discussed. Particular topics covered during the year have included a strategy for dealing with interference to television and radio reception, crossband working, packet radio, licence revision and research permits.

Statistics show that, following the computerisation of licence records by the Post Office, acting as agents for the DTI, the issue of licences is now normally completed in five days. Prosecutions under the Wireless Telegraphy Act for illegal transmitting activities resulted in five convictions for unlicensed use of amateur bands, as opposed to 896 convictions for illegal CB operation, and 124 pirates convicted for broadcast band infringements.

As at March 31, 1986, there were 56 346 amateurs licences on issue (Class A, all bands — 28 750; Class B, VHF/UHF only — 27 341; Beacons — 42; Repeaters — 213). The total Income from these licences was £700 000 and since 1970, increases in licence fees have been more or less kept in step with the retail price index.

During the year, 290 173 licences were issued to all users of the radio spectrum, and these permitted a further (approximate) 900 000 mobile stations to operate. Viewed in this context, the hobby activity of amateur radio must be rather small fry in the eyes of the powers-that-be. To this reporter, at least, the RRD report serves to stress how important it is to amateur radio, ***everywhere***, to have effective representation of its interests at official levels by authorative, responsible, and respected, national societies having the support of ***all*** users of the amateur bands.

RE-ISSUE OF PRE-1958 G-LICENCES

The DTI has announced a change in policy regarding the re-issue of lapsed amateur radio licences with their original call signs. It has decided to permit previously held licences to be re-issued to the original holders — even when the original qualifications were not based on the current Radio Amateur Examination Syllabus. This announcement follows on from the concession announced last June which extended the validity of the amateur Morse test for life, this bringing its validity into line with the RAE. The only anomaly left, therefore, was the question of the pre-1958 lapsed licences, and after representations from the RSGB and the consideration of several individual cases the Department decided to bring this into line also.

Licences with call signs in the G5 plus three letters series cannot, however, be re-issued with their original calls as this series was recently withdrawn and holders issued with new call signs.

The onus is on applicants to prove that they previously held a licence/particular call, and to provide proof of identity. The way is now open for a number of old-timers to find their way back onto the bands after a long absence.

RRO REPORT (Follow-up to above report)

Radio Communication January 1987, reports that, as it was going to press, the management consultancy, CSP International, was due to present its final report to the DTI on "spectrum pricing." It is understood by the RSGB that the report proposes that the government should relinquish detailed control of most of the radio spectrum not used by the military to independent Spectrum Management Licensees (SMLs). Each SML would control a block of radio frequencies and "sell" them to users.

It appears that amateur radio will not be subject to these arrangements however. According to the RSGB's source, amateur radio was thought to fall well outside the possible terms of reference of the new recommendations and no proposals were formulated.

—From AR's London Correspondent, Tony Smith G4FAI

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ATV GROUP FOR LAUNCESTON

A meeting of amateurs held recently in Launceston saw the formation of the Northern Tasmanian ATV Group.

Five amateurs attended the meeting and seven others registered their interest prior to the meeting.

Further meetings are planned for the third Saturday each month.

Some of the aims and objects of the Group are:

- Further promote interest and activity in amateur radio.
- Provide a forum for discussion, instruction and training in amateur radio.
- Conduct educational and instructional broadcasts.
- Encourage outdoor activities for persons with video cameras.
- Provide assistance to organisations and individuals requiring video taping.
- Conduct ATV broadcasts on a regular basis.

If you live in the northern part of Tasmania and are interested in amateur television, whether Slow-Scan or Fast-Scan, or merely interested in the mode, perhaps you would like to be part of the group. If so, contact Bob VK7NRR, ex-VK7NAI, for further information. Registration forms are available from Bob on request or at the monthly meetings of the Northern Branch of the WIA.

—Contributed by Bob Richards VK7NRR

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SUNSHINE COAST AMATEUR RADIO CLUB

The following office bearers were elected at the Annual General Meeting of the Sunshine Coast ARC on February 4, 1987.

President Paul Dunford VK4BPD
Secretary Joe Ellis VK4AGL
Treasurer Kevin Oakhill VK4NKO
Committee Geoff Sanders VK4NEL
Jeremy Smith VK4ZCC

Amateurs interested in joining the Sunshine Coast Amateur Radio Club should write to the Secretary, PO Box 80, Nambour, Qld. 4560, phone (071) 41 2315 for more information.

—Contributed by Joe Ellis VK4AGL, Secretary, SCARC

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Club Corner

Contests

Ian Hunt VK5QX
FEDERAL CONTEST MANAGER
Box 1234, GPO, Adelaide, SA. 5001

CONTEST CALENDAR

APRIL

4 — 5 IBM QSO Party
8 — 10 DX YL to North America YL CW
11 — 12 CARF Commonwealth Phone
15 — 17 DX YL to North America YL SSB
25 — 26 Swiss "Helvetia" Contest

MAY

2 Utah QSO Party
9 Nevada QSO Party
30 — 31 CW WW WPX CW Contest

Around this time we have a break in local WIA sponsored contests, however do not forget that the next of these events will be the *VK Novice Contest* to be held in June. I would hope that the high levels of atmospheric noise on the 80 metre band may have reduced by then.

CW WW WPX CW CONTEST

Rules for the CO World Wide WPX Contest were not available for printing in the March issue and the SSB section of that contest is now past. The CW section is as listed above. I now have a little more information which may be of interest to you.

The rules are the same as were used last year and are, in fact, unchanged from the format used for many years past. Following are a few points to keep in mind.

Only 30 hours out of the 48 hour contest period may be used by single operator stations. Off times can be taken in up to five periods, but off periods must be a minimum of 60 minutes in length. Multi-stations can operate the full 48 hours.

The QRP section has become very popular and is worth your attention.

The definition of the prefix multiplier is spelled out in detail and is not to be confused with the interpretation used by the CO WPX Award program.

A prefix is the two-or-three-letter/number combination which forms the first part of the call sign.

Also, bear in mind that stations in call areas different to that indicated by their call signs are required to sign portable.

The multiplier is determined by the number of different prefixes worked and is counted once only, regardless of how many times it is worked on other bands.

Another point to keep in mind is that, in the multi-operator, single transmitter category, only one transmitter and only one band may be used during the same 10 minute period. Picking up a new multiplier on another band during the same period is definitely prohibited.

An alphabetical/numerical check list of claimed prefixes is a requirement and must be included with your log.

An updated trophy and plaque awards list now shows over 40 awards in existence for this contest.

Deadline for submitting your SSB entry is May 10 and for the CW section, July 10. Be sure to indicate SSB or CW on the envelope.

All logs go to: WPX Contest, 76 North Broadway, Hicksville, NY, USA. 11801.

UBA SWL TROPHY

Information had not come to hand regarding this contest in time for publication in the March issue. The SSB section was timed for March 28- 29. You should, however, be able to catch the CW section on May 23-24. Time of the contest is from 0000 Saturday to 2400 UTC Sunday.

This SWL activity will be held annually on the last weekends of March and May, and replaces the UBA Cup Competition held in January and February.

Only six hours may be used out of the 48 hour contest period, three continuous hours on Saturday and the other three hours on Sunday.

BANDS: 3.5 to 28 MHz (no WARC bands).
LOGS: To be in columns as follows: Date/Time in UTC; Station Heard, RS(T) by the SWL; Station Worked; Points and Multiplier. *Station Heard* may be logged only once per band. (No CO, QRZ, etc). If points are claimed for both stations in QSO the call of each must appear in the *Station Heard* column. Call of *Station Worked* may not appear more than 10 times on each band.

There is a penalty of three times the value of the *Station Heard* for duplicating logging, one point for *station worked*.
POINTS: Stations in SWL's own continent — one point. Stations outside own continent — two points.
MULTIPLIER: Each different prefix heard on each band.
FINAL SCORE: Total points from all bands, times the total prefixes on all bands.
AWARDS: Certificates to the top five and the first in each country with a reasonable score. Also, the top YL and multi-station.

Include a summary sheet showing the scoring, alphabetical list of prefixes on each band, and the usual signed declaration that the rules and regulations have been observed with your entry.

Entries must be postmarked no later than four weeks after the end of each contest. They go to: Marc Domen, ONL 6945, Gebrm Blommestraat 14, B-2200, Antwerpen (Borgerhout), Belgium.

ROSS HULL VHF/UHF MEMORIAL CONTEST 1986 — Results
THE ROSS HULL TROPHY STAYS IN VK3

Congratulations go to Les VK3ZBJ, on yet another effort to come out as top scorer in this contest. I had the pleasure of a short visit from Les when he was in Adelaide during last year to watch the Adelaide Grand Prix. Needless to say the Ross Hull Contest was one of our main topics of conversation. It certainly seems that Les has the game sewn up as far as VHF is concerned. I know that he has always been very keen on anything to do with the higher frequencies for many years. Les has also made his contribution in other ways with the many articles he has had published in the past. So, once again Les, our heartiest congratulations. Maybe you could write an article for *Amateur Radio* describing some of your VHF experiences. I am sure that it would make very interesting reading to many and not just VHFers either.

Results of the contest, listed in order of call area are:

CALL SIGN (VK)	7 DAY (Points)	2 DAY (Points)
2YVU*	212	77
2AAK	189	77
2TR	18	18
2BQS	18	6
2XCI	5	5
2BY	Check Log	Check Log
NATIONAL WINNER		
3ZBJ*	1870	529
TWO DAY CERTIFICATE WINNER		
3AUU	835	333*
3AUG	674	—
3YRP	614	202
3VF	401	179
3ZXY	364	145
4TKA*	156	25
4FXZ	106	77
4FXZ/7	25	14
5NC*	1128	395
5LP	592	216
5AAS	—	4
8ZLX*	647	319

* indicates certificate winner

You will see that there were only 19 logs submitted for the Ross Hull Contest. This is a very disappointing result, particularly when you consider the very wide publicity the contest received both in my column and the VHF/UHF column, written by Eric VK5LP As well as information and encouragement appearing in these columns, other publicity was provided both by discussion and the written word in various ways.

I firmly believe that there is not enough real interest in this contest to warrant it continuing in its present form and, unless I am convinced otherwise between now and the Federal Convention, my report to the Federal Council will contain opinion to that effect.

It is not enough that "lip service" be paid. I have endeavoured for several years now to try and bring some life back into the Ross Hull Contest, all to no avail.

I would suggest that it is pretty pointless for the WIA Federal Contest Manager to have to organise and run a national contest when there is so obviously practically no demand for same.

Let me provide the following evidence.

Only one Division has had either the courtesy, or interest, to reply to the discussion paper I sent to all Divisions concerning the matter of *VHF/UHF Aspects of Contests*, that was sent out in late May 1986.

I published a copy of the same discussion paper in the August 1986 issue of the magazine. There has been no more than two letters received on the subject by me.

The measure of interest in a contest can only be determined by the number of entries received by the contest manager.

The total of 19 entries in the 1986 contest can be considered as a measure of interest on the following basis:

There are 2960 Limited Licensees in Australia. These, one would expect, to be interested mainly in VHF. There are 1169 operators with Combined (Limited/Novice) Licenses. That makes a total of 4129.

If you assumed that just 20 percent of Full Call operators had some VHF equipment capable of operating (and I would believe the percentage in this category to actually be much larger), the figure here would be 1848. Thus, the Grand Total of operators in Australia with VHF capability would be 5977.

The figure of 19 operators entering the contest represents 0.32 percent of the total figure quoted.

Would you think that a contest would be worthwhile running under these conditions? ? ?

Over to You!

A number of the 19 contestants in the Ross Hull Contest remarked in their letters that they were entering with the intention to try and show that there is interest in the contest. I appreciate their interest, however they were certainly not backed up by the majority.

I again refer you to my discussion paper, wherein I have suggested that an alternative to the present approach to the contest could be to have an exclusive VHF Field Day Contest. I can remember back in the days of the VK5 VHF Group that such an event on a local basis was well patronised.

I again hasten to assure you that I have nothing against VHF etc, however, I sincerely believe that the present approach is a waste of the Contest Manager's time and virtually an affront to him.

I would not wish to conclude my comment on the 1986 Ross Hull Contest without providing a special mention regarding the entry of Noel VK3AUG. Noel tried exceptionally hard in the contest using only *one band*. Surely an effort worthy of great merit. You will undoubtedly realise the value of this effort when I tell you that Noel is really one of the "Older" of the "Old Timers", and

I know that he will not mind me describing him in such terms, as they are meant as an expression of respect. Noel is aged 74 and a half years and obtained his AOCP in 1937 with the call sign of VK3UG, which was changed after World War II to VK3AUG. It is certainly a pity there are not more like Noel about, who would go to some lengths to try and support a contest by participation in an effort to try and ensure its continued presence. Good on you Noel!

GENERAL COMMENT

I have still not completely sorted out the matter of all the certificates outstanding at this stage. This is one of those tasks which I have tended to put aside in favour of more urgent work, however I realise that to the recipients it is of some importance. Rest assured still that you have not been forgotten and that this aspect of the contest manager's work will very soon be brought right up to date.

I recently received a copy of the listing of all International Contests together with the modes applicable and the dates for 1987, 88 and 89. These have been compiled by the International Amateur Radio Union (IARU) and refer only to contests originated and sponsored by member societies of the Union. (See March AR for the IARU Contest Table). Taking these into account indicates that for each year, there are 35 contests for CW operators, 23 for Phone and only one for RTTY operation. This however, makes a total of 59 contests held on 48 weekends. On top of this there are all the other contests organised by magazines, such as *CQ* and *73*, together with the multitude of events run by local Divisions and various private clubs, etc. No wonder that at times it is claimed that there are too many contests.

JOHN MOYLE MEMORIAL FIELD DAY CONTEST

I do not understand just what happened in connection with the published rules for the Field Day Contest, however a couple of items within the rules were somehow missed in the final listing.

Whilst it is a little too late to do anything about this situation for this year, I will include the missing portions in these notes. At least, that way there will be a more or less permanent record of them and the next FCM may see fit to add them to next year's rules. The missing portions are in connection with New Zealand stations operating portable in the ZL Field Day Contest. Details are as follows:

To be added to Rule 9. Number Exchange.
"*One Exception* exists in connection with Rule 9. Where contact takes place with a Field Day Station which is operating in the NZART Field Day Contest, the Serial Number Received will be as transmitted by the ZL station according to the rules under which that station is operating in the ZL Field Day; (eg RST/Branch No, etc)."
Rule 10, Scoring should be amended to read as follows:
"For Portable Field Stations — Contacts Outside Australia.
(G) Contacts with ZL Field Day Stations — 20 points.
(H) Contacts with other overseas stations — 2 points."

These changes to the rules acknowledge the value of contact with other stations in the field and bring the points score for such contacts properly in line with the general approach to scoring in this contest.

It would appear, following perusal of my copy of the material provided for the February issue, that somehow the typesetter for the magazine had worked from a copy of the 1986 rules. The "Contest Disqualification Criteria" referred to should have been those printed in the 1986 August issue of the magazine and not the 1985 issue as quoted. Mind you, I can understand the possibility of such mistakes as the rules for both 1986 and 1987 are almost identical and it could have been convenient to refer to the earlier printed set of rules to assist in making up the layout for the magazine.

By and large there have been very few problems of this nature over the years and considering that a large amount of the work done for *Amateur Radio* magazine is on a voluntary basis I cannot but help admire those who work together to produce such a good magazine for us each month. The Editor and all his helpers and others involved in the production certainly deserve our congratulations on their continued efforts.

REMEMBRANCE DAY CONTEST SCORING

Recently I received a copy of an article written by Colwyn Low VK5UE, on the subject of Remembrance Day Contest Scoring. I would expect that this article would have been published by now and I commend it to your attention. Colwyn forwarded an advance copy of his article to each of the Divisions in his attempt to start some further thinking on the subject.

In his article, Colwyn has addressed one of the main points which has concerned my regarding the scoring method used, that being the cancelling out of the number of contestants from each State when the formula is applied. I have been at pains to try and show that this approach was effectively removing the participation aspect from the contest results.

Now, Colwyn is a professional engineer with a keen appreciation of mathematics, in fact, way above my head, thus I both respect his opinion and also must admit to some pleasure at the fact that he seems to agree with my thinking on the subject.

This then is another matter which I intend to bring up in my report to the Federal Convention.

Undoubtedly, the matter of Remembrance Day Contest scoring is always a vexing question. I do find it interesting however, to see just what differences in results can occur by the manipulation of the various formulas.

Well, perhaps I had best begin working on the Federal Convention Report and finish off the notes for this month. I trust that you continue to enjoy your hobby, particularly contesting. It certainly seems that propagation is improving which augers well for contesting and DXing on the HF bands.

—73 until next month, de Ian VK5QX

The following contest may be of interest to VHF/UHF readers. If you are visiting the Northern Hemisphere in July, take some VHF/UHF equipment.

THE THIRD ANNUAL CQ WORLD-WIDE VHF WPX CONTEST

STARTS: 0000 UTC Saturday, July 18, 1987.
ENDS: 2400 UTC Sunday, July 19, 1987.
CONTEST PERIOD: 48 hours for all stations, single or multi-operator. Operate any portion of the contest period you wish.
OBJECTIVES: are for amateurs around the world to contact as many amateurs as possible in the allotted 48-hour period, to promote VHF/UHF activity, to allow VHFers the opportunity to experience the enhanced propagation available at this time of year, and for interested amateurs to collect VHF prefixes for award credit.
BANDS: 50, 70, 144, 220, 432, 902 and 1296 MHz bands may be used, as authorised by local law and license class.
TYPE OF COMPETITION: 1. Single operator — (a) all band; (b) single band; (c) all band, low power; (d) single band, low power. 2. Multi-operator — (a) all band; (b) single band. 3. Portable (with temporary power source only). 4. FM only. The "portable" category is for single or multi-operator stations. Low power is defined as 30 watts PEP output or less. Stations may select one category of competition only. All transmitters must be located within a 500 metre diameter, or within the property limits of the station licensee's address, whichever is greater. The antennas must be physically connected by wires to the transmitters.
EXCHANGE: Call sign and "Maidenhead" locator grid square (four digits, eg FN20). Signal reports are optional and need not be included in the log entry.
SCORING: One point per QSO on 50, 70 and 144 MHz; two points per QSO on 220 and 432 MHz, four points per QSO on 902 and 1296 MHz. Work stations once per band, regardless of mode. Multiply total QSO points times the total number of prefixes (PX) worked. *This differs from the scoring for the CQ HF WW WPX Contest, where a prefix counts only once regardless of band.*

Example: W1XX works stations as follows:
37 QSOs and 12 PXs on 50 MHz
45 QSOs and 18 PXs on 144 MHz
26 QSOs and 10 PXs on 220 MHz
38 QSOs and 11 PXs on 432 MHz
6 QSOs and 3 PXs on 1296 MHz
W1XX's total score is: 232 QSO points X 54 PXs = 12636.

MULTIPLIERS: The multiplier is the number of prefixes worked, additive on a band-to-band basis. A prefix is considered to be the three letter/number combination which forms the first part of an amateur radio call sign. A station in a call area different than that indicated by his call sign is required to sign portable. This applies even for home stations; eg WB2OTK is required to sign /4 for contest purposes only. In all cases, the portable prefix is the multiplier.

Example: NV6O/2 counts as NV2; KT2B/VE3 counts as VE3, etc. Special event, commemorative and other unique prefix stations are encouraged to participate.

A station who changes location during the course of the contest is free to contact as many other stations as he wishes; however, the moving station counts as only one QSO and PX unless he changes call areas during the course of operation, in which case his prefix changes by definition, thus becoming a new QSO and PX. Example: K2SMN operates from the NJ/PA border; he may be counted as K2SMN for one QSO and one PX (K2) by all those he contacts from NJ. He may be counted as K2SMN/3 for one QSO and one PX (K3) by all those he contacts from PA, including stations previously worked from NJ. Changing "grid squares" does not justify a new contact.
AWARDS: Many will be awarded to top-scoring stations. (In 1985, 24 different trophies were awarded in eight categories spanning three major geographic areas).
LOGS: Must be postmarked no later than August 31, 1987 to be eligible for awards. Logs should be mailed to the CQ VHF WPX Contest, c/o SCORE, PO Box 1161, Denville, NJ 07834, or to CQ Magazine, 76 N Broadway, Hicksville, NY 11801.

—Contributed by Peter Putman KT2B, CQ VHF WPX Committee Co-Chairman

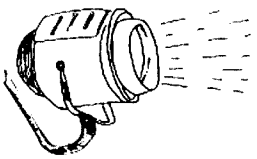
HAZARD "BUZ" REEVES K2GL (SK)

ELECTRONICS PIONEER "Buz" Reeves K2GL, 80, died suddenly on December 23, 1986. Buz founded numerous companies, the best known of which was Cinerama, which created the cinematic sensation of the 50s by the same name. Cinerama also developed stereo magnetic recording film. During the 70s, this company received two Academy Awards for these technical developments. The X-ray cutting process developed by another one of his companies to turn-out perfect crystals is responsible for today's numerous quartz crystal uses. Because of the importance of these crystals to communications during World War II, the company was awarded several citations by the military.

Buz assembled one of the top amateur radio stations in the world. At the time of his death, the station consisted of 12 operating positions, each using Kenwood 940s and Alpha 77 or Henry 3K linears. The antenna farm consisted of over a dozen towers, most 30 to 60 metres tall with several dozen beams and quads. Over the years the station has used the call signs K2GL, K2GM, WA2ZAA and, most recently, N2AA. The station has won top honours in the multi-operator, multi-transmitter category of the major international contests such as the ARRL DX and CQ WW DX Contests.

He was a strong ARRL supporter and a frequent benefactor of the ARRL Foundation. It was his initial pledge of $10 000 which caused the Goldwater Scholarship Fund to be created.

—From *The ARRL Letter* January 13, 1987



Spotlight on SWLing

Robin Harwood VK7RH
52 Connaught Crescent, West Launceston, Tas. 7250

Recently, I was involved with the Australian — Vanuatu Emergency and Traffic Net, which was activated very rapidly after it had become apparent that Vanuatu had been completely devastated by a cyclone. Communications were in disarray and amateur radio provided a vital link in relaying health and welfare messages.

Sam Voron VK2BVS, quickly organised a network of amateurs in Australia and the South Pacific, to continuously monitor 14.307 MHz to assist the Vanuatu amateurs. At deadline time, the net is still operational, but is scaling down as other communications become available. Out of this disaster has come temporary third party agreements with both Vanuatu and the Solomon Islands.

Already this year, we have had several cyclones in the Cook Islands, on the Futuna Islands, Fiji and now Vanuatu. Last year, the Solomon Islands and Tonga were hit. This has certainly highlighted the need for an emergency channel for third party traffic within the South Pacific. Because most South Pacific nations cannot afford expensive satellite communication systems, there will be a continuing need for HF communications. Will the channel of 14.307 MHz continue to be it? Time alone will tell. The Pacific Maritime Mobile Net is close by on 14.314 MHz around 0430 UTC, so it is close by to maintain liaison.

Incidentally, if you wish to monitor Pacific HF broadcast channels, there are a few easily heard in Australia. Radio Noumea, in New Caledonia has been well heard for over 30 years now, on 7.170 MHz from 0700 UTC until 1100 UTC. It is in French, naturally. Other channels in use are 3.345 MHz and 666 kHz. Radio Vanuatu has been heard on 3.945 MHz from around 0730 UTC onwards. It was also on 7.260 MHz, but this has not been heard since the cyclone, yet could be operational again at anytime. The Solomon Islands is on 5.020 MHz around 0630 UTC onwards. I have also occasionally heard them on 9.545 MHz in our local daytime and they sign-off that channel at 0730 UTC. Their MW channel of 1.125 MHz is a clear channel here in Australia and I have heard it once.

The final Pacific HF broadcaster is RFO Papaetee, in Tahiti. This is well heard in eastern Australia on 15.170 MHz. I hear it from 2300 UTC until 0730. The station is in French but there are programs in Polynesian. It is also on 6.135 and 11.860 MHz. Incidentally, the frequency varies slightly from day to day. All of the above do QSL, but appreciate International Reply Coupons (IRCs).

I have not included the Papua-Nuigini station that also operates on HF, because they require additional information, that I have not room for. They operate between 3.200 and 3.400 MHz and are provincial stations. The national station on 4.890 MHz from Port Moresby has provided a good signal in our local evening hours.

And, while we are on tropical bands, I was recently in conversation with a couple of VK4s who have come down to study at the Australian Maritime College. They have told me that the constant atmospheric static crashes render the lower HF channels unusable during the summer months. That is why the users gravitate to higher frequencies. It also explains why there are few MW stations in tropical areas. This problem has been recognised ever since broadcasting commenced, and allocations were made for broadcasting within tropical areas. These are 2.300 to 2.495 MHz, 3.200 to 3.400 MHz and 4.700 to 5.100 MHz. You will find many broadcasters within these allocations, generally low-powered.

There has been an increasing trend for international broadcasters to transmit within the 60 metre tropical band (4.700 to 5.100 MHz). These bands were largely reserved for local domestic broadcasting. Radio Moscow, Radio Beijing and Radio Pyongyang have been heard here with external programming.

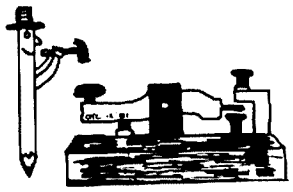
The band 3.900 to 4.100 MHz is also a broadcasting band within tropical areas and also in Europe. That is why many European broadcasters are heard, such as the BBC, Radio France International and Swiss Radio International. In North and South America, this band is reserved for either amateurs or utility services, so it is unusual to hear Latin Americans on this band.

An unusual broadcasting event took place on Sunday, January 25. Two international broadcasters conducted a joint program, linking up from their respective studios by satellite. Radio Australia and Radio Japan linked up for an hour from 0800 to 0900 UTC in English. At that time, Tokyo was broadcasting to Australasia on 15.235 and 11.860 MHz and Radio Australia was on a number of channels, including 9.710 MHz to Japan. The program was in English and it was jointly hosted in Melbourne and Tokyo. Radio Australia had a hiccup at the start, when they briefly lost the satellite feed from Tokyo, but this was quickly restored.

Audio quality was excellent and I found it interesting to compare both Radio Japan and RA for signal strength. A special QSL card was issued by both broadcasters to commemorate this joint broadcast. Could this mean an exchange agreement of transmitter time, similar to that between Radio Japan and Radio Canada International? Only time will tell.

Well, that is all for this month. Until the next time, the very best of 73 and good listening!

—Robin VK7RH



Pounding Brass

Gilbert Griffith VK3CGG
7 Church Street, Bright, Vic. 3741.

MORSE OUT TCW IN!!!

All groups involved in CW (Morse) transmissions are in the process of being consulted regarding the imminent introduction of one of two new modes of transmission.

A recent letter from the International Secretary for Morse Standards, Mr Esle Roesrom, states that, "At the January Conference on Communication, it was decided to introduce one of the two new modes after the appropriate consultation with the main users.

"Although amateurs represent only a small fraction of the user groups, your recommendation and/or preferences are being sought in this matter."

It is estimated that a general speed increase of 50 to 100 percent will be achieved with the new mode, bringing CW out of the past and back into the present and allowing competition with Baudot, ASCII, etc, and the speed of a competent user should far exceed voice transmissions.

Expected licence test speeds are to be at 10 and 20 words per minute in place of the five and 10 words per minute at present, so writing quickly and clearly will become an important aspect of the examinations.

In many people's minds, this will be a great step forward as there are enough people getting through examinations these days by merely ticking the boxes and trusting to luck.

Here is a brief run-down on the proposed modes.

Mode 1 — TCW (triambic carrier wave)
To consist of three different duration bursts of carrier of one dot length, two dot lengths and three dot lengths, with the usual letter and word spacing. It is generally agreed that the saving in time and speed increases of 50 percent or so will more than offset the slightly more difficult learning process. There will be 39 characters of three units or less each. See Table.

Mode 2 — FSTCW (frequency shift tone CW)
This will consist of up to three equal length dots or carrier bursts which, when centred on a tone of 750 Hz (main carrier) will provide a high tone of 800 Hz and a low tone of 700 Hz. There are 27 characters available in three tone bursts alone. I have drawn up a table of the proposed characters with the key for both modes 1 and 2.

Mr Roesrom suggests that "the most likely outcome will be in favour of mode 2, (FSTCW) because of the narrow bandwidth, the necessity of being on the exact frequency and the musical quality of the transmission."

Evidently, the decisions on the character code itself took up three weeks of the conference in order to stop the generation of popular songs by using the appropriate characters. (Hi Hi).

On air tests suggest that, "this mode (2) is especially good at cutting through static and QRM, etc." Having heard both modes on tape, I agree entirely. An enclosed file of letters from the "big three" indicate that Mode 2 equipment is in the pre-production stage at the present time. These will be single mode, multi-band rigs without the useless extras such as microphones, speech compressors, ALC, etc, etc so their price will be attractive. They will also feature in-built TCW/FSTCW generators and the new design paddles so there will not be any need for all those wires on the desk.

That is all the information I have at the moment, so if you wish to comment, I am prepared to collect all mail and direct it to the Secretary by June 1. Please address all mail as follows:
New Mode CW, c/- Gil Griffith VK3CGG, 7 Church Street, Bright, Vic. 3741.
to arrive no later than June 1.

I will answer any questions and keep you informed in next month's column.

.— .——. .—. .. .—..
..—. .—— ——— .—..
.. .o— —— o o..
.o ooo ooo o..

You may recall back in December AR, a reference to *Morsum Magnificat.* Marshall has sent me a first edition to peruse. If you are a Morse addict I suggest you take advantage of this new publication. It features 15 or so articles in 50 pages and makes interesting and entertaining reading. The editors are looking for your articles as well, so any stories, anecdotes or circuits would help. Simply send an International Bank Draft for $A13 to Tony Smith G4FAI, 1 Tash Place, New Southgate, London, N11 1PA, England.

Here is a brief excerpt from a short article by Keith Crittenden G0CGB:

"... It wouldn't matter what I said , I had already told him I was going QRT, so he wouldn't expect me to reply. At last he signed off, but what's this I hear? Another signal. What are they saying? They are calling me, someone's tail-ending my contact. I'm not ready for a second bout tonight ... help!

"There followed a most ridiculous QSO. It took all my concentration just to copy down the Morse, leaving none of my brain free to actually read what I was writing. I became totally panic-stricken and, reading from my crib- sheet, told my contact I was having trouble with the receiver, and had to go QRT ..."

I wonder how many of us remember those heady days of cold sweat and fear ...?

The other day, I just happened to be tuning around 80 metres on the QRP home-brew that I sometimes keep at work when, in walks a fairly regular customer who usually parks his car in front of my shop around 4.30 pm whilst visiting the supermarket next door.

He seemed to be understanding the Morse pretty well, (most people say. "Is that Morse code?") so we got to talking and it appears, that during the war, he used to copy code for an intelligence department. Not only International Morse though! He used special typewriters to copy Russian AND Japanese codes! Anyway, I will try to extract a story out of him and see what I can come up with for the column in the near future.

After mentioning the "Beast" last month, I came across another coincidence while reading this months' AR. Ivan Huser's *Touch Keyer.* An easy circuit to build, especially if you have already built the accu keyer, so I will be adding Ivan's front end to mine very shortly.

Speaking of accu keyers, there are a number of modification going around the traps which are useful for cleaning up the timing and adding some speed to the basic version. (EA, March 1978). My keyer runs okay on 12 volts with only a couple of modifications to increase the speed but many operators use six volts with all the modifications and have a really great signal. I will present a list next month. Meanwhile, if you want to build one, the paddle is still available in New Zealand, and the board can be bought from RCS, in Sydney.

I believe the Curtis 8044 series chip is available, as I wrote for specifications last year, but as far as I know, no one imports it. If you know of an Australian distributor, please let me know. Otherwise, I will find out about ordering direct. (Check the *ARRL Handbook,* page 29- 2, 1986 edition).

Are you ambidextrous? Can you send Morse with either hand?

If so, I need your help. I am sick of scrabbling for a dropped pen and trying to write at the same time as send. I want to learn to send with my left hand, too. I feel it would be great for contesting, and for writing out that word which just won't come "off the top". Today I am putting a polarity switch into my paddle, so that the dots come off the left thumb — let us hope I am on the right track!

How about an award? Let us say 50 contacts before the end of the year, by your wrong hand (or foot) and a log insert signed by another couple of amateurs to the effect that they feel you are honest, and that they have seen you send with both hands. Speed is unimportant, so I will see you on the air.

... 28 for this month.

—Gil.
ar

Table 1.

KEY

MODE 1:

. dot
o dah (two dot lengths)
- dash (three dot lengths

MODE 2:

. 700 Hz or - 50 Hz. One dot length
o 750 Hz or 0 Hz. One dot length
- 800 Hz or +50 Hz. One dot length

A	..	T	—
B	o—	U	.—
C	.oo	V	..o
D	—o	W	.o.
E	.	X	o.o
F	.o	Y	oo.
G	..—	Z	o.—
H	—.	1	—..
I	o	2	—.—
J	.— —	3	— —.
K	.—.	4	—o.
L	o..	5	—.o
M	oo	6	—oo
N	o.	7	—o—
O	ooo	8	— —o
P	.o—	9	— — —
Q	.—o	0	o—.
R	——	?	oo—
S	...		o—o

IMMORTAL WORDS OF ADVICE

BEWARE of the lightning that lurks in an undischarged capacitor, lest it cause thee to be bounced on thy buttocks in a most ungentlemanly manner.

CAUSE thou the switch that supplies large quantities of juice to be opened and thus tagged, so thy days may be long on this earthly vale of tears.

PROVE to thyself that all circuits that radiate and upon which thou work are grounded, lest they lift thee to high frequency potential and cause thee to radiate also.

TAKE care that thou use the proper method when thou take the measure of high-voltage circuits so that thou do not incinerate both thee and the meter; for verily, thou hath no account number and can easily be replaced, the meter does have one, and as a consequence, brings much woe to the supply department.

TARRY not among those who engage in intentional shocks, for they are surely non-believers and are not long for this world.

TAKE care thou tamer not with Interlocks and safety devices, for this will incur the wrath of thy seniors and bring the fury of the safety officer down about thy head and shoulders.

VERILY, I say unto thee, never service high-voltage equipment alone, for electric cooking is a slothful process, and thou might sizzle in thy own fat for hours before thy Maker sees fit to drag thee into His fold.

—From *Collector and Emitter* November 1986

Sydney Amateur Digital Communications Group AX25-X3 Protocol for use in Amateur Packet Radio

Part 1: OVERVIEW

Steven Blanche VK2KFJ
Secretary, SADCG
PO Box 231, French's Forest, NSW. 2086

THIS ARTICLE IS based on the SADCG AX25 protocol instruction manual for the Vancouver Amateur Digital Communications Group (VADCG) Terminal Node Controller (TNC), I have used the relevant information, to provide guidelines for individuals wishing to write their own packet software. The X.3 parameters were first used in the Vancouver V2 protocol, by the VADCG and are now adapted by the SADCG to work with the AX25 protocol.

The X.3 parameters where implemented into the AX25 protocol, as the SADCG felt that it would be better to use an international standard, this being the CCITT X.3 Recommendation for Terminal Interfaces, or otherwise known as CCITT X.3 Terminal Interface Protocol (X.3 TIP). This would make it easy to use, for amateurs already involved in the telecommunications industry, plus allow easy adaption of commercial packet software.

The X.3 parameters used in amateur radio is sometimes referred to as the AX.3 parameters or AX.3 TIP The SADCG AX25 software for the VADCG TNC is broken into three sections: AX25 Link Interface Program (LIP), AX25 Network Interface Program (NIP) and AX25 Terminal Interface Program (TIP).

COMMAND STRUCTURE

The command structure is based on the CCITT X.3 standard for tailoring the interface between a terminal and a digital data network node controller (in this case, your TNC). X.3 parameters typically control the insertion of line-feed characters, setting an idle timer and controlling the flow of data between the TNC and the terminal. There are some additional commands which are specific to the amateur packet radio situation and not within the scope of the X.3 standard. These commands allow the user to link and unlink from other stations, to select another packet radio protocol, or to enter a monitor program in the Master Control Subsystem.

To issue a command, place the TNC into command mode by typing the Command Escape Character (usually an ASCII Escape) defined by X.3 parameter 1. The use of a '*' (asterisk) indicates that the TNC is in command mode. If there is still data in the terminal buffer to be transmitted when the Escape character is typed, that data will be placed into a packet and transmitted automatically. Note that the TNC will not respond to the Escape character if X.3 parameter 1 is set to 0 (see the TRansparent command if you wish all characters entered at the keyboard to be transmitted). If you wish to send the Command Escape Character during normal "conversation ," type it twice and It will be sent once.

The format of a command is:

<ESCHAR> <command> <operand > <CR>
where:
<ESCHAR> is the current Command Escape Character (X.3 parameter 1) which defaults to ESCAPE (ESC) in distribution versions. This will place the TNC into command mode (if allowed by parameter 1).
<command> is a command from the table following.
<operand > is the data to be used by the command, if required (see below). Some commands have no operands and others require one or more.

For example, to set the call sign of the station to VK2ABC, type:

<ESC>CA VK2ABC<CR>

Note: The angle brackets < and > are used to enclose a single character for visual purposes only. You do not type them, just the single character defined within them. For instance, <CR> means you press the carriage return key, not <, then carnage return, then >.

No spaces are allowed between the <DCCHAR> and the command. At least one space is required to separate the command from an operand (if an operand Is required), and there should be no trailing spaces after an operand. The command is required to be at least two characters long, but may be longer. For example, CO, CON, or CONNECT will all do the same thing. The commands may be typed in upper, lower or mixed case. Input is converted to upper case in the command processor. Characters entered for transmission will not be converted to upper case. The maximum length of a command line is 80 characters.

During command entry, use the editing characters (parameters 15 to 19) to correct errors. TNC will sound the bell in your terminal (assuming you have one!) if you try to back up too far. The bell will also sound in case of an invalid command or operand.

The available commands follow. Note that the minimum command Is given by two capital letters. In some cases these are not the first two letters of the command.

Commands labelled as not yet implemented are planned for the near future. They are accepted as valid commands by the TNC, but have no effect.

Note: Call signs are all six characters in length. If your call sign Is less than six characters, enough trailing spaces will be added to make it up to six. If a station has more than one TNC with the same basic call sign, the call sign may be followed by a minus sign (-) and a Secondary Station Identifier (SSID) number which may take values from 0 to 15. If your call sign is six characters long, the minus sign before the SSID is optional. If no SSID is specified, a default value of 0 will be assumed. Example call signs: VK2ABC, VK2ABC-1, VK2AB, VK2AB-10.

CO COnnect <call sign><CR>
Leave monitor mode and attempt to link to the station with the specified call sign.

CO COnnect <call sign>rpt1 rpt2 .. rptn<CR>
Leave monitor mode and attempt to link to the station with the specified call sign using the digipeaters whose call signs are specified in the "rpt" positions. Your transmissions will be repeated first by the call sign in the "rpt1" position followed by "rpt2" and so on up to a maximum of eight repeaters.
For those who are used to the TAPR connect command, the following format is also supported.
COnnect <call sign > via rpt1 rpt2 .. rptn.

DI Disconnect <CR> Performs the reverse function of COnnect. Causes the TNC to unlink from the link partner and return to monitor mode. This command takes no operands and is in error if a link is not established.

CA CAll sign <call sign><CR> Set the call sign of this node. Useful for changing the call sign of a borrowed TNC without burning new EPROMS. Operand must be one to seven characters, and will be converted to upper case. The default call sign is In the MASTER EPROM.

IN INitialise<CR> Passes control back to the MASTER which displays the protocol selection menu. This is the same as hitting the RESET switch on the front panel except that the MASTER does not require an AUTOBAUD sequence. No operand required. Use this command to change from one protocol to another.

AB ABort<CR> Acts the same as the INitiallse command. Will be changed at a later date. No operan:l required.

MO MOnitor<CR> The monitor in the MASTER is entered. You may use the monitor and then return to AX25 protocol without losing present status. This cpmmand is mainly used during software development, but It also allows the user to view the various buffers in the TNC. This command does the same as hitting the TRAP switch except that no AUTOBAUD sequence is required. No operand. See the Master Control Subsystem Manual for more details.

MM Monitor Mode<CR> This is for a planned facility which has not been implemented as yet.

TR TRansparent <option><CR> Places the TNC in the selected transparent mode. Once the TNC is transparent, all data sent to it is transmitted (including eight bit data). The option selects the method of exciting from transparent mode.
Option = 0 (or absent) — you must generate a "break" from the keyboard. The TNC will be returned to command mode. Alternatively, press the TRAP or RESET buttons on the TNC.
Option = 1 — generate a break or the following conditions must be met.
1. Wait until the TNC has no more data to send (the TNC is idle).
2. Send three Command Escape Characters before the idle timer times out (the default allows about one second maximum between each character). The Command Escape Character used should be the one that was in effect before the TR command was given (default is ESC).

SE SEt <decimal parameter #> <decimal value #><CR> Set X.3 parameter values. This command is used to set parameters which tailor the way the TNC communicates with the terminal or computer, as well as the way the LIP (datalink) and NIP (network) programs function. The default values of these parameters and their function is described in a later section of the manual. The operands may be a list of parameter reference numbers and corresponding values each separated by a space.

PA PAr? <decimal parameter #><CR> Display the current value of the specified parameter. The operand may be a list of parameter numbers each separated by a space.

ST ST <decimal parameter #> <decimal value #><CR> Set X.3 parameter values used during transparent mode. This allows optimisation of TNC parameters used during transparent operation. As transparency is implemented by using this special set of parameters, this command

should be used with care, especially with parameters 1 to 3, 5 to 10, 12 to 15, 19 to 22.

PT PT <decimal parameter # > <CR> Display the current value of the specified transparent mode parameters.

MESSAGES

AX25 LIP 053186 AX25 NIP 053186 AX25 TIP 053186

This is the initial logon message which should be displayed on the terminal when the AX25 protocol is selected from the MASTER menu. The numbers represent the date when the software was last changed.

This is the prompt character which indicates the TNC is in command mode. The '*' prompt will only appear if command mode is permitted and prompt signals are allowed. See X.3 parameter numbers one and six.

<CALLSIGN> linked
This service message indicates that a link has been established with the call sign displayed.

(CALLSIGN) linked via rpt1, rpt2 etc
This service message indicates that a link has been established and shows the digipeater path. The digi call signs are displayed after all messages where applicable.

<CALLSIGN> unlinked
This message appears after a Disconnect command has been acted upon.

(CALLSIGN) busy
This appears when the station called is already connected to another.

<CALLSIGN> endlink
This message appears when a DISC (disconnect) frame is received from a linked node and indicates that the link is terminated. It means that the link was terminated from the other end.

<CALLSIGN> no contact
This message appears after a selected number of time-outs have occurred and the network layer has decided that communication with the other node is impossible. The link is not established.

<CALLSIGN> unknown
This message indicates that an unknown link status code has been received from the datalink layer (LIP). This indicates a software error of some kind and its occurrence should be reported to the software developer.

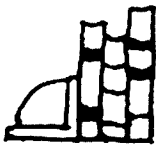
PAR <xx:yy>
This is a response to the 'PAR?' or 'PT' command and means that parameter xx is currently yy.

PAR <xx:INV>
This is a response to the 'PAR?' or 'PT' command and means that parameter xx does not exist.

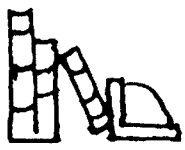
ERROR
This message occurs when an unknown or incorrectly formatted command is entered, a parameter value is invalid or the command is not permitted at this time. Note that this message also rings the terminal bell (if you have one!).

PAGE
This message indicates that terminal output has been paused according to parameter 22 (Page Wait). After reading the page of output, type a control Q (XON character) and terminal output will resume.

ar



Book Review



ALL ABOUT VERTICAL ANTENNAS

by W Orr and S Cowan

Published by Radio Publications

Gil Sones VK3AUI
30 Moore Street, Box Hill South, Vic. 3128

This book covers all aspects of vertical antennae. Both theory and practice are covered in a most readable form. The performance of vertical aerials is discussed together with how to optimise performance. Construction of simple and complex aerials is discussed. There are many helpful tips for the practical realisation of designs.

The importance of earthing to vertical aerial performance is explored and various forms of earthing, both actual and virtual are described. Ways of improving and optimising grounding are shown — a most important topic for a vertical aerial.

Single, multiband and wideband designs, ranging from modest to elaborate aerials, are discussed.

Vertical arrays are discussed and several designs are given for directional arrays. Performance of these designs is also discussed.

Practical designs of both modest simple aerials and quite elaborate arrays are given. These include helpful constructional information, together with tune-up information.

The performance and characteristics of vertical aerials is explored.

Whether you are erecting a converted CB aerial or an elaborate array, this book has the information you need. Another excellent publication for Bill Orr and Stuart Cowan.

ar

Australian Ladies Amateur Radio Association

Joy Collis VK2EBX
PUBLICITY OFFICER, ALARA
Box 22, Yeoval, NSW. 2868

I often hear people say; "Yes, I am interested in amateur radio, but I am too old to study for it now" or "I didn't have a very good education, so I couldn't pass the examinations" or even (horrors!) "But it is really a man's hobby, isn't it?"

I recently received a letter from a lady who refutes each of these arguments — Margaret VK2MV. We will let Margaret tell it her way:

"In 1973, at the age of 63, I broke my ankle and was forced to leave lovely Forster, where we had retired to a very steep, elevated position at Bennett's Head.

"Lester VK2KT, my OM, had been an amateur radio operator since 1927, (OZ3CL, later ZL3CL).

"My injury altered our plans dramatically, I had to move to level ground to become mobile again.

"There was a basic electronics course at Taree Technical School in 1977. As I was unable to play sport, I joined. Having had only 15 months at High School, I knew I had little chance of passing the necessary examinations. However, perseverance "paid off" and in 1978 I received "The Big Brown Envelope" in the mail. *I was a Novice*. There was no holding me now. After another one and a half years of study I received my Full Call, VK2DQG, later VK2MV. No words can describe "that day" — my 70th birthday.

"I am telling you this because I wish to encourage those of us who are not "well educated" to "give it a go!" This very special hobby is well worth the effort. Opens up a new world and brings many wonderful friends. Not to mention, opportunities for those who persevere with it.

So go 'TUIT"'.

Margaret's letter says it all!

LIZ ZANDONINI W3CDQ

While on the subject of age and amateur radio, congratulations are due to Liz W3CQD, who recently completed 64 years "on air." Liz, who is 88 years young, is ALARA's oldest member, and still active on CW.

Liz took a national radio course early in World War I, hoping to become a ship operator, and received her commercial licence in 1917. Instead of going to sea, however, she found herself teaching code to hospitalised veterans at Fort Meade and Fort McHenry.

In 1921, she went to work for the Bureau of Statistics, the only woman among the 21 personnel of its radio section. Her work included taking measurements, winding coils, making receivers, testing things and translating radio items from foreign magazines. She also assisted with the publication of *How to Build a Crystal Set from an Oatmeal Box*, which sold 20 000 copies.

In 1922, Liz obtained an amateur licence, and built her first receiver and transmitter (one stage, five watts). She is strictly a CW operator, using her 1922 hand key. She has a two metre hand-held, but rarely uses it.

As she lives in an area where outdoor antennas are prohibited, she uses a 66 foot (20 metre) long multiband dipole strung in her attic, and has worked an impressive number of contacts using this simple aerial.

Over the years, she has built up a widening circle of friends around the world, is an active member of numerous amateur radio organisations, and, has attended many conventions. She has also travelled extensively, meeting overseas radio friends, and has a long list of "pen-pals" with whom she regularly corresponds. She has welcomed numerous radio amateurs to her home, particularly overseas visitors, and has been "too busy" to consider marriage. Liz has been the recipient of a number of coveted awards and trophies.

Her answer to the question "What has amateur radio meant to you?" is summed up in one word — "Friendship!" That she certainly has. Her ALARA friends congratulate her and wish her well.

—Material obtained from *World Radio*, September 1985, *Auto Call* November 1986, Mavis VK3KS

YL CONTESTS

THELMA SOUPER MEMORIAL CONTEST 1987 — JUBILEE YEAR SPECIAL

Along with the usual trophies for this award there will be special prizes, engraved as a permanent record of the Silver Jubilee Year of WARO and to be kept by the recipients.

DATE: Saturday and Sunday, April 4 and 5, 1987, from 0700-1000 hours UTC each evening.

All contacts on 80 metres, phone or CW, a bonus station using the WARO call sign ZL2YL will be in operation for random periods and will count as a multiplier once on each night of the contest, if worked.

Logs to reach the Contest Manager, V Shaw ZL1OC, PO Box 2088, Whakatane, NZ, by May 2, 1987.

DX YL NORTH AMERICAN YL CONTEST

CW, Wednesday April 8 at 1400 UTC to Friday, April 10, at 0200 UTC.

Phone, Wednesday April 15, at 1400 UTC to Friday April 17, at 0200 UTC.

Logs to Mary Lou Brown NM7N, 504 Channel View Drive, Annacortes, WA 98221, USA, by May 27, 1987.

FINLAND YL AWARD

There are 4500 radio amateurs in Finland, of whom 140 are YLs, as yet the YLs do not have their own association, but they do have an Award of their own:

FINNMAID — requirements as follows:

Contacts with OH YL stations, Australians need three contacts, and SWLs need 10 confirmations of their reports. Stations contacted must be owned and operated by OH YLs. Send log data with eight IRCs to: SRAL Award Manager, Box 44, 00441 Helsinki 44, Finland, Europe.

Unfurling the Australian Flag in San Francisco at the home of Mary KB6CLL, with Dan N6FT and Graeme VK0GC (Macquarie Island).

YL ACTIVITIES

Jenny VK5ANW, was delighted to meet Tuti YD0TTK, at the 10th Australian-World Invitational Rover Moot at the Woodhouse Campsite on January 6. Tuti showed a keen interest in ALARA.

Jan VK3DMH, was the only YL to be issued with the special commemorative call sign, VI3PVA, (Papal Visit Australia) in October 1986. She reports that it was a wonderful experience, grateful to the OMs who kept the frequency clear for her, "especially during nose-powdering or telephone calls".

Congratulations to Christine Taylor on achieving the call sign VK5ZCQ. (Her OMs former call sign).

It was a real pleasure to meet Nancy VK2NVP, when she was passing through this little township recently. Another case of "putting a face to the voice!"

NEW MEMBERS

Welcome to Mary 5W1FM and Eva OH3ST.

Welcome back to Shirley WD8MEV and Margaret VE7DKC. Great to have you with us once again.

Until next month.

—73/33, Joy VK2EBX

Jenny VK5ANW, and Tuti YD0TTK at the 10th Australian-World Invitational Rover Moot at Woodhouse, South Australia. (January 6, 1987).

International News

A YEAR OF PROMISE

1987 will be another busy year for the ITU with a heavy program of conferences and meetings. In addition to the beginning of the CCITT Study Groups' Final meetings for the current study period and the CCIR's Interim meetings, two major World Administrative Radio Conferences, another session of the highly successful USERCOM and the quadrennial world exhibition TELECOM, will all take place this year.

The World Administrative Radio Conference (WARC-79) recognised the unsatisfactory situation in the HF bands allocated exclusively to broadcasting and resolved that the use of the HF bands allocated to broadcasting should be the subject of planning by a World Administrative Radio Conference.

The First Session of this World Administrative Radio Conference for the planning of the HF bands allocated to the broadcasting service — HFBC(1) was held in Geneva in 1984 and established the planning principles and the technical parameters to be used for planning these bands. The Second Session — HFBC(2) — opened in Geneva for a period of five weeks on February 2. It had the delicate task of reviewing the results of the intersessional work and of adopting the procedures for the implementation of Improved planning for the broadcasting service in the bands concerned (DSB operation). The Conference was also to adopt technical standards and appropriate procedures for the future introduction of SSB operation. Finally, it was to review and revise the relevant provisions of the Radio Regulations.

The World Administrative Radio Conference for mobile services (MOB-87) will be held for a period of five weeks in September/October. It will review and revise the provisions of the Radio Regulations for the mobile services, the mobile satellite services and the radionavigation and radiodetermination- satellite services.

An important aspect of the work of this Conference will be to complete the regulatory framework required for the implementation of the Future Global Maritime Distress and Safety Systems (FGMDSS). This new system was conceived and formulated by the International Maritime Organisation (IMO) to take advantage of modern communication techniques in order to reduce the present rate at which life and property is unnecessarily lost at sea. MOB-87 will also examine the requirements for the use of public correspondence by aircraft, making appropriate provisions if necessary.

The first International Telecommunication User Conference (USERCOM 85) was the result of a joint initiative of the International Telecommunication Users Group (INTUG) and the ITU. It encouraged and provided the setting for the first real dialogue at the international level between users and service providers. The success of USERCOM 85 has led the ITU and INTUG to collaborate in organising USERCOM 87 which was held in London in March with the theme "Facing up to telecommunication changes". Discussion papers covered:

—the implications of current developments;
—consequences for business;
—the relation between telecommunications and economic growth;
—developing the appropriate regulatory environment.

The convergence of telecommunication and computer technologies provides tremendous scope for enhancing such vital national activities as trade and commerce. It is, therefore, imperative that a wide range of ideas and opinions be available to the World Administrative Telegraph and Telephone Conference which is scheduled to be held in 1988. In this context, informal mechanisms for information exchange amongst all partners involved in telecommunication, including traditional service providers, industry and users, have a most useful role to play. All concerned with the provision and use of telecommunication services would have the opportunity of being heard and understood. In turn, ITU Member governments would be able to prepare effectively for the Conference which will establish the infrastructure regulations to govern interactive data flows of the future.

Finally, what has become the major telecommunication exhibition in the world will be held for the fifth time this year. TELECOM 87 will take place in Geneva from October 20 to 27. The multiple activities which comprise TELECOM — the exhibition, the Book Fair, the World Telecommunication Forum, the Film Festival, the Youth in the Electronic Age Competition — all contribute to make this quadrennial event a real crossroads of ideas and information on every aspect of telecommunications, a meeting place for all concerned with the executive management, planning and extension of telecommunication networks, the development of new technology and equipment, as well as for researchers, investors and financiers, lawyers, scientists, engineers, users and all professions with an interest in the many branches of the telecommunication sector.

—From *Telecommunication Journal*, Vol 54 — 1/1987

ASSOCIATION DES RADIO-AMATEURS DE MONACO

On March 29, 1987, in the Principality of Monaco, the Association AMADE (World-wide Friends Association for Childhood, Association Mondiale des Amis de l'Enfance) held a National Day of Childhood.

The President of AMADE is His Highness The Prince Albert of Monaco.

Founded in 1984 by Her Highness The Princess Grace of Monaco, AMADE is a non-governmental organisation, having a consultative statute such as UNICEF, UNESCO or the European Council.

The National Amateur Radio Society of Monaco, ARM, was active on this day using a special call sign of 3A7A. A QSL card will be sent for each contact made.

The ARM's President d'Honneur is SAS Le Prince Albert de Monaco.

ar

MORSEWORD 1

Compiled by Audrey Ryan
Wife of Joe VK3ABA

This works like a crossword puzzle. It contains only one word in each row or column and each letter of that word is spelled out in Morse code. Think about the clues and then encode your answer, putting a dot or a dash in each square. For example, if the clue were *felines*, the answer would be *cats* and you would write it in the grid thus: - . . . . - . . .

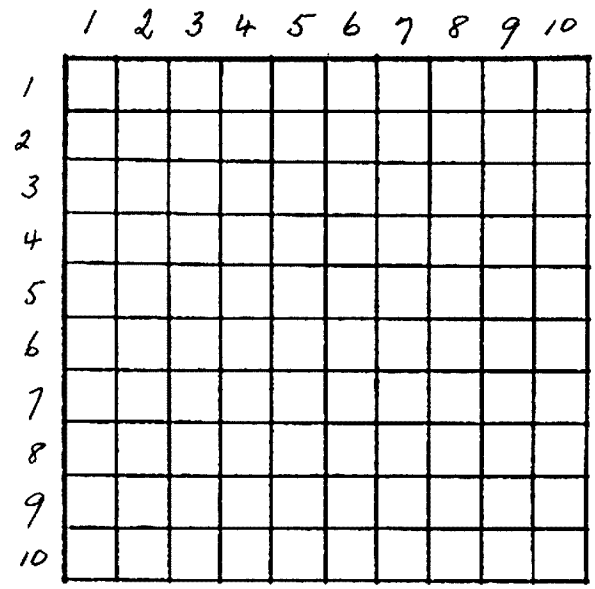
ACROSS

1. Vegetables
2. Plunge under water
3. The port side
4. Type of lettuce
5. Rub out
6. One of the prophets
7. Sudden rush
8. This will stand you in good . . .
9. Saliva
10. A coastal feature

DOWN

1. Sports field
2. French military cap
3. I do, you do, he . . .
4. Animal
5. Dirty mark
6. Store
7. Credit
8. Loosened
9. Something useful
10. Facile

Solution page 57



Education Notes

TRIAL AOCP EXAMINATION PAPER

Brenda Edmonds VK3KT
FEDERAL EDUCATION OFFICER
PO Box 883, Frankston, Vic. 3199

Select the correct or most appropriate alternative.

1 When DC current flows in any conductor:
- a current carrier holes move.
- b there is a heating effect.
- c the electric field alternates in polarity.
- d electrons move from high to low potential points.

2 If the voltage across a resistor is tripled its power dissipation is multiplied by:
- a 2.
- b 3.
- c 4.
- d 9.

3 The voltage rating of a zener diode is the voltage at which:
- a reverse breakdown occurs.
- b forward conduction occurs.
- c thermal runaway begins.
- d the internal resistance begins to rise sharply.

4 A pilot light in a power supply should be connected between:
- a the DC output voltage and earth.
- b the mains cord.
- c the active and neutral leads of the power transformer.
- d neutral and earth leads of the power transformer.

5 The function of the screen grid in a tetrode vacuum tube is to:
- a reduce secondary emission.
- b control electron flow to the cathode.
- c reduce the control grid-anode capacitance.
- d attract electrons from the anode.

6 The resonant frequency of an L-C circuit is given by the formula f =:
- a $1/2\pi\sqrt{LC}$.
- b $2\pi\sqrt{LC}$.
- c $1/2\pi LC$.
- d $2\pi/\sqrt{LC}$.

7 The side bands of an FM amateur transmission:
- a should not be more than 3 kHz wide.
- b occur only on one side of the carrier.
- c occur at multiples of the modulating frequency.
- d add to the power of the carrier.

8 Voltage ratings for capacitors are usually given as:
- a peak and working.
- b working and mean.
- c inverse and peak-to-peak.
- d peak and mean.

9 The power gain of an amplifier producing 30 watts output with an input of 0.3 watt is:
- a 3 dB.
- b 10 dB.
- c 20 dB.
- d 100 dB.

10 Interference seen as 'Cross-hatching' on a TV screen occurs when:
- a the front end is overloaded.
- b harmonics of an amateur transmission beat with the sound carrier.
- c an SSB signal is demodulated by the TV set.
- d an interfering carrier signal beats with the picture carrier.

11 The nominal characteristic impedance of a halfwave folded dipole is:
- a 50 ohms.
- b 300 ohms.
- c 72 ohms.
- d 150 ohms.

12 Ionisation of the various ionospheric layers is caused by:
- a changes in weather patterns in the Troposphere.
- b the magnetic field of the earth.
- c upward drifting gas from the earth's atmosphere.
- d radiation from the sun.

13 A varactor (varicap diode):
- a shows a decreased capacitance as forward bias increases.
- b may be used as a DC voltage amplifying device.
- c may be used for frequency tuning at VHF
- d can be used as an amplifier at microwave frequencies.

14 An advantage of the ceramic microphone over the crystal microphone is its:
- a ability to withstand high temperature and humidity.
- b low impedance.
- c greater sensitivity at low frequencies.
- d size.

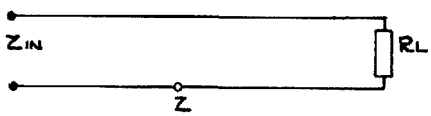
15 Negative feedback at audio frequencies is used to:
- a neutralise power amplifier stages.
- b prevent VHF oscillation.
- c reduce background noise.
- d reduce distortion.

16 For accurate measurements of impedance, capacitance and inductance:
- a bridge circuits are often used.
- b separate meters must be used.
- c an RF reference source is required for calibration.
- d the measuring device should be lightly coupled.

17 A power supply voltage doubler:
- a produces regulated DC.
- b uses a charged capacitor to increase the output voltage.
- c can only be used with a halfwave rectifier.
- d produces an output voltage twice the input peak-to-peak.

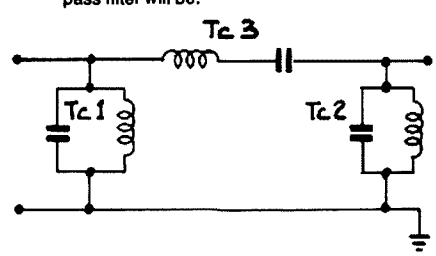
18 An observed frequency shift in signals emanating from amateur satellites is due to:
- a receiver drift.
- b satellite rotation.
- c Doppler effect.
- d transmitter power variation.

19 In this open wire transmission line, if the value of R_L is significantly greater than that of Z_o:



- a the line will have a high SWR.
- b power dissipation in the line will be higher than in the load.
- c the line will be unbalanced.
- d the value of Z_{in} in relation to Z_o will be frequency dependent.

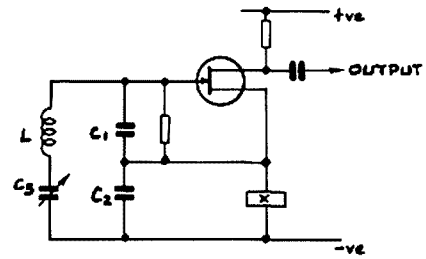
20 The inductance components in this UHF band pass filter will be:



- a iron cored for maximum Q.
- b physically smaller than at HF
- c chosen so that the resonant frequency of TC1 and TC2 is half that of TC3.
- d chosen so that the impedance of TC3 is maximum.

21 A Lissajous pattern displayed on a CRO:
- a is obtained by applying two simultaneous sine wave voltages to the Y plates.
- b can be used to measure modulation percentages.
- c can be used to directly measure the frequencies of two sine waves at once.
- d can be used to calibrate audio frequency generators against a known reference.

22 To ensure correct operation, component X in this common VFO oscillator circuit must be:



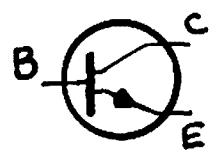
- a a fixed capacitor.
- b an NPN transistor.
- c a low value resistor.
- d an RF choke.

23 The terminal voltage of a 12 volt lead-acid battery drops to 11.5 volts when connected to a constant load which draws 2 amps. Assuming negligible resistance in leads and connections, the voltage drop is due to:
- a the high specific gravity of the electrolyte.
- b a rise in temperature of the load.
- c significant internal resistance of the battery.
- d the capacitance between the battery plates.

24 A common single figure element of a digital frequency meter display comprises:
- a seven liquid crystals in series.
- b seven separately controlled LEDs.
- c eight separately controlled LEDs.
- d a series-parallel LED array.

25 A water pipe when used as a common earth at an amateur station may become 'live' if it:
- a is also used as a mains earth.
- b has a high resistance path to earth.
- c is made of copper.
- d has both transmitter case and coax braid connected to it.

26 During normal operation as an amplifier, this transistor will be biased so that:



a B is more positive than E.
b B is more positive than C.
c E is more positive than C.
d B is mors positive than both C and E.

27 The frequency at which consistently good HF propagation is possible is called the:
a MUF.
b ALF.
c critical frequency.
d optimum working frequency.

28 The "frequency memory" in a modern 2 metre transceiver is normally maintained for long periods in the 'power off' state by:
a an internal lithium battery.
b a single dry cell.
c switching off the supply to the liquid crystal display.
d a solar cell.

29 Significant frequency instability in a home built VFO might be cured by:
a reducing the Q of the tank circuit.
b enclosing it in a metal case.
c improving the voltage regulation.
d reducing the L/C ratio.

30 If an SSB full carrier transmission is modulated more than 100 percent it will produce increased:
a output power.
b sidebands.
c intelligibility.
d fidelity.

31 In a triode vacuum tube amplifier, bias is usually set so that the grid potential is:
a more positive than the cathode.
b more negative than the cathode.
c no more than 1.5 volts.
d more positive than the anode.

32 BCI can be diagnosed as cross-modulation if:
a the receiver volume control does not vary the interference audio level.
b it is heard at all settings of the dial.
c it disappears when the broadcast antenna is removed.
d it is heard only when a broadcast station is tuned in.

33 A FET may be preferred to a bipolar transistor in an oscillator circuit because it:
a is not temperature sensitive.
b generates less thermal noise.
c remains more stable with small L or C changes.
d does not require a stable power supply.

34 A resistor colour coded red, violet, orange, gold may have any value between:
a 1440 and 1760 ohms.
b 25650 and 28350 ohms.
c 24300 and 29700 ohms.
d 361000 and 399000 ohms.

35 The effective distance of propagation by ground wave:
a increases with increasing frequency.
b varies with atmospheric conditions.
c depends on the conductivity of the ground.
d is strictly limited to line of sight.

36 The RIT control on a modern transceiver allows:
a small variations in the receiver frequency.
b reception of International Time information.
c decoding of Repeater Input Tone bursts.
d reset of Incremental Transmit frequency.

37 In a 144 MHz FM transmitter which is modulated at 8 MHz, the frequency multiplication stages will increase the original deviation by a factor of:
a 8/144.
b 8 x 144.
c 2 x 3 x 4.
d 144/8.

38 TVI from the harmonics of HF amateur transmissions can be reduced by using:
a a low pass filter at the transmitter output.
b a higher powered transmitter.
c a narrow band rejection filter at the transmitter.
d a high pass filter at the transmitter output.

39 The transistor oscillator of a DC-DC converter power supply usually operates at a high audio frequency so that:
a RF bypassing is not required.
b a small efficient transformer can be used.
c the transistors do not overheat.
d no transformer is necessary.

40 The approximate wavelength and period of a 10 MHz radio wave will be:
a 10 metres and 0.1 microsecond.
b 15 metres and 1 microsecond.
c 20 metres and 1 microsecond.
d 30 metres and 0.1 microsecond.

41 In this SSB transmitter, block X should be a :

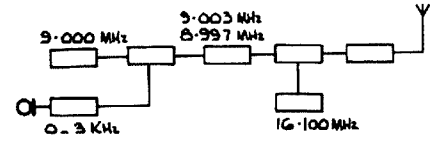
a filter designed to reject 9.000-9.003 MHz.
b buffer amplifier stage.
c frequency multiplier.
d filter designed to reject harmonics of 9 MHz.

42 A modern VHF receiver tuned in 25 kHz steps:
a is crystal locked at 25 kHz intervals.
b can only be operated between 144-145 MHz.
c uses a phase locked loop system.
d can be readily modified for continuous frequency tuning.

43 Self oscillation of a transmitter stage can occur when:
a a multiplier stage is overdriven.
b it is operated in class C.
c input and output frequencies are the same.
d a modulated signal is being amplified.

44 A test instrument using a permanent magnet moving coil meter to measure AC voltage and resistance must include both:
a switching and capacitors.
b a voltage source and diodes.
c shunts and capacitors.
d inductor and thermocouple.

45 The secondary of this transformer could provide:



a 480 V at 2 amps.
b 360 V at 2 amps.
c 240 V at 2.5 amps.
d 120 V at 1.5 amps.

46 In HF receivers, positive feedback loops are used in:
a audio amplifiers.
b IF stages.
c RF oscillators.
d detector stages.

47 For amateurs the main characteristic of the D layer is:
a absorption of MF and HF
b reflection of HF at night.
c refraction of VHF.
d its intensity of ionisation at night.

48 The reflector element of a Yagi antenna is:
a longer than the driven element.
b shorter than the driven element.
c shorter than the longest director.
d same length as the longest director.

49 Spurious oscillations caused by stray inductances and capacitances in transmitter circuitry:
a can be stopped by using an appropriate filter.
b are known as parasitics.
c are not likely to be radiated.
d are usually harmonically related to the radiated frequency.

50 The 'gain' of an antenna expressed in dBd usually is:
a gain in free space over atmosphere.
b gain over a theoretical point source.
c gain over a reference dipole.
d dependent on current flow in the driven element.

Intruder Watch

Bill Martin VK2COP
FEDERAL INTRUDER WATCH CO-ORDINATOR
33 Somerville Road, Hornsby Heights, NSW. 2077

I commence the column this month with some good news, that of congratulations to those who earned the *Intruder Watch Certificate of Merit* for 1986. The recipients were:

Certificate No 007 G H A Bradford (SWL, NSW)
Certificate No 008 Allan Doble VK3AMD
Certificate No 009 Bill Wallace VK4KHZ
Certificate No 010 Tom Walker VK4BTW
Certificate No 011 Lindsay Collins VK5GZ
Certificate No 012 Roy Watkins VK6XV
Certificate No 013 Jim Roddy VK8JF

Our thanks go especially to these people for their good help during the past year.

Thanks also to those who contributed in December 1986, namely:

VK2s ADE, CNS, DEJ, EHQ, G Bradford, VK3s AMD, XB, VK4s AKX, BG, BHJ, DA, KHZ, VK5s GZ, TL, VK6s JQ, RO, XV, and VK7RH.

Statistics for December were:
161 AM intruders; 116 CW intruders; 86 RTTY intruders, 74 other modes, and 35 intruders transmitted their call signs.

You may remember I began last month's column with a reference to the temperature being 30 degrees Celsius at the time of writing the column. I should known when I was well-off. As I write this, February 1, the thermometer has only one click to go to reach the old 100 degree mark (38°C) . . . and it's gonna make it!

Statistics are now available for the whole of 1986, but it is a reminder, unfortunately, of the extent of intrusions into our bands.

8014 intrusions were reported for the year;
4089 were AM intrusions;
1796 were CW intrusions;
1262 were RTTY intrusions;
867 were using other modes;
592 identifications were heard.

A total of 65 observers sent in their reports, which totalled 710 pages of logs. There were 167 more logs received than in 1985, which shows that amateurs are still concerned with preserving their bands. Similarly, 14 more observers helped-out than in the previous year. A comparison of the total number of reports received yearly since 1983 might be of interest:

1983	1984	1985	1986
6908	7468	7466	8014

(See the trend?).

So the message, having read the yearly statistics, is clear, and is the same as last year. The aim is continuing support from Observers, to result in less intrusions. So I'll say 73 now while i think about that! See you later . . . take care.

PS — the thermometer made it!

ar

ANSWERS TO TRIAL EXAMINATION QUESTIONS

1 b	11 b	21 b	31 b	41 a
2 d	12 d	22 d	32 d	42 c
3 a	13 d	23 c	33 b	43 c
4 c	14 a	24 b	34 b	44 b
5 c	15 d	25 b	35 c	45 d
6 a	16 a	26 a	36 a	46 c
7 c	17 b	27 d	37 d	47 a
8 a	18 c	28 a	38 a	48 a
9 c	19 a	29 c	39 b	49 b
10 d	20 b	30 b	40 d	50 c

Awards

Ken Hall VK5AKH
FEDERAL AWARDS MANAGER
St George's Rectory, Alberton, SA. 5014

AWARDS ISSUED RECENTLY

DXCC PHONE
352 Donald A Howison VK2DXH
353 Harry Petrodaskalakis VK3ABO
354 B E C Lavender VK4LV

VHF CC
119 M T Deakin VK4DV (52 MHz)

WAS VHF
170 M T Deakin VK4DV (52 MHz)

WAVKCA
1520 Rune Jedeman SM6AVM
1521 Ichiro Ishino JR3IIR
1522 Kazuo Ogawa JA1KWC
1523 Takashi Kato JH1BXH
1524 Harry Petrodaskalakis VK3ABO

VK1 AWARD

This award is issued by the WIA ACT Division, (upon receipt of a correctly presented application) to any licensed amateur operator or shortwave listener. The certificate displays one of Canberra's most distinctive landmarks, the Telecom Tower, situated on Black Mountain in the heart of Australia's Capital City. The tower is depicted in light blue on a white background with award information in black lettering.

The information required is a log extract showing date (UTC), time (UTC), mode, call sign of the VK1 station worked and ciphers exchanged. Shortwave listeners should include the station worked by the VK1 station being claimed.

Each VK1 call sign worked counts as one point. Each call sign may only be claimed once. The change of status to mobile, portable, etc, is not allowed as a separate contact. Contacts via terrestrial repeater systems are not valid contacts towards the award.

AWARD REQUIREMENTS

HF within VK (excluding VK9 and VK0)

Basic Award	20 points
Bronze Upgrade	50 points
Silver Upgrade	75 points
Gold Upgrade	100 points

HF outside VK (Includes VK9 and VK0)

Basic Award	10 points
Silver Upgrade	25 points
Gold Upgrade	50 points

VHF and higher frequency requirements are the same as HF outside VK for all areas.

Cost of the Basic Award is $A3, each upgrade costs $A1, or two IRCs.

In an attempt to assist stations qualifying for the award, a VK1 Award Net operates each Sunday evening on 3.570 MHz, immediately following the VK1 Divisional WIA Broadcast. The Award Net generally commences at approximately 1030 UTC.

Applications for the Award should be addressed to: The Award Manager, GPO Box 600, Canberra, ACT. 2601.

WORKED ALL QUEENSLAND — VK4-Award

This award is divided into two sections — Worked All Cities and Towns and Worked All Shires.

Any transmitting amateur or SWL may apply for the award, provided that these applications comply with the rules.

Only one award is issued, but this will be updated upon receipt of further additions.

WORKED ALL CITIES AND TOWNS

There are 22 incorporated Cities and Towns in Queensland.

Brisbane	Logan
Bundaberg	Mackay
Cairns	Maryborough
Charters Towers	Mount Isa
Dalby	Redcliffe
Gladstone	Rockhampton
Gold Coast	Roma
Goondiwindi	Toowoomba
Gympie	Townsville
Hervey Bay	Warwick
Ipswich	Thuringowa

Initial Award: 15 contacts with radio amateurs operating from these Cities and Towns. A "silver sticker" if all Cities and Towns are worked.

WORKED ALL SHIRES

There are 112 Shires in Queensland. The population figures in these Shires range from 250 to well over 25 000.

Albert	Jericho
Allora	Johnstone
Aramac	Jondaryan
Arakun	Kilcoy
Atherton	Kilkivan
Burdekin	Kingaroy
Balonne	Kolan
Banana	Laidley
Barcaldine	Landsborough
Barcoo	Livingstone
Bauhinia	Longreach
Beaudesert	McKinlay
Belyando	Mareeba
Bendemere	Maroochy
Biggenden	Millmeran
Blackal	Mirani
Boonah	Miriam Vale
Booringa	Monto
Boulia	Moreton
Bowen	Mornington
Broadsound	Mount Morgan
Bulloo	Mulgrave
Bungil	Mundubbera
Burke	Murgon
Caboolture	Murilla
Calliope	Murweh
Cambooya	Nanago
Cardwell	Nebo
Carpentaria	Noosa
Chinchilla	Paroo
Clifton	Peak Downs
Cloncurry	Perry
Cook	Pine Rivers
Crows Nest	Pioneer
Croydon	Pittsworth
Dalrymple	Prosperpine
Diamantina	Quilpie
Douglas	Redland
Duaringa	Richmond
Eacham	Rosalie
Eidsvold	Rosenthal
Emerald	Sarina
Esk	Stanthorpe
Etheridge	Tambo
Fitzroy	Tara
Flinders	Taroom
Gatton	Tiaro
Gayndah	Torres
Glengallan	Waggamba
Gooburrum	Wambo
Herberton	Warroo
Hinchinbrook	Widgee
Ilfracombe	Winton
Inglewood	Wondai
Isis	Woocoo
Isisford	Woongara

as from 1/1/1979

Initial Award: 51 contacts. "Stickers" for 61, 71, 61, 91, 101 Shires, with a gold sticker if all Shires have been contacted.

MODES AND BANDS: All legitimate modes and bands may be used — LF, HF, VHF, UHF, OSCAR, EME, etc — but cross-band modes are not allowed.

SPECIAL VK-RULE: As a number of areas are not very active, DXpeditions to these areas are encouraged. . .to help the award hunter (and others) to attain that rare Queensland Shire, Town or City.

The following will apply:

A copy of the VK/P log shall be forwarded to the Queensland Awards Manager for use as a checklist.

The VK/P operator will automatically be credited with "as having worked" that particular area, if at least 20 different stations have been contacted from that location.

METHOD OF APPLICATION: A certified list of contacts, as per CHC rules, to be sent to: The WIA(Q) Awards Manager, GPO Box 638, Brisbane, Qld. 4001 or J C Moulder VK4YX, Queensland Award Manager, PO Box 323, Warwick, Qld. 4370, with either $A2 or eight IRCs, or equivalent for the initial award. Subsequent stickers will be issued free, although return postage would be appreciated.

Contacts made as from January 1, 1976 will be valid for this award with the exception of Arakun*, Mornington*, Hervey Bay Town and Logan City, contacts as from June 1, 1961.

Queensland amateurs, as a matter of courtesy, should find out in what city, town, or shire, they reside and should include this information on their QSL cards.

(* Prior Shire offices permit of entry required as these Shires are restricted areas for radio transmissions).

WIA 75 AWARD RECIPIENTS — Update

CERTIFICATE No	NAME & CALL SIGN
695	Melkyanus M Jewangu YC0NOO
696	Benny Wyenantea YB3CN
697	Indra Muda Lubis YC6XE
698	Roswita YC0CAM
699	Rachim Ry YB0CAR

EDR 60 JUBILEE AWARD

During 1987, Experimenterende Danske Radioamatorer (EDR) is celebrating its 60th anniversary, and to commemorated the occasion the *EDR 60 Jubilee Award* is issued.

To claim the award you require 60 points, which are gained by working OZ stations in the period from January 1 to December 31, 1987. Each OZ station counts as one point and club stations count as five points. All amateur bands and modes are allowed, but repeaters cannot be used. Special endorsements for CW, SSB, RTTY, one band, etc.

Cost of the award is six IRCs and can be obtained by log extract certified by two licensed amateurs and post marked no later than January 31, 1988 to:

Allis Andersen OZ1ACB, Kagsaavej 34, DK-2730 Herlev, Denmark.

The awards, which will be printed when the deadline has ended, will be issued with numbers, and will be issued in order of which the applications have arrived.

A list containing the call signs of club stations is available from the above address for a SAE and one IRC.

—Contributed by Allis Andersen, Awards Manager, EDR 60 Jubilee Award

USSR AMATEUR RADIO AWARDS

The Central Radio Club of the USSR has seven amateur radio awards regularly available to amateurs world-wide, who meet the qualifications for each.

Probably the two most popular of these are the RAEM and the R-100-O Awards. A brief outline of the awards and full rules follow:

The *RAEM Award* is one given for CW QSOs with Soviet amateur stations within the Arctic Circle and in Antarctica.

The *R-100-O Award* is given for contacts with 100 or more of the 184 Soviet oblasts.

The *R-150-S Award* would most closely compare with the ARRL's DXCC: you must contact stations in 150 countries from the CRC's country list. This same list is also used in the CRC's *CQ-M* contest for the countries multipliers.

The *W-100-U Award* does not have a close

counterpart award. The major requirement is to contact 100 Soviet amateurs on HF, the only restriction being these include five contacts in the UA9 call area.

The *R-15-R Award* could compare with the ARRL's WAS Award. You must make contact with each of the USSR's 15 Republics.

The *R-6-K Award* compares with the ARRL/ITU's WAC Award.

The *COSMOS Award* is essentially a two metre only award, so rules will not be published here. This award was established by the Radio Sport Federation of the USSR in 1961 on the occasion of the first flight into space by Youri Alekseevich Gagarin, a citizen of the USSR.

The RAEM Award — is given to radio amateurs and SWLs, who provide proof of CW QSOs (for SWLs, who provide proof of hearing CW QSOs) with Soviet radio amateurs who are located at QTHs at latitudes of 66 degrees 33 minutes north or greater (ie; within the Arctic Circle), or on the continent of Antarctica. A point count of at least 68 points or more must be obtained to qualify for the award.

The point count for each contact is determined like this:

15 points for contact with station RAEM
10 points for an Arctic Island or Antarctic contact
5 points for contact with any station between the Arctic Circle (Latitude 66 degrees 33 minutes north) and 70 degrees north.

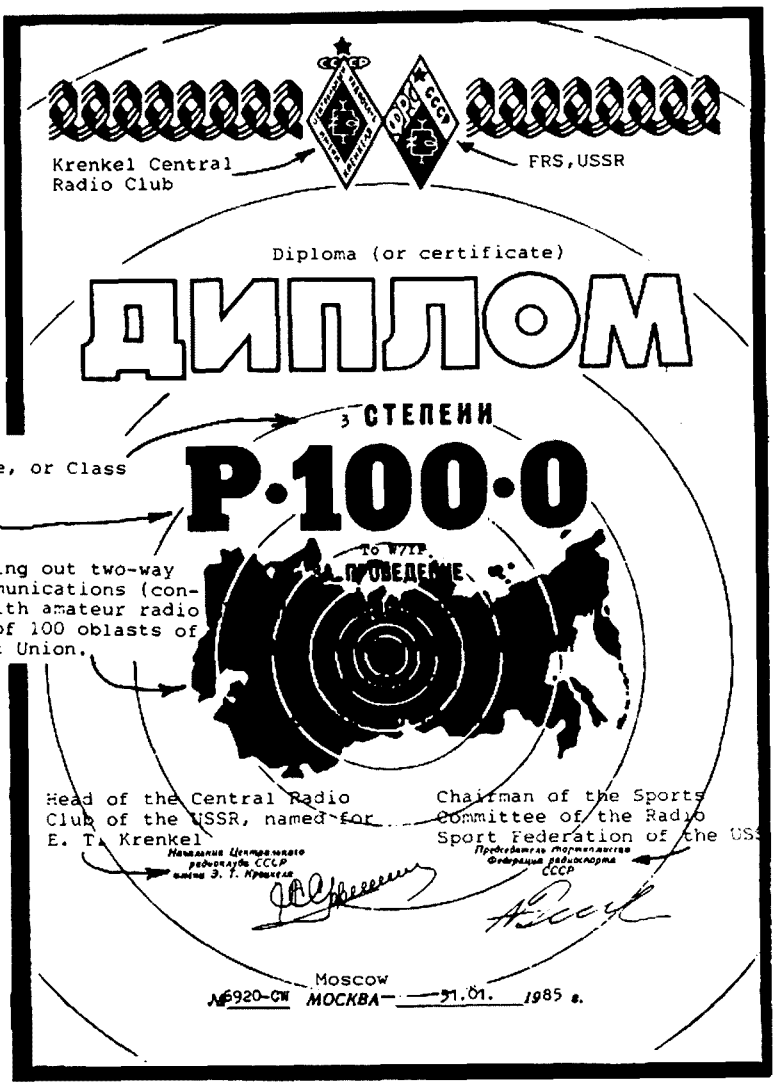
RAEM was Ernst Krenkel's amateur radio call sign, and Krenkel died in 1971.

Contacts before December 24, 1972 do not count for this award.

Some, but not all, RAEM-qualifying Russian QSLs will show the point count for the RAEM Award. Some QSLs even show "five points for RAEM" when, upon looking at a map of the Soviet Union, the QTH makes you think it would only qualify for two points.

To apply for this award you must make a list of contacts showing date, call, mode and band. QSL cards do not have to be submitted. To play safe, you should have your contacts list verified against your QSLs by two club officers of a recognised radio club. (This is not mandatory, just a safeguard). The CRC also require 14 IRCs to accompany each application. Post applications to the Central Radio Club, PO Box 88, Moscow, USSR.

Don't expect a fast turn-around time from the date of your award application mailing, even if you send it air-mail.



R-100-O — is issued to all licensed radio amateurs and SWLs who fulfill the following conditions.

It is necessary to carry out two-way contacts (observations) with the radio stations of 100 regions (oblasts) of the Soviet Union.

The award is available in three classes:
First Class — for two-way contacts (observations) on the 3.5 MHz band only
Second Class — for two-way contacts (observations) on the 7 MHz band
Third Class — for two-way contacts (observations on any amateur band

All contact (observations) are to be made on CW or Phone only.

Minimum reports of RST 337 or RS 33.

All contact (observations) carried out after January 1, 1957 are valid.

Applications must include the list of contacts (observations) with date, call sign, type, frequency and be sent to Box 88, as above.

Cost of the award is 1 Rouble or 14 IRCs which covers the forwarding registered postal expenses.

R-150-S — to obtain the R-150-S it is necessary to carry out two-way contacts (observations) on one or any amateur bands with 150 countries of the world including 15 Union Republics of the USSR.

All contacts (observations) are to be made on CW or Phone only and are to have taken place after June 1, 1956 to be valid.

Minimum reports of RST 337 or RS 33.

Applications must include the list of contacts (observations) made with date, call signs, type of emission, frequencies and be sent to Box 88, etc.

Cost is the same as the R-100-O Award.

W-100-U — The W-100-U Award was established in 1959 on the occasion of the 100 anniversary of the birthday of A S Popov, the great Russian scientist — the inventor of radio.

It is necessary to contact/observe two-way contacts on one or any of the amateur bands (3.5, 7, 14, 21, and 28 MHz) with 100 different amateur radio stations in the USSR including five stations in the 9-region. Contacts to be on or after January 1, 1959.

Basic rules as above.

R-15-R — amateurs/SWLs must contact 15 Union Republics on any amateur band (3.5, 7, 14, 21, and 28 MHz). The Republics are UA1, UN1, UW1, UA2, UA3, UW3, UV3, UA4, UW4, UA6, UA9, UV9, UA0, UW0; UC2; UP2; UQ2; UR2; UB5, UT5, UY5; UO5; UD6; UG6; UF6; UL7; UH8; UI8; UJ8; UM8.

Contacts on or after July 1, 1958 are valid.

Basic rules as above.

R-6-K — it is necessary to carry our 12 two-way contacts/observations on SSB, CW and Phone with radio amateurs in the following:

a Europe — one contact
b Africa — one contact
c North America — one contact
d South America — one contact
e Asia — one contact
f Oceania — one contact
g The European Part of the USSR (UA1, UN1, UW1, UA2, UC2, UP2, UQ2, UR2, UA3, UW3, UV3, UA4, UW4, UB5, UO5, UT5, UY5, UA6, UW6) — three contacts
h The Asiatic Part of the USSR (UD6, UG6, UF6, UL7, UH8, UI8, UJ8, UM8, UA9, UW9, UV9, UA0, UW0) — three contacts.

The award comprises three classes:
First Class — for two-way contacts/observations on the 3.5 MHz band only
Second Class — for two-way contacts/observations on the 7 MHz band only
Third Class — for two-way contacts/observations on any amateur bands

Contact on or after May 7, 1962 are valid.

General rules as above.

—Compiled by Jack Wichels W7YF and contributed by Ken Stevens VK5QW

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AUSTRALIAN DESIGNED AND MANUFACTURED

The IDASS queueing system, designed and manufactured in Australia, is microprocessor controlled providing automatic visual and voice direction for customers awaiting service in queues. Almost any kind of electronic visual display can be used while the voice is of high quality being derived directly from female or male voice recordings which have been digitised. Of particular interest is the application of voice control by a microprocessor. The system was designed originally for a well-known Australian bank. Several systems are installed and have proved to be very successful in improving customer service and easing staff pressure during busy periods.

Applications are expected in many fields including telecommunications, banking and finance, transport and the public service.

For further information please contact Zenology Pty Ltd, Suite 1, First Floor, 245 Springvale Road, Glen Waverley, Vic. 3150. Phone (03) 233 5764.

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LAND MOBILE RADIO CHANNEL

Using the latest packet radio techniques, together with error correction/detection, the DR 9600 Radio Modem provides reliable data communications over the standard land mobile radio channel. Efficient carrier sensing allows co-existence of data and voice on the same channel. This high speed operation is possible due to a state-of-the-art modem designed for use in the radio environment. Data encryption is standard.

Terminal equipment connecting to the DR 9600 sees a normal RS-232C modem port with handshaking DTS/CTS and XON-XOFF. Models are available with a five port multiplexer. Software allows 256 separate systems on the one channel. The advanced error detection and correction techniques operate automatically and transparently to the user to ensure "hassle-free" data integrity. The combination of the DR 9600's modem and advanced software results in a BER of $1*10^{11}$.

For further information please contact Zenology Pty Ltd, Suite 1, First Floor, 245 Springvale Road, Glen Waverley, Vic. 3150. Phone (03) 233 5764.

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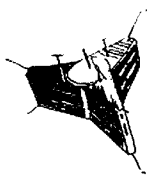
AMSAT Australia



NATIONAL CO-ORDINATOR
Graham Ratcliff VK5AGR
INFORMATION NETS
AMSAT AUSTRALIA
Control: VK5AGR
Amateur Check-In: 0945 UTC Sunday
Bulletins Commence: 1000 UTC
Primary Frequency: 3.685 MHz
Secondary Frequency: 7.064 MHz
AMSAT SOUTH WEST PACIFIC
Control: John Browning W6SP
Bulletins Commence: 2200 UTC Saturday
Frequency: 14.282 MHz

Participating stations and listeners are able to obtain basic orbital data, including Keplerian Elements from the AMSAT Australia Net. *This information is also included in some WIA Divisional Broadcasts.*

SATELLITE ACTIVITY FOR THE MONTH OF DECEMBER 1986

1. LAUNCHES

The following launching announcements have been received:

INTL NO —1988	SATELLITE	DATE	NATIO-N	PERIOD min	APG km	PRG km	INCL deg
094A	Cosmos 1803	Dec 02	USSR	118.0	1527	1502	82.6
095A	Cosmos 1804	Dec 04	USSR	90.8	448	210	70.0
096A	USA 20	Dec 05	USA	1428.3	[illegible]860	35328	5.3
097A	Cosmos 1805	Dec 10	USSR	97.8	6[illegible]	84[illegible]	82.5
098A	Cosmos 1806	Dec 12	USSR	11hr48m	39307	612	63.0
099A	Cosmos 1807	Dec 16	USSR	89.6	[illegible]70	177	67.0
100A	Cosmos 1808	Dec 17	USSR	105.0	[illegible]33	995	8[illegible]
101A	Cosmos 1809	Dec 18	USSR	104.1	964	944	82.5
102A	Cosmos 1810	Dec 26	USSR	89.1	302	189	65.0
103A	Molniya 1-70	Dec 26	USSR	1hr 41min	39075	484	63.0

During the period 78 objects decayed including the following satellites:

1975-125A	Molniya 3-4	Aug 12
1985-034B	NUSAT 1	Dec 15
1986-025A	Cosmos 1737	Dec 03
1986-095A	Cosmos 1804	Dec 18

TECHNICAL MAILBOX

Magazine Review

Roy Hartkopf VK3AOH
34 Toolangi Road, Alphington, Vic. 3087

INPUT TO THE MAILBOX

Last September, we introduced this column to AR and it was not long before we received a flood of mail. Well, you all must have had a good Christmas break because the flood has all but dried up! How about some input from you, the readers, to keep it going? Initially we did say that we preferred not to become too involved with "nuts and bolts" type fault fixing of specific commercial equipment, but we would still like to hear from you on such faults that *you have encountered and fixed!!!*

Your problem is quite possibly being experienced by someone else!

RF INTERACTION TO PREAMPLIFIERS

VK5. . . Stirling

"I am interested in using my tower for a folded monopole vertical antenna. Will any damage occur to the VHF/UHF preamplifiers and coaxial relays already mounted on, and earthed to the tower?"

Firstly, you will have figured out how you are going to feed the tower and, as such, you will have come to the conclusion that, depending upon the height of the tower and just what antennas you have on the tower, "top hat" capacity will significantly effect the electrical length of the tower. This will require careful consideration and probably a lot of experimentation to obtain a suitable match. Multi-band operation will further compound the problem. Maybe this is the reason why so many opt for inverted Vees.

Now, the question of pre-amplifier damage. "Very unlikely" is the short answer, but this will depend upon the type of preamplifier you are using. Most incorporate relay switching (activated by a RF detection circuit and/or a PTT key line), as well as diode protection. Some are capable of through- put powers of up to 100 watts.

Two years ago I had the opportunity to check the noise figure (NF) of several, under laboratory conditions, using the HP automatic noise meter, of several commonly available preamplifiers. I was disgusted that the claimed noise figures did not come within a "bulls roar" of their quoted figures. Initially, I thought I had a nonachiever and obtained a second, . . .and a third! Very little difference. Why? I knew why as soon as I looked at the circuit configuration and RF protection used. What really irritates me is the false noise figure claims of 0.8 or 1.2 dB, when, in fact, the two types in question gave (at best) 2.9 and 5.4 dB respectively.

The increase in gain provided by the preamplifier, as seen on the S-meter (if you have one!), may lull the newcomer into thinking all is well. Maybe, but chances are that the box was as deaf as a post in the first place and did provide an increase in noise plus signal, BUT far from the performance that should be obtained if the manufacturers claims were true.

Assuming you did have a genuine 0.8 dB NF, then your receiver sensitivity, in degrees Kelvin, would be about 58. But if, in fact, the NF was 5 dB then this would have jumped to about 625. What this really means is, that on 144 MHz, when beaming at the horizon, the antenna temperature (ground temperature) is about 270 degrees Kelvin and, as such, *your* 625 L preamplifier will *prevent* you from getting down to the noise floor.

If you are into satellites and elevate your array, the degradation is even more profound. It becomes even more dramatic if you relate this to 432 MHz!!!

Could this be the reason for not hearing all that DX being worked by the other chap — and you had put this down to his better QTH??

Relays used in most of these preamplifiers will provide sufficient isolation between the antenna and the preamplifier input, when turned off, to be adequate for our power levels. Most have protection diodes as well. This should be adequate to prevent failure of your preamplifier when operating on HF I do not feel that the voltages generated into your VHF/UHF antennas will cause a failure. However, I would be reluctant to advise operating both at the same time should you run a linear of reasonable power. With respect to the relays themselves. A possibility may exist (remote that it should be) that the RF sense circuit could detect the HF signal and turn off the preamplifier. However, if you had the preamplifier turned off in the first place, such an event would not take place. Moreover, if it did, it would in fact, offer added protection if you can follow that logic.

You certainly can rest easy that the relays will not be damaged.

There is no way to obtain receiver sensitivity easily if you are seriously into VHF/UHF. With the latest devices available you can realise NFs that a few years ago would be unheard of in amateur circles. In fact, it is timely to relate that my latest preamplifier for 432 MHz returns a NF of 0.26 dB (2SK571) which is a lower limit than I can utilise with my antennas.

It is paramount that the preamplifier be mounted as near as possible to the feed as feedline loss will be added to the preamplifier NF It should be isolated from the transmitter generally with two high quality relays to handle the transmitter power; eg TRANSCO, and the second to provide the isolation; eg DOWKEY with G option.

The preamplifier must also be terminated at the feed impedance during transmit and, do NOT short the input. Feed the preamplifier output via another coax back to the shack.

The relay sequence should then allow the preamplifier to be terminated when not in use. The antenna is connected to the RF amplifier output (linear). Turning the "system on" will activate the "preamplifier relay" on removing the termination and connecting the antenna to the preamplifier input. It is best to be able to interrupt this line (via a press button) to terminate the preamplifier for comparative noise measurements when required.

When going to transmit the key line for your change over will disconnect the "preamplifier relay" (termination connected), activate the "transmit antenna relay" and finally, allowing the linear to be activated.

All sequences should be inter-locked with delays commensurate with the operate times of the respective relays. You may utilise the supplementary switching contacts if they are provided on the relays.

You cannot realise results without doing it right and, believe me, there is no easy shortcut. Why invest in a device that will provide a very low NF only to protect it with NF negating diodes and lossy relays? Many manufacturers do! Conversely, if you do not protect it correctly it will surely fail.

Candidly, loading the tower for HF operation, when you have it bristling with HG. VHF or UHF antennas. I believe is just not worth the effort. I have found that any advantage obtained through a lower radiation angle of a vertical radiator on the lower HF bands is negated by the increase in noise to which they are susceptible. Conversely, if you simply do not have the room for inverted Vees or a multi-band dipole then maybe you have little chance.

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G General C Constructional P Practical without detailed constructional information T Theoretical N Of particular interest to the Novice X Computer program

HAM RADIO **December 1986.** Cumulative index, 1982- 1986 (G). CW Processor (T P). FSK Analysis (T X).

WORLDRADIO **November 1986.** General news of amateur radio activity, DX, new antennas and other products, maritime mobile, etc (G).

CQ **December 1986.** 813 Linear Amplifier (P). Paddle and Keyer Notes (G). 160 metre Vertical (P). Antenna Problems (N).

THE SHORT WAVE MAGAZINE **December 1986.** Capacitor Values (G). Dangerous Oil Filled Components (G N). Antenna Feed Point (P N).

RADIO COMMUNICATION **February 1987.** Switched Capacitor Filters (P).

73 MAGAZINE **December 1986.** Modifying Wafer Rotary Switches (P). Switched Capacitor Filter using ICs (P). 1986 Index.

OST **January 1987.** Accurate SWR and Watt Meter (C). Building a 180 foot Tower (G).

VHF COMMUNICATIONS **Autumn 1986.** Microstrip Transverters for 23 and 13 cm (C). VHF to SHF Bandpass Filters (P).

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CORRECTION

Square Wave Generator — Part One
November 1986, AR

Page 10, Figure 4 — Voltage Controlled Oscillator — Board 1.

The capacitor in the loop filter between pins 9 and 13 of IC14 (4046) is shown as 2.2 nF It should be 2.2 uF The incorrect value will result in loop stability problems.

MORSEWORD 1 SOLUTION

	1	2	3	4	5	6	7	8	9	10
1	•	—	—	•	•	•	—	•	•	•
2	—	•	•	•	•	•	•	•	—	•
3	•	—	•	•	•	•	•	—	•	—
4	—	•	—	•	—	—	—	•	•	•
5	•	•	—	•	•	—	•	•	•	•
6	•	—	—	—	—	—	—	•	•	•
7	—	—	•	•	•	—	•	•	•	—
8	•	•	•	—	•	•	—	—	•	•
9	•	•	•	•	—	—	•	•	•	—
10	—	•	•	•	•	—	—	•	—	—

Across: 1 peas 2 dive 3 left 4 cos 5 erase 6 Amos 7 gust 8 stead 9 split 10 bay

Down: 1 arena 2 kepi 3 does 4 hare 5 stain 6 stow 7 tick 8 eased 9 asset 10 easy

VK2 Mini-Bulletin

Tim Mills VK2ZTM
VK2 MINI BULLETIN EDITOR
Box 1066, Parramatta, NSW 2150

THIS COMING YEAR

As these notes were being compiled in mid-February, the closing date for the March AGM Agenda and Council Elections was but a few days away. At that stage, there were no submissions for either subject. Perhaps by the time the closing date arrived something had come in the mail.

A reminder that the next Conference of Clubs will be hosted during April (11-12) by the Fisher's Ghost ARC. Federal agenda items will be discussed at the Conference.

Would all affiliated clubs keep their information sheets for the Division up to date. A listing of currently affiliated clubs will appear in a later issue of these notes. Would repeater groups note that, by now, you should have received a request to provide the annual update for your listing in the Call Book from the Federal Office. Please process and return without delay to: FTAC, c/- PO Box 300, Caulfield South, Vic. 3162.

While on the subject of the next Call Book, if the present listing is incorrect or changes need to occur for the next issue, would you also send a copy of any notification sent to DOC to the Call Book Editor, at PO Box 300, Caulfield South, Vic. 3162. Alternatively, you may ring or call at the Divisional Office, 109 Wigram Street, Parramatta, with the details. Phone (02) 689 2417 11 am to 2 pm weekdays or 7 to 9 pm Wednesdays. The entries for the next Call Book close about mid-year, but do it now! We ask that you let others know if you hear on-air discussions, etc, that their entries in the current book are wrong. The drop-copy to the Editor helps provide a cross reference to DOC listings. Members listings are the same as the AR address label unless you have notified otherwise. Station addresses may differ if you use a post box, as there is nothing to provide a correction.

WICEN

It has been decided that the interests of WICEN and the Division would be best served by WICEN seeking incorporation under the provisions of the Unincorporated Associations Act (1984). In meetings between the Council and WICEN Committee, a charter, objects and guidelines were developed and agreed. A meeting of WICEN membership was held at Parramatta on February 14, and voted unanimously to adopt the charter, objects, articles and guidelines. This is now underway, but approval will take some months with the backlog in Corporate Affairs.

Apart from the protection to the members of WICEN that incorporate will provide, there is little outward change to the operation of WICEN. The charter and objects request WICEN to continue to develop and provide the WICEN role in New South Wales on behalf on the NSW Division. After incorporation, the registered name is WICEN (NSW) Incorporated, or (Inc).

During this transition period there is the need to revise the membership register. Over the past 10 years, there has been a number who have been in WICEN, but have let their membership lapse. If they would like to renew before incorporation is finalised or there are new members wishing to join, the 1987 fees are $5. This should be sent to 'WICEN Treasurer', PO Box 123, St Leonards, NSW. 2065. An information leaflet may be obtained from the above address or the Parramatta Office. Affiliated clubs have also been sent this information so you may inquire from them.

If you were a WICEN member and have some identification equipment — helmet, badges, etc — but do not intend to renew, would you please make arrangements to return these items.

Further WICEN information is given on the Thursday evening net at 8.30 pm on Sydney repeaters 7150/8275. The Divisional Broadcasts also contain a regular segment.

NEW MEMBERS

A warm welcome is extended to the following new members who were in the February intake.

H D Davies	VK2LY	Denistone
D R Day	VK2DFD	Dural
M A Fitzalan	VK2EMA	Tottenham
J P Hvass	VK2ECF	Rockdale
G P Inwood	VK2XEX	Lane Cove
A H Langham	VK2MAL/XDO	West Pymble
W H G Metcalfe	VK2EZA	Cambridge Gardens
A H Pickford	VK2EF	Avalon Beach
W Rogan	Assoc	Drummoyne
G J Schneider	VK2FDW	Glendale

Five-Eighth Wave

Jennifer Warrington VK5ANW
59 Albert Street, Clarence Gardens, SA. 5039

WHERE ARE THEY NOW?

You will remember that in January's *Five-Eighth Wave*, I wrote about the history of the Mount Gambier High School Radio Club, and wondered if any of those young men gained their licenses, and where they are now? (I was unaware, at the time of writing, that the photographs I was describing had been published in AR, May 1985). However, since then, I have received a very interesting letter from Bob Krummel VK3BD, (ex-ZT1F 1933-35, and VK6BK 1947-49) who was one of those in the Club. It would appear that only Bob and John Heaver VK3XEH, obtained their licenses.

After the photograph was published in AR, Bob contacted John and they renewed their former acquaintance. Then, with the help of Joyce and Ross Haig, old school friends of Bob's still living in the Mount Gambier area, they set about discovering the whereabouts of the others.

Unfortunately, six of these are deceased. They are: Gilbert Saville, Noel Fredericks, Rex Sullivan, Ken Crafter, Harold Brown and Arthur Simms. Michael O'Neil is in a home for elderly citizens at the Mount, Glen O'Shaughnessy lives at Moana Beach and Lloyd Orchard was Editor of the Naracoorte newspaper until his retirement in 1985.

So, there it is, and my grateful thanks to Bob for taking the trouble to provide the information.

COUNCIL NOMINATIONS

In this issue of AR, VK5 members will find, in their SA Journal, either a voting sheet on which there is a list of nominees to Council, or, If there were not more than the required number nominated, a list of your new members of Council. I hope that there will be a vote as this gives you some measure of say over those who run YOUR organisation. If you don't like what we are doing then we could all be out of a job by May! However, if you think that this is rather a drastic approach, but you still aren't happy with some aspects of the organisation, there are other avenues open to you.

If you are a member of a club, is your club representative going to be present at the Clubs' Convention? Did you submit an agenda item for either the local or Federal Conventions, or have you voiced your opinion on items that are already going to be discussed? Even if you are not a member of a club, you can voice your opinion either by writing to Rowland VK5OU, your Federal Councillor, or to Council as a whole. Better still, you could have nominated for Council. It may be too late for some of these courses of action, but bear them in mind for next year.

As well as Graham VK5AGR, whom I mentioned in last month's column, we shall also be losing part of the services of John VK5PJG, from Council. John joined us in 1983 and has held the positions of Minutes Secretary, Building Supervisor, Education Officer and Publications Officer. Although John is retiring from Council he will be continuing as Publications Officer.

I would like to thank John for the time and effort he has put into his years on Council. I am sure the 'quiet achiever' will be missed by us all.

CONGRATULATIONS. . .

. . . to Steve Mahony VK5AIM (our Disposals Officer), of Elizabeth Downs, and Sue Coccetti (nee Jackson), of Craigmore, on the occasion of their forthcoming wedding. Our very best wishes to you both.

DIARY DATES

April 24-26 Clubs' Convention Weekend (visitors are welcome to attend, particularly at the Saturday sessions, however, we do ask that you contact Don VK5ADD beforehand, so that we have an Idea of numbers, particularly if you require meals, for which a small charge will be made).

Tuesday, April 26 Annual General Meeting, 7.45 pm.

J150 AWARD CERTIFICATES

Correction & Additions

980 9M1MC should be first Nepal
1028 should be VK5NAV, not VK5NAM.

New Awards

1067	VK5ALO*	1068	M Stippschild SWL
1069	LA3XU	1090	EA1CPE
1091	DU1UJ	1092	FE9QP
1093	F9JR	1094	4S7EA[1]
1095	4X6IL	1096	4Z4IK
1097	YO2OHI	1098	TI2JJP[2]
1099	VU2EN	1100	HZ16260[3]
1101	VU2SMN	1102	YC1HKH
1103	YC4FRX	1104	YC7BBI
1105	YB3CN	1106	VS6UN[4]
1107	VS6UA	1108	9K2YA[5]
1109	G3BWN	1110	G0EGE
1111	G4VBH	1112	DL8OC
1113	G4DXG	1114	G0DVY
1115	G4XAQ	1116	VU2LAM
1117	OE6CAG	1118	JR8JSI
1119	JI2FAP	1120	VU2UR
1121	G3BKG	1122	V85TV
1123	G4FRV	1124	YB0AF
1125	VK2NSE	1126	VK8NGP
1128	VK5BWR	1129	VK2CWS
1130	VK5AWA	1131	VK2EJH
1132	VK5ZRT	1133	VK5NWL
1134	VK5AHJ	1135	VK5AS
1136	VK6OO	1137	VK5PWK
1138	JF6ITM	1139	JO1OEL
1140	JM1XCW	1141	JA1RBQ
1142	VK5ADR	1143	VK5LV
1144	VK5BDY	1145	VK0DA[6]
1146	NU0A	1147	YB4FNN
1148	ZC4NL[7]	1149	P29FS
1150	VK0TW/5	1151	VK5PWF
1152	VK5AGW[8]	1153	VK2ESW/5
1154	VK5KMJ	1157	WB6WQA
1159	VK6ACK	1160	VK5KAS
1161	VK3PMH	1165	VK6AEA
1167	VK4NYE	1168	VK4BWG
1170	VK5NXB	1173	VK5NMJ
1174	VK4FQW	1175	VK2DJW
1176	VK2ASZ	1177	VK2VFL
1178	VK5SS	1179	VK2IU
1180	VK4VGY	1183	GW0FEU
1186	YC0LJS	1187	W6BF
1188	TR8CA[9]	1189	5V7SA[10]
1204	K5IQ /N5GXE[11]		

* Home Call Sign SM0KAK

1. 1st Sri Lanka
2. 1st Costa Rica
3. 1st Saudi Arabian SWL
4. 1st Hong Kong
5. 1st Kuwait
6. 1st Heard Island
7. 1st Cyprus
8. 1st All 70 cm
9. 1st Gabon
10. 1st Togo
11. 1st Combined husband and wife certificate

ar

VK3 WIA Notes

Jim Linton VK3PC
IMMEDIATE PAST-PRESIDENT
WIA VICTORIAN DIVISION
412 Brunswick Street, Fitzroy, Vic. 3065

NEW MEMBERS

The following members are welcomed to the VK3 Division.

Geoffrey Clarke VK3ARP, Scott Coleman, Stephen Cox, Allan Davies, Richard Everett VK3XRO, L Greaves VK3BGM, Michael Hewitt, Kevin Hickman VK3CBT, M F King, Jozef Kozka, Ian Marsh VK3PLL, L R Martin VK3BLM, D A Nisbet VK3XDA, F R Richards, Robert Robinson VK3VZR, Donald Shand VK3DZM, M C Swinton VK3BRE, and James Tregellas VK3XJT.

EXAM DEVOLVEMENT

The Council of the Victorian Division has carefully considered the draft accreditation package on examination devolvement issued by the Department of Communications.

In so doing, it solicited comments from radio amateurs and clubs within Victoria, conducted an open forum, and analysed responses to the package made by other WIA Divisions.

The Council noted that:

a The Department has issued a *Draft* document which indicates DOC's intention to devolve some or all of its examination function related to the Amateur Radio Service.
b The Department has sought comment on the document with regard to its proposed method and requirements for accreditation, prior to the finalisation of the document wording.
c The Department has sought an *indication* only of interest in accreditation.
d No formal proposal on any aspects of the examination function or process has been made by the Department to this time.
e There is no suggested basis for organisational, procedural or financial arrangements in the draft document.

And the Council recognises that views given in response to a draft document will assist the Department in the framing of a proposal to accredit an organisation or organisations at some future time.

The Council held a special meeting to determine its response to the draft document, which was also attended by the Division's Education Officer, Fred Swainston VK3DAC, and Immediate Past President, Jim Linton VK3PC.

INTERIM POLICY

An interim policy was formed keeping in mind the absence of any formal criteria — in other words, a firm devolvement proposal from DOC at this time.

Based on a number of assumptions that had to be made, Council resolved that, if the Department devolve its examinations function:

1 The WIA be the sole accredited organisation to administer and distribute examinations.
2 The Department retain its responsibility for setting the examination paper and retain and maintain the question bank.
3 In the best interests of the Amateur Radio Service, the Victorian Divisional Council recommends that, if the Wireless Institute of Australia becomes the sole accredited body for the whole or part of the examination process, it seeks a substantial financial subsidy from the Department.
4 The Wireless Institute of Australia, as the organisation recognised as representing the interests of the Amateur Radio Service, be involved to the *exclusion* of all others or not at all.
5 And, if the Victorian Division be involved in any way, then that involvement shall be without the use of voluntary labour and shall be on a full cost recovery basis.
6 Due to the absence of a firm proposal from the Department on devolvement the Victorian Division has *unresolved* doubts concerning its implementation.

WHERE TO NOW?

As stated, the Division has an Interim policy, and anxiously awaits further information from the Department, input from Individuals or clubs, and debate on the issue at the WIA Federal Convention next month.

REVIEW OF FINANCE AND OPERATIONS

The Council is continuing to review the financial operations are carried out in the Division, its costs and financial allocation, and budgetary control measures.

In the latest moves, changes to the operation and policies relating to the Inwards QSL Bureau are now in force.

Council resolved that, owing to the high and ever-increasing costs of operation of this service, several changes would be made:

1 ***Amateurs currently registered with the Bureau and those registering in the future with an established credit balance.***
At the present time, whenever cards are mailed, your balance is debited with eight cents to cover handling and packaging. Also, to offset costs of honorariums paid to the bureau managers.
This charge will be increased to 25 cents. If cards for more than one person are mailed to the same address, the 25 cent charge will be made in respect of each recipient and debited to the addressee's account.
2 ***Country members of the WIA (Victorian Division)***
It is no longer equitable that mailing of cards be on a "no cost" basis. Country members will be required to share the operational costs of the bureau with Metropolitan members.
Country members may arrange to collect cards from Zone Secretaries or they may *register individually with the bureau* and pay for postage and handling costs at the same rate as Metropolitan members.
3 ***Clubs (including country) and Zones***
All Clubs and Zones will be required to pay their own mailing costs, plus the 25 cents handling charge (chargeable on a single bulk posting). A credit balance should be established with the bureau for this purpose.
Clubs and Zones should provide current lists of persons requiring services to the bureau.
Cards may be collected from the bureau by arrangement with Barbara Gray.
Clubs and Zones who wish to register *non-WIA members* will be required to pay a *levy of $2* for each person so registered. This levy is payable in advance and will cover one calendar year from January 1 to December 31, or part thereof.
4 ***Non-WIA members who do not receive cards through clubs or zones***
a) Non-WIA members may register with the bureau in the same manner as members, and pay the same mailing and handling charges.
b) Cards *can be sorted* and made available for personal collection by payment of $2 annually to the bureau as in paragraph 3. Collection will be made from 412 Brunswick Street, Fitzroy, or from the bureau by prior arrangement with Barbara Gray.
5 ***Person collection of cards***
WIA members may register with the bureau and collect cards (sorted) from 412 Brunswick Street, Fitzroy, or direct from the bureau by prior arrangement with Barbara Gray — ***at no charge.***
6 ***Uncollected cards***
Cards for amateurs not registered with the bureau
All cards not collected or directly mailed to clubs or individuals will be forwarded to 412 Brunswick Street, Fitzroy, where they will be held for collection for a period of six months. Collection may be made by arrangement, or between 10.00 am and 3.00 pm on weekdays (excluding Public Holidays). These cards *will not be sorted.*

HOW TO REGISTER WITH THE INWARDS QSL BUREAU

FOR DIRECT MAILING
CLUBS AND ZONES
Forward a list of names and call signs and mailing address to the bureau of members requiring service. Enclose ***cash or cheque*** to cover mailing and handling costs for period required, and $2 levy in respect to each non- WIA member registered.

PRIVATE AMATEURS (both WIA members and non-WIA members) REQUIRING MAILING SERVICE
Forward name, call sign and mailing address to the bureau, together with *cash or cheque* to cover mailing and handling costs for required period.

PERSONAL COLLECTION (sorted cards)
Forward name and call sign to the bureau. Non-WIA members should forward cash or cheque for $2.

Cards will be made available at 412 Brunswick Street for collection unless alternative arrangement is made with Barbara Gray.

ADDRESS FOR ALL INWARDS BUREAU CORRESPONDENCE

Inwards QSL Manager, Barbara Gray, 1 Amery Street, Ashburton, Vic. 3147.

VK4 WIA Notes

Bud Pounsett VK4QY
Box 638, GPO, Brisbane, Qld. 4001

1986-87 DIVISIONAL PRESIDENT'S REPORT
Submitted at the 1987 Annual General Meeting of the Wireless Institute of Australia, Queensland Division February 20, 1987

1986 has been a year of many changes and innovations. We have seen new modes of transmission become more popular and new ideas concerning amateur spectrum usage. Those of us who use satellite communication have witnessed the near loss of an old mate, OSCAR-10, and the launch of JAS-1, the latest offering from the JARL.

Sadly, 1986 has also witnessed the passing of some of our friends and acquaintances in amateur radio, who became silent keys. It is indeed sad to lose some of the pioneers of this hobby of ours which has become a service to the community.

This past year, the VK4 Division has seen the retirement from a number of voluntary positions, for a well-earned rest, of some of the Officers of the Division and the recruiting of "new blood" by their replacement volunteers.

QSL BUREAU

Throughout the year, the Bureau has had a steady flow of cards, both into and out of the Division. A perennial problem is non-collection of cards by amateurs. Over the years, many cards have accumulated in the Bureau, which has caused mush concern to the Council. In this past year, a very successful program was carried out, with the co-operation of the News and Information Service, involving lists of unclaimed cards being read over the news broadcasts on a regular basis. This found many of the untraceable owners and cleared quite a backlog.

In November, the Council regretfully accepted the resignations of the Inwards QSL Bureau team who, after five years of toiling at the job, decided to take a well-earned rest and to pass on the experience to new volunteers. Almost immediately, the position was filled by Bill Dalgleish VK4UB, the current Outwards QSL Manager, who will be assisted in the job by volunteers from the Redcliffe and North Brisbane areas. Many thanks to Murray Kelly VK4AOK, and welcome to Council.

WICEN

In May, a new WICEN policy was adopted which has assisted in improving liaison between WICEN and the SES, by ensuring an active communication between the two bodies and a constructive interchange of ideas and information. Although this policy has yet to be adopted fully in all regions, the first few months of operation has resulted in many improvements in, what has been until now, some of the major problem areas of effective communications.

In line with this new policy, WICEN members in the Gold Coast and Redcliffe areas have joined the SES as wardens to co-ordinate damage control operations. Perhaps a system like this would prove beneficial in your area.

A document known as *WICEN in a Nutshell* was produced in July, which details information concerning WICEN for the information of non-WICEN members and other interested persons and has been very successful.

Amongst many activities that took place in VK4, WICEN was selected to provide much of the communications between the checkpoints for the inaugural UNICEF *Earth Run* in November.

NEWS AND INFORMATION SERVICE

As usual, over the past 12 months, the News and Information Service has provided the amateurs of Queensland with what has been arguably one of the best services *in* VK. Bonnie has *become* one of the best known non-amateurs on the airwaves which led to a pleasant surprise in December, when she was awarded a plaque from the Redcliffe Amateur Radio Club in appreciation of hsr efforts.

Bud Pounsett VK4QY, as Editor, has provided the Division's members throughout the State with a variety of information relating to amateur affairs so that all amateurs in VK4 can be kept abreast of developments affecting us all.

The broadcast team, headed by Jack Gayton VK4AGY, has carried out a sterling task to ensure that this broadcast is heard on as many bands and in as many modes as possible.

In December, Jack Gayton VK4AGY, accepted the position of QTC Editor to alleviate some of the workload of promulgating information throughout the Division.

Council's policy over the years has been, for our weekly news service, to be as informative as possible.

QTC is for hard-copy items of purely VK4 interest and AR is to be used where information is to e presented to amateurs throughout Australia.

SERVICE LIAISON

During 1986, a number of repeater applications were handled by QTAC, including applications from the Gympie Amateur Radio Club, the South-East Queensland Amateur Television Group, the Gladstone Amateur Radio Club, the Chinchilla Amateur Radio Club and numerous others. It appears that VHF and UHF are alive and well in VK4.

To enable good co-ordination between amateurs and the DOC (who make the ultimate decisions), would all groups please inform QTAC fairly early of any ideas, vague plans and aspirations, so that we may assist your project. How can we help you to be licensed if we don't know of *your existence*?

EDUCATION

Following allusions by senior members of DOC at the Federal Convention in May, that the DOC may eventually release itself of the burden of conducting examinations in the future, Ron Smith VK4AGS, prepared a questionnaire. This was circulated in September, to determine the feasibility of a suggestion that the WIA accept the responsibility of conducting examinations, should the DOC cease conducting examinations. This information was used by a committee investigating the matter in a document which has been sent to the Federal Office to assist in their deliberations on the matter. The conclusions reached in VK4 were that the WIA should accept this responsibility so that adequate standards will be retained and not abandon our role in educating present and future amateurs. The report concluded with the sentiment that we should "blow our blinkers off" and really develop the Amateur Radio Service.

INTRUDER WATCH SERVICE

Some problems were noted in the last year with illegal operation on 10 metres by taxis in Hong Kong which have been passed on to the DOC.

Once again, the diligence of those amateurs participating in the Intruder Watch Service by submitting logs of intruders has made VK4 one of the most active Divisions in this matter. My personal congratulations to those of you who dedicated your time to preserve our bands.

BOOKSHOP

The Bookshop has been active this year and, despite the relatively low value of the Australian Dollar, has managed to show a respectable profit. This was due to the efforts of the Bookshop manager, Anne Minter VK4KZX, who was also awarded a plaque by the Redcliffe Amateur Radio Club in December, in appreciation of her work.

Throughout the year, the Bookshop visited the Sunshine Coast Amateur Radio Club, the Redcliffe Amateur Radio Club, the BARCfest, the Gympie Goldfest and the Gold Coast Hamfest, as well as regular attendance at the Divisional General Meetings.

RADIO CLUB CONFERENCE

April saw the staging of the 11th Radio Club Conference, held at the Griffith University.

Despite some serious last-minute problems with the accommodation, and with the social gathering on Saturday night, most attending delegates agreed that the Conference was a success.

This year, many of the State motions concerned the RCC itself, and, after much deliberation, and some discussion, a consensus was reached that, although some re-organisation is required in some form or another, the Conference must continue in future.

A committee set up by the Council found that, due to a lack of volunteers and a lack of major difficulties within the hobby, there would be no Conference in 1987, but that a Conference must be held in 1988, possibly hosted by a regional club or branch. Negotiations are currently being held with the CQ Branch.

HISTORIAN

Alan Shawsmith VK4SS, has completed a major project recently in a book known as *Halcyon Days*, a history of amateur radio in VK4. Whilst concentrating on the 1930s, it also covers from the turn of the century to after the last war. At this time, Alan is seeking a publisher and the Division will be providing sufficient finance to ensure publication.

DIVISIONAL CONSTITUTION

During 1986, the Constitution of the WIA(Q) has come under scrutiny by a committee consisting of Norm Wilson VK4NP, Laurie Blagborough VK4ZGL, Peter Brown VK4PJ, and Divisional Councillors. This was to bring the Constitution up-to-date and tie up any loose ends present after 25 years since the last review. The review is still proceeding, as a task of this nature must not be entered into lightly.

1986 will be remembered by the Gympie Amateur Radio Club as the year that their inaugural and highly successful Goldfest was held in September.

During this year, many Divisional Officers and myself, have endeavoured to visit as many clubs and groups as possible and will contrive to maintain liaison with clubs and individuals as often as possible.

The upcoming year promises to be an extremely busy year for the Institute as a whole.

Preparations are being made to relieve the DOC of the burden of examinations, which will provide more active participation by the Institute in the future of amateur radio in VK. The challenge to affiliated clubs and the Institute to assist in examining amateurs will be met, but will provide some headaches in 1987/88.

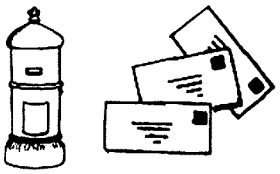
This Division is actively working towards representation in the 1988 EXPO to be staged in Brisbane, to promote amateur radio, but effective representation at an amateur price will keep next years Council active.

Finally, I would like to take this opportunity to thank all the volunteers and especially the families of those volunteers who have assisted, yet again, to steer the VK4 Division so successfully through yet another 12 months.

I will repeat the message included in the response to the DOC submission concerning accreditation of clubs in the examination fields by asking our membership to "blow off our blinkers", look ahead and get on with the task at hand — to enjoy being involved in our hobby.

Signed: David Jerome VK4YAN
Divisional President

ar



Over to You!

Any opinion expressed under this heading is the individual opinion of the writer and does not necessarily coincide with that of the publisher.

EXAMS AND BLACK BOXES

Citizen Band: No Exams — Black Boxes
Commercial Users: No Exams — Black Boxes
Amateur Radio: Exams — Freedom

How long will amateurs enjoy this freedom of choice if examination standards continue to fall?

Examinations for amateur radio licenses have been steadily falling over the years due to:

1 Those who want something for nothing and,
2 Those who want to fill our bands at any cost.

The latest road to disaster, confrontation and lower standards is DOCs proposal to allow private aligned groups to conduct and be involved in examinations.

For the maintenance of quality and recognised examination standards, it is essential that those involved in the organisation of examinations be independent, non-aligned, professional bodies such as RMIT, TAFE and similar organisations.

Yours sincerely,

Tony Tregale VK3QQ,
73 Nepean Street,
Watsonia, Vic. 3087.
ar

FURTHER TO. . .

. . . further to the note by Graham VK5AGR, in the AMSAT Australia column of AR, February 1987, it is necessary also to take into account feeder loss when calculating ERP

Typically, my own antenna system is 30 metres away from the shack. This means that my RG8 feedline introduces a loss of about 3 dB. Assuming, say, an SWR at the transmitter of 1.2:1, the antenna SWR will be in the order of 1.45:1, and the loss, up to the antenna, will be 3.2 dB (Refer to *System Loss and Antenna SWR*, AR, April 1982).

Thus, with a nominal antenna gain of 13 dB, my ERP is not 200 watts for 10 watts input, but less than 100 watts, due to the total system gain being 13 - 3.2 = 9.8 dB.

Therefore, check your line loss before having to reduce output power.

George Cranby VK3GI,
Box 22,
Woodend, Vic. 3442.
ar

IMPRESSED WITH TWO METRE REPEATERS

Having made a couple of trips to Canada I have become very impressed by the quality of and facilities provided by many of their two metre repeaters. There are many similarities between the Australian and Canadian Amateur Radio scenes and our governing bodies but Canada is far ahead of us in repeater technology. Vancouver for example has two intelligent repeaters on two metres providing phone patch, message store and forward, and time reports amongst other facilities by the integration of a computer with the normal radio repeater. As third party traffic and phone patching are both now available to the Australian amateur is there any regulatory reason why such facilities cannot be provided here in this country?

I can see many benefits not only to the improvement of the technical expertise of the Australian amateur but also to the community in general by having phone patch facilities attached to some of our VHF repeaters. There are many hours in a day when city repeaters are not being monitored by a home station and many more hours in the rural areas. Thus, should emergency services be required it is often impossible to contact them because there is no station with access to a telephone. There are many situations where a life could be saved by having access to a telephone, and it is an unfortunate situation that public telephones are becoming increasingly more difficult to find in working order.

I would be interested to know the policy of DOC, Telecom and the WIA in regards to phone patch facilities on VHF repeaters but more importantly in the opinions of other readers of AR on this subject. Is there enough interest and concern amongst Australian amateurs to improve our technical expertise and catch up to the Canadians and in so doing, improve our operating facilities?

Yours sincerely,

David Jewell VK3DAJ,
17 Rosaline Avenue,
Mount Waverley, Vic. 3149.
ar

SUBS FOR 1987

Please find subs for 87. I am not an amateur, only a Good Buddy CBer and Shortwave Listener. At a meeting of the North West Branch of Tasmania recently a discussion was held re the Pensioner Discount. I was amazed at the attitude of some of the members, mostly retired, and obviously by some of their activities, not short of a bob or two!

Another point I would like to make is the attitude of amateurs to CBers. What they should remembers is that CBers are subsidising the amateurs. One has only to check the number of licenced operators both CB and amateur to see who is paying the most to use the air waves.

Another point is this; most of the current amateurs are over 55 and thus will not be around for much longer.

The WIA and amateurs in general should be encouraging CBers as this is the source of future amateur operators.

Perhaps a special low class of amateur licence might be instrumental in getting some of these CB operators into the amateur ranks, thus giving them the incentive to obtain higher classes of licence.

Well, I have had my little gripe so will say cheers for now.

Yours faithfully,

Rick Rickard L30350,
41 Latrobe Road,
Railton, Tas. 7305.
ar

STOLEN EQUIPMENT RECOVERY

I wish to advise readers that my Icom IC-2A, serial no 09665, has been handed to the police by a gentleman who bought it at a pawn brokers in February 1986 (less than a month after it was stolen).

He told the police that he saw an editorial in ARA, January edition. He has no call sign yet but was sitting the February examinations in Brisbane.

Yours sincerely,

Iris Bonsey VK4NME,
42 Edinburgh Drive,
Bethania Waters, Old. 4205.
ar

NON-PARTICIPATION

At the February General Meeting of this club, a decision was made not to participate in this years John Moyle Memorial Field Day Contest.

This decision was not taken lightly, and the record will show that our club has participated in most National Field Days during the past 20 years, and currently holds 11 certificates gained in that contest.

In past years the National Field Day was the big club event on the contest calendar. However, the emphasis on VHF and the ridiculous scoring system does nothing to encourage multi-operator stations entering the contest. By definition, a multi-operator station has the manpower and resources to operate on all HF and VHF bands.

Currently there is little incentive to set up HF equipment, when the value of any contacts made will be minimal when compared with those on VHF after the application of the disproportionately large multipliers for VHF contacts.

The object of the contest as outlined in February's AR mentions:

. . . training (operators) for preparedness in emergency situations. (P42).

Are we to assume that all emergency traffic will be handled on the VHF bands? The generous bonus for using "natural" power, would also seem at odds with the aims of the contest. Surely in an emergency situation, as encountered by this club on Ash Wednesday 1983, it is more beneficial to provide reliable communications, even if it is petrol powered, then rely on suitable sun or wind, or the production of power using baked beans.

The GARC would like to hear from individuals or clubs who share our concern about the direction of the National Field Day contest, and who would support a return to a more equitable scoring system.

Yours sincerely,

Barry Abley VK3YXK,
Secretary,
Geelong Amateur Radio Club,
PO Box 520,
Geelong, Vic. 3220.
ar

A LETTER OF PROTEST ON 50 BAUD

Sir, please excuse my typing since my hands shake badly due to my age, I am 95 years old.

My reason for writing is to protest against the speed increase of amateur RTTY in this area, you see, I am an old CW operator but no longer able to operate the key, as I could back in the 'good old days' due to the shakes.

My doctor recommended that I take up a hobby to occupy my mind. Dancing was out of the question unless the beat was in sync with my shakes. I found a record once that sync'd in on a sub-harmonic but the physical exertion put me in hospital for 10 days. Other hobbies have ended up the same way, in disaster.

However, in my efforts to discover a hobby, I found that I could copy 45.45 Baud RTTY in my head, and it was in perfect sync with my shakes. The up- shift and down-shift were quite exhausting until I converted jumping on and off my wheel chair, to sitting and nodding my head. It works beautifully and I have spent many pleasant hours reading the RTTY news broadcasts at 45.45 Baud.

Now that you have increased the news speed to 50 Baud, I have checked with my doctor to see if there is a drug available that could increase the speed of my sync so I could copy your increased speed. Some of the drugs have possibilities, but they are not legal and that is another story.

To date, I have only been able to sync on 45.45 Baud stations, so I implore you to go back to 45.45 Baud, for all the old timers like me. Sure, you can call it progress, but we all know the automobile did not entirely replace the horse.

Yours faithfully,

Signed: A Shaker.

PS — I developed a reperf system by installing punches on my teeth, but the added weight caused my uppers to keep falling out and hitting my hearing aid, not to mention the tape almost choking me, so I had to give that idea away.

Dated: April 1, 1987

—Forwarded by Bud Pounsett VK4QY
ar

Re FEBRUARY WICEN

Please refer to WICEN News on page 56 of February AR.

It has been pointed out to me that my report gave the impression that the Saint John Ambulance Brigade organisation were totally dependent on WICEN for their radio communications.

I wish to take this opportunity to correct any unintentional misunderstanding. Saint John Ambulance had their own communication network, both HF and UHF on all their vehicles, plus base stations. Also, VK3SJA and VK3SJB were on air each day from 0900 to 2300 in a supporting role at SJA radio headquarters, in the Melbourne suburbs.

WICEN relayed messages only on the occasions when bad areas handicapped their communications.

Regarding progress reports from the check points along the bicycle route, as stated in my report, WICEN reported the progress of everyone connected with the bike ride — riders, Police Motorcyclists, doctors, and all first aid vehicles and personnel, to enable the *whole* organisation to be aware of their progressive whereabouts and any requirements.

I especially draw attention to the long hours and vital work the large team of Saint John Brigade volunteers, mobile, start and finish, together with the doctors who all carried out their roles efficiently and well.

The whole organisation in every respect did an outstanding, satisfying job which involved long hours and hard work.

It was a very valuable exercise in cementing good working and co-operation relationships with the Saint John Ambulance and all concerned, and the training on this and similar involvements with Saint John Ambulance, Red Cross, SES, etc over the years, has made WICEN a first-class communications reserve.

K V Scott VK3SS
34 Henry Street,
Maffra, Vic. 3860.

ar

COMMENT. . .

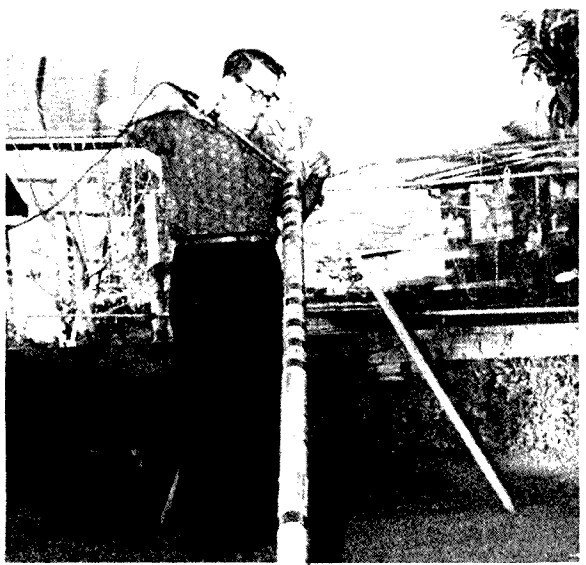
Before commercial equipment was available the amateur had to be a practical constructor in order to get on the air. But there were many who were interested in electronics and experimenting for its own sake. Are there many such people left who would like to measure, for instance, frequencies to 10 GHz and beyond, make simple voltage controlled oscillators in the Gigahertz region, measure characteristic impedance better than some multi- thousand Dollar commercial gadgets, and so on? All with equipment (home- made) costing a few measly Dollars — just for the fun of it. If so, I would like to hear from you.

Roy Hartkopf VK3AOH
34 Toolangi Road,
Alphington, Vic. 3078.

ar

Thumbnail Sketches

Alan Shawsmith VK4SS
35 Whynot Street, West End, Qld. 4101.



—Photograph courtesy the *Courier-Mail* Printing Service

LORIMER DOUGLAS (RICK) RICKABY VK4VR (SK)

Rick, as he was known to his many mates, spent almost all of his life in some facet of radio communication.

He joined the RAN at the very early age of 14-years, quickly graduated as a telegraphist (called Radio Officers in some marine services) and sailed the world for 13 years. This experience set him up for the rest of his life in more ways than *brass-pounding*.

In 1935, Rick took out his first call sign, viz VK2ACY. One year later he emigrated to the Sunshine State and began work as Broadcast Technician at 4VL, Charleville. In this same year (1936) he came on air as VK4VR, and used this call sign for the next 40 years (WWII excepted).

Rick's next move was to 4AK, Oakley, and then to the parent station 4BK, Brisbane in 1941, where he played a very busy role in transferring the transmitting section from the City to the outer suburb of Seven Hills. This was a precautionary measure in case of an enemy aerial attack on Brisbane during the War.

Two years later, (1943) he offered his talents to the American Armed Services Pacific Area, and was based at Brisbane in the radio repair and maintenance section. In 1946, he was posted as Radio Officer to the Dutch Force, at Biak, and here he used the amateur call sign PK6VR, with much DX success.

Back in Brisbane, in civilian life, he worked for various radio firms, finally joining the Metropolitan Security Service in the mid-60s where he remained until becoming a Silent Key in October 1975, during his 70th year. All will agree his life was busy and varied.

He is affectionately remembered by the OOTers for his skill on the key and his ability to raise and lower tall masts — something he no doubt learned in the Navy and which caused him to be in constant demand around the fraternity. He also gained unexpected fame with his *Beer Can* vertical antenna, a creation which captured the Australian imagination and he had articles written about him in several magazines, including the *Australian Post* and overseas publications.

Before his death, Rick VK4VR had the deep satisfaction of seeing his son, Brian, take the AOCP and the call sign, VK4RX. Later, his daughter-in-law, Val, claimed the OMs call, VK4VR, for herself.

ar

Silent Keys

It is with deep regret we record the passing of —

MR J P BESTED	VK5CS
MR L P GREENWELL	VK2VEA
MR T GRIERSON	VK5SA
MR RON HOLT	VK2QQ
MR W L LAND	L30422
MR R J LUKEIS	VK3BRL
MR HAROLD LUNN	VK2ANE
MR LEONARD OLIVER OAKLEY	VK3BNH
MR J C R PAPESCH	VK2BPL
MR P J POLLARD	VK6IV
MR S V SMITH	L50565
MR R A C WILLIAMS	VK6AOS

Obituaries

IAN LESLIE GRIFFIN VK3VS
1921-1987
(ex-VK3IJ & VK5VO)

It is with deep regret that I record the passing of my close friend, Ian Griffin VK3VS, on January 26, 1987.

Ian was born in Geelong and lived his early days at Marong, near Bendigo. It was at Bendigo that Ian became interested in radio and obtained his amateur licence with the call sign, VK3IJ. In 1939, he ventured to Melbourne and worked at Radio Corporation, in South Melbourne, before joining the AIF and serving in the 39th Battalion.

His war service took Ian over the infamous Kakoda Trail, in New Guinea. From this ordeal he returned home in bad health. After rehabilitation and recovery he joined the Salvation Army in 1946, and to this cause he devoted his entire life.

He served in many capacities in several locations including South Australia, where he held the call sign VK5VO.

He served with distinction in the Salvation Army, retiring with the Rank of Major only last year. During his year of retirement, at Reservoir, Ian was active on the HF and VHF bands where he made many friends. His gentle humour and quiet manner will be sadly missed by his many friends who extend sympathy to his wife, Ivy and his family.

—Contributed by Des Greenham VK3CO

ar

29th JAMBOREE ON THE AIR

It is obvious that JOTA is still growing in Australia. JOTA in 1986, saw some 32 000 people involved — over seven percent more than in 1985. The Branch Chief Commissioners and/or Guide State Commissioners seem to have been involved in nearly every state, thus indicating the importance they place on the event.

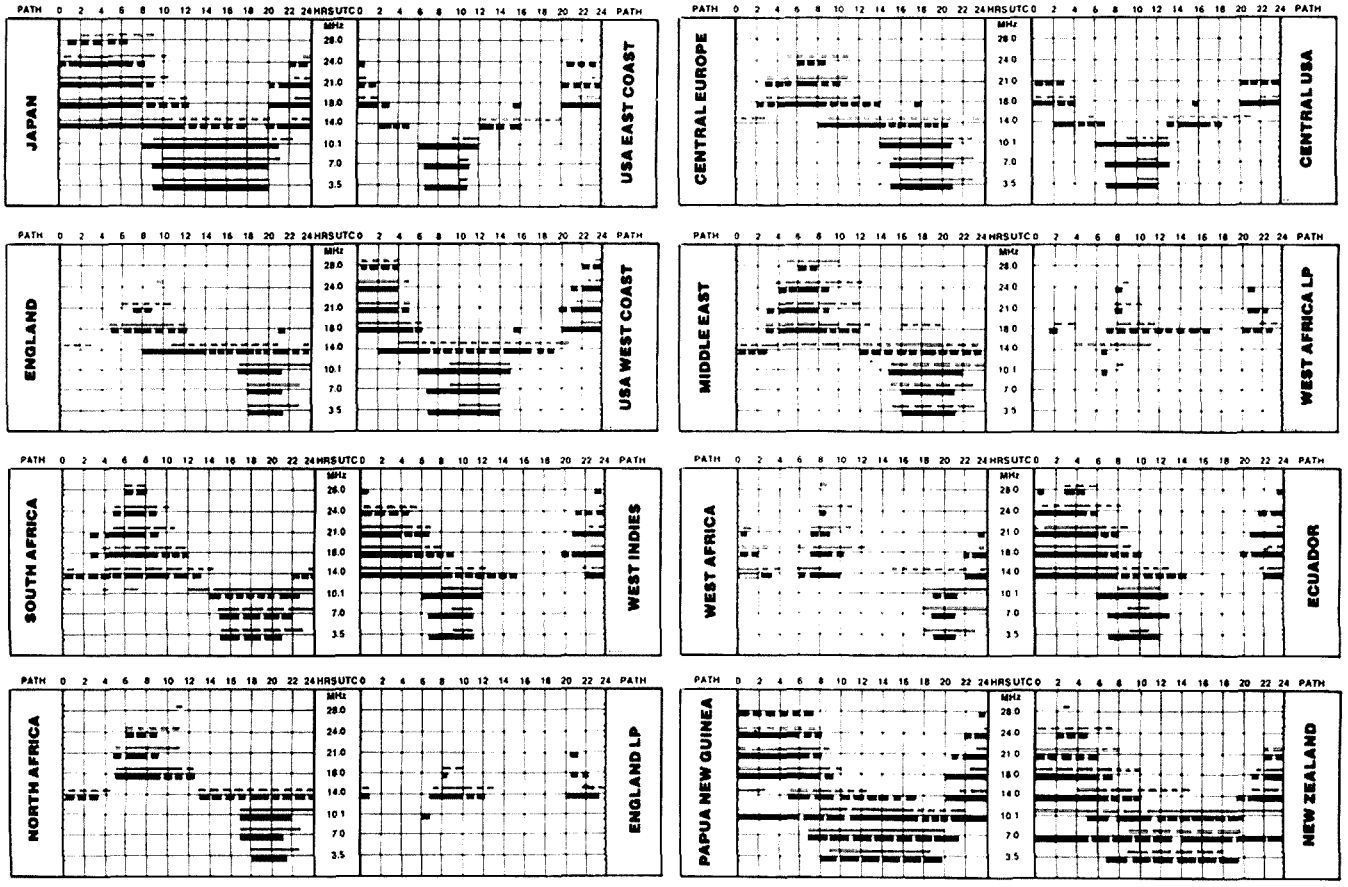
There was less comment about propagation problems, no doubt due to an increase in numbers of contacts by 45 percent. One Branch Organiser believed the overseas contacts were more difficult but better and longer contacts were made throughout Australia itself, although overseas contacts increased by 66 percent!

Heavy rain hit VK1BP, right at the start of the opening broadcast and it was feared the noise of the rain on the marquee would interfere with the transmission. Apparently, it made little difference. Some troops reported camps washed out with terrible storms in VK3.

—Condensed report from Peter Hughes VK6HU, National Co-ordinator for Jamboree on the Air

Ionospheric Predictions

Len Poynter VK3BYE
14 Esther Court, Fawkner, Vic. 3060



LEGEND
From Western Australia (Perth)
From Eastern Australia (Canberra)

Mixed mode dependent on angle of radiation (long broken lines).

Better than 50% of the month, but not every day (continuous lines)

All paths unless otherwise indicated; (ie LP = Long Path) are Short Path.

Less than 50% of the month (short broken lines).

Predictions are presented courtesy of the Department of Science, IPS Radio and Space Services, Sydney.

Solar Geophysical Summary

OCTOBER TO DECEMBER 1986

GENERAL

Solar activity was mostly low in October — one energetic flare was observed on the 19th. There were up to five regions visible and most were 'reverse' polarity and so are typical of the incoming cycle. Flux rose to 99 on the 23rd, the highest since February 1986, with a sunspot number of 35.7, the highest since June 1984.

In November, activity was low with no energetic flares observed. At times there were a number of small regions visible and were a mixture of old and new spots — the disc being spotless on 12, 13, 26, 28 and 30th. The flux peaked at 91 on the 1st with the lowest of 71 on the 11th. The sunspot number was 14.7.

December was also low with no energetic flares observed. The sun was without spots from 1-8, 15, 18-20 and 26-31. The regions visible appear to be new cycle regions. This adds further weight to the suggestion that we are now past solar minimum and moving into the new cycle. The flux peaked at 75 on the 11th with the lowest value of 70 on the 7th. The sunspot number for the month was 6.4.

The running sunspot numbers were 4/86 = 13.8; 5/86 = 14.5; 6.86 = 13.9.

SUNSPOT CYCLE STATISTICS —

CYCLE 19

Start (minimum)	April 1954	R=3
Maximum	March 1958	R=201
End (minimum)	October 1964	R=10

Length 10.5 years.

CYCLE 20

First spot	September 1963	13 months pre-minimum
Start (minimum)	October 1964	R=10
Maximum	November 1968	R=111
End (minimum)	June 1976	R=12

Length 11.7 years (prolonged decay).

CYCLE 21

First Spot	November 1974	15,19 months pre-minimum
Start (minimum)	June 1976	R=12
Maximum	December 1979	R=165
End (minimum)	June 86 to December 1986? ? ?	

Length 10 to 10.5 years

CYCLE 22

First spot	March 1985	31,(Region 4640)

Length 11.7 years (prolonged decay).

—Extracted from Solar Geophysical Summary supplied by the *Department of Science IPS Radio and Space Services.*

RADIODES

ODE TO A RELAY

O wondrous part — ingenious part,
Product of th' inventor's art
Which sits within a maze of wire
And — working hard — doth never tire.

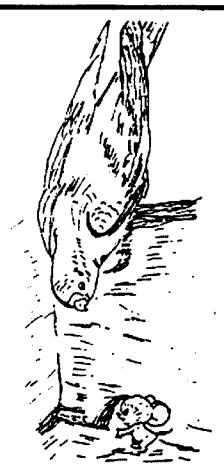
Supply the power of its coil
And evermore it does its toil.
No slowing of its act is seen,
Provided that you keep it clean.

Sometimes a click, sometimes a thump
Declares this switch is not a chump.
Ten thousand times without a break,
This gadget works and keeps awake.

O ponder then this glorious thing.
Give honour due — its praises sing.
For does it not in lowly state
Use lesser power to change the great?

But soft — what makes my spirits sink?
It has no brain and cannot think,
And so the fault is far more strong
If e'er its mechanism's wrong.

—"Hambard" (Originally printed in the Nigerian ARS Newsletter 1970s)



DEADLINE

All copy for inclusion in the **June 1987** issue of *Amateur Radio*, including regular columns and Hamads, must arrive at **PO Box 300, Caulfield South, Vic. 3162,** at the latest, by **9 am, April 21, 1987.**

Hamads

PLEASE NOTE: If you are advertising items FOR SALE and WANTED please write ***each*** on a separate sheet of paper, and include all details; eg Name, Address, Telephone Number, on both sheets. Please write copy for your Hamad as clearly as possible. ***Please do not use scraps of paper.***

- Please remember your STD code with telephone numbers
- Eight lines free to all WIA members. $9.00 per 10 words minimum for non-members
- Copy in typescript, or block letters — double-spaced to ***Box 300, Caulfield South, Vic. 3162***
- Repeats may be charged at full rates
- OTHR means address is correct as set out in the WIA current Call Book

Ordinary Hamads submitted from members who are deemed to be in the general electronics retail and wholesale distributive trades should be certified as referring only to private articles not being re-sold for merchandising purposes.

Conditions for commercial advertising are as follows: **$22.50 for four lines, plus $2.00 per line (or part thereof)**
Minimum charge — $22.50 pre-payable
Copy is required by the Deadline as indicated on page 1 of each issue.

TRADE ADS

AMIDON FERROMAGNETIC CORES: Large range for all receiver and Transmitting Applications. For data and price list send 105 x 220 mm SASE to: **RJ & US IMPORTS,** Box 157, Mortdale, NSW. 2223. CLOSED DURING JUNE (No inquiries at office . . . 11 Macken Street, Oakley). Agencies at: Geoff Wood Electronics, Lane Cove, NSW. Webb Electronics, Albury, NSW. Truscott Electronics, Croydon, Vic. Willis Trading Co, Perth, WA. Electronic Components, Fishwick, Plaza. ACT.

WANTED — ACT

VALVE TESTER: in working order for USA & Aust vintage tubes project. Please advise make and model, range coverage, condition and price plus freight. Jock VK1LF, OTHR.

WANTED — NSW

BEAM: 3 element tribander. VK2PWU, 7 Tulip Street, Hyams Beach, NSW. 2540. PO Box 36, Huskisson, NSW. 2540. Ph:(02) 43 0685.

FAST TO SLOW SCAN CONVERTER: for a video camera or circuit of the same. Also any info on SSTV. All costs paid. Bill VK2FAW. Ph:(044) 21 0689.

VALVES FOR COLLECTION: duds OK. 800, 803, 805, 806, 808, 811, 812, 814, 826, 833A, 852, 880, 100TH, etc. Brian VK2EFD, QTHR. Ph:(049) 77 2178.

CIRCUIT DIAGRAM: for AWA Carphone Junior, and information on the crystals. Will reimburse photocopy expenses & postage. John VK2DVW, OTHR. Ph:(02) 57 6567 AH.

WANTED — VIC

COLLINS 75A-4 RECEIVER: Tubes 811A, 6AZ8, 6BN8, 6DC8. Gary VK3GY. Ph:(03) 789 4383,

YAESU FT-200 HF TRANSCEIVER: with spares if possible but not important. Must be clean. Contact John VK3ABW, QTHR. Ph:(03) 568 7428.

WANTED — QLD

CIRCUITRY: &/or service information on Transistor Portable Receiver — Zenith Trans-Oceanic Royal 1000. John VK4NZ, 25 Scrub Road, Coolum Beach, Qld. 4173.

FOR SALE — NSW

BEAM: 6 element Hi-Gain TH6-DXX, deceased estate VK2HF, $230 ONO. FV101 external VFO for FT101, as new condition, $95. Large collection of QST & Ham Radio mags dating back to 1960. Offers please or willing to donate to library. Mark VK2BAK. Ph:(02) 487 1299.

ESTATE OF THE LATE VK2EO: Collins S-Line 75S-3 receiver with 200 Hz CW IF filter, 32S-3 transmitter with home-brew power supply, 30L-1 linear, Hy-Gain TH6-DX 6 element HF beam, Telescopic 36 ft, 3 section windup tower, Vibroplex paddle and valve keyer. Inquiries and offers to Allan Mason VK2GR, QTHR. Ph:(02) 412 5412 BH, (02) 680 2538 AH.

SWAP: 52 issues Amateur Radio 1933-1939, plus 1 Weston & 2 Palec valve testers for pre-1940 Australian radio magazines, trade catalogues or vintage radio parts. Brian VK2EFD, QTHR. Ph:(049) 77 2178.

YAESU 102 TRANSCEIVER: FRG7700 receiver, Kyothuto 2m transceiver. For details. VK2YN, QTHR.

YAESU FT-757GX, $975. Tektronix oecMoacope 545A, Mainframe $450. Plug-in preamps, type CA dual-trace $195. Type B, wide band $175. Type L, fast-riee $175. Type O operational amp $150. Type 1A1, dual-trace $175. Type 1A4, four channel $150. Type W, high-gain differential comparator $150. Type 1A7, high-gain differential amplifier $100. With manuals. VK2CPK, QTHR. Ph:(02) 238 7889 BH, (02) 411 1227 AH.

YAESU FTDX-400 HF TCVR: spare pair new final tubes, plus others. Instruction manual. $250. Barry VK2LA, QTHR. Ph:(02) 661 1088.

FOR SALE — VIC

BRAND NEW ITT 813 TUBES: made 1973 $50 ea. Used Johnson Ceramic sockets, suit 813 $15 ex. Filament transformers to run pair 813s, $20 ex. Emtronics EAT300 tuner, $140. Telereader Code Master CWR-610. CW, RTTY, De-coder & CW Trainer, $190. Garry VK3GY. Ph:(03) 789 4363.

ICOM 25H 2m TRANSCEIVER: in original box. $335 ONO. VK3TG QTHR. Ph:(058) 52 1636.

IC-701 & P/S: desk mic SM2, $650. IC-720A & P/S, desk mic SM5, $850. TS520 remote VFO $75. All E/C. One owner. VK3ED, QTHR. Ph:(03) 746 1438.

JRC HF TRANSCEIVER: as new. Comprising JST-100XCVR. NBD 500 PS, NFG-97 ant tuner & NVA-88 spkr. This is latest from JRC with ultimate in reliability & performance. Peter VK3IZ. Ph:(03) 842 8822 BH or (03) 715 1164 AH. Inspect at 27 Rosella Street, Doncaster East.

KENWOOD TS-120S: & desk mic. Good condition. $450 ONO. John VK3BAS, QTHR. Ph:(057) 52 2056.

TWO VHF SOCKETS: SK620A $50, P&P Is there anyone who can help with a 'J' formal video tape that is working for transfer-editing of tapes. VK3YNB, QTHR.

YAESU FT75B: with AC & DC port pack $320 ONO. Ceramic sockets for 813 or 6/AO tubes. Power trans from 300 V CT to 3000 V CT, cheap. TX tubes all types, cheap. VK3UT, QTHR.

FOR SALE — QLD

KENWOOD TS-430S: ex cond, light use, mainly as rx. Optional AM & narrow SSB filters fitted. Scanning mic. Manual & orig carton. $1050. VK4ABY, 13 Gasaman Street, Gatton, Qld. 4343. Ph:(075) 62 2934.

YAESU FT-7: 1.8 kHz SSB filter, extra 10m band added, orig pkg, manual, VGC. $350. H-brew linear using 4 x 6146B to suit FT-7. Well made $190. Parts for solid-etate HF linear, 10W in 150W out, 2 x DX542CF (sim MRF454), large heat sink, relays, all unused. $90. Valve 6m transverter, H-brew, $15. ARR15 aircraft receiver by Collins, 1.5-18.5 MHz, w. info, mods, GC, $100. Mutek SLNA 144s switching 2m preamp, VGC. $65. AR magazines, 1951 to present, only few missing. What offers complete lot? VK4AIZ, OTHR. Ph:(07) 391 5526 — not Fri pm or Sat.

YAESU RELAY BOX FRB-707: for connection FT707 tcvr to FL-2100Z linear or FTV-107R transverter. New in carton $25 posted. Icom LDA unit Ex202. For installation in IC730 tcvr. Provides band control voltage for auto band change on Icom linear or ATU. New. $25 posted. VK4AGQ, QTHR. Ph:(07) 266 8107.

FOR SALE — SA

ATTENTION — EME ENTHUSIAST: For health reasons must sell my partially completed EME installation. 24 x 16' aluminium trusses shaped & assembled ready to make 32' parabolic (dish) antenna with f/d 0.45 & projected gain around 30 dB on 70 cm. Suitable for 1296 & probably higher. For details see page 64 of June 1986 AR. Price reduced to $2200 by omitting the existing tower. Enough material on hand & included to complete most of the project. A great engineering undertaking for an enthusiast — much of the work is already done. Your gain is my regret. Eric Jamieson VK5LP, OTHR. Ph:(08) 389 1204. Inspection by appointment only.

FOR SALE — TAS

DECEASED VK7 ESTATE: Kenwood TS520S, MIC 30 & MIC 50 mics, trap dipole, balun, TV300 LP filter, coax, "Leader" LAC 895 antenna tuner, inbuill SWR & PWR meter, "Hansen" SWR bridge, 50W dummy load. All commercial gear, not home-brew. Morse key (ex-PMG, collectors item), text books. All immaculate. Offers for all or part to Bill VK7TE, QTHR. Ph:(003) 26 2297.

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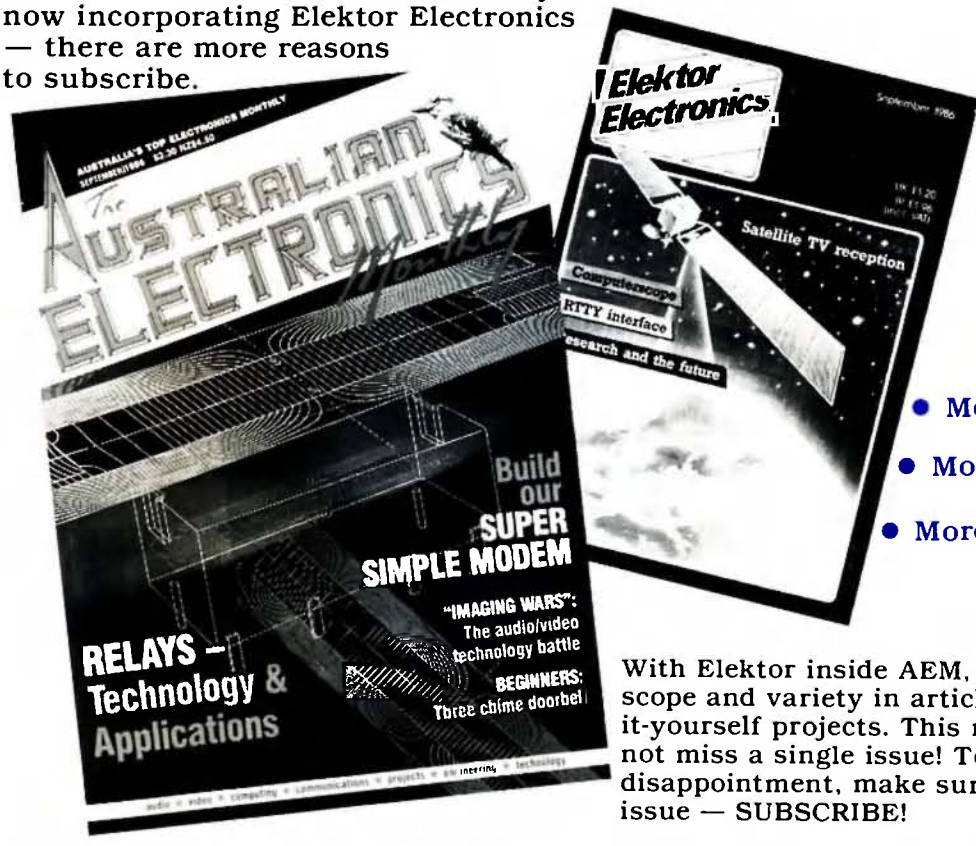
With Australian Electronics Monthly now incorporating Elektor Electronics — there are more reasons to subscribe.



- More projects!
- More features!
- More practical articles!

With Elektor inside AEM, now you get more scope and variety in articles, features and do-it-yourself projects. This means — you should not miss a single issue! To avoid disappointment, make sure you get every issue — SUBSCRIBE!

It's cheaper to subscribe! Rather than pay $57.00 for an annual subscription ($4.75 a month), you can subscribe at $49.95!

And what's more, you could win yourself a great Weller soldering station!

Fill out the coupon and send it today.

Australian Electronics Monthly is edited by Roger Harrison VK2ZTB and published by Kedhorn Holdings, Fox Valley Centre, Cnr Fox Valley Rd & Kiogle St, Wahroonga 2076 NSW.

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Subscribe, and you could win this superb Weller WTCPN Soldering Station courtesy of Cooper Tools. Each month, we'll award this prize — worth over $140! — to the new subscriber who best answers the questions here.

Q1: Weller irons employ "....." point temperature control.

Q2: On a separate sheet of paper, in 30 words or less, what was it that prompted you to subscribe to AEM this month?

Annual subscription price: ~~$57.00~~ $49.95!
(overseas prices on application).

Complete this coupon, cutout or photostat and send to:

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CooperTools

A transformer powered soldering station complete with a low voltage, temperature controlled soldering pencil. The special Weller closed loop method of controlling maximum tip temperature is employed thereby protecting temperature sensitive components while the grounded tip and non inductive heater protects voltage and current sensitive components. The soldering pencil features stainless steel heater retention tube, a non burning silicon rubber cord and a large selection of iron plated tips in sizes from .8 mm diameter to 6 mm diameter with a choice of tip temperature of 315°C (600°F), 370°C (700°F) and 430°C (800°F). The transformer case features impact resistant mould for durability and protection against accidental arcing a quick connect/disconnect plug for the soldering iron, extra large wiping sponge, tip tray to store extra tips, plus an improved roll on switch with a long life neon indicator light, a non heat sinking soldering pencil holder and a 2 metre cable. Swivel cord.

Card No. .....
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*Unsigned credit card orders cannot be accepted.

New IC-R7000

Introducing a Professional Scanning Receiver at an Affordable Price.

25-1000MHz Plus!

frequency coverage
(no additional module required for coverage to approx. 2.0 GHz.)

ICOM announce a scanning receiver that offers professional performance with IC-R7000 advanced technology – 25-1000MHz coverage, multimode operation and a sophisticated scanning and recall system.
IC-R7000 covers aircraft, marine, business, FM/AM broadcast, amateur radio, emergency services, government and television bands.

ICOM IC-R7000 has many outstanding features.

- **99 MEMORIES:** You can store up to 99 of your favourite frequencies for instant recall. Memory channels can be called up by simply pressing the memory channel knob or direct through the keyboard.
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- **SCANNING:** instant access is provided to commonly used frequencies through the scanning system. The Auto-M switch enables signal frequencies to be memorized while the IC-R7000 is in the scanning mode. Frequencies that were in use can be recalled at the operators convenience.
  An optional voice synthesizer automatically announces the scanned signal frequency to ease problems with logging.
- **MULTI MODE:** Push button selection enables FM wide/FM narrow/AM/SSB upper and lower modes to be received.
- **6 TUNING SPEEDS:** 0.1, 1.0, 5, 10, 12.5 and 25 kHz through knob selection.
- **ADVANCED TECHNOLOGY CONSTRUCTION:** The IC-R7000 has dual colour fluorescent display with memory channel readout and dimmer switch.
  Dial lock, noise blanker, combined S-meter and centre meter.
  Optional RC-12 infra red remote control operation. All the above professional features are produced in a convenient, compact unit of size:

Height	282mm
Width	286mm
Depth	276mm

- Specifications guaranteed from 25-1000MHz and 1260-1300MHz.
  No additional module is required for coverage to approximately 2000MHz. No coverage is available from 1000-1025MHz.

Please send me details on: ICOM3353

☐ IC-R7000 ☐ ICOM's full range of communications equipment.

Senders details:

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ADDRESS _____

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PHONE: _____ (BUSINESS) _____ (HOME)

POST TO: ICOM, 7 DUKE STREET, WINDSOR, VICTORIA, 3181. PH: (03) 529 7582.

All stated specifications are approximate and subject to change without notice or obligation. ICOM customers should be aware of equipment not purchased at authorized ICOM Australia Agents. This equipment is not covered by our parts and labour warranty.

ICOM

The Frequency of Ideas.

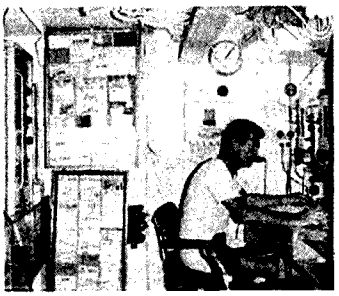
Amateur Radio

JOURNAL OF THE WIRELESS INSTITUTE OF AUSTRALIA
VOL 55, No 5, MAY 1987

International Travel Host Exchange
Photophones Revisited (conclusion)
Tune-Up Protection Device
Antenna for Space

Amateur Radio

Davy VK4XX, doing the Sunday "shift" of VK4RAN in the W/T Office aboard the HMAS *Diamantina*.



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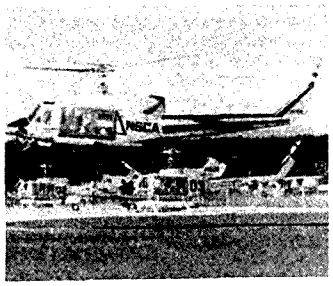

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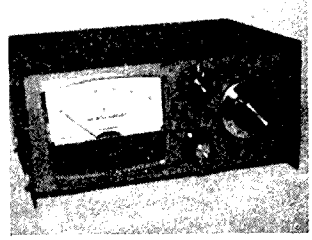
Special Features



See page 6

See page 3

Technical Features

See page 31

Regular Features

DEADLINE

All copy for inclusion in the July 1987 issue of Amateur Radio, including regular columns and Hamads, must arrive at PO Box 300, Caulfield South, Vic. 3162, at the latest, by 9 am, May 22, 1987.

Amateur Radio

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Inquiries and material to:
The Editor,
PO Box 300,
Caulfield South, Vic. 3162.

Material should be sent direct to PO Box 300, Caulfield South, Vic. 3162, by the 20th day of the second month preceding publication. Note: Some months are a few days earlier due to the way the days fall. Check page 1 for deadline dates. Phone: (03) 528 5962.

HAMADS should be sent direct to the same address, by the same date.

Acknowledgment may not be made unless specifically requested. All important items should be sent by Certified Mail. The Editor reserves the right to edit all material, including Letters to the Editor and Hamads, and reserves the right to refuse acceptance of any material, without specifying a reason.

TRADE PRACTICES ACT

It is impossible for us to ensure the advertisements submitted for publication comply with the Trade Practices Act 1974. Therefore advertisers and advertising agents will appreciate the absolute need for themselves to ensure that, the provisions of the Act are complied with strictly.

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Editor's Comment

ARE YOU ONE OF A THOUSAND?

What is the Wireless Institute worth to you? Something like one thousand who were members last year have not renewed their membership this year. Do we assume their answer to the question is "Less than the subscription you want us to pay"?

If you are one of that thousand, you are only able to read this by courtesy of a club or another amateur whose membership is still current. I hope you still have sufficient interest in the present and future of amateur radio to have made at least an effort to see this issue. Those of you who gave reasons for resignation or non-renewal invariably said the COST was more than they could afford. Not one indicated disapproval of the Institute's activities or policies, simply the cost.

We have had threats from some, who are displeased with this action or that policy, that they will resign as a result. They have renewed their membership, because as people who THINK about the future of our hobby they know that without the Institute that future could only be described as dim! They know that they can have more influence on the Institute and its activities from within. They have thought about a future in which there is no WIA, and decided they prefer this Institute to no Institute.

Is it really so, that the WIA could cease to exist as a result of a few (?) resignations? Do you, who have left us, think that we will continue as before in your absence? We are faced with the same financial problems that you are. Subscriptions have to be raised because all our expenses are rising too. In spite of the most stringent economies, and the extent to which we are run by unpaid volunteers, the costs of producing this magazine continue to rise. Many of these costs are unaltered, whether we produce one copy or ten thousand. Every member who leaves places a heavier burden on those who remain.

Several members have told us they would like AR to carry more information and reporting of Institute management — committee meetings, convention agenda and debate, etc. To some extent that could be done, if we had more space. It would need a larger, more expensive magazine.

Because of cost pressures, DOC has been directed to stop administering the amateur certificate examinations. Devolvement is the word. The WIA is the logical body to take over that responsibility. It may be possible for the WIA to do it at less cost to candidates than applies now. If falling membership renders the WIA less representative and less viable, the commercial educational alternative will unavoidably cost more.

Does the WIA provide value for money? Do you belong to a sporting club, or an association of people who share your interest in gardening, drama, photography, or whatever? What are their current subscription rates? Are you really so broke that you can't afford the WIA? If so, you can't afford to be a radio amateur! At least, a strong Institute ensures that the opportunity is still there. Without the WIA and its sister societies the hobby of amateur radio could be finished. Do you really want to help that to happen?

Bill Rice VK3ABP
Editor

INTERNATIONAL TRAVEL HOST EXCHANGE
Are Amateurs Inhospitable?

Ash Nallawalla VK3CIT/ZL4LM
PO Box 539, Werribee, Vic. 3030

From left: Ash G0/ZL4LM, Lesley VK3PZA and Roger G3LQP.

The International Travel Host Exchange (ITHE) is a voluntary scheme founded in 1984 by the ARRL Board of Directors to promote international goodwill and friendship. The ARRL and other interested sister societies maintain a file of amateurs interested in participating in the scheme.

In Australia it is represented by the WIA. The scheme merely consists of a list of names and addresses of amateurs who have indicated their willingness to meet visiting overseas amateurs and their families; to show them around; and, if possible, to accommodate them for a few nights, or exchange vacations with amateurs of other countries. The original intention of the scheme was to arrange house swaps, but this did not appear to be popular. Today the scope of the scheme has been widened to appeal to more participants. This article examines the scheme and provides some guidelines as viewed by a participant.

ARE WE INHOSPITABLE?

In 1986, the number of participants was just one each in Australia and New Zealand (a VK1 and and an amateur couple in NZ). Are we really so inhospitable, or would we have volunteered had we known more about the scheme? I suspect that the latter is the case. I have lived in, or visited, at least five countries where eyeball contacts or stays with local amateurs have made the visit more enjoyable. There is no doubt that most of us would enjoy meeting other amateurs, particularly those from other parts of the world. I am sure many of us have a spare bed or two, and that we can afford the expense of feeding extra mouths for a few days a year.

DO WE NEED SUCH A SCHEME?

Many amateurs get the opportunity to travel overseas for business or pleasure, and a few manage to prearrange a meeting with an amateur at their destination, usually due to a long on-air friendship. However, there must be many other travellers who do not have HF privileges or do not know overseas amateurs. Some amateurs defer an overseas trip possibly because they could only afford to pay for the fares but not hotels. Even if one could afford to take a first-class conducted tour, it would not be the same as being entertained by locals not involved with the hospitality industry, particularly by those who share our hobby.

The ITHE scheme merely formalises something that has existed unofficially, and creates new opportunities for many more people. We can all play our part in enjoying this comradeship whether we are able to travel or not. The scheme does not involve a reciprocal commitment. Amateurs not on the list can contact a participant and get exactly the same treatment as someone who is also on the list. Conversely, someone on the list may never be able to travel. The more names we have on the list, the lesser is the burden (albeit pleasant) on the existing participants. Perhaps, one day the scheme will become so popular that, instead of appearing on a list, a participant will be denoted by an asterisk against his/her call book entry.

With our Bi-centennial year not too far away, I would like many more of us to register with ITHE and invite overseas amateurs "down under." They might as well see New Zealand whilst they are in the neighbourhood. As a citizen of both countries I would like to promote both! I think we are helping the tourism industry because we may attract some who could not otherwise afford to come, and most visitors would combine some paid accommodation or a conducted tour with the ITHE scheme.

HOW TO VOLUNTEER

The WIA Federal Office will supply application forms upon request (SASE appreciated). The information requested consists of your name, address, telephone number, languages spoken, whether you wish to meet a visitor and/or whether you can provide accommodation. This information is forwarded to the ARRL which maintains the master-list and supplies a copy thereof to the WIA and other IARU members. The rest is up to the participants and their guests.

GUIDELINES FOR HOSTS

After your name is listed, you may be contacted by a prospective visitor. If the dates of the visit do not suit you, you should not hesitate to say so. If you can be of assistance you should provide all relevant information that will avoid later embarrassment, eg do you charge for accommodation (if you operate a motel), are you handy to public transport, can you pick them up at the airport, do you plan to show them some sights (if not, they could pre-book local sightseeing), what is your family composition (so that they may bring suitable little gifts), what type of accommodation can you provide (is it sleeping bags in the shed or a double bed and ensuite?), etc. Remember, you should only offer to do what suits your bank balance and schedule, bearing in mind that you may wish to entertain other such visitors each year. Do not expect your visitors to spend all their time in your company, as they are not coming only to meet you. You will probably see them briefly at breakfast and late at night, but you can offer to host at least one special meal, say, a barbeque with some local amateurs? You can also help with arranging reciprocal licenses and perhaps by lending the guest a hand-held unit.

GUIDELINES FOR GUESTS

The WIA Federal Office will provide members intending to visit a particular country or region a copy of the relevant part of the list. A prospective guest should aim to cause the host the least possible inconvenience or expense. Do not forget to provide all relevant details when making initial contact, eg dietary restrictions, your proposed itinery, etc. Keep you children under control, and do not presume to have permission to smoke in the host's home or car. If you are lucky, you may be given a key to the house; if not, do not expect the host to wait for you past a reasonable time. You should pay (or offer to) for admission charges to tourist attractions, petrol, food, etc, especially if your host is providing accommodation. Do not take the offer of "Make yourselves at home" too literally — you may be a "slob" and not know it! For example, some people do not bathe daily, and others may find this distasteful. Go out of your way to provide a very favourable image of your country-folk, *or* else the host may write off Australians as a bad risk.

NOW FOR THE BAD NEWS

Any amateur can be a guest of an ITHE participant, but the scheme should not be abused. There is no vetting of either guests or hosts, so an element of risk exists. We tend to assume that other amateurs are as honest, as agreeable, or as clean as us. This is generally true, but there is always the exception. Be aware of cultural differences that could be mistaken for rudeness or ill manners. A person accustomed to having servants to do the dishes may not volunteer to help the host; in some countries the use of polite terms such as "please" or "thank you" is not mandatory and is reserved for formal situations. Your hosts may also have disagreeable traits, so you will have to take them as they come.

OUR TRIP

The following account is provided by way of example only, and does not purport to be the right way to be a participant. My wife, Lesley VK3PZA, and I visited the UK and Holland last Christmas, partly to promote my book *Better Radio/TV Reception* at the BBC and Radio Nederland, and partly to have a holiday. I do not have an efficient HF set-up, so I did not have any existing amateur friends there. We telephoned Roger G3LQP, an ITHE participant who lives near London, to introduce ourselves and he immediately offered to accommodate us for as long as necessary. We wanted to accept his offer for the first seven nights, take an eight day coach tour, and spend our last two nights in London so as not to bother him. He would not hear of this, due to the high cost of London hotels, and insisted that we spend the last two nights with him. Upon arrival at Heathrow, we were asked to meet him at Hammersmith, whence we were driven to his Surrey home. As gifts, we took some souvenirs, macadamia nuts (very popular), and some duty free Australian rum. We also treated his family to a show in Drury Lane. I used his station and my G0/ZL4LM call sign to explore the HF and VHF bands. He took us out for a meal one evening. We felt guilty seing little of him, but he put us at ease saying that we were there to see Britain, not him. We endeavoured to eat out as often as possible and bought a few groceries to help out. We not only saved perhaps $1000 on accommodation, but we experienced some warm British hospitality and made new friends. Needless to say, we have also registered with the ITHE. We hope we too can make someone else's visit just as enjoyable as ours.

BUILDING BLOCKS REVISITED

— Part One

Harold Hepburn VK3AFQ
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Whatever the end objective of the constructor each module could be made as and when time, inclination and money was available. Printed circuit boards for the project were sold through the VK3 Division of the WIA and were available up until the late 1970s, when it became apparent that home-brewing was in a decline (hopefully a temporary one) and their supply was discontinued.

Recently there has been a decided upswing in inquiries for boards for the 1975 project and this, together with the rapid price increases of commercial equipment brought on by the decline of the Australian dollar, led to the belief that the time might be opportune to update the original concept.

This series of articles will therefore describe ten modules, each which has a "stand alone" use in an amateur context and which, in combination, can make a single band HF SSB/CW transceiver with an output of 40 watts PER If a transceiver is the end objective, then the modules needed for the receiver can be made first and the necessary additions to expand the receiver into a transceiver made later.

It should be noted that this series of articles will deal only with the HF equipment, up to 30

Some 12 years ago, the writer described in *Amateur Radio,* a series of modules or building blocks which could be used to make anything from a simple VHF FM receiver to a single HF transceiver with a digital readout.

MHz. The VHF modules will be described by John Day VK3ZJF. John and the writer have collaborated at all times to ensure that both the HF and VHF modules are compatible in both physical size and electrical detail as to feed levels, etc.

DISCUSSION

Before any detailed design could commence a few supply and cost difficulties had to be solved. The current cost of IF filters into the hands of the end user varies between $A160 and $A250, depending on the source and specification. No problems, if you already have one in the junk box, but a bit off-putting if you are not that fortunate.

Good quality tuning capacitors suitable for use in a VFO are likewise very difficult to obtain and are prohibitively expensive when they are located. Even if a source of tuning capacitors could be found, the final problem appeared insoluble. No source could be found at all for the mechanical drive mechanism to drive the VFO capacitor. Again junk box possession of a suitable dial drive makes the owner a lucky person but such possession cannot be assumed in articles of this ilk.

The virtual disappearance and/or high cost of key components for amateur constructors is not surprising. Once the amateur switched their favours to complete commercial equipment, the component market ceased to be attractive to manufacturers and, understandably, they directed their efforts elsewhere.

In the event, practical solutions for all of these problems were found.

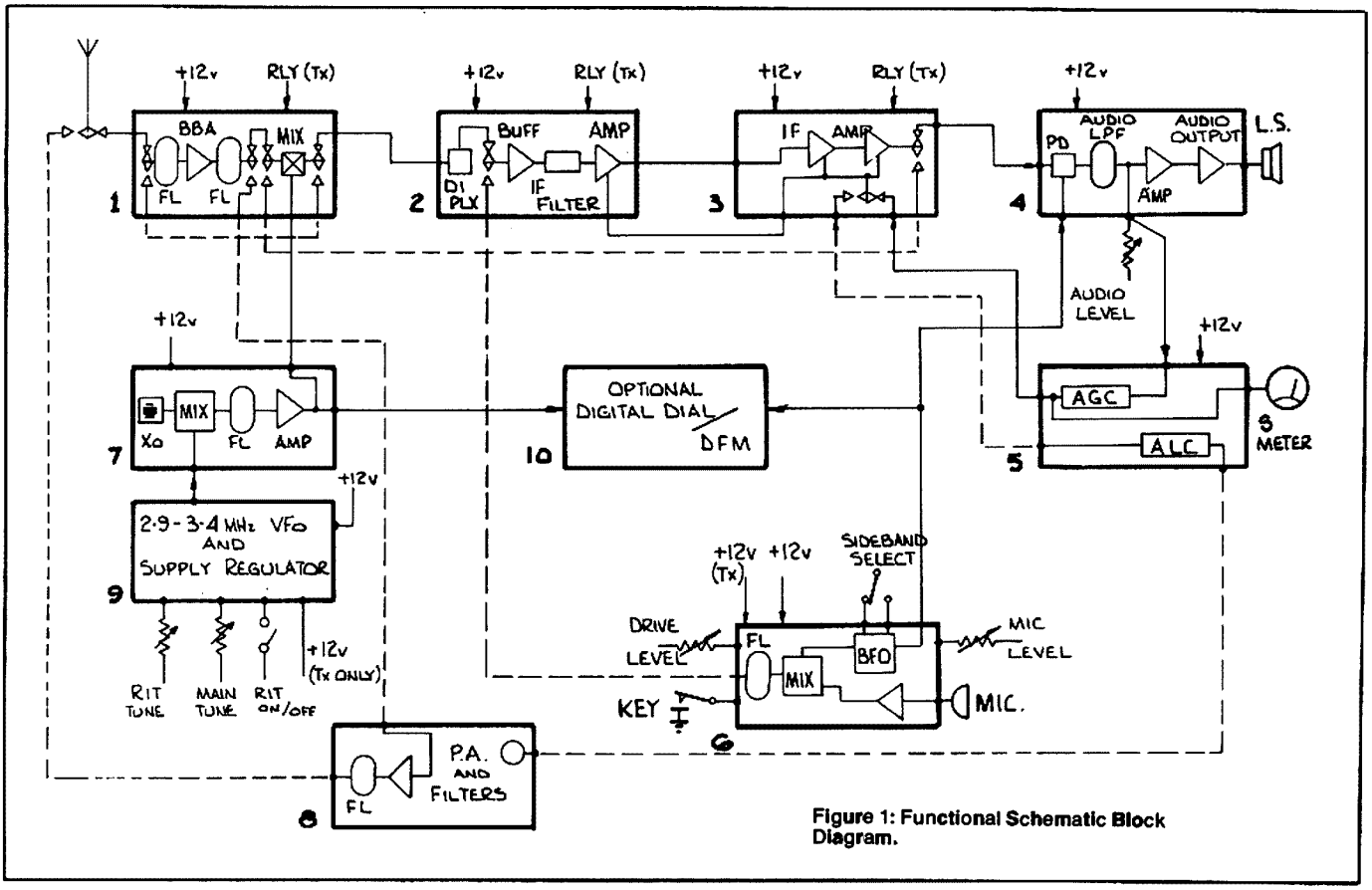


Figure 1: Functional Schematic Block Diagram.

The high cost of IF filters was avoided by making use of the ready availability of low cost computer crystals and using them in a ladder — not lattice — configuration. The way to do this was pioneered by J A Hardcastle G3JIR, in a series of articles in *Radio Communications*, the house magazine of the RSGB. The most important of these articles was in the February 1979 issue of RADCOM, but prior articles in the December 1976 and January 1978 issues, contained additional practical information. It will be shown later, that the cost of a suitable filter can be brought down to around $A15-20, if tackled properly.

The problem of tuning capacitors and their associated drives was avoided by using voltage tuning of a varactor diode, together with a ten turn potentiometer and an associated multidial. This latter device is a mechanical reduction drive with a numerical read out and is widely used in professional electronic equipment other than radio gear. The particular device used is available in Australia and — for a tuning range of 500 kHz it gives a readout to 1 kHz. The tuning rate approximates to 50 kHz per turn.

Having found a way round the basic problems, it became possible to design a series of modules which had "stand alone" uses but were capable of being combined into single band SSB/CW receivers, transmitters or transceivers.

All components and devices used in the modules described in these articles are current in use items and are all obtainable in Australia. Where availability from the local corner store is suspect, specific suppliers will be named.

FUNCTIONAL DESCRIPTION

Detailed circuitry will be given for each module as the articles progress, but a functional description of each part of the system is appropriate at this stage.

Figure 1, is a block diagram which shows the complete system that consists of ten modules. The modules numbered one to eight are each contained on a 6 by 1.5 inch (153 x 38 mm) single sided circuit board. Module 9 — the VFO and its associated voltage regulator consists of two 3 x 1.8 inch (76 x 46 mm) single sided PCBs which fit into a diecast box. Module 10, the readout/DFM, consists of two 6 x 1.5 inch (153 x 38 mm) single sided PCBs according to the degree of complexity chosen.

MOODULE ONE

This board contains two two-pole bandpass filters on the chosen signal frequency, a broadband amplifier and a double balanced diode mixer.

In the receive mode, the incoming signal passes first through one two-pole filter section, is amplified by the broadband amplifier, goes through the second two-pole filter section and then into the mixer. Injection input from Board 7, combines with the amplified and filtered signal, to give an output at the IF frequency of 8 MHz.

In the transmit mode the mixer takes an 8 MHz SSB/CW input from Board 3 and also from the VFO chain. The mixer output, now on the signal frequency, is filtered and amplified by the other components on the board. The connection changes necessary to go between receive and transmit, are done with miniature relays.

MODULE TWO

This board contains a receive only diplexer, a pre-filter matching stage, a six-pole ladder filter centred on 8 MHz and a post-filter IF amplifier.

When in the receive mode the diplexer ensures that a 50 ohm load is presented to the mixer on Board 1, at all of the unwanted mixer outputs. The pre-filter stage presents a 50 ohm load to the mixer on Board 1 at the IF of 8 MHz and the appropriate (around 200/300 ohm) load to the ladder filter. The filter has a bandwidth of around 2700 Hz. The gain of the post filter IF amplifier is AGC controlled.

In the transmit mode, the diplexer is not used. The 8 MHz double sideband from Board 7 goes through the matching stage, is stripped of the unwanted sideband and the resultant SSB is amplified in the post filter stage. This time however, the gain of the post amplifier stage is controlled by an ALC voltage derived from Boards 5 and 8.

In both modes, the output of the board goes to the IF amplifier. Again, change over functions are done with miniature relays.

MODULE THREE

This board uses two 8 MHz amplifier stages. They are used for both reception and transmission. When receiving, the gain of the stages is AGC controlled whilst the transmitting stage gain is ALC controlled. When receiving, the output of the board goes to the product detector on Board 4. When in the transmitting mode, the output is steered to the mixer on Board 1. Miniature relays are again used to do the necessary change-overs.

MODULE FOUR

This module is used only for reception. The board contains a passive doubly balanced product detector, an audio low pass filter with a fairly steep roll off starting around 2.6 kHz, a low gain audio preamplifier and an audio output power stage. The output stage generates between 2.5 and 4.5 watts of audio output, depending on load impedance and supply voltage.

MODULE FIVE

This board contains the circuitry necessary to generate an audio derived AGC voltage for reception and an RF derived voltage for transmitting purposes.

A simple S-meter system is also on-board with the meter being relay switched, to provide an indication of output when transmitting.

MODULE SIX

This board contains a crystal controlled BFO (with selectable sideband facility), a microphone amplifier and an active doubly balanced modulator operating at 8 MHz. The BFO is, of course, used for both reception and transmission, but the microphone amplifier and DBM are only used when transmitting.

MODULE SEVEN

This is the injection mixer board. It is required for both reception and transmission.

The board contains a crystal oscillator whose output is combined in an active doubly balanced mixer with the output from the VFO on Board 9. The required output product is selected with a two-pole bandpass filter. A wideband amplifier follows the filter to raise the level to the 10 mW required by the RX/TX mixer on Board 1.

MODULE EIGHT

This board is used only for transmitting purposes. It contains the stages required to raise the signal output from Board 1 to around 40 watts PEP. An output signal filter is also on the board.

MODULE NINE

This module is used for both reception and transmission. It comprises two "half-sized" boards. One board holds the varactor tuned VFO proper, whilst the second holds the circuitry necessary to provide a very stable, ripple free, source of DC for both the VFO itself and for the supply to the tuning diode.

The main tuning potentiometer, the RIT potentiometer, an RIT ON/OFF switch and an RIT indicator LED, together with the two PCBs, are all housed in a diecast box.

MODULE TEN

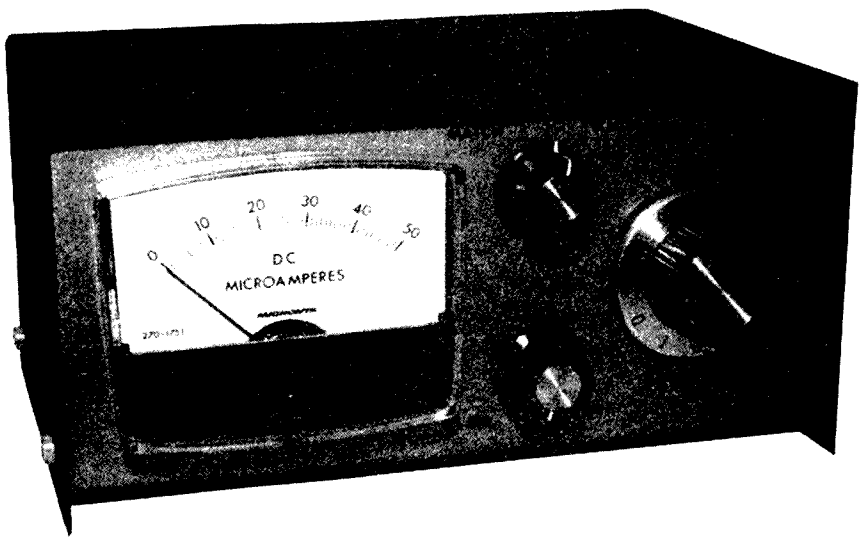
The boards comprising this module provide a purely optional extra in the format of a digital readout of operating frequency. When used for this purpose, outputs are taken from the BFO and from the injection mixer board. These two signals are combined, filtered and divided down to give an output which is one-tenth of the signal frequency. This one-tenth signal is used as input to a LSI counter chip which drives a six digit display. If desired, a third board allows external signals up to 50 MHz to be processed and presented to the LSI counter section, thus becoming a self contained digital frequency meter.

A detailed description of the various modules will commence in the next issue of *Amateur Radio*.

A TUNE-UP PROTECTION DEVICE

FRED PIESSE VK3BYW
61 Munro Street, East Kew, Vic. 3102

The need for such a device arose several years ago when the final transistors were damaged in an early model IC-701 transceiver, whilst attempting to match a random length of wire for an antenna at a bush camp.



Subsequently, I replaced this unit with a current model "top of the line" transceiver and my fear of damage occurring during tune- up was not dispelled when I read in its instruction manual; "As the output is quite high, avoid connecting the antenna connector to open lines and do not transmit under mismatched conditions. Otherwise the final stage could be overloaded and cause a malfunction of the unit", and also, "The final transistors used in the IC-751 are of good design and are protected to a reasonable extent by circuits incorporated in the set". Further, under the same heading; "When in doubt about antenna systems, use the lowest power settings to achieve meaningful readings. Use a good tuner or transmatch when necessary. Always use caution and exercise judgment when testing RF power generators".

I endeavoured to purchase a commercial unit which would provide the protection that I needed, but without success, so I built a device which works well and gives me peace-of-mind whenever I need to use an Antenna Matching Unit.

It is an adaption of an SWR bridge. Extra circuitry enables the transceiver to operate directly into a dummy load during adjustment of the AMU. The small amount of voltage needed to excite the bridge is derived by means of an RF transformer from the dummy load line.

If, for any reason, the antenna load cannot be properly matched, the transceiver will not shutdown or be damaged while it operates into a dummy load.

The RF transformer is wound on a ½" (12 mm) diameter toroid core (Amidon T50-6), and mounted on a small piece of matrix board through which the pigtails can be threaded. It is coated with epoxy resin to hold the windings in place. The primary winding has two turns of 20 SWG enamel covered wire and the secondary is 10 turns of 24 SWG wire.

Keep the RF leads short. I was able to mount the transformer by its pigtails only between the SO239 dummy load socket and a lug on the rotary DPDT switch as shown in the photographs of the unit.

Precision of the Wheatstone bridge depends on the accuracy of the 50 ohm resistors used. In my case, 50 ohms stock was not available so two 100 ohms in parallel were used in each 'leg' of the bridge.

A handful of 100 ohm resistors were checked with a good digital Ohm Meter and it was found that the rejection ratio of one watt stock was surprisingly low. Six of these, accurate to two decimal places, were used. The combined rating of each pair of bridge resistors should be half a watt, or more.

The 0-50 μA meter used in the unit is not calibrated in VSWR values. A table which relates meter scale readings with approximate SWR values is shown in Table 1. The meter scale is linear, but the bridge circuit is not. However, it is near enough for the purpose. The table can be used to mark SWR points on an existing scale or for a replacement one.

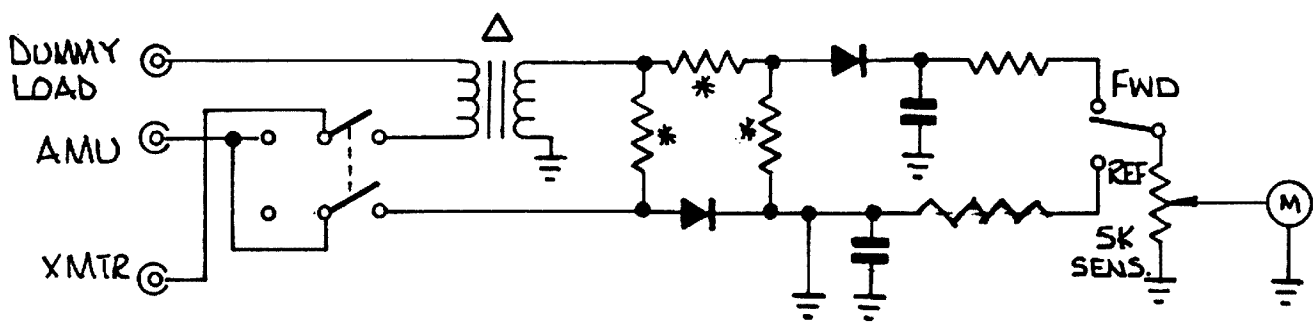
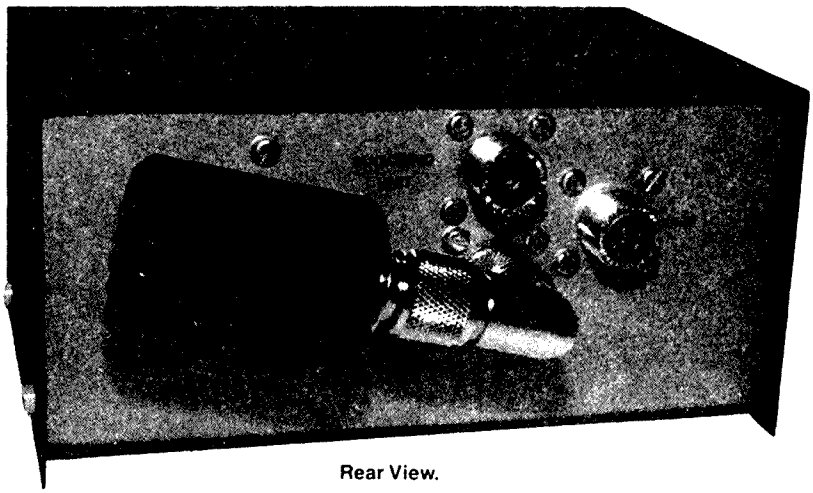
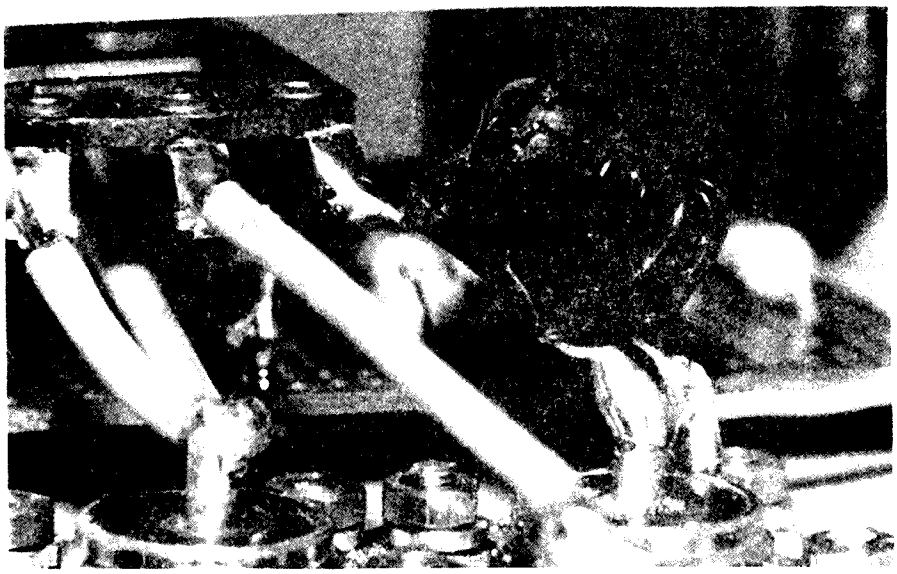


Figure 1: Schematic Diagram and Parts List.

Δ RF Transformer — see text
X Bridge Resistors — see text
Other Resistors — 4.7 k half-watt
Capacitors — 0.002 ceramic
Diodes — general purpose germanium OA90, OA95
Meter — DC 0-50 μA



Rear View.



Internal Views.

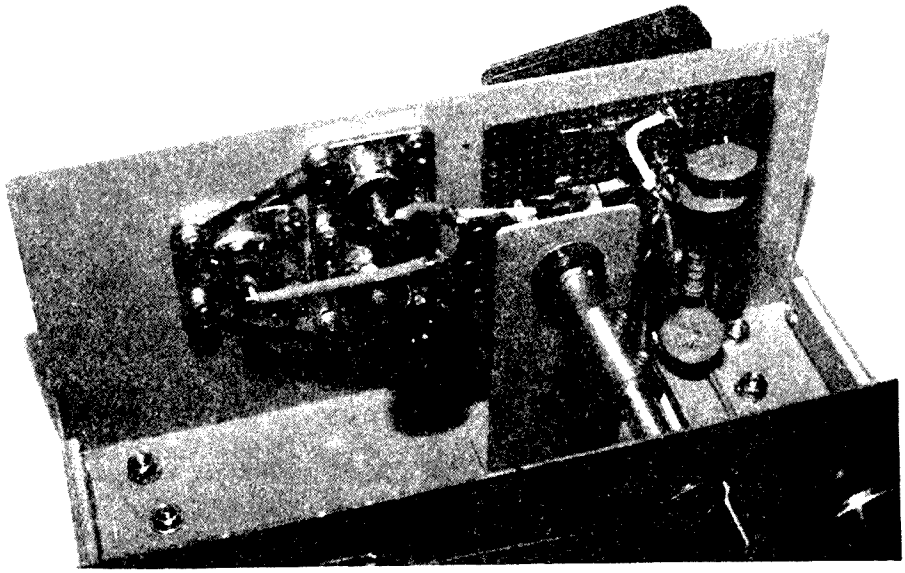


Table 1.

SCALE READING	VSWR VALUE
0	1.0
2.38	1.1
4.55	1.2
6.52	1.3
8.33	1.4
10	1.5
11.54	1.6
12.96	1.7
14.28	1.8
15.5	1.9
16.67	2.0
21.4	2.5
25	3.0

For SWR values exceeding three, use the formula:

$$VSWR = \frac{(50 + X)}{(50 - X)}$$

where X is the reverse scale reading.

This unit will simplify tune-up of transmitters with valve finals as the matching unit can be adjusted independently of the transmitter controls. QRM caused by strong carrier signals will be reduced during tune-up periods. The strength of the signal with this device in use is very low and will not move the needle of my in-line power meter even when set for maximum sensitivity.

The unit is shown with a detachable dummy load which saves lugging the heavy station unit when operating mobile.

It is housed in a home-made box measuring 160 x 90 x 75 mm (WDH) and is finished in Auto-Spray Touch-Up Paint.

It is easy to build, low in cost, and has dispelled any fear of damage to my equipment.

Omni-Directional Antenna for Space Communication

Joe Ellis VK4AGL
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This article describes a Dual Slanted Vertical unit suitable for communicating with satellites.

ONE OF THE factors that keep Australian amateurs from participating in satellite communication is the high cost of rotatable antennas. The main cost is the motors that take care of changes in elevation and azimuth. A pair of motors or a composite motor will cost about $600 or more and when the cost of high-grade coaxial and control cables is added, a considerable amount of money has been outlayed

The writer began with simple turnstile antennas which consisted of a pair of halfwave dipoles at right angles to each other, fed 90 degrees out of phase and mounted a critical distance above a reflecting surface. This device has some drawbacks although it is a popular concept on spacecraft. OSCAR-12 (JAS-1) is equipped with two canted turnstiles on 435 MHz. I then progressed to long-boom crossed Yagis, custom-built to my requirements and added new motors, better grade coaxial cable and heavy duty control cables.

This is okay if you have a thousand dollars burning a hole in your pocket.

With OSCAR-10, my main preoccupation, off air due to cosmic radiation damage to its central computer system, I have lately had spare time to play about with simple, but elegant, omni-directional arrangements such as the *Lindenblad Array*. The one that is described here is a dual slanted vertical unit. Once again, this approach is popular with the spacecraft designers and a slanted vertical for 145 MHz is part of OSCAR-12. It might be rewarding at this stage to outline what we are attempting to achieve in the design of an antenna suitable for communicating with spacecraft.

Basically we know that a radio wave is composed of electric and magnetic fields of which the former is of most concern to us.

These fields are normally separated by 90 degrees of phase. By convention, if the electric field is vertical with respect to ground, it is vertically polarised. Similarly, if this field is horizontal to ground, it is considered horizontally polarised. Vertical polarisation is used in mobile work and for contact with repeaters, etc at VHF frequencies whereas horizontal fields are popular with attempts at long-range VHF/UHF in simplex mode.

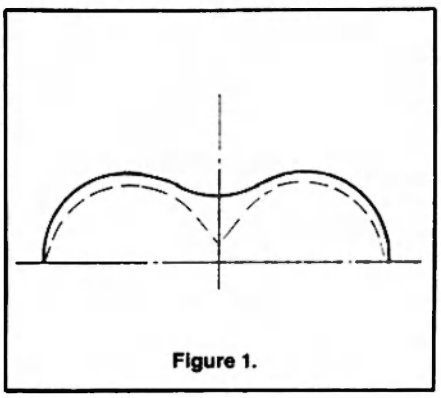
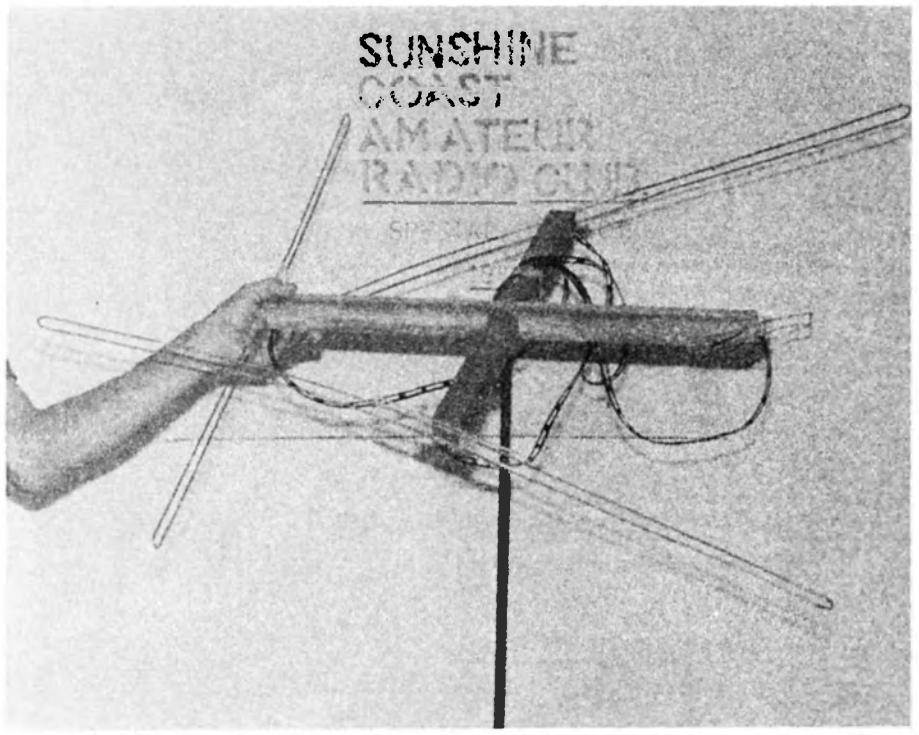


Figure 1.



In earth-based communication, generally speaking, the magnitude of the electric field varies but does no rotate about its axis and we call it linear polarisation. With space communication we use circular polarisation to access the spacecraft, designing our antenna systems to rotate the electric field about its axis. In any case, our radio transmission will commence to rotate as the wave-front collides with electrons, the earth's magnetic field and elements of hydrogen and oxygen.

The phenomenon is known as *Faraday*

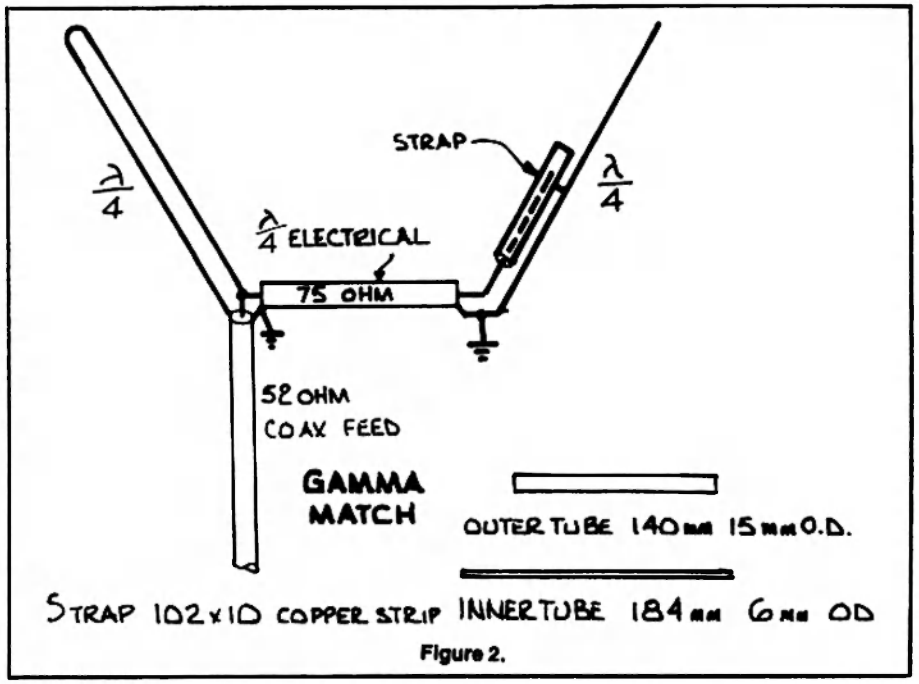


Figure 2.

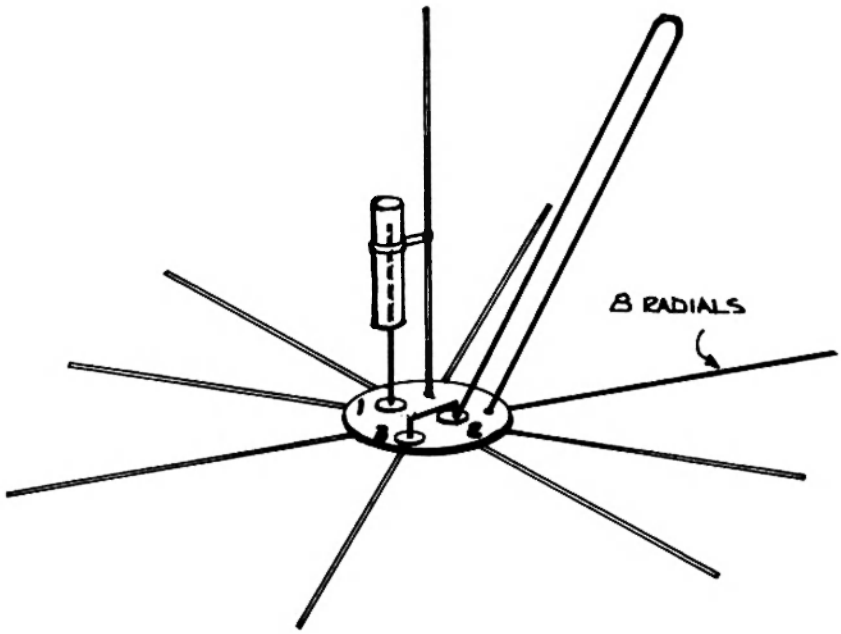


Figure 2a: Physical Layout.

Phasing Line between 1 and 2.
Coaxial Feed to 3.

Rotation. The main thing to remember is that maximum transfer of energy to and from a spacecraft will occur when we match its polarisation. We also want our antenna to perform well at the horizon with a gradual decrease in performance as we elevate to directly above our QTH where the spacecraft is at is closest. In the case of OSCAR-12 — 1500 kilometres.

Let us look at Figure 1. The dotted lines show the vertical plane pattern of a quarter-wave vertical and the solid line shows the same radiator offset 45 degrees. It can be seen that the null above the antenna has been filled in. The other thing that happens is that the usual impedance drops from around 37 ohms to 21 ohms — no worries, we will sort that out later!

The next step is to add another offset radiator driving it 90 degrees out of phase and generating circular polarisation. Shock, horror — to find that it is circular only directly overhead and rapidly degenerates into an elliptical form as we descend to the horizon where, in fact, it becomes linear. It is a relief to learn that most radio waves arriving from spacecraft tend to be elliptically polarised. Linear polarisation enables us to use the antenna for repeater work, as well. In fact, this device works extremely well on the out of town repeaters. Worthwhile giving it a try? Okay, let's get to work!

The first step is to get yourself a piece of galvanised gutter flashing and cut a circle 152 mm in diameter. Next, acquire some three millimetre copper earth wire from your local electrical or telegraphic authorities. The wire the writer acquired was badly twisted and bent and this was straightened by gently pulling it with his old tractor. (Feel free to use your Turbo-Sports or any other way!).

With a chassis punch cut three holes suitable for SO239 UHF fittings and pop-rivet these in place. (I placed these in a triangle, 50 mm apart).

Dale VK4GSX, offered a number of options and I chose to use a vertical radiator on one side and a folded dipole on the other to simplify the object mechanically and from a feed point of view.

The vertical radiator is prepared next. Cut it 518 mm long. Bore a hole in the plate alongside one of the SO239 fittings. Allow only 493 mm to protrude above the plate and solder it in place.

A gamma match is made by following the diagram in Figure 2. Attach as shown and bend the whole assembly 30 degrees away from the vertical. We are using 30 degrees here for reasons of matching ease.

Next, prepare the folded dipole as shown and bend it also 30 degrees away from the vertical. One side goes through a hole in the plate and the other to an SO239 fitting.

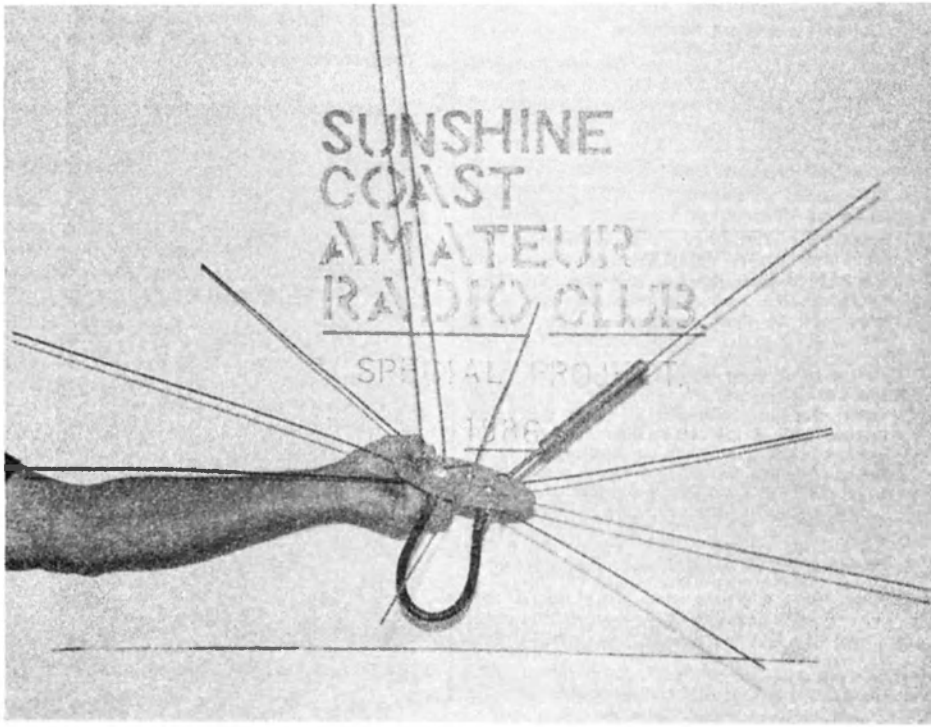
Now, make eight ground radials. They will protrude 419 mm from the edge of the disc so make them a little longer so you can solder them to the metal.

Forget resin cored solder — you need a man-sized iron, 60/40 bar solder and raw muriatic acid. Wash off with water when the job is completed.

(By the way — did you know that the ground plane antenna was invented in 1938 by George Brown et al, and first tested at the RCA Laboratory, Camden, New Jersey. George went on to patent this invention in 1941).

The only other thing left now is to make a quarter wavelength of 75 ohm coaxial cable for the phasing line.

Begin with a length about 350 mm long and reduce it a few millimetres at a time whilst checking it with a grid-dip meter until it approaches a frequency of 145.900 MHz. Tuning procedure is simple. Before attaching the phasing line apply power directly to the vertical radiator, and tune the gamma device for minimum SWR. (It came down smoothly for the author).



Next, the same for the folded dipole, you have plenty excess protruding through the plate for minor adjustment, but it should not be necessary. After that attach the phasing line and normal coaxial feed of 50 ohms. (When the author reached this stage the device was sitting on a cardboard box on the floor of the shack with the receiver on scan. It was heartening to hear an out of town repeater, at Gympie, identify).

The unit was placed on an arch outside the shack about two metres above ground level and I lay-in-wait for OSCAR-12.

It has since worked particularly well for uplink work on that satellite. At low elevation I use around 30 watts of VHF power as I am firing through trees etc. At higher elevations, power is reduced to 10 watts with very good results.

For those curious about how the matching works I shall explain. The gamma match is tuned for 50 ohms and the 75 ohm quarter wavelength line transforms this to 112 ohms. The folded dipole has an impedance of 100 ohms, and since this is effectively in parallel, there is close to 52 ohms for the coaxial cable from the transceiver — Neat eh!

If the opportunity arises, I may describe some of these antennas from the past in future articles.

ar

RADIODES

COMPREHENSION

Summer ist y'Kummen an
Get your appareil tuned man.
Wenn Sie can't get on ze air
Don't blame others — au contraire
Vous will feel un tres grand fool
If you hab' nicht tuned eine spule.

Quand conditions sind nicht gut
Watch the pressure of your blut.
Say "manana" to vous vous,
Specto telly for the news.
Prenez vite a cup of char
Or else schrieben an Ihre ma.

Es Is nicht gut to be presto
Parce que you are en QSO.
Settle down — essen le fabric,
Ne sois pas DXCC sick.
Domani certainment must follow,
Sante's meilleur if trnaquillo.

SO NW OM WLL SY 73
ES AGN WE U WLL C
TNX FER FB QSO
QRU? ES HR NIL SO
HPE CU FON 5 9 HI
TNKS FER ALL NW QSY

—"Hambard" (Originally printed in the Nigerian ARS Newsletter 1970s)

DRAM

No, it is not the misspelling of a "wee-drop," but DRAM is the new IBM chip that has been developed by their engineers in their bid to revolutionise and reduce the end cost of their product on the market.

The bit illustrated, and you will need your glasses, will hold four megabits of data in RAM, which can be accessed in, wait for it, 65 nanoseconds. At this rate its memory of 4 194 304 storage cells, equivalent to approximately 40 pages of double spaced typed manuscript, in the excessive time of less than a quarter of a second.

The engineers have produced the device with consummation of power in mind. It operates off a 3.3 volt rail instead of the conventional 5 volt standard, that we have become accustomed to.

An artists impression of the 'device' reproduced as the actual size.

MODIFIED X-BEAM FOR 20 METRES

John Moen VK2KA
6 Gordon Street, Armidale, NSW. 2350

The G4ZU X-Beam is well-known as a reasonable substitute for a two-element Yagi, where available space at one's QTH is at a premium.

IT ALSO OFFERS less wind resistance than a cubical quad, and may be more acceptable aesthetically than a quad or a conventional Yagi.

The original design was first introduced to me about 20 years ago by Chas Buckley VK3PP, to whom I am indebted for the step-by-step construction procedure which he so kindly provided. There are just two elements — a driven element and a director. (See Figure 1). Each element is in effect, condensed into a shape like the Greek capital letter Sigma Σ. When properly mounted, it is easily rotated on top of a seven metre length of 27 mm OD water pipe. The feedline is 52 ohm coaxial cable.

My design reduces the turning radius by over 30 percent; ie from 3.66 metres on each leg to 2.44 metres. This is accomplished by substituting loading and coupling coils at the centre of the driven element. It thus enables inductive link coupling to be used with advantages which will be apparent when the time comes for tuning it. The idea comes from the *ARRL Antenna Book* 1960 edition. In the chapter on Rotary Beam Construction, pp 269-270, miniature beams are described and my coil assembly L1/L2, see Figure 3, is taken direct from their design.

Regarding the material used for the elements, I chose bamboo rods whereas Chas VK3PP, used aluminium tubing with the latter forming part of the conductor. When using bamboo, two or three coats of marine varnish need to be applied before securing the conductor wires by tape or clamp. Heavy duty nylon fishing line is required for connecting the four ends of the rods, and for the supports radiating from the central king post. Bricklayers nylon twine is also ideal.

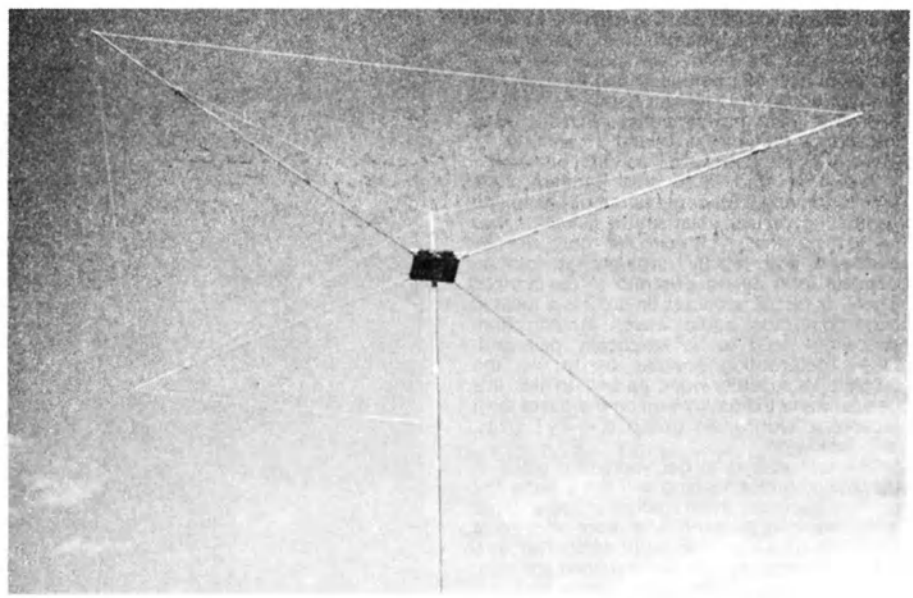
CONSTRUCTION

1. Take a piece of steel plate 300 x 300 x 3 mm. Drill a 25 mm hole in the centre to take the king post later. On the base weld a 100 mm length of water pipe 28 mm ID capable of forming a snug fit over the 27 mm OD mast pipe. Drill screw holes on each diagonal of the plate to take the clamps or U-bolts holding the bamboo. The latter will dictate the size required. See Figure 2. Drill holes also for two stand-offs.

2. Choose a wooden rod such as an old broom handle that will fit into the 100 mm length of pipe. This will act as a post to keep the unit off the ground during assembly.

3. Obtain four identical pieces of bamboo rod each 2.5 metres long. Treat with three coats of marine varnish. Bolt or clamp to the mounting plate. See Figure 1.

4. Wind coils L1/L2 (See Figure 3) as follows: L1 former — 200 mm long, 40 mm OD heavy duty 3 mm thick black polythene tubing which is obtainable from tyre repair specialists. L1 consists of five turns of No 12 copper wire



X-Beam (modified). L1, L2 at front of mounting plate. L3 (on director) at rear.

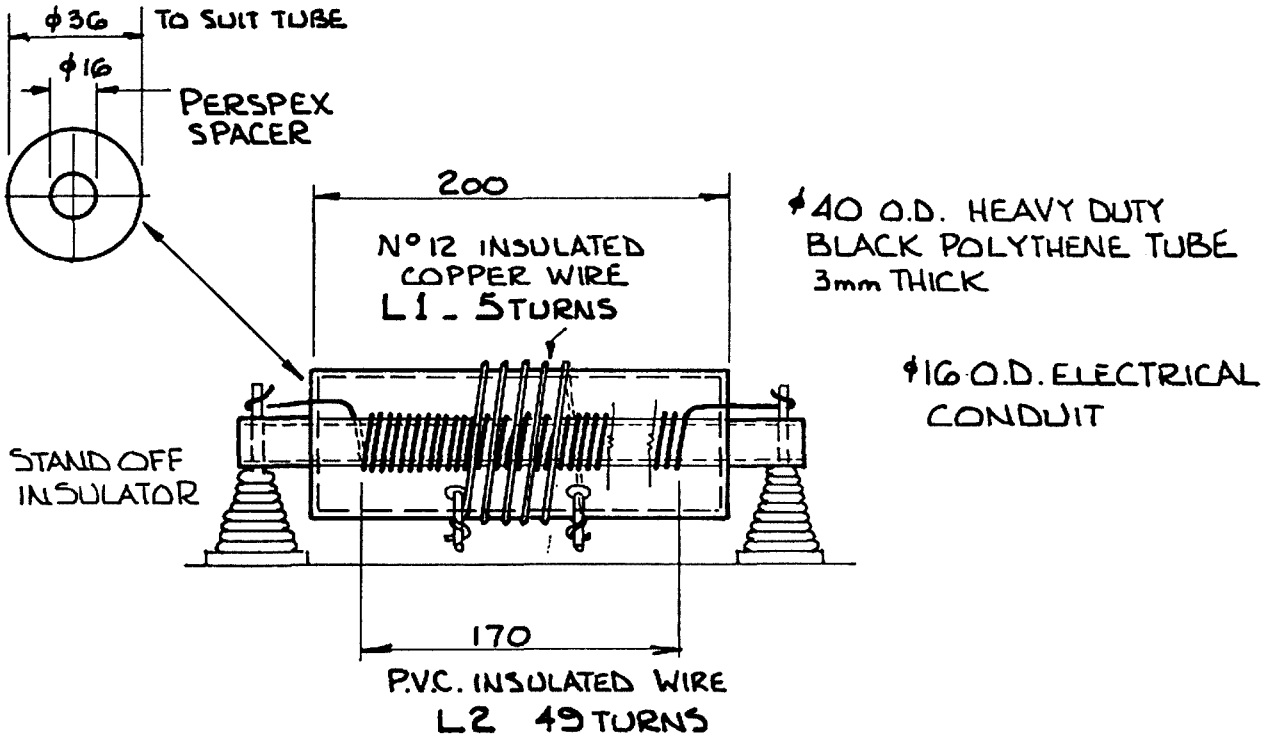


Figure 3: Loading Coil with Coupling.

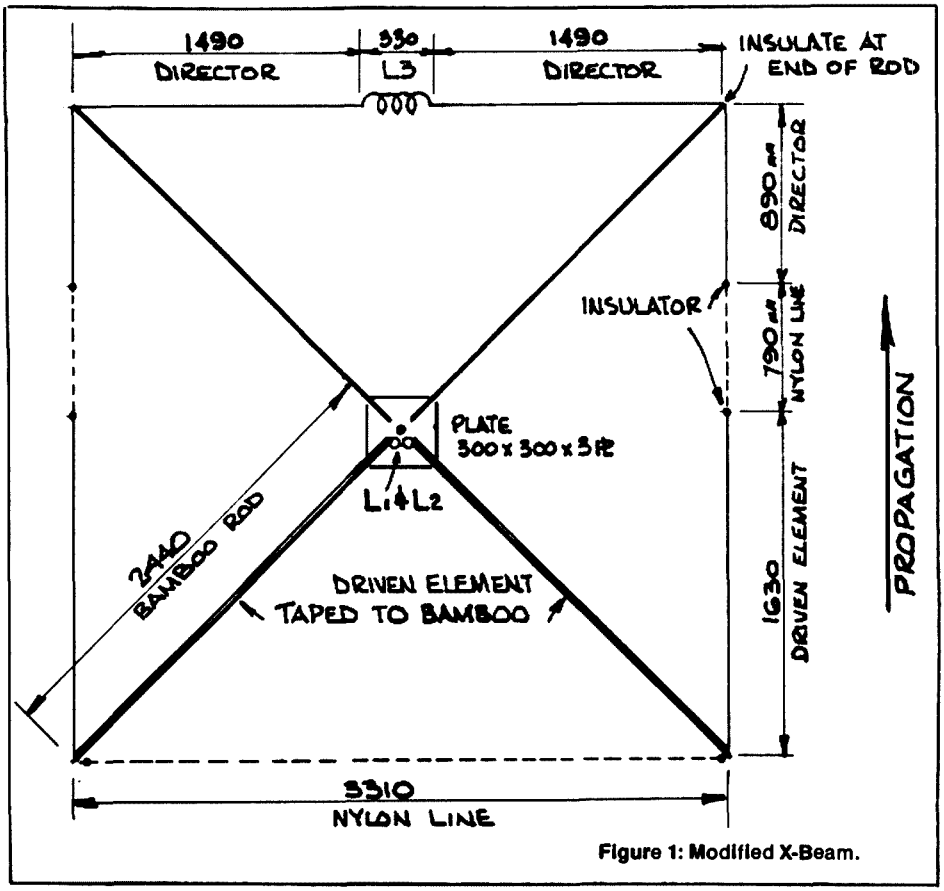


Figure 1: Modified X-Beam.

spaced to give a coil length of 50 mm. Seal in place with epoxy.

L2 former — 275 mm long, 16 mm OD electrical conduit. L2 consists of 49 turns of insulated copper wire close wound. Length of the coil is 170 mm. I used the stranded type from ordinary twin flex.

Mount the two coils as shown with L2 coaxially inside L1. Layered perspex strips can be used for the two stand-offs and for spacers where required.

5. Mount the coil assembly L1/L2 on the plate and solder 4.1 metres of bell-wire or suitably insulated antenna wire to each end of L2. Tape or clamp each to the two bamboo rods chosen to make the driver element leaving the ends free for the moment.

6. Wind coil L3, for the director, as follows:
L3 former — 330 mm long 16 mm OD as in L2.
Coil consists of 88 turns of stranded insulated copper wire as in L2, close wound. Solder 2.4 metres of bell-wire to each end. This constitutes the director.

7. Suspend the director centrally between the ends of the two unused bamboo rods and insulated from them. Adjust tension on the two nylon lines connecting the ends of the director and ends of the driven element as shown in Figure 1.

8. Take a 400 mm length of dowelling or broom handle 25 mm OD or wider. Sharpen one end and drive it into the centre cavity on the mounting plate to act as a King Post for the four nylon cords suspending the ends of the bamboo rods. Final adjustments of tension must wait until the antenna is tuned. Secure a 100 mm sleeve to the mast with 2 x 5 mm bolts through both sections of piping.

TUNING

Using a dip-meter check for resonance at the preferred frequency and trim equal amounts of

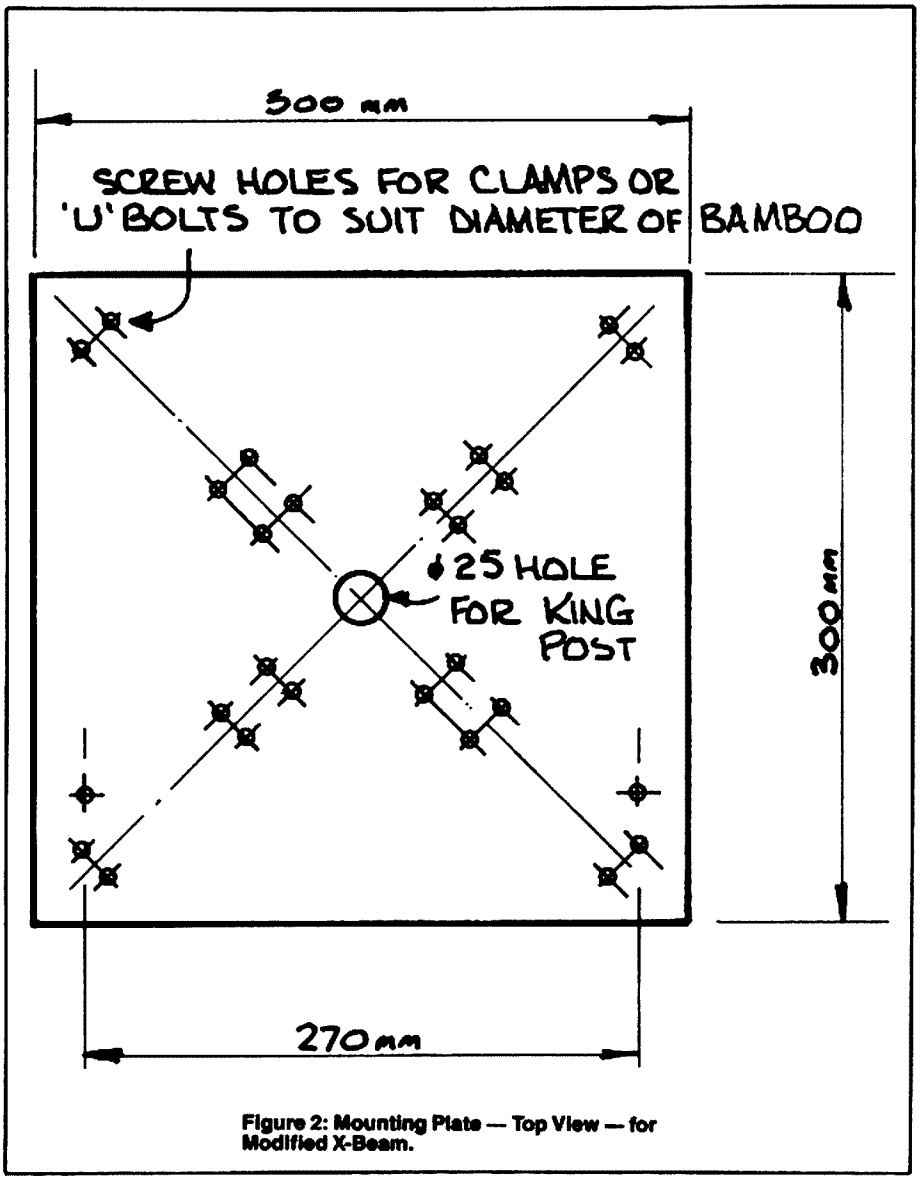


Figure 2: Mounting Plate — Top View — for Modified X-Beam.

conductor wire from each end of the driven element. The test is made at the L1 feed-point.

Check resonance of the director also, with a one-turn test loop around the centre of L3. I aimed at a frequency of 14.800 MHz for a corresponding preferred transmit frequency of 14.150 MHz. Allowance must be made for the height of antenna chosen so a further trimming may be required even after erecting it to mast-height. At my QTH the mast height is seven metres, and the following readings were obtained when power was eventually applied:

Frequency MHz	14.000	14.100	14.150	14.200	14.250	14.300
SWR	1.3:1	1.0:1	1.0:1	1.1:1	1.5:1	1.7:1

SUPPLEMENTARY NOTES

The element spacing, ie that between driven element and director, approximates the optimum theoretically for a two element Yagi of one quarter wavelength.

The inductive coupling between L1 and L2 has provided good EMC. Even though the X-beam is only five metres away from the television antenna no TVI has been apparent on Channels 5A and 10.

The X-beam exhibits up to three S-points gain in front-to-back ratio on receive. I have insufficient data for the same test on transmit as I have no remote control facility to rotate the mast and there is some delay in doing it manually.

The ground peg for the mast is a section of 20 mm OD water pipe embedded in concrete. This size fits snugly inside the pipe mast which has an ID of 23 mm and permits easy rotation when adequately greased with petroleum jelly. The mast has additional support by an antenna U-bolt with wing-nuts enabling it to be clamped to a post or the house.

The three types of water pipe — the sleeve welded to the mounting plate, the mast pipe itself and the ground peg — are all available from plumbing supply sources.

If desired, aluminium tubing may be used instead of the bamboo in which case the driven element could include these legs as part of the conductors but the clamped end would need insulating with polythene irrigation tubing or similar material and some experimentation would be necessary on the length of the conductor wires.

APPLICATION FOR 80 METRES

I have used inductive coupling successfully in an 80 metre dipole substituting a coil, L2, at the centre instead of the usual connection. This also shortens the overall length from 39.6 metres to 18 metres, which is convenient for a small backyard. Using only one former this time — the 40 mm OD tubing — L2 consists of 200 turns of bell-wire close wound in two layers. At each end is connected 8.8 metres of No 16 wire for the antenna. The primary L1 consists of 12 turns of No 12 wire wound on top of L2, coaxially, and spaced to give a coil length of 60 mm. This should provide an SWR of 1.0:1 on a frequency of 3.600 MHz at an antenna height of 10 metres above ground.

References:
SCHULTZ, JOHN J, W2EEY/DJ0BV. The G4ZU X-Beam for 20, *CQ* magazine, June 1065.
The ARRL Antenna Book, 1960 edition, chapter 12 — Rotary Beam Construction — Miniature Beams.

SILENT KEY

Robert Gunderson W2JIO, 67, a well-known *QST* author, died on January 11, 1987.

Robert worked for the Hudson Radio Company, in New York City, answering customer questions. He became known as the "question-and-answer man of radio row".

W2JIO, who was blind since birth, edited and published for 25 years *The Braille Technical Press*, a monthly electronics magazine for the blind. He was known for developing test instruments for blind engineers and technicians. Prior to retiring in 1974, he taught radio electronics for 37 years at the New York Institute for the Education of the Blind.

—Adapted from *The ARRL Letter* February 10, 1987

FO-12 MODE JD COMES ALIVE

What may have been the first two-way packet QSO between US amateurs using the mode-JD transponder aboard Japan's FO-12 satellite took place on February 26, 1987, between Ed Krome KA9LNV and Andy MacAllister WA5ZIB. The transponder is set up to act as a digipeater. Ed reports:

"...at 2330 UTC, I did a connect to myself (through the satellite). Then at 2332 and at 2339, I monitored WA5ZIB connecting to himself. I connected to him at 2340 for a rather brief QSO. What a thrill! Although I tried out all the uplink channels, the two way QSO was on 145.890 MHz.

"My equipment was a RadioShack Model 100 computer and a PacComm TNC-2. The modem was a G3RUH board. The FM uplink was a FT-208R hand-held (yes, an HT!) driving a home-brew 30 watt amplifier. The antenna was horizontally polarised home-brew 12 element Yagi, built to the NBS design. For the 70 cm downlink, I used a 19 element home-brew K2RIW Yagi and a home-brew GaAsFET mast-mounted preamplifier. This fed a Microwave Modules receive converter, which was attached to a TS-430S. Use of the 430S allowed use of the digital AFC provided by the G3RUH modem.

"Some observations: The downlink Doppler shift was enormous! The received signal was found at about 435.922 MHz at acquisition of signal, and had shifted to 435.905 MHz by the time the satellite disappeared over the horizon. The digital AFC would move the receive frequency as much as 5 kHz in one ON period. (The satellite currently runs the Mode-JD transponder in a five-minutes-ON/five-minutes-OFF cycle — Ed). Tuning for modem lock was relatively easy, although it *is* possible to tune to an erratic lock that won't print. After an OFF period, the downlink frequency shifts so far that you must manually tune the receiver to re-acquire lock."

—by Ed Krome KA9LNV

(Aside from the five minute ON/OFF cycle, there is a two-hours- ON/two-hours-OFF cycle. During the two-hour ON period, the five-minute ON/OFF cycle is executed. —Ed).

On February 28, W3IWI and G3RUH had what is believed to be the first US/Europe QSO via mode JD. Other European calls heard at that time were DB2OS and ON6UG.

—From *Gateway*, The ARRL Packet-Radio Newsletter, March 6, 1987

PHOTOPHONES REVISITED

A review of amateur optical communications

Continued from previous issue. . .

Mike Groth VK5AMG
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Photocells

A photocell (Figure 21) is a vacuum diode whose cathode is coated with a material that emits electrons when exposed to light. The spectral response is determined by the cathode coating, which may be a mixture to produce a more constant sensitivity across the visible spectrum. Most photocathodes are relatively insensitive to red and infra-red light but a photocell with a caesium cathode can detect infra-red wavelengths out to nearly 1300 nm.

Photocells are large detectors with cathode areas from one square centimetre to 10 cm^2 but they have a very low thermal noise, wide dynamic range and fast transient response. They have been successfully employed as detectors in visible light photophones in the past but have been largely superseded by the silicon photodiode.

Photomultipliers

A photomultiplier is a vacuum photocell fitted with a series of dynodes (Figure 22) which multiply the photocurrent by secondary electron emission. A typical photomultiplier has a sensitivity of the order of 10^5 amps/watt, and can detect a modulated light flux of 10^{-13}W.

The photomultiplier is best suited for detecting faint light signals in a dark environment and will saturate with a relatively low level of background light. They are very expensive ($50 plus) and relatively fragile devices which can be damaged if exposed to a bright light with the HT applied. They are mainly used for amateur optical DX experiments and are not recommended for inexperienced amateur experimenters.

Photodiodes

A photodiode uses the photon energy to produce charge carriers in the depletion region of a semiconductor junction and generate a current. This phenomenon is observed in several semiconductors but the highest quantum efficiency and lowest leakage are obtained with a p-i-n junction which has a wide depletion layer. A photodiode acts as a current generator but is often operated with a reverse bias (Figure 23) to improve the transient response.

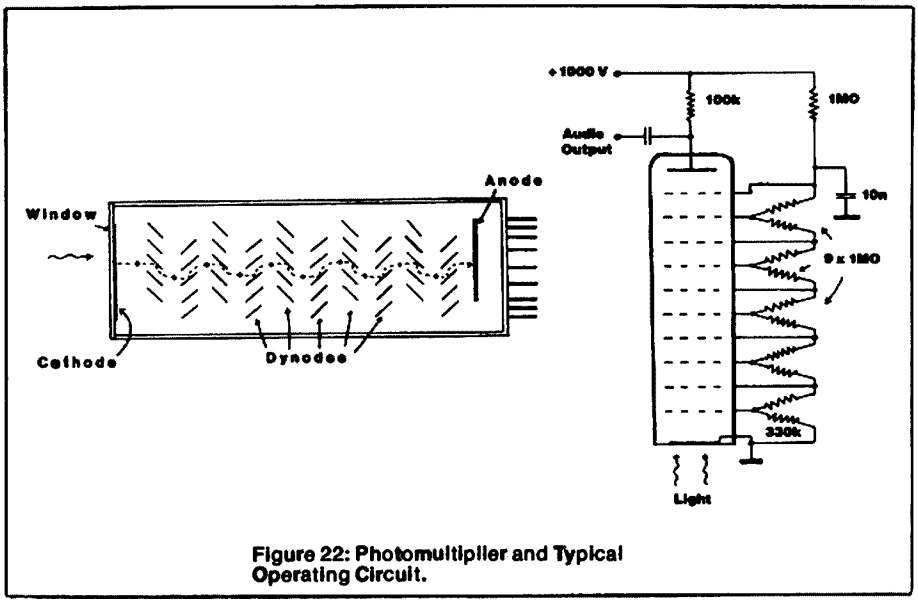


Figure 22: Photomultiplier and Typical Operating Circuit.

A silicon photodiode will detect ultra violet, visible and near infra-red radiation out to a wavelength of 1100 nm. The peak response at 950 nm is near the emission wavelength for infra-red diodes and many of the small photodiodes sold by electronic component suppliers have an integral infra- red filter. Photodiodes are well suited for optical communications being small, cheap and rugged with a high quantum efficiency and a relatively low thermal noise level.

Measurements made by the author indicate that a BPW50 silicon photodiode connected to a low-noise audio amplifier can detect a tone modulated signal of 2 x 10^{-11}W at a wavelength of 900 nm. An AM speech signal of 10^{-10}W is quite readable while an FM subcarrier system requires a signal flux approaching 2 x 10^{-10}W.

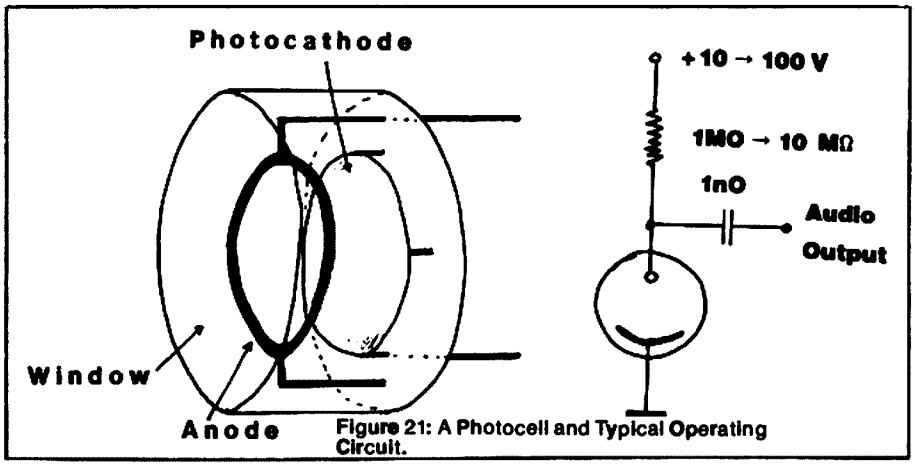
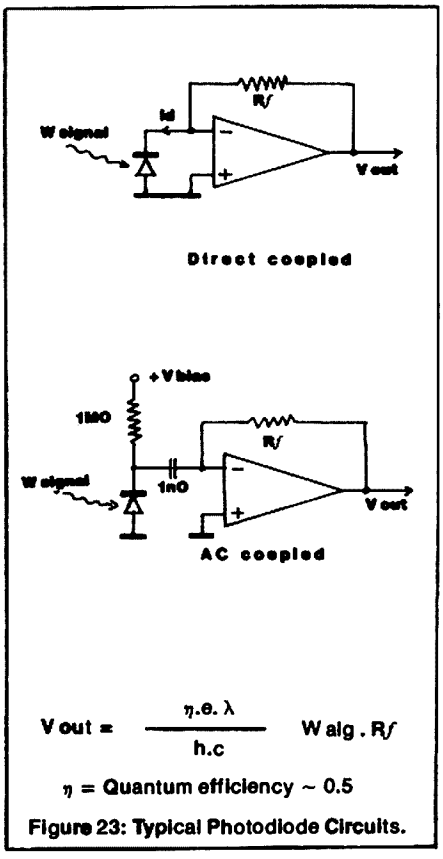


Figure 21: A Photocell and Typical Operating Circuit.



$$V_{out} = \frac{\eta . e . \lambda}{h . c} \; W_{alg} . R_f$$

η = Quantum efficiency ~ 0.5

Figure 23: Typical Photodiode Circuits.

A germanium photodiode has a cut off wavelength of 1800 nm with its peak response at 1550 nm and is a good spectral match for detecting the light from an incandescent lamp. The noise level is higher than a silicon photodiode. An OAP12 germanium photodiode requires a flux of 3 x 10 ^{10}W to produce a readable speech signal.

A light emitting diode may be used as both the light source and detector in a short range photophone as shown in Figure 24. The cut-off wavelength of a LED operating as a photodiode is about the same as the emission wavelength and the quantum efficiency is rather low when detecting radiation from another LED of the same type.

Photodiodes sensitive to far infra-red wavelengths have been developed using new semiconductor compounds with a very narrow energy band gap. These include indium arsenide (InAs), indium antimonide (InSb), platinum silicide (PtSi) and mercury cadmium telluride (HgCdTe) which is sensitive to radiation out to 15 μm. Many of these detectors have been developed for military applications and a lot of the technical data is classified.

Far infra-red wavelengths are of limited use for optical communications due to the high thermal background radiation between 3 μm and 50 μm. Detectors operating in this wavelength range have to be operated at about 80°K, which requires a liquid nitrogen cooling system.

Phototransistors

Light falling of the base region of a transistor will generate charge carriers, which are multiplied by the transistor action. Silicon photodiodes with a cut-off wavelength of 1100 nm are readily available from electronics retailers and are widely used in optical isolators and position sensors. Germanium phototransistors may be obtained by removing the opaque black paint from an older glass encapsulated germanium transistor such as an OC70, OC71 or OC75.

A phototransistor is often operated with an open circuit base for maximum sensitivity but this produces a high noise level as the leakage current and background light photocurrent are amplified together with the signal. The dynamic range is limited, and the transistor will saturate at moderate levels of background light.

By operating a phototransistor in a bootstrapped amplifier as shown in Figure 25 the quiescent current is stabilised by the DC feedback while the base impedance is very high at audio frequencies. This circuit is relatively insensitive to background light but can detect a tone modulated optical flux of 200 pW (2 x 10^{-10}W), and a speech signal of about 1 nW (10^{-9}W).

Germanium phototransistors were widely used in amateur photophones in the 1960s to detect light from modulated filament lamps but were largely rendered obsolete by the development of silicon transistors. A germanium phototransistor has a high leakage current and noise level but when operated in a circuit similar to Figure 25, it should be possible to detect a speech signal of less than 10 nW.

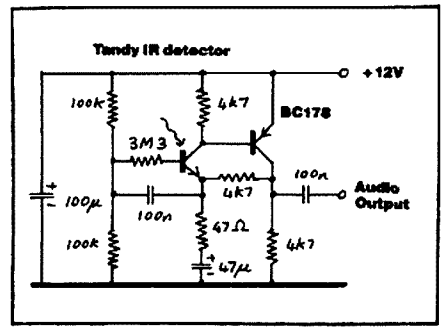


Figure 25: A Phototransistor Circuit for Modulated Light.

Photoresistors

Several semiconducting materials exhibit a reduction in bulk resistivity when exposed to light. Since this is mainly a surface effect a typical photoresistor is manufactured from a thin layer of photoresistive material mounted on an insulating substrate between a pair of conducting fingers. The resistance changes are relatively slow and there may be some treble cut when detecting a speech modulated signal.

Photoresistors are the oldest form of photoelectric detector and were used in all photophones until the development of the photocell in the 1920s. The selenium cell was the primary detector until 1917 when it was superseded by other materials including thallous sulphide (Thalofide), molybdenite, lead sulphide, and cadmium sulphide.

Photoresistors are the noisiest class of optical detectors and inferior to photodiodes for visible or short wavelength infra-red. The lead sulphide (PbS) cell with a cut-off wavelength of 3.4 μm is useful for detecting radiation at the long wavelength end of the near infra-red. The noise level is very high at room temperatures, and it operates best at -30°C, when a speech signal of about 10 nW (10^{-8}W), can be detected. Dry ice, which sublimes at a temperature of -49°C is a suitable cooling medium.

The cadmium sulphide photoresistors sold as light dependent resistors (LDR) are sensitive to visible light with a relatively slow transient response. While they can detect a speech modulated optical signal with reasonable fidelity they are much noisier than photodiodes or phototransistors and are not particularly suitable as photophone detectors.

Photoresistors using doped germanium are used for detecting very long wavelength infra-red radiation. The cut-off wavelength depends on the doping element, and varies from 25 μm for copper, to nearly 100 μm for gold doped germanium. These detectors are usually operated at about 4°K with liquid helium cooling.

OPTICAL LINK PERFORMANCE

Atmospheric Attenuation

The optical power in a beam of light transmitted through the atmosphere will decrease exponentially with distance as a result of scattering and absorption. Atmospheric attenuation is often the dominant factor in determining the range and reliability of an atmospheric optical link over distances of a kilometre or more.

Provided the distance is large compared with the diameter of the transmitter lens or mirror the illumination (E) produced by the beam at a distance R is given by;

$$E = \frac{T_{tx}}{R^2} e^{-\beta R}$$

Where I_{tx} = Tx. beam intensity (W.ster^{-1})
β = Attenuation coefficient.

The atmospheric attenuation coefficient is the sum of three main components namely, rayleigh scattering from fine aerosols, absorption by atmospheric gases, and scattering from large suspended particles such as fog, dust and thick smoke.

Rayleigh scattering describes the scattering of energy by particles smaller than the wavelength such as air molecules and fine aerosols. The scattering decreases with the fourth power of the wavelength and is responsible for the blue colour of the sky and the blue haze observed over mountains. Red and infra-red light will penetrate haze better than blue light but the transmission losses due to rayleigh scattering are relatively low.

Ultra-violet radiation is absorbed in air and is unsuitable for optical communications except over very short distances. Quartz windows and lenses are required as glass is opaque to

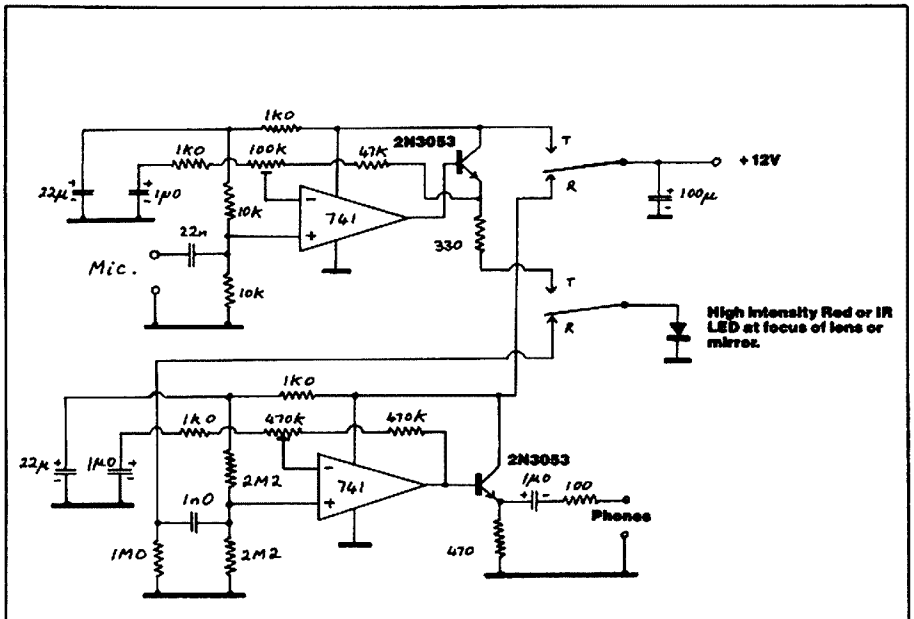


Figure 24: A Simple Photophone using a Single LED.

wavelengths shorter than 350 nm. An ultra-violet optical link would present a significant visual hazard to anyone looking down the transmitter beam without eye protection.

Atmospheric water vapour produces strong absorption bands in the near infra-red as can be seen in Figure 26 which shows the transmission factor over a one kilometre path on a fine autumn or spring day. The infra-red absorption would be lower on a clear frosty night but more than doubled for a humid summer's day.

Atmospheric absorption from rain, mist, fog, smoke or dust is the main limitation on the reliable operating range of an optical link. There is no significant difference in the transmission of infra-red and visible light in fog or rain. It is not possible to predict the signal loss due to adverse weather conditions with any precision but a rough estimate of the attenuation coefficient may be made from the daylight visual range with the aid of Table 2.

Background Light

Background light falling on the detector will generate white noise which is often the main noise contribution in an optical receiver operating during the day. The detector current from the background light will be a function of the brightness of the background at the operating wavelength, the receiver beamwidth, and the spectral response of the detector and optical filters.

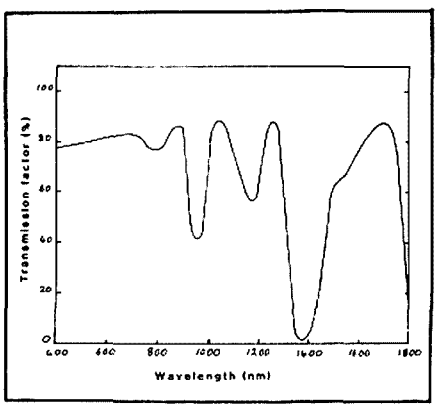


Figure 26: Atmospheric Transmission for a One Kilometre Path.

Code No	Daylight Visual Range	Description	Attenuation Coefficients (km⁻¹)	(dB/km)
0	50 metres	Dense fog	92	400
	100 metres	Heavy fog	46	200
1	200 metres	Thick fog	23	100
2	500 metres	Moderate fog	9.2	40
3	1 km	Light fog	4.6	20
4	2 km	Thin fog	2.3	10
5	4 km	Haze	1.2	5
6	10 km	Light haze	0.46	2
7	20 km	Clear	0.23	1
8	50 km	Very clear	0.09	0.4
9		Exceptionally clear		

Table II: The International Visibility Code.

The reflectance and colour of the background will depend on the transmitter environment; trees, sky, buildings, etc. The ambient illumination will vary with the weather and the time of day. However it is possible to estimate background light levels for special cases so that the daylight performance of different systems can be compared.

The albedo or average reflectance of the earth is about 0.3 and the solar illumination at the surface is 1100 W/m². It has been assumed that the background at noon on a fine day has a brightness of 330 W/m² which is equivalent to a luminance of 50 $Wm^{-2}ster^{-1}$. The corresponding spectral radiance $R(\lambda)$ is plotted in Figure 27.

The background luminance on a heavily overcast day, may be less than 10 $Wm^{-2}ster^{-1}$ and at sunrise and sunset the solar illumination is about one percent of its noon value. The full moon is about a million times less bright than the sun and the background radiance in these cases may be estimated by dividing the values read from Figure 27 by the appropriate factor.

It can be shown that the flux reaching the detector of an optical receiver operating with a background radiance $R(\lambda)$ is given by;

$$W_{bg} = \frac{A_l A_d \eta R_{bg}(\lambda)(\Delta\lambda)}{f^2} \quad \text{watts}$$

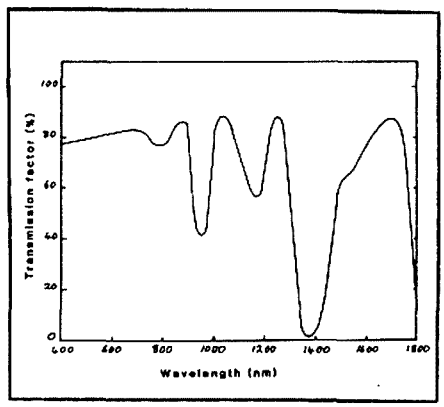


Figure 27: Assumed Daylight Background Radiance.

Where A_l = Area of receiver lens or mirror. (m^2)
A_d = Active area of detector. (m^2)
η = Transmission factor of optical system.
$R_{bg}(\lambda)$ = Background radiance. ($W\,m^2\,ster^{-1}\,nm^{-1}$)
$\Delta\lambda$ = Spectral bandwidth of the receiver. (nm)

The noise equivalent power (NEP) produced by this background light flux is;

$$NEP = \sqrt{\quad\quad} \quad \text{watts}$$

Where Δf = Audio bandwidth (Hz)

It can be seen than an optical receiver for operation in the presence of background light should have a narrow field of view and an optical filter centred about the operating wavelength. A very narrow band interference filter ($\Delta\lambda$ = 3 nm) can be used with a gas or injection laser but a wider bandwidth ($\Delta\lambda$ = 30 nm) is required to transmit the radiation from a light emitting diode. A simple red or infra-red filter will give a significant improvement in the signal to noise ratio when detecting radiation from an incandescent light source.

Typical values for the background light flux and noise level for several common detectors and filters are *given in* Table 3. This table assumes a lens diameter of 100 mm and a focal length of 250 mm. For lenses or mirrors having a significantly different f/D ratio the NEP from the table should be multiplied by 2.5 D/f.

Detector & Filter	Central Wavelength λ (nm)	Optical Bandwidth Δλ (nm)	Detector Flux W_{bg} (W)	Light Noise NEP (W)
Solar cell, 15mm x 13mm BPW50 silicon photodiode. (with IR filter)	700	700	5×10^{-4}	2×10^{-9}
OAP12 Germanium photodiode. (no filter)	900	400	5×10^{-6}	2×10^{-10}
BPW50 photodiode with narrow filter (GaAs diode)	1000	1200	2×10^{-5}	3×10^{-10}
Photomultiplier with interference filter. (He-Ne laser)	900	30	4×10^{-7}	4×10^{-11}
	633	3	9×10^{-9}	7×10^{-12}

Table III: Background Light Estimates.

This table assumes:
1 100 mm diameter lens or mirror.
2 f = 250 mm.
3 Full noon sun, I_{bg} = 50 $Wm^{-2}ster^{-1}$

For other weather or lighting conditions the detector flux and noise power can be estimated as follows;

Overcast day:	*Divide* W_{bg} by 10.	NEP by 3.
Sunrise or sunset:	Divide W_{bg} by 100.	NEP by 10.
Full moon at zenith:	Divide W_{bg} by 1000000.	NEP by 1000.
Moonrise or moonset:	Divide W_{bg} by 10^8.	NEP by 10000.

Operating Range

The operating range of an optical link is dependent on the weather and time of day. Any quoted range must be qualified with the appropriate operating conditions. The vacuum range is the theoretical communications range in the absence of atmospheric absorption and is a convenient parameter for expressing the optical performance of a given transmitter and receiver. The operating ranges for various conditions can be estimated from the vacuum range and the atmospheric attenuation coefficient as illustrated by the following example.

A simple photophone transmitter consists of a current modulated Tandy XC880 GaAlAs infra-red diode mounted at the focus of a 100 mm magnifying glass (f = 250 mm). The transmitter beam intensity may be calculated as follows.

The specifications for the Tandy XC880 IR LED are:

Emission wavelength	= 880 nm
Power output @ 20 mA	= 1 mW
Dispersion angle	= 24 degrees, (half power point)
Source diameter (d_s)	= 5 mm

The source intensity is calculated by assuming the radiation is emitted into a 24 degree cone when:

$$I_s = \frac{1\text{ mW}}{2\pi[1 - \cos(12^\circ)]} = 7.3\text{ mW/sterad @ 20 mA.}$$

The transmitter intensity and beamwidth will be;

$$I_{tx} = I_s \left[\frac{D_{lens}}{d_s}\right]^2 = 2.9\text{ W/sterad, @ 20 mA}$$

$$\theta_{tx} = \frac{5\text{ mm}}{250\text{ mm}} = 20\text{ milliradians, or 1.2 degrees}$$

If the detector is a BPW50 infra-red photodiode then a signal flux of 10^{-10} W will be required for speech reception. For a 100 mm diameter lens the minimum transmitter illumination will be;

$$E_{min} = \frac{4\,W_{min}}{\pi\,Q_{op}\,(D_{lens})^2}$$

where Q_{op} = Optical efficiency. (From Table 4)

$$= \frac{4 \times 10^{-10}}{\pi \times 0.8 \times (0.1)^2} = 1.6 \times 10^{-8}\text{ W/m}^2$$

and the Vacuum Range (VR) will be;

$$VR = \sqrt{\frac{I_{tx}}{E_{min}}} = \sqrt{\frac{2.9}{1.6 \times 10^{-8}}} = 13.5\text{ km}$$

The operating range (OR) can be obtained from the equation;

$\text{Log}_{10}(VR) = \text{log}_{10}(OR) + OR \times [\text{Transmission loss (dB/km)}]/20$

This equation does not have a simple analytic solution for the operating range but can be solved by successive approximations. From Table 4 the clean air transmission loss at a wavelength of 880 nm is 0.8 dB/km which gives an operating range of 7.4 km on a clear night.

In the middle of a fine sunny day the background light noise for a BPW50 infra-red photodiode at the focus of a 100 mm lens (f = 250 mm) would be about 2×10^{-10} W (Table 3). In this case, a signal flux in the order of 10^{-9} W will be required for speech reception. Repeating the previous calculations with $W_{min} = 10^{-9}$ W will give a vacuum range of 4.3 km, and a clear air daylight range of 3.3 km.

The background light noise at sunrise and sunset will be about the same level as the detector and amplifier dark noise. Assuming a total noise level of 5×10^{-10} W and a minimum useful signal of 2×10^{-10} W for speech communication the clear weather twilight range would be 5.9 km. The background light from a full moon would produce a detector noise of less than 10^{-12} W which is much smaller than the typical receiver dark noise and moonlight will not significantly effect the operation of this optical link.

The effect of water vapour may be illustrated by repeating these calculations for an optical link using a CQY89 GaAs LED as the light source. The intensity of the CQY89 (7.5 mW/sterad @ 50 mA), is similar to the XC880 giving a vacuum range of 13.7 km. The emission wavelength of 930 nm is on the edge of a water vapour absorption band and the predicted operating range is reduced to between four kilometres on a humid summer evening and six kilometres on a frosty night. The predicted clear daylight range is 2.2 km to 2.9 km depending on the humidity.

The estimated clear weather operating ranges for various optical communications systems are listed in Table 5. It can be seen that quite simple equipment can transmit speech or data over distances of two or three kilometres in clear weather. Over *long* optical paths the received signal strength is primarily determined by the atmospheric attenuation. Very intense transmitter beams are required for long distance optical communication.

Reliability

The reliability of an optical link depends on the path length as well as the frequency and severity of adverse atmospheric conditions. Signal losses of 200 dB/km at a wavelength of 900 nm have been observed by the author during thick fog with fluctuations of 30 dB/km over periods of a few seconds. Under these conditions, an optical link using infra-red LEDs and photodiodes would have an operating range of about 180 metres. A modulated gas laser beam would be readable at 500 metres. A transmitter using a 100 W quartz-iodide lamp would have a range approaching 280 metres.

Therefore an optical link using simple components can provide reliable communication over distances of 100 to 150 metres in all weather conditions. Signal dropouts would be experienced during heavy fog at 200 metres while a light fog or heavy rain would disrupt communications over a one kilometre optical link. Depending on the equipment used amateur photophone contacts of five to 10 kilometres could be expected on clear nights with possible DX contacts of 50 kilometres or more under suitable atmospheric conditions.

Light Source	Detector & Optical Filter	Wave-length (nm)	Optical Efficiency Q_{op}	Clear Weather Atts (dB/km) Frost	Mild	Humid
Low press mercury	Si photodiode Blue-green	430-580	0.4	1.1	1.1	1.2
Green LED	Si photodiode	565	0.5	0.8	0.9	1.0
Sodium	Si photodiode	589	0.5	0.8	0.8	0.9
He-Ne laser	Si photodiode	633	0.6	0.8	0.8	0.9
He-Ne laser	Photomultiplier + 3 nm filter	633	0.3	0.8	0.8	0.9
Red LED	Si photodiode	650-700	0.6	0.7	0.8	0.9
GaAlAs LED	Si photodiode + IR filter	880	0.8	0.6	0.6	0.7
GaAs LED	Si photodiode + IR filter	930	0.8	1.2	1.9	2.6
Filament (T=2870°K)	Si photodiode (no filter)	400-1100	0.21*	0.8	0.9	1.0
Filament (T=2870°K)	Ge photodiode (no filter)	400-1600	0.35*	1.1	1.3	1.6
Filament (T=2870°K)	Si photodiode + IR filter)	800-1100	0.066*	0.9	1.0	1.1

* Assuming 75 percent of the power supplied to the lamp is emitted as visible or infra-red radiation from 0.3 μm to 20 μm.

Table IV: Optical Range Parameters.

Transmitter & Detector (100 mm lenses used at each end)	Night Vacuum Range (km)	Clear Night Range (km)	Clear Daylight Range (km)
XC880 GaAlAs LED (880 nm) + BPW50 Si photodiode (IR filter)	13.50	7.40	3.30
CQY89 GaAs LED (930 nm) + BPW50 Si photodiode (IR filter)	13.70	4.80	2.50
High Intensity red LED + Si phototransistor (Red filter)	3.40	2.60	2.00
NE 2 Neon globe + Si phototransistor	0.61	0.58	0.45
100 W sodium vapour lamp + Si photodiode (yellow filter)	43.00	13.00	7.60
Current modulated torch globe + OAP12 Ge photodiode (no filter)	1.10	0.90	0.60
12 V, 100 W quartz-iodide lamp + OAP12 Ge photodiode (no filter)	170.00	16.00	13.00
12 V, 100 W quartz-iodide lamp + BPW50 SI photodiode (IR filter)	134.00	17.00	15.00
10 mW He-Ne gas laser + Photomultiplier (3 nm filter)	60000*	73.00	48.00

** Assuming a beam divergence of 200 microradians (200 mm/km)*

Table V: Operating Range Estimates.

OPTICS RADIO AND WIRELESS

The use of light to transmit information was a form of wireless communication under the broad definitions employed in the Wireless Telegraphy Act, but the 1983 Radio Communications Act defines a radio transmission as:

- aany transmission or emission of electromagnetic energy of frequencies less than three terahertz: or
- bany highly coherent transmission or emission of electro-magnetic energy of frequencies not less than three terahertz and not exceeding 1000 terahertz, without continuous artificial guide.

This definition excludes incoherent optical signalling systems such as amateur photophones or infra-red remote control systems but a commercial laser powered optical link is a radio system, and requires a licence.

At present there are no Australian frequency allocations above 300 GHz, and it would assist in the orderly development of the submillimetre spectrum, if the WIA approached the Department of Communications with a proposal for amateur allocations above 300 GHz. This application could include reasonable use of coherent radiation from 100 THz to 1000 THz (3 μm to 300 nm) for amateur communications experiments. (This will be investigated. —Ed).

CONCLUSIONS

Optical communication is a practical method for transmitting information over short distances. It is used commercially for computer links between city buildings or across roads where it is not practical or economic to use a wire or radio circuit. Optical links would be well suited for linking amateur computers especially between apartment blocks where RF links can cause interference with adjacent entertainment and security systems. An optical packet message system would be tolerant of the occasional signal dropout caused by rain, fog or birds flying through the beam and it is not impossible to visualise the future establishment of an

amateur optical packet network in the high-rise residential systems of the capital cities.

Optical DX can provide a challenge to the radio amateur or experimenter who likes to do things the hard way. Optical voice and data transmissions of 100 km or more have been achieved in the past and optical moonbounce is technically possible. In many ways, optical communication has come of age after a century of retarded development. It is both the oldest and one of the newest branches of amateur radio.

ADDITIONAL READING

This review is a distillation of information gathered from many sources by the author over a period of 18 years and it would be impossible to give a comprehensive listing of references. Much of the theory can be found in standard physics text books but the following references make interesting background reading and provide a suitable starting point for a detailed literature search if desired.

1BELL, A G
On the Production and Reproduction of Speech by Light, American Journal of Science, Vol 20, No 118, pages 305-324, (October 1880)

2RANKINE, A O
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3HUXFORD, W S & PLATT, J R
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5BEESE, N C
Light Sources for Optical Communication, Infrared Physics, Vol 1, No 1, pages 5-16, (1961)

6KING, B G. et al
An Experimental Study of Atmospheric Optical Transmission, Bell Systems Technical Journal, Vol 62, No 3, Part 1, pages 602-625, (March 1983)

TECH EDITOR'S NOTE: An account of such experiments by amateurs was published in *Amateur Radio.* Optical Communication for the Amateur by Chris Long, AR, January 1979, page 7.

WANT TO TRY RTTY?

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RTTY is simple with the VZ200/VZ300 computer and the RTTY Modem Kit which is readily available from *Dick Smith Electronic* stores.

The writer has built four such units, and worked on several others. They work well on both FM and SSB signals. Tuning is much more difficult however to decode an SSB transmission.

Firstly, some pertinent points:

1 A frequency counter is necessary to correctly align the modem.
2 The circuit board traces in many places are very thin and are inclined to lift, so do not attempt to solder this kit unless you have a good soldering iron.
3 It is necessary to bend the pins on the 44 pin edge connector. This is directly related to point 2. Once this connector is soldered to the board do not attempt to remove it or it may be necessary to spend many hours repairing circuit traces.
4 It is good practice to utilise sockets for all ICs.

Following is an outline of the procedure I used in assembling the kit in the hope that it will operate first time if you decide to go ahead with the project.

a Check that the kit contains all the correct components — check them off against the list and place them in a safe place; eg in a component file drawer or a block of foam, just so long as they are safe.

(Technical Editor's Note: Do not insert ICs and semiconductors into white styrofoam as static electricity may impair their performance.

b Prepare the project case carefully following the instructions provided with the kit.
c Bend the pins on the 44 pin edge connector. Take great care here to ensure that it closely resembles the illustration provided In the instructions.

Cheer up! The boring, time-consuming and tedious part is over and assembly of the boards can commence.

1 Start by installing the wire links on each board.
2 Next, insert the components, soldering each one as you install it. This will prevent solder bridges and/or missed joints which are not soldered at all. Also, keep in mind the *appearance* of the board. Try as much as possible to keep the component codings running in the same direction.
3 When all components and IC sockets are soldered into place install all the ICs, with the exception of the EPROM.
4 The 44 pin edge connector can now be placed in position, but do not solder it yet! Proceed now as though the project were complete. Place the project in the case, ensuring all the holes line-up, and then plug it into the expansion port. If everything lines-up and the edge connector is correctly seated, you may now solder the edge connector in place.
5 The last thing to do is wire the five pin DIN plug and wiring between the boards. Colour code these wire so they don't accidentally become mixed up.
6 Before putting the EPROM in place check all soldering and wiring. Ensure all IC pins are in their sockets correctly and none are bent under.

If everything checks out, insert the EPROM. Again ensure the pins do not fold under.

It is now time to put everything together in readiness to align and test the unit.

a Place the two boards back-to-back as per the instructions. Ensure the soldered surfaces of neither board are touching. They should not if you have used the plastic bolts and nuts thoughtfully.
b Plug the modem into the expansion port of the VZ200/300 and switch the computer on. If all is well you should be greeted with a copyright message, etc as shown on the instructions. If not, switch off and prepare to go fault-finding. Check the fault remedy chart.

ALIGNMENT

Do as the instructions say. Align the transmit frequencies, toggling between +5V and ground several times to ensure the frequencies are correct. As the two adjustments interact somewhat a little patience is required to align both frequencies correctly. See fault remedy chart.

Remember that five volts is available anywhere VCC is marked.

There are several ways in which the receiver can be aligned without the aid of a signal generator and scope.

a Remember that you have already aligned the transmitter tones so all that requires to be done is to record a minute or two of RYs, etc. Then, play them back into the receiver and adjust RV2 for best decoding. The LED should glow brightly.
b If you have a two metre FM unit, use the transmitter to access the RTTY Repeater and use one of its pre-programmed responses to tune RV2 for best decoding; eg in Melbourne VK3RTY on 147.350 MHz (+600 kHz offset) will respond with a menu file if *space?I-W* is sent. (Space means the space character or space bar, not the word! ! I).

Of course, you may use the method as shown in the instructions if a scope and signal generator are accessible. I have used this method and found that the other two methods are quicker and equally successful.

As I have worked very little RTTY on HF with the system I cannot say whether the receiver alignment is any more critical for SSB reception. However, when testing my own unit on the 80 metre broadcast it worked quite satisfactorily, losing the decoding only during loud static or interference.

Good luck with the project and, if you take time and care, you will be rewarded with a successful RTTY system.

Following is a list of some faults which may be encountered and a list of items to check. (Of course, it is assumed that you have checked the wiring, soldering and that the ICs are all correctly inserted in their sockets). Also, check that the wiring of the five pin DIN and microphone plugs are correct — the failure of many units has been traced to this.

FAULT	KEY
VZ Basic only at power on	A, B, C
Garbage characters on screen	B,C
Transmit relay not working	C,D
Tones not changing (Relay OK)	E
No tones	F
Cannot tune 22.950 Hz tone with RV3	H
No receive decoding	G

KEY	CHECK
A	EPROM inserted? EPROM faulty? (unlikely)
B	EPROM pins bent under?
C	Dry joint, solder bridge or broken trace at 44 pin connector EPROM socket or IC1
D	Faulty relay, faulty IC1, Faulty Q1, TXD line open circuit
E	RV1 or RV3 incorrectly set, IC4, IC7, IC2
F	IC5
G	Faulty IC6, RXD line open circuit, faulty IC4
H	RV3-R53 combination incorrect.

NOTE:
Whilst testing the unit, unless you have the unit in its assembled state, ie the two boards placed one atop the other, it is likely the tuning LED will remain on whether or not a good signal is present.

GREAT CIRCLE CALCULATIONS FOR REVERSE POLISH CALCULATORS

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The program for calculating the distance between two stations, latitude and longitude of each known, which appeared in algebraic-logic-calculator form in *Amateur Radio* can be used equally easily on RPN-logic calculators such as the *Novus Scientific* and *Hewlett-Packard* range.

The form of the program looks different, as RPN logic, which does the arithmetic function on the most recent pair of numbers to have been entered, or on the most recently calculated answer or entry and a previous one, does not need brackets to stop the calculator performing functions "not yet due" when the = key is pressed to perform some arithmetic.

The formulae are:

$$\text{Cos } D = \sin A \sin B + \cos A \cos B \cos L$$

and

$$\text{Cos } C = \frac{\sin B - \sin A \cos D}{\cos A \sin D}$$

where

- A = latitude of your station
- B = latitude of other station
- L = longitude of other station minus longitude of your station
- D = distance along the path in degrees of arc. Multiply by 60 to get nautical (air) miles, or by 111.111 to get kilometres
- C = true bearing from north if sin L is +ve. If sin L is negative, true bearing is (360 - C)°.

Do not forget, calculators use degrees and decimal divisions of degrees when calculating trigonometrics ratios for angles. Many calculators have a program built into them to convert from degrees-minutes- seconds format to degrees and decimals. It does simplify the arithmetic if that facility is available!

THE PROGRAM

First, write down (or enter into memory, if enough memories are available) your station latitude and the latitude of the station contacted. Do not ignore sign: + for stations N latitude, - for stations S latitude.

Calculate and write down, or store, longitude of station contacted minus longitude of your station. W longitudes are entered as +ve, E longitudes as -ve.

Enter latitude of your station (watch that sign!), or recall it from memory.

Calculate its sine
Enter latitude of contact (mind the sign!)
Calculate its sine
X multiplies the sines
This result remains in the stack for later use
Enter latitude of your station
Calculate cosine of angle
Enter latitude of contact
Calculate cosine of angle
X multiplies cosines together
Enter difference in longitudes
Take cosine
X multiplies by previous result (already in position)
+ adds this result to previous multiplication, already in position
Take arc cosine of result to get the distance expressed in degrees of arc
Write down, or store, for use in bearing calculation
Multiply by 60 to get distance in nautical (air) miles, by 111.111 to get distance in kilometres

BEARING

Enter latitude of other station
Take its sine, this remains in the stack for later use
Enter latitude of your station
Take its sine
Enter distance in degrees form
Take its cosine
X multiplies the cosines
— subtracts this from sin B calculated earlier
Enter distance in degree form
Take its sine
Divide it into last result
Enter your latitude
take its cosine
Divide into previous result
Take arc cosine
If sine (difference of longitudes) is -ve, then bearing for antenna is (360 - bearing calculated)°.

WORKING THROUGH AN EXAMPLE

You are at Whyalla, 33° 02' south, 137° 35'.

Looking up the Call Book, you find the other station's address is in Mildura. From an atlas, 34° 11' south, 142° 10' east.

Since calculators do arithmetic and calculate trigonometric ratios on decimally divided degrees, your location is -33.033°, -137.5833°; the other station, -34.1833°, -142.1666°. L, the difference in longitude, is -137.5833 — (-142.1666°), or 4.5833°. The minus signs express the convention used in the maths that North Latitude and West Longitude are positive. The Equator and Greenwich Meridian are each 0.

Key in your latitude (or call it from memory)	-33.0333
Take its sine, which is	-0.5451
Key in other station's latitude	-34.1833
Take its sine	-0.5618
X multiply the sines	0.3063
This result remains in the stack to be used later	
Enter your latitude	-33.0333
Take its cosine	0.8384
Enter other station's latitude	-34.1833
Take its cosine	0.8272
X (multiply the cosines)	0.6935
Enter longitude difference	4.5833
Take its cosine	0.9968
X (multiply by previous result)	0.6913
+ (add this answer to earlier calculation)	0.9976

This answer is the cosine of the distance in degrees of arc. Arc cosine 0.9976 is 3.9862°. Write it down or store it. It will be needed during the bearing calculation.

To get the distance in nautical (air) miles, multiply by 60, in kilometres, by 111.111.

Which makes the distance from Whyalla to Mildura 239.2 nautical miles, or 442.9 kilometres.

BEAM HEADING

Enter latitude of other station	-34.1833
Take its sine	-0.5618
Enter latitude of your station	-33.0333
Take its sine	0.5451
Enter distance in degree form	3.9862
Take its cosine	0.9976
Multiply the trig ratios	-0.5438
— (subtract from sine B)	-0.0180
Enter latitude of your station	-33.0333
Take its cosine	0.8384
Divide into earlier result	-0.0215
Enter distance in degree form	3.9862
Take its sine	0.0695
Divide into previous result	-0.3095
Take arc cosine of result	108.0262°

Since sine of longitude difference > 0, then bearing Whyalla — Mildura is 108°.

ACKNOWLEDGMENTS

Advanced Applications for Pocket Calculators Gilbert. TAB Books, 1975.
The ARRL Antenna Book Hall et al. ARRL 1982.

Both of which gave information which provided answers inconsistent in either distance or bearing when checked against NATMAP maps covering the area of the example.

Try This!

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NOISE BRIDGE

A novel noise bridge was described in* Ham Radio *for July 1986. The article was titled "A VHF Noise Bridge" by A E Popodi OE2APM/ AA3K.

The unusual feature was the use of a PIN diode for the variable resistance arm and a variable capacitance diode for the variable capacitor. The bridge was designed for 144 MHz operation, the principle however, could be extended to any higher HF or VHF/UHF band.

The heart of the bridge is shown in Figure 1.

The capacitance is controlled by the voltage source. The value of capacitance is determined by the voltage and the variable capacitance diode characteristics.

The resistance is controlled by the current flowing through the PIN diode and the characteristics of the diode.

The main advantage of this technique is that short leads with minimum stray inductance and capacitance can be achieved. This is especially important for VHF and UHF

Another possibility is the remote mounting of the measuring head. This would enable measurements with the antenna up a mast.

The voltage and current sources can be fabricated relatively simply. Reasonable stability is required to ensure reproducable results.

The article in *Ham Radio* contains details of calibration and construction for a 144 MHz bridge. The technique is suitable for other bands.

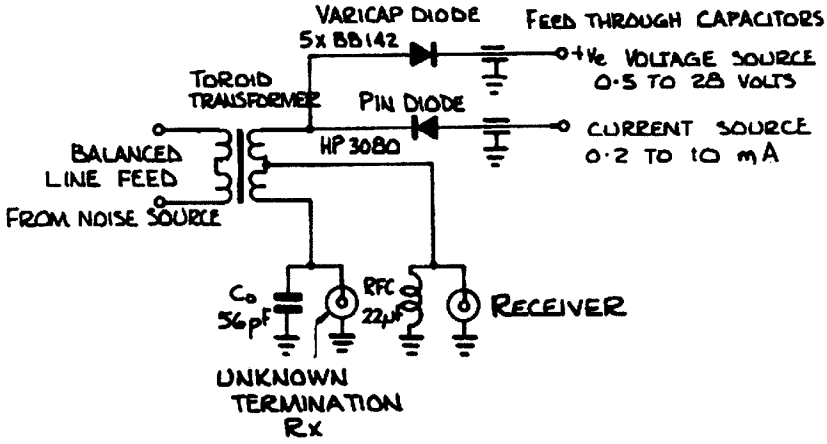

Figure 1.

RNARS

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COVER STORY:

The accompanying photograph is of the W/T Office aboard the, now decommissioned, HMAS *Diamantina*, which is located in the old Brisbane Dry Dock and forms a large and interesting part of the Queensland Maritime Museum Association.

Diamantina is a River Class Frigate, built by Walkers of Maryborough and launched in 1944. It was commissioned in 1945 and served in New Guinea and the Solomon Island waters, with the surrender of Japanese forces at Nauru, Ocean and Bougainville Islands being signed aboard her.

Diamantina was acquired by the Queensland Maritime Museum Association in 1980, and since then a great deal of voluntary labour has been undertaken by members of the museum with the aim of restoring the vessel, as near as possible, to her original condition.

The W/T Office now holds the amateur radio station of VK4RAN, and can be heard on the frequencies of 7.010, 7.020 , 14.020 and 14.040, CW-only, most Wednesdays, Saturdays and Sundays. It is hoped that, as more operators become available/volunteer, the station will become fully operational on all open days.

The *Diamantina*'s radio equipment consists of a TCA MF transmitter together with a TCA MF/HF transmitter with TCA receiver, with two receivers by Murphy (no not THAT Murphy!) of the B40 and B41 type. Antennas in use at present are the ship's wires, as the two tunable whips are not operable due to water-damage and the main transmitting whip has no control box.

Sad to say, the W/T Office does not possess a Navy pattern Morse key (but would be most interested to hear from anyone with one to donate to a good cause).

The Museum is situated next-door to the EXPO 88 site, so it is anticipated that the Museum will see a marked increase of visitors during this period. The Museum (said to be Brisbane's best kept secret) is well worth a visit when you are next in Brisbane — or better still, why not become a member?. The Museum has an ever-growing amount of Maritime Artifacts and Memorabilia.

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BEACONS — REPEATERS

Tim Mills VK2ZTM
FTAC Beacon Co-ordinator
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At the Federal Convention this month, the Beacon Policy Paper will be presented for consideration. During the past year, only a few amateurs took the time to contribute to its preparation. It is somewhat disappointing that more people did not want to take part in policy-making for the hobby.

Although there are now about 240 amateur repeating systems and some 50 beacons in Australia, the requirements to establish these systems is misunderstood by many amateurs. In this column over the next few issues, some of the points to consider will be discussed. But first, some background.

The main QSP in February's AR detailed the revised co-ordination approach required by the Department. Although it as always been a role for the Institute to provide this function, the approach has differed in each State. The most important thing to co-ordinate is the frequency or channel to be used. In the beginning, for repeaters, there was only a broad outline with a couple of channels to be used and each State made its own allocations from them. (See Repeaters, Friend or Foe, AR 1985/86). As time progressed and systems approached State borders, some inter-region consultation occurred, but mostly it did not and the first known was a call book listing. The first beacons usually appeared on whatever crystal was available. A degree of band planning for beacons has seen them move to their own one-channel-per-system allocations. There will be some refinement to this approach on the completion of the beacon policy paper.

For repeaters, particularly two metres, the choice of the channel has to be carefully determined to minimise shared and adjacent channel interference. This task is made easier with the Federal Office having detailed data in the computer, which can be retrieved whenever a new application is to be assessed. An amateur repeater network differs from its commercial counterpart in that there is no restriction on user-access with respect to location or power used. Since some amateurs have a DX instinct and will work anything they hear, a reasonable geographical separation has to be maintained before the same channel should be reused. This has not always been done in the past and problems did occur, and still do. The pager network adjacent to two metres at 148-150 MHz, is also presenting an increasing interference problem which has to be addressed.

The voice repeater systems are as follows:

10 METRES — This is a new system for Australia. To date there is an experimental system in Melbourne and Perth. Channels follow the USA approach in the sub-band 29.500-29.700 MHz. Four channels with 100 kHz offset. The current systems use split linked sites to overcome desensitisation problems.

SIX METRES — The band has set aside 16 channel pairs used once, with two allocations per call area. The offset was 600 kHz, but is being changed, as required, to the international 1 MHz standard. Currently there is a system in Perth, two in Melbourne, one planned in VK4 and two planned and being constructed in VK2.

TWO METRES — There are 31 channel pairs available with heavy and, in some cases, saturated use made in VK2, 3, 4 and 6. VK1, 5, 7 and 8, with smaller populations to serve, have confined their systems to the 146- 147 MHz portion. The international 600 kHz offset is used.

70 CENTIMETRES — There are 60 channel pairs with a policy constraint to use only those channels ending in 25 or 75. An interference from two metre user transmissions concept, is no longer valid as all two metre channels are in service. There has to be checks made so as not to allocate a 70 centimetre channel in the same area which is a harmonic of a two metre system in the same region. The problem results in local user feedback. A 5 MHz offset is used, which is common to most parts of the world except Europe. In Europe they use either a 1.6 or 7.6 MHz offset. The band portion 433/435-438/440 MHz is mainly an Australian/New Zealand segment. The Europeans use 433/435 for the 1.6 system and 431/438 for the other. The Americans are above 440, but the loss of this band segment in Canada after WARC-79 and not being permitted In the USA within 80 km of the border has introduced changes currently being implemented.

23 CENTIMETRES — A new repeater band, and from Australia's point of view, not without its difficulties. The (Australian) major airport radar systems, centred on 1275 with a guard band, and the amateur satellite service sub-band 1260/1270 has meant it is not possible to use the Japanese originated 20 MHz offset. It has to be something less than 20 MHz, to fit the available segments. The band planning requirements were covered a couple of months ago in AR by Ron Henderson and Peter Gamble. The Australian plan uses a 12 MHz offset in the 1240/1260 MHz portion.

There are currently no repeating systems above 23 centimetres.

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SIMPLE ANTENNA TUNER

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This simple antenna tuner is not intended to be a cure all.

In fact, the tuner configuration is standard and possibly the only variations are the toroid former and the neon indicator. Although neons do not appear to be common in amateur antenna tuners, they have been used in other antenna tuner fields. The tuner is meant to be used in conjunction with the so-called "random length of wire" antenna.

As most amateurs would know, when camping out in the "Mulga", one does not simply use a so described length of wire. The so-called "random length" would be closer to either a quarter or half wave at the frequency of operation — or the harmonic of it. This would only leave a decision of series or parallel tuning, fundamental or harmonic.

As with all end-fed antenna wires — the tuner *must* have a good earth. This practice is normal, due to the high voltage/current relationship present at the output of the tuner. One final refinement is the neon bulb in the tuner output lead. Only one side of the neon is placed in circuit and when the tuner is in some semblance of load condition — the neon will glow brightly. The neon also doubles as a modulation monitor.

The type of neon used is dependent on output power. Small neons and broadcast band types of variable capacitors are okay for low power units such as the FT-7. Wider spaced capacitors and larger neons would be required for a higher power rating. The coil consists of 30 turns, spaced on a toroid former. The coil is tapped every three turns and can be mounted directly to a 12 position switch. The two position switch can be engaged for series or parallel operation. When searching for the correct settings, vary the tuning capacitor will cause a quick flash as the circuit passes through resonance.

The entire construction may be enclosed in a small metal box. End feed a half wavelength of wire on the frequency in use and use a good earth and you cannot go wrong!

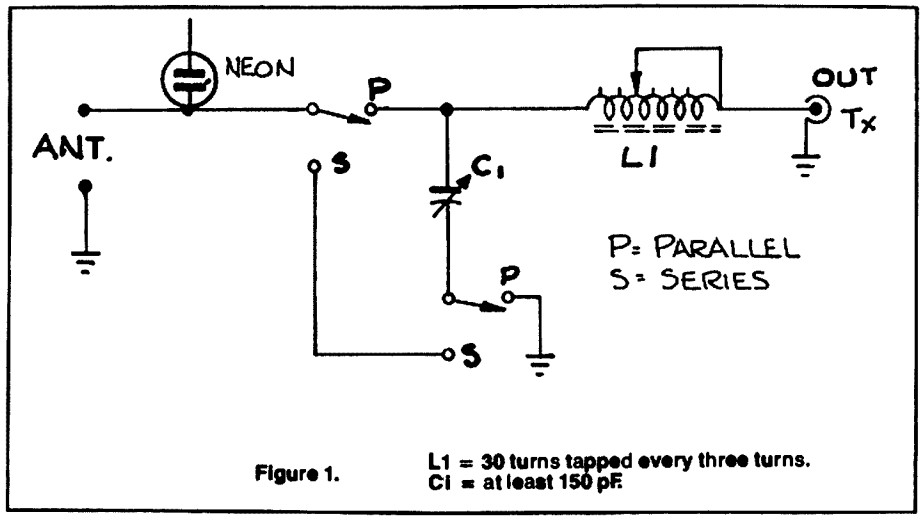

Figure 1. L1 = 30 turns tapped every three turns. C1 = at least 150 pF.

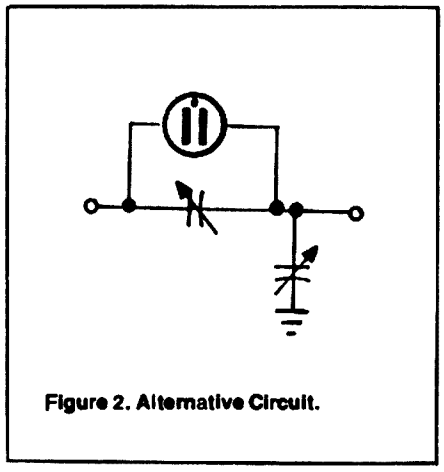

Figure 2. Alternative Circuit.

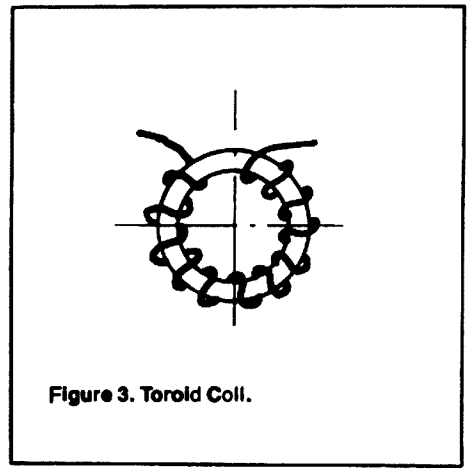

Figure 3. Toroid Coil.

CLASSIC COMMUNICATIONS EQUIPMENT

Colin MacKinnon VK2DYM
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The TR-AP-21-A TRANSCEIVER

"L'emetteur-recepteur UHF leger de bord type TR-AP-21-A" is a low power transceiver assembly built by the French company, "Omera- Segid" for aircraft use in the military UHF band.

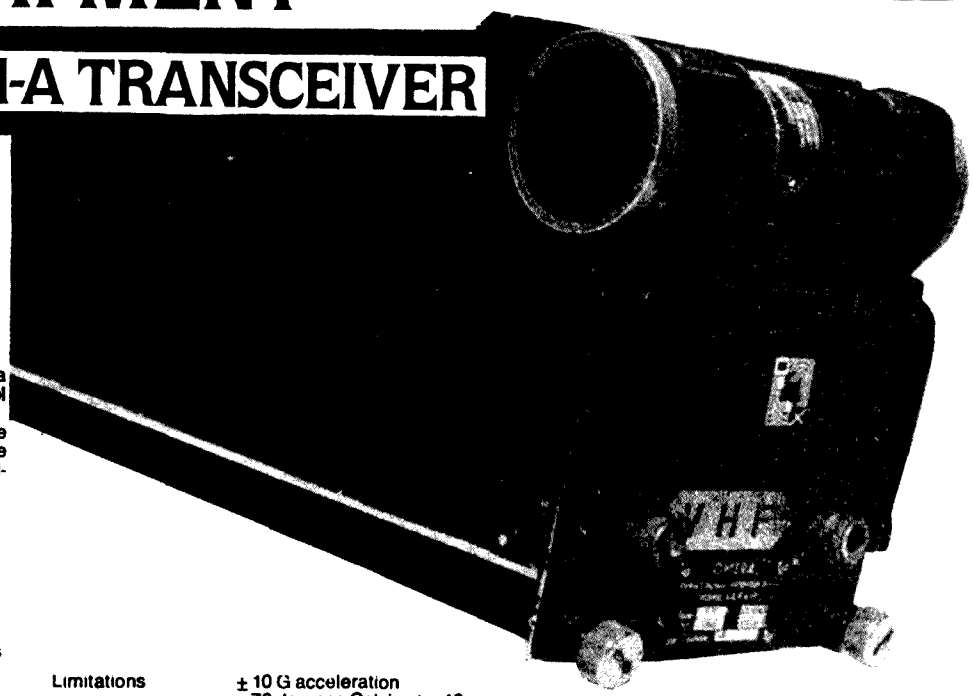
The unit consists of the transceiver, ER-76 A, a converter power supply, BA-220 A, and a control box, BC-148 A.

The sets were designed around 1960 and were fitted to the Mirage III fighters purchased for the RAAF They have recently been replaced by solid-state Collins radios.

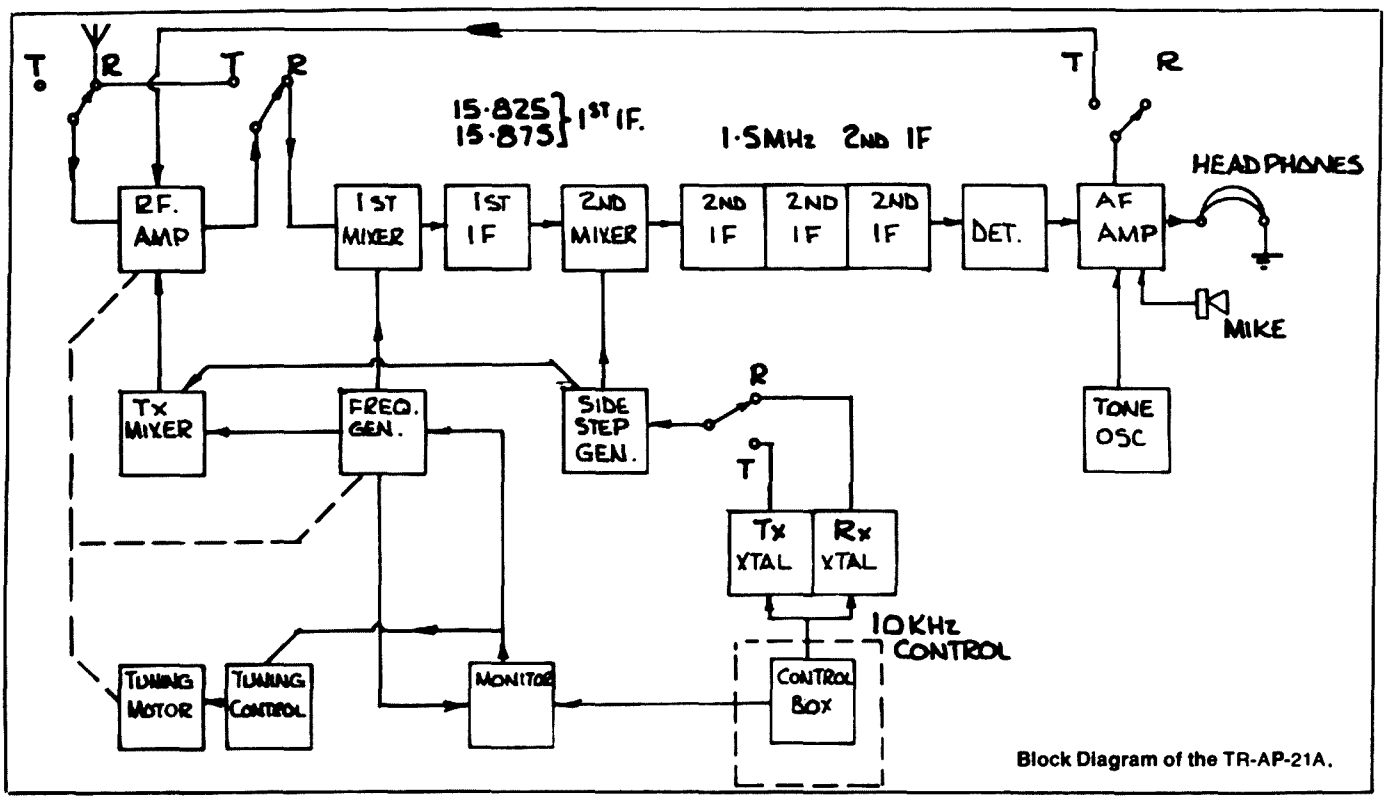
Technical specifications are as follows:

Frequency Range	225 to 399.95 MHz
Channel Spacing	50 kHz minimum (RAAF used 100 kHz)
Stability	± 20 PPM (about 6 kHz)
Preset Channels	20 — using the BC-148 A control box
Power Required	28 volts DC at 10 to 15 amps
Power Output	3 to 5 watts (depending on frequency)
Modulation	Amplitude modulation and tone (MCW)
Weights	ER-76 A . . . 11 kg BA-220 A . . . 3.4 kg BC-148 A . . . 1 kg
Limitations	± 10 G acceleration + 70 degrees Celsius to -40 degrees Celsius

As well as transmission and receotion of voice and MCW, the set includes an intercom



Partial view of the unit. Blower fan can be seen at the top-right, preset controls are behind a movable panel with the makers badge on it. The N-connector for the antenna lead is to the right of the VHF plate.



Block Diagram of the TR-AP-21A.

facility and a digital mode, but these features were not used by the RAAF

A companion assembly called the TR-AP-28 A, with an ER-78-A transceiver, covered the VHF band between 100 to 156 MHz. It is identical in external appearance but has a different RF front end and different IF unit. It was not purchased by the RAAF and although some RAAF units have a plate marked "VHF" on the front, they are, in fact, standard UHF sets tuned to the low end of the UHF band. I believe that this provided a choice of a "low band" or "high band" channel arrangement as required by particular operational needs, with one set available covering 20 lower frequency channels, and the other another 20 channels further up the band.

In service, the sets were used for air-to-air communications and some air- to-ground contact. The range depended on the aircraft altitude and up to 400 kilometres-range was possible.

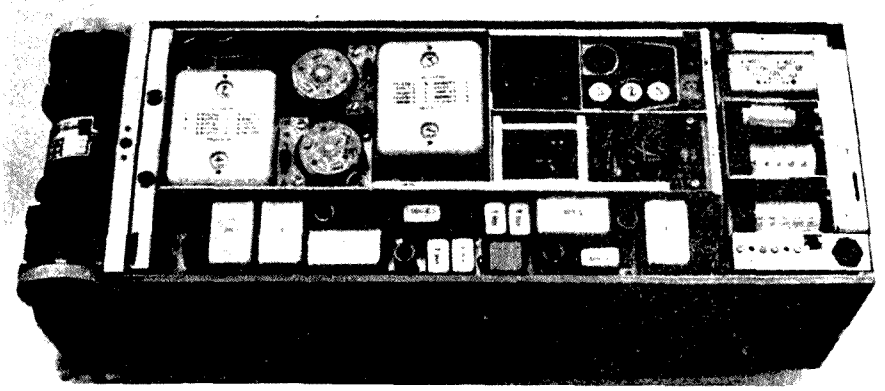
The transceiver is constructed with an aluminium frame, with removable upper and lower covers, into which a number of sub-assemblies fit and connect. A cooling fan is mounted on the top front, as the temperature inside the aircraft can be very high. Also on the front are connectors and controls to allow bench or in situ testing of the unit. The main interconnection to the aircraft harness is on the rear panel, and electrical contact is made as the set is pushed into a shock-mount frame in the aircraft.

The radio contains 40 subminiature, ruggedised valves, and is conventional in design, although obviously much attention has been given to ensure reliability and ease of servicing.

Refer to the block diagram in conjunction with the following description of operation.

On reception, the input signal is transferred via an unconventional design of T/R relay to two RF amplifiers and thence to a mixer diode, to which is also applied the mixer frequency to achieve a first IF frequency of either 15.825 or 15.875 MHz. This rather unusual selection allows for the 50 kHz channel spacing (the difference between the two IFs is 50 kHz).

The IF signal from the first mixer is amplified and applied to the second mixer where it is mixed with a signal from the side-step oscillator to give a resultant 1.5 MHz second IF frequency. The side-step oscillator is so- called because it generates each of the four frequency steps needed for the 50 kHz difference between channels for reception and those needed for transmission.



Top view with the covers removed.

There are three second IF stages, followed by a diode detector which also provides an AGC signal. The resultant audio signal passes through a diode noise limiter to a preamplifier and audio amplifier stage consisting of a phase shift amplifier to two pentodes in push-pull. A squelch circuit at the detector relies on the AGC signal to allow stronger signals to pass to the audio stages.

On transmit the audio stages are used as a microphone amplifier which feeds to the RF stages where the RF amplifiers now act to amplify the transmit signal. A transmit oscillator signal from the frequency generator to a transmit mixer controls the output frequency.

The correct frequencies are provided by a phase lock-loop frequency generator, controlled by the "monitor." Unlike modern IC dividers, this unit has a multiplicity of crystals in crystal ovens which are selected by rotary Ledex switching in accordance with the channel setting of the BC-148 A control box.

The operational details of the frequency generator and monitor are quite complex, involving harmonic generators and additive mixing of four different oscillators using a total of 32 crystals! A comparator, or discriminator, generates a sawtooth wave which in turn controls frequency correction circuitry.

The monitor also provides a signal to thyratrons which release a braking mechanism, switch a motor on and adjust its speed. This motor rotates a variable capacitor gang that tunes the RF amplifiers. When a new frequency is selected the motor is activated and rapidly rotates the capacitor gang to the new tuning position. It actually allows the tuning to go past the correct point, due to the inertia effect, then reverses and turns back at a slow speed until it is in tune. The brake then holds the tuning gang at that position.

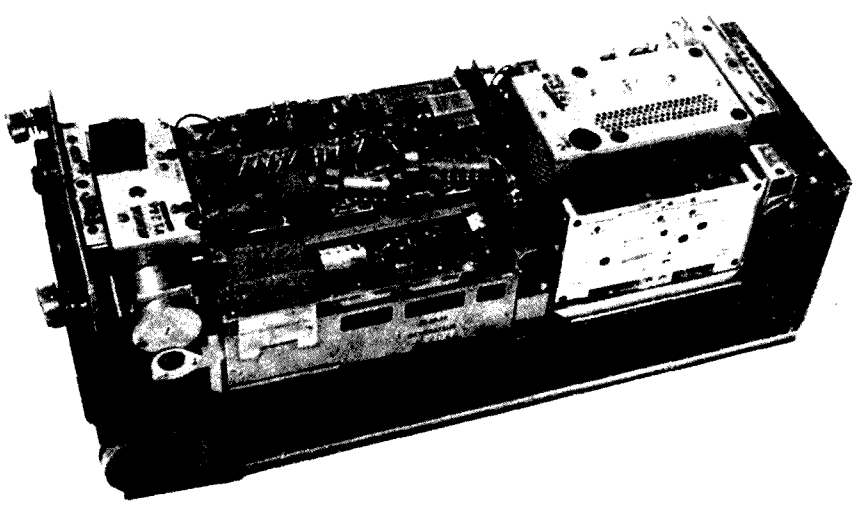
The specifications state that it takes no more than six seconds to settle on any new frequency channel!

The control box BC-148 A allows 20 frequency channels to be preset and then selected via a rotary switch. It also controls the volume and on-off functions. Note that the part number of the controller is to an international system as the same control box can be used with other makes of UHF radios.

The power supply BA-220 A comprises a rotary converter or dynamotor providing 250 volts HT, and a regulator to give 20 volts. As well, it has relay switching for the crystal oven heaters and filaments. In the set itself the 250 volts is dropped to 125 volts and regulated for the oscillators and RF amplifiers.

The ER-76 A has appeared on the surplus market, along with various specialised test equipment to suit, but I have not seen any BA-220 power supplies, and I believe the control box may still be in use.

A high power UHF transceiver from the same source, the TR-AP-22 will be described next month.



Bottom view.

VHF UHF — an expanding world

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All times are Universal Co-ordinated Time and indicated as UTC

AMATEUR BANDS BEACONS

FREQUENCY	CALL SIGN	LOCATION
50.010	JA2IGY	*Mie*
50.060	KH6EQI	*Honolulu*
50.075	VS6SIK	*Hong Kong*
50.109	JD1YAA	*Minami Tori-shima*
52.013	P29BPL	*Loloata Island*
52.020	FK8AB	*Noumea*
52.100	ZK2SIX	*Niue*
52.150	VK0DS	*Macquarie Island*
52.200	VK8VF	*Darwin*
52.250	ZL2VHM	*Manawatu*
52.310	ZL3MHF	*Hornby*
52.320	VK6RTT	*Wickham*
52.325	VK2RHV	*Newcastle*
52.345	VK4ABP	*Longreach*
52.350	VK6RTU	*Kalgoorlie*
52.370	VK7RST	*Hobart*
52.408	VK0MA	*Mawson'*
52.420	VK2RSY	*Sydney*
52.425	VK2RGB	*Gunnedah*
52.435	VK3RMV	*Hamilton*
52.440	VK4HTL	*Townsville*
52.450	VK5VF	*Mount Lofty*
52.460	VK6RPH	*Perth*
52.465	VK6RTW	*Albany*
52.470	VK7RNT	*Launceston*
52.485	VK8RAS	*Alice Springs*
144.019	VK6RBS	*Busselton*
144.400	VK4RTT	*Mount Mowbullan*
144.410	VK1HCC	*Canberra*
144.420	VK2RSY	*Sydney*
144.430	VK3RTG	*Glen Waverley*
144.465	VK6RTW	*Albany*
144.470	VK7RMC	*Launceston*
144.480	VK8VF	*Darwin*
144.485	VK8RAS	*Alice Springs*
144.550	VK6RSE	*Mount Gambier*
144.565	VK6RPB	*Port Hedland*
144.600	VK5RTT	*Wickham*
144.800	VK6VF	*Mount Lofty*
144.950	VK2RCW	*Sydney*
145.000	VK6RPH	*Perth*
432.057	VK5RBS	*Busselton*
432.160	VK6RPR	*Nedlands*
432.410	VK8RTT	*Wickham*
432.420	VK2RSY	*Sydney*
432.440	VK4RBB	*Brisbane*
432.445	VK4RIK	*Cairns*
432.450	VK3RAI	*MacLeod*
432.535	VK3RMB	*Mount Buninyong*
432.540	VK4RAR	*Rockhampton*
1296.171	VK6RBS	*Busselton*
1296.420	VK2RSY	*Sydney*
1296.480	VK5RPR	*Nedlands*
10300.000	VK6RVF	*Roleystone*

1 Mark VK0AQ, at Mawson, recently reported the VK0MA Beacon is operational most of the time. Off periods are caused by local power failures and, sometimes, the long trek to the beacon site through soft snow is not always welcome, so it can be off for a few hours or even a day or two, depending on circumstances. Other than power failures, it now seems quite reliable and runs about 70 watts and is on 52.408 MHz.

THE ROSS HULL CONTEST

So much for my recent exhortations! Only one letter on the subject arrived this month, being from Norm VK2XCI, who, amongst other things, has the following comments.

Norm believes the timing of the contest is a "bone of contention". He realises December/January is the best period for Es, but it does fall into the middle of a holiday period and many operators are away from home. (True — but then many operators are also not working and are home . . . 5LP). He considers a Ross Hull Field Day Contest has some merit, perhaps a field day period at the beginning, middle or end of the contest, either as a separate contest (as with the present two day/seven day set-up) or giving bonus, extra or multiplier points for the contest proper. Then those who may be away and have portable equipment with them might be encouraged to have-a- go.

The present duration allows for some good, even spectacular propagation at some time over the contest period, but Norm says some people have to work their holidays around the two day period, perhaps months in advance. He says in HF contests the operators don't get any chances to pick the eyes out of their operating periods!

Why not a separate award for each band, with the best score in any one band taking the trophy? This would give the "monobanders" a real chance to win. The current excellent scoring system could probably be retained; it appears to be quite equitable.

Norm summarises by saying he would like to see a shorter contest with a nominated "high activity" (eg field day), period during the Summer Es/Tropo period, but outside the December 24 to January 2 period.

Thanks for your thoughts Norm. Maybe they will generate some comments.

EME REPORT

I was saddened to read in the March 1987 special edition of *The Propagator* the monthly newsletter of the Illawarra Amateur Radio Society, that, after 17 years of moonbounce (EME) operation, the VK2AMW Moonbounce Project has ended.

It did not end due to any lack of enthusiasm on the part of the participants, but due to the theft of almost every piece of equipment and cables attached thereto.

The lock on the door to the operating building had been broken to make entry. All the equipment used in the installation was removed, also the large dish control cubicle with all its equipment, two metre steel shelving units, etc, which must have required several men and a truck to move it from the site. All the RG213U and RG58U coaxial cables, which ran in underground conduits between the building and the dish structure had been pulled out, together with the multicore control and power cables which followed the same route. A few small items remained, but in general, the building had been "cleaned out" as far as their vital operating and ancillary equipment was concerned.

An assessment was then made of the overall security situation and of the large amount of work and money which would be required to rehabilitate the equipment, and these matters were discussed with those most involved. Finally, and reluctantly, it was decided that rehabilitation was not feasible.

The VK2AMW project was carried on first at Dapto between November 1969 and April 1978, when the project was moved to the present site at Mount Keira following severe vandalism to the 432 MHz EME equipment. The project came on air after the move in June 1982 and, in that interim period, Lyle VK2ALU, spent much of his time in the design and construction of the 1296 MHz equipment.

The first of the Moonbounce articles were included in *The Propagator*, December 1969, and Lyle said the March 1987 issue may include the last reference to the project. However, he believes there are new frontiers to be looked at, and it may be possible for even higher frequencies to be tried for EME and using smaller dishes and suggests he is interested in trying to hear VE7BBG using his own six foot dish on 1296 MHz for the time being.

I take this opportunity, on behalf of the VHF/UHF fraternity, of saying how sorry we are that such a great project should have to end under such circumstances. We can only hope that fellow amateurs have not been involved in the thefts and the equipment has been taken for its cash value and not to be set up and used by someone too tired to construct the necessary equipment themselves.

Over many years I have read with interest the "EME Report" in *The Propagator* and frequently I would be able to take extracts from the notes so written to Inform the amateur population, in general, what was taking place at VK2AMW. I thank those involved for the opportunity to do this and to say how pleased I have been to receive the newsletter so promptly each month,and hope it will continue to come to my desk.

In the meantime, we all say, congratulations to VK2AMW and its faithful band of operators and workers and, despite the present situation, you have made a number of achievements of which you can be proud so there will be some satisfaction. Well done!

TWENTY-FIVE YEARS

Congratulations to Illawarra Amateur Radio Society which, In 1987, celebrates 25 years of activity. The March 1987 issue of their newsletter, *The Propagator* was a special bumper issue with extracts of proceedings from 1962 through to 1977, all of which makes nostalgic reading and will serve as a historic reference In the future. I hope the remaining 10 years will be covered in a future issue, the present March issue ran to 32 pages and is an issue which should be filed away for later use.

It was of particular interest to read of the time when the first 432 MHz echoes were received from the moon on March 31, 1972, by VK2AMW, and then the successful contact between VK2AMW and WA6HXW on APril 19, 1972.

All of this is of particular interest to me as I actually visited the EME site at Dapto in the company of Lyle VK2ALU, during the 1970s and took some photographs of the dish and its construction as I was interested in building one at the time.

THE WORLD ABOVE 50 MHZ

That Is the title of the pages written by Bill Tynan W3XO in *QST* and I was particularly pleased to receive his copy for the March 1987 issue as it refers in some detail to the updating of terrestrial DX records. I would like to list the records first and follow this with some of his comments.

TERRESTRIAL WORLD DX RECORDS

BAND	CALL SIGNS	DISTANCE Miles (Kilometres)	DATE
6m (50 MHz)	JH5HTP/6 & PY5BAB/5	12 413.7 (19 9779)	Mar 11, 1982
2m (144 MHz)	I4EAT & ZS3B	4882.9 (7858.2)	Mar 31, 1979
1.25m (220 MHz)	KP4EOR & LU7DJZ	3677 (5917)	Mar 9, 1983
70cm (420 MHz)	KH6IAA/KH6 & KO6R	2554 (4111.2)	Jul 28, 1980
33cm (902 MHz)	W2PGC & K3SIW 9	480.8 (773.7)	Dec 24, 1986
23cm (1240 MHz)	W86NMT & KH6HME	2532.5 (4075.7)	Aug 13, 1966
13cm (2300 MHz)	VK6WG & VK5QR	1170 (1883)	Jan 17, 1978
9cm (34 GHz)	VK5QR & VK6WG	1171 (1884.6)	Jan 25, 1986
5cm (5.7 GHz)	G3ZEZ & SM6HYG	610.3 (982.2)	Jul 12, 1983
3cm (10 GHz)	I0SNY/EA9 & I0YLI/IE9	1031.5 (1660)	Jul 8, 1983

1.24cm (24 GHz)	I4BER/6, I4CHY/6 & I350Y/3, IW3EHQ/3	179.6 (289)	Apr 25, 1984
63mm (47 GHz)	HB9AMH & HB9MIN	33 (53)	Jun 11, 1984

Bill W3XO, states that having acquired a new computer program to replace the spherical earth model used previously, he now has a program which takes into account the true shape of the earth, and the distances listed are calculated based on the closest distance between the two stations, as determined by their geographical co-ordinates or grid locators without regard to the distance actually covered by the signals getting from one station to another. This approach heads off the arguments such as "our contact was long path," "bent path," or "mountain bounce" etc.

Bill believes the table is up-to-date, but is always open to comments and corrections if errors have been made or if someone has information regarding new records. It appears no new records are known to him for six metres, two metres, one and a quarter metres or 70 cm since those published in September 1984. The small differences from the distances then published are due to recalculation with the new computer program.

For the new 33 cm band, W1JR says the contact between W2PGC and K3SIW/9 appears to be the record and occurred during a major tropo opening over much of the eastern half of the US.

The outstanding tropo event that occurred late in November 1986 produced new North American overland records for the 70, 23 and 13 cm bands, but no new world records. The best 23 cm DX was between WB3CZG and two Dallas-area stations, WB5LUA and KD5RO — a distance of 1290 miles (the US still uses miles . . .5LP). With KD5RO about six miles further south he gets the record. WB3CZG also worked these and other nearby stations on 70 cm, including WA5VJB, at approximately 1320 miles. On 13 cm, contacts between W8YIO and WB5LUA, at 934 miles, and KD5RO, about 940 miles, apparently tops all previous overland work on this band anywhere in the world. However, the 13 cm world record remains where it has been for nine years, with VK6WG and VK5QR, for their over water work across the Great Australian Bight.

A new 23 cm record has recently been claimed by WB6NMT and KH6HME, slightly bettering the mark previously set by N6CA and KH6HME.

According to information received from SM5AGM, the keeper of the Region 1 records, the nine centimetre record previously reported held by two New Zealand stations, was eclipsed in July 1983 by G3LOR and SM6HY. The world record for this band is held by VK5QR and VK6WG, who have again demonstrated what their part of the world is capable of producing in the way of tropospheric propagation by setting the current mark for this band as well.

Bill says no changes have come to his attention for the 10 GHz band; information from SM5AGM lists a new European record for 24 GHz between two Italian teams and an apparent record for the 47 GHz band by a pair of Swiss so, In the absence of any other claims, Bill, at this time, considers they represent the world record.

Also, from the same pages of *QST* is the 70 cm standings compiled on January 9, 1987. Ten stations have worked all US States, all with the aid of EME. Of the others working their way up to working all States, the list is headed by K1FO with 44 States and 39 call areas. This total has been aided by EME contacts. It is a pity the WAS listing does not also indicate how many States have been worked without EME, as I believe this would be a truer indication of the range of contacts. For example; a station might have worked only 15 States without the aid of EME but, because he has the EME facility, is listed as having Worked All States. This is not meant to downgrade EME contacts by any means, it is just so a total comparison can be made. The station with the greatest number of States worked without EME is held by W4WD/7 with 38 States and 33 call areas, followed by WB9SNR with 34 States and 11 call areas. Both of these stations and many others with 20 or more States should be congratulated for their commendable efforts.

Two other items from Bill's pages — G4UPS (formerly ZD8TC) summarised last year's six metre Es activity in Europe by saying there are a number of Continental stations prepared to listen on six metres and reply via 28.885 MHz.

The other item concerns K6QXY, who has now erected an array for six metres consisting of four 1.75 wavelength, 10 element Yagis, spaced 28 by 24 feet and is now actively looking for six metre EME scheds.

FROM WEST AUSTRALIA

The Western Australian VHF Group Bulletin has a few interesting snippets of information which are worth mentioning to readers. Firstly, a VK6 call sign was heard on two metres in Cairns on 20/12/86. Although no contacts were made, it shows such are possible given the right conditions.

Dave VK6AOM, of the Esperence Amateur Radio Society, reported on the WIA News Broadcast that, on 8/2/87, from 0700 to 1400, he worked 18 VK3s and nine VK5s on 144.100; and six VK3s and VK5s on 432 MHz.

At 1038, he had the pleasure of working David VK7DC, at Burnie, Tasmania, a distance of more than 2000 km. Signal reports were 5x2/3 each way on two metres. 432 was tried at that time without success. Another attempt was made at 1200 and 5x3 reports were exchanged. These are understood to be the first ever VK6 to VK7 contacts on two metres and 70 cm. This OSO ended in a four- way contact with VK3AUU and VK5NC joining in. Conditions were so stable that VK7DC was still good copy at 1400 when he closed down. As a bonus, VK6AOM had worked six VK3s on six metres earlier in the day.

In the same news was a report from Bob VK6BE, at Albany, and the Southern Electronics Group, who said the bands opened there during the afternoon and continued until late evening. Contacts from Albany were made to VK5 and VK3 on 144 and 432 MHz, while Wally VK6WG, worked his SHF friends on 3 GHz. Apparently an attempt on 5 GHz did *not* work out.

During the same opening, Aub VK6XY, in Albany, was able to work through the Geelong two metre repeater with only a two metre hand-held and rubber duckie antenna!

The friendly rivalry between Esperance and Albany seems to be encouraging a very healthy increase in activity in those areas. Each centre is claiming to be the VHF capital of Western Australia; the report suggests that Perth stations should be doing something positive to get into the act again.

Also, from the WA VHF Group Bulletin is information that the Perth six and two metre beacons are at present operating from the top of a building in Nedlands with apparently good results. Eventually they hope to reinstall the beacons transmitter inside the TVW7 transmitter house, and to run their own feeders up to the antenna. Two lengths of old Heliax cable have been donated for this purpose and their condition is presently being assessed.

THE UHF/SHF BANDS

It rather disturbs me to continue to be hearing around the bands that the Department of Communications has discussed, with the Executive of the WIA, a proposal to withdraw the complete 13 cm (2304 MHz) band from the Amateur Service to make way for Multipoint Distribution Services (a commercial operation) and that the WIA did not oppose such action!

Now I am fully aware that some information discussed on air can be altered from the original by passage from mouth to mouth, but it seems there is a semblance of truth in the statement when a well-known and highly respected amateur as Wally VK6KZ, finds it necessary to write to DOC, the WIA, ARA, and VK5LP for starters, trying to establish with certainty that such a proposal has been discussed.

What we do know with certainty is that in Western Australia the Sylédis radio location system has forced Perth amateurs to modify their ATV equipment to a higher frequency in the 70 cm band and that television relay equipment was used in the 13 cm band during the America's Cup.

Apart from the ramifications of the attack on the 70 cm band, the possible loss of the 13 cm band is really bad news for the Amateur Service. One needs to agree that there is not a great deal of use made of that band but that gives no reason for the complete removal of the use of the band by amateurs. More equipment is slowly becoming available to amateurs for use on that and higher frequencies and the continuing provision of at least a reasonable portion of all bands would not be an unreasonable assumption.

To dispel any incorrect statements that might be circulating, the WIA should at least make a statement indicating whether such discussions have occurred or are occurring, and whether they have agreed, in principal, to the removal of the 13 cm or any other bands from the Amateur Service, and with whom they have consulted.

The present situation comes very close to that which I remember in the 1950s when the loss of the six and two metre bands to television seemed likely and only the combined efforts of the then VHF operators ensured frequencies in those bands for those amateurs who were to follow.

It seems to me that the continuing situation of the Amateur Service being the secondary service in so many of the UHF and SHF bands, there will be continuing conflicts between the amateurs and commercial interests. Perhaps the allocation of a fair segment of each band for the exclusive use of the amateurs would be better than the present shared system even though this would probably result in a loss of the fairly wide bands we share at present for a lesser, but exclusive allocation. If such could be achieved by open discussion with all parties it might achieve more than having all discussions behind closed doors without any advice of the outcome.

However, I do see some encouragement for the future in the report, *Amateur Radio* February 1987, page 23, column three with Mr David Hunt, the DOC Manager, portion of which reads "I think Importantly our responsibility is to allow it (all sorts of technological developments) to happen — allow the amateur service to become part of the progress of technological change. We wouldn't want to impose any restrictions on the amateur service to not experiment and develop new techniques in communication." Surely that statement can also apply to the amateur service being allowed to continue its experiments in those bands allocated to it and not be under constant threat of removal purely in the interests of commercialism.

I commend Wally Howse VK6KZ, for his initiative and give him my support. Will you, the readers, do the same?

BAND CONDITIONS

Six metres still has the occasional flutter into activity via Es, mainly concerning VK2 and VK4. Channel 0 has been very strong on a number of occasions, but no signals could be raised at its end, presumably no one was listening.

On two metres, I am still without a rotator and likely to be for another month it seems. I never believed one could be so lost without that band. To make sure I had not missed anything too important I contacted Mick VK5ZDR, and he informed me that morning contacts into VK3 were being made on a generally continuing basis on two metres. The best morning lately was on 1/3 between 2130 and 2230, when he worked VK3s ZL, DFI, KEG, AUU and AZG, all on two metres and VK3AUU and VK3KEG on 70 cm. Signals generally were very good.

Mick also said after almost 20 years, he finally caught up with that long time VHF operator, Ian VK3ALZ, who was operating from Mount Macedon (portable) using a quad antenna on the car and enjoying a pleasant evening on the mountain. Mick recalled about the last time he worked Ian was in the 1960s on 70 cm. VK5LP also remembers Ian as an advocate of using two QQE06/40 valves in a two metre amplifier. This is really equivalent to having four tetrodes in the amplifier and they took some taming, but were capable of plenty of power if you got them going properly.

SIX METRE STANDINGS

The next list is scheduled to appear in August 1987 and I would like entries/updates to be on my desk by May 31, to allow time for processing.

Claimants are requested to supply the following details:
Date of Contact, Time in UTC, Call Sign of Station Worked, Country, Mode, Report Sent and Received, QSL Sent and whether received. Split Frequency Contacts should be indicated. Please add you own call sign, signature and date of claim. I reserve the right to ask claimants for QSL cards for perusal to support verification if considered necessary. If you have worked five or more countries (including VK) you are eligible to be entered on the list. You may never catch the high scorers, but don't let this worry you, it can be fun watching your own results gradually creep up the ladder!

MACQUARIE ISLAND

Gil VK3AUI, sends some information from Sojo VK0SJ, who provided many stations with their first VK0 contact whilst on Macquarie Island. A computer print-out gives a total of 150 different VK stations worked plus 20 ZL stations. A number of these stations were worked several times. The contacts to the various call areas were: VK1 2; VK2 16; VK3 73; VK4 13; VK5 12; VK6 3; VK7 28; VK8 5; ZL2 8; ZL3 10; ZL4 2. These contacts were all on six metres. (I have never seen such a long list of VK7 stations, to make 28 a lot must have come out of the woodwork just to work Sojo! I wonder where they are normally? . . . 5LP).

In addition, Sojo worked 10 stations on two metres, being VK3s AMZ (first contact), AQR, AUU, AWY, AZY, BRZ, DUT, XQ and XEX (who was the longest distance at 2174 km).

The longest distance on six metres was John VK4FNQ, at Cairns, a distance of 4300 km.

Gil VK3AUI, commented in his letter that we had been very lucky with Macquarie Island as we have had some very dedicated operators . . . "Peter got up and *going in* spite of problems and then David and Sojo gave things a good push. Lots of stations were able to get a VK0 contact."

Gil also says "The summer was really something with lots of DX. The two metre opening to Macquarie was good. Pity I missed it. Still, I am glad it has been done. The gear has come back. Hope some others get inspired to give it a go in the future.

"I feel there is a lot of DX to be worked on 6, 2, 432 and higher. All we need are people willing to have a try. Many of the islands could yield quite exciting contacts. I hope Heard Island might get a base as I feel it has a good chance with a keen operator.

"As to operators for odd spots, I think they have to be highly motivated. This really helps to get things going. Complete station gifts or loans are not much use if the operator isn't keen. The more the operator is willing to contribute the better the chance of success." Thanks for that nice parcel of news, Gil . . . 5LR

OVERSEAS

From *The Short Wave Magazine* (kind favour of VK5AIM), is an interesting comment in the January 1987 issue regarding OSCAR-10, as quoted in the UO-11 Bulletin:

"All efforts to this time have concentrated on using the first 512 bytes of the IHU memory, since this is the memory into which the 1802 computer will automatically load uplinked data. Through the unflagging efforts of the AO- 10 command stations (DB2OS, ZL1AOX and VK5AGR), the whole 14 kbytes of the IHU memory were tested. Several blocks of the higher memory were in much better condition than the lower area. If programs can be loaded into this higher memory, there is hope of bringing the satellite further under control.

"Anyone who has 'peeked and poked' into a computer's memory knows what a tedious and lengthy business it is. So, hats off to those who have been doing this remotely at anything up to 40 000 km range. It proves that radio amateurs are every bit as resourceful as the professionals concerned with the remote control of spacecraft." (This is in line with the DOC Manager, Mr Hunt's comments previously mentioned).

CLOSURE

Not a lot of local activity to report as you have noted, but I seem to have found a fairly wide ranging series of subjects for your reading.

I would still like to hear from more readers of their amateur activities and if you can send relevant photographs these would be appreciated.

As we will have passed through the equinox by the time you read this, the next period to devote some attention to is the winter Es which often comes along during June and July, especially on six metres, so keep an ear on the band and make some calls.

Closing with two thoughts for the month: *There is a way of transferring funds that is even faster than electronic banking. It's called marriage"* and *My life is in the hands of any fool who makes me lose my temper."*

—73, *The Voice in the Hills.*

* THE WIA *HAS NOT* GIVEN AWAY 13 CM

Contrary to the opinions being expressed in various places recently, the WIA has not given away the 13 cm band. At a recent meeting with DOC where this band was discussed, a copy of the documentation relating to Multipoint Distribution Services was obtained. This is currently being studied and a submission will be made to the DOC on this matter.

Multipoint Distribution Services (MDS) are radio communications services which provide for one-way transmission of information, either broadcast quality, video/audio or data. Normally, omni-directional antenna are used. There are five existing MDS channels in the 2076-2111 MHz band and DOC proposes to allocate a further 14 channels in the 2300-2400 MHz band. In this band fixed, mobile and radio location services are the primary users, while the amateur service is a secondary user.

If any amateur has any comments or suggestions on this matter would they please forward them URGENTLY to me, care of the Federal Office.

—Peter Gamble VK3YRP
Chairman FTAC
ar

International News

SOLOMON ISLANDS RADIO SOCIETY

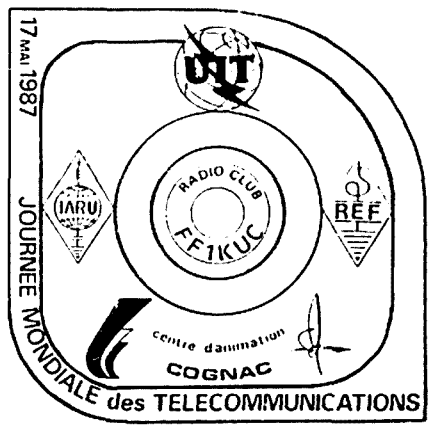
The Solomon Islands QSL Bureau has been resurrected and is not operating. It has over 2000 QSL and SWL cards for former H44/VR4 stations. Most H44/VR4 stations have been expatriates who were in the country for only a couple of years, at most. There are consequently no forwarding addresses.

Any former H44/VR4 stations or anyone who knows of a former H44/VR4, are asked to write to the Solomon Islands QSL Bureau, Box 418, Honiara, Solomon Islands with the information. Photocopies of QSL cards received from former stations are also helpful as they frequently give the name of the operator, home country call signs and/or addresses, and alternate QSL addresses.

There are over 1000 cards in the bureau for Anthony Bryan Sturm ex-H44IA, ex-P29IA, ex-ZL2IA. Any information about him would be gratefully received.

DXers are urged to send their QSL cards direct to a H44 station or the H44 QSL Bureau as QSL bureaus in some areas have been known to delay H44 cards by years due to the low volume to H44 — by which time the operator has left the country.

—Contributed by Andrew H44AF, Solomon Islands QSL Manager
ar



RESEAU DES EMETTEURS FRANCAIS

The amateur radio club of the city of Cognac (Departement of Charente, France) and the National Society Reseau des Emetteurs Francais, will commemorate May 17, 1987, with expositions and demonstrations of many radio amateur activities including the reception of television via satellites, on the occasion of World Telecommunications Day.

For this day there will also be a philatelic exposition about the following topics:

- ITU and World Telecommunications Days,
- WCY 1983 (World Communications Year),
- Amateur radio, broadcasting and television,
- Microwave telecommunications and satellites,
- Inventors and users in the field,
- The telephone.

A special philatelic, four colour cover will be franked with an Illustration post mark of the French PTT, especially Issued for the occasion. Price for one cover is FF10 (plus postage and packing) or 6 IRCs (including post and pack). Requests are to be sent to Raymond Aupetit 14, Residence Bois Boutin, F-16340 L'isle D'Espagnac, France.

All other information or requests for any amateur radio demonstrations or philatelic exposition may be obtained for one stamp or one IRC — address as above.

Novice Notes

CHEAP RADIO — THE "JUNK BOX"

Drew Diamond VK3XU
Lot 2, Gatters Road, Wonga Park, Vic. 3115

A significant number of technical articles today still refer to a mysterious receptacle called the *junk box*. Newcomers with an interest in constructing on a limited budget may ask where the material to stock this junk box is obtained (the answer will probably be some vague reply like "just collected it over the years — you know").

It is now over 10 years since colour television was introduced here, and many receivers bought back in 1975 are now beginning to look a bit sad. The cost of a new picture tube generally prohibits an economical repair, and so the poor set — once the family's pride and joy, is sent to the rubbish tip.

These junked sets represent a gold mine of parts for the technical amateur (see photo 1). Let me list some of the more potentially useful items obtainable: Power transformer (often rewindable. The ones with a divided bobbin are particularly good), coils, transistors, diodes, capacitors, resistors, potentiometers, trimpots, valves (in the really old sets), 4.43 MHz crystal, knobs, winding wire (from deflection coils), EHT transformer (for balun core), plugs, sockets, screws, nuts, speaker, etc.

Assuming that you have managed to find an old set by some means; start by vacuuming out the accumulated dust. Avoid any rough treatment of the tube, and it would be prudent, if possible, to leave it mounted in the chassis or cabinet for ease of handling and disposal later.

It would be wise to trace and note the connections to the power *transformer for* future reference, as some are not marked. At least the primary mains connection should be identified and recorded. The individual boards and any other useful items can now be removed (photo 2).

Riveted components can generally be extracted by carefully drilling out the pressed part of the rivet with a sharp drill of slightly larger diameter (photo 3).

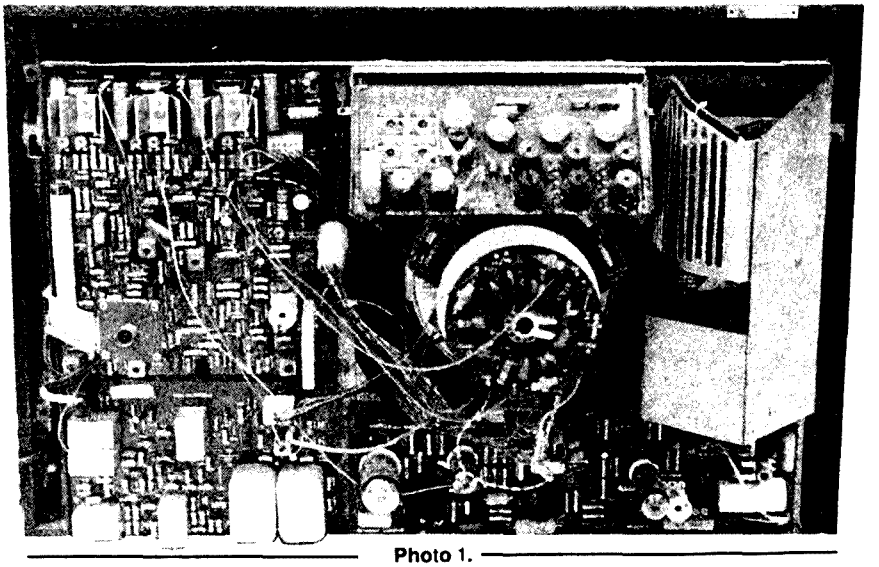


Photo 1.

Some purists may question the advisability of using recycled parts in this manner. It must be remembered however, that we are amateurs, answerable only to ourselves. In addition, a great deal of satisfaction can be obtained in building equipment cheaply, by adapting components and "cobbling up" a project, rather than by precisely following a published design. Naturally, used parts should be checked (as far as possible) before reuse. Suspicious looking components, such as discoloured resistors or cracked capacitors should be discarded, even if they appear to check okay, as their long-term reliability will be poor.

SOME FURTHER READING AND RELATED PROJECTS

GREENHAM, VK3CO. *Home-Brew Regulated Power Supply.* AR, July 1985.

HAYWARD & SON, W7ZOI. *The 'Ugly Weekender'.* QST, August 1981.

MARRINER, W6XM. *One Tube 10W CW Transmitter.* CQ, June 1983.

DEMAW, W1FB. *The Fine Art of Improvisation.* QST, July 1985.

ar

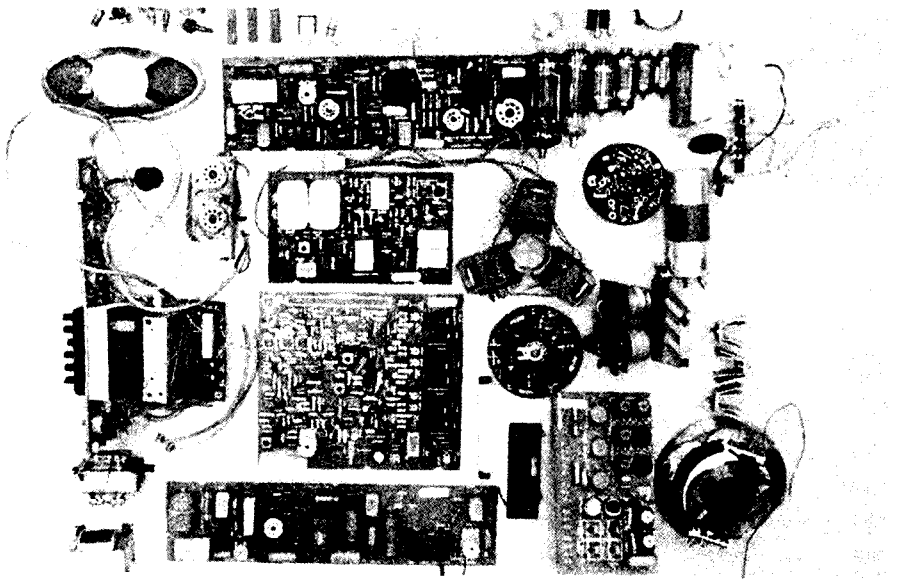


Photo 2.

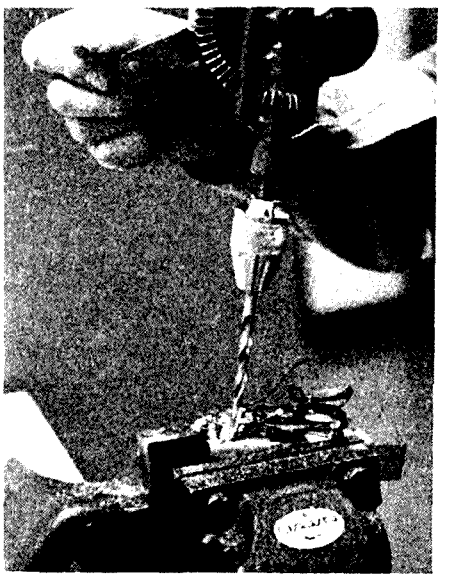


Photo 3.

How's DX?

Ken McLachlan VK3AH
Box 39, Mooroolbark, Vic. 3138

Well, apparently the propagation is not as bad as amateurs tend to believe, although in VK there has been a noticeable decline of activity compared with the same period of last year, particularly on the low frequency part of the amateur spectrum.

The ARRL are conducting a Golden Jubilee DXCC Award this year and already there are quite a number of amateurs who have gained the necessary number of 100 countries.

Reports indicate that KA2AJT, obtained it in 45 hours and 10 minutes of operating. His friend K2TQC, took a little longer, 46 hours even. Not bad operating gentlemen and of course readers have probably guessed by now that the mode was CW.

I have always maintained that the DX is there, if you are prepared to go after it. Again I stress that many amateurs just listen, but the way to go is get in there and call CQ, on any band, not neglecting 15 and 10 metres, as, at times, they can yield the most unusual and exotic prefixes.

I admire the outgoing positive attitude of the amateurs that get amongst the action in contests, pile-ups for a rare DX station or just get on air to have a friendly chat with an amateur in another country, through calling CQ.

How about it ladies and gentlemen, are we going to hear more CQs from this vast country of ours this year?

It would be amiss of me not to mention the fact that a lot of listeners can do quite a lot of good, in the hearing of distress calls and alerting the proper authorities. This happens quite frequently and personal feelings are that the events are not capitalised on, to put our hobby in a favourable light with the media and public at large, who are really unaware of the potential coverage that our hobby allows us.

ON THE MEND

It is hard to keep some DXers down. One of those is Iris W6QL, and the holder of a multitude of other calls from all parts of the world. A card from Iris, whilst in Sri Lanka indicates all is well and through good medical attention she is well on the mend and will soon be in Nairobi, then back home to the United States. The VK gang will be listening for you and Lloyd, Iris.

GRUMBLES AND HASSLES

By all accounts F6FNU has or rather had 70 different problems multiplied by an unknown figure. He is, but by now that may have changed to being 'was' the QSL Manager for 70 different stations and after numerous complaints about his QSLing he has resigned from the French Society, making him ineligible to despatch cards through the bureau. What the future holds for the amateurs that entrusted their logs to him for issuing their cards is unknown, but he is believed to be very silent both on and off air at present and he is not spending many Francs at the local post office.

If you have sent a card via the bureau to a station he manages, it is felt that you would have to be lucky to have received a reply. If there were enough VKs that had outstanding cards and they cared to note the details to me, I would correlate the list and forward it to the French Society. Though I feel sorry for the predicament and embarrassment that confronts them, it is felt that they have an obligation to find a solution to the problem of such a magnitude.

ST PETER AND ST PAUL ROCKS

This was a disaster, for the VKs that wanted it for a new one. They were active, but mainly in nets and with very sparse CW operation. It is believed that some VKs did make the valued contact on both modes. Congratulations, and for your luck, a ticket in the lottery would be appropriate.

YEMEN

Reports from overseas indicate that a station either signing 4W1AA or N5GJL/4W has been heard and worked. Gerry N5GJL, is in Yemen with a transceiver, according to reports from his mother, as published in overseas newsletters. It is unknown whether he has a licence or authorisation that will stand up to the scrutiny of the Newington DXCC desk, but he is QSLing and giving the address of Gerry Jensen, Crew 770, PO Box 17086, Sala'a, North Yemen. It is another one of those cases of work first and worry later. (It is one I would like in the log, better still with a confirmed QSL and the knowledge it was legitimate — VK3AH).

SPRATLY ISLAND

Sense has at last prevailed. The proposed expedition has been postponed until January 1988, because of the political climate in the area. My personal belief for it to be removed from the DXCC list, until all hostilities in and around the area have ceased, still stands. It is wondered if the ARRL DXCC Committee has yet contemplated this action, before a serious mishap occurs.

ARRL DXCC

The committee has agreed not to allow country status for TP2CE and Tierra del Fuego. T50DX cards, according to Don Search, are not acceptable as a credit, as the documentation does not mention any call sign or amateur frequencies, also, St Peter 1 cards are acceptable after June 1 and none of the Ethiopia ET3 calls are valid since the early 1980s, when the hobby was suspended in that country.

The good news is that 5A0A cards are correct, and can be claimed for DXCC.

SAO TOME

Luis S92LB, is still around and he has migrated to two other bands, to make life more interesting for those that seek a QSO with him. He now works 40, 20 and 15 metres and has been worked in VK. So good hunting and lots of luck. Some overseas newsletters have graciously advised their readers that if he is being worked and there are VKs on the frequency, to please alert him. Thanks in anticipation for your assistance folks.

CHINA

It is now five years since the hobby recommenced in that country and the following stations were active as at the end of October last year. This is the last official update that I have but it is known that others are becoming active month by month.

CALL	QTH	DATE OF ESTABLISHMENT
BY1PK	Beijing	March 29, 1982
BY8AA	Chengdu Sichuan Province	November 4, 1982
BY4AA	Shanghai	October 12, 1983
BY1QH	Beijing	April 29, 1984
BY5RA	Fuzhou Fujian Province	January 4, 1985
BY5RF	Fuzhou Fujian Province	January 4, 1985
BY8AC	Changdu Sichuan Province	February 28, 1985
BY0AA	Urumaqi Xinjiang Uygur Zizhiqi Province	April 5, 1985
BY1SK	Beijing	June 1, 1985
BY4AOM	Shanghai	September 28, 1985
BY4RN	Nanjing Jiangsu Province	December 25, 1985
BY4SZ	Suzhou Jiangsu Province	June 8, 1986
BY4RB	Zhenjiang Jiangsu Province	June 22, 1986
BY9GA	Lanzhou Kansu Province	August 5, 1986
BY7KT	Guangzhou Guangdong Province	July 20, 1986
BY5QA	Fuzhou Fujiang Province	August 20, 1988
BY5HZ	Hangzhou Zhejiang Province	October 7, 1986

The two latest stations to come on air, BY5QA and BY5HZ, are using equipment that was donated to them by the Japanese Amateur Radio League. Another station due on line at any time now is BY4WNG, from the Nanjing Institute of Technology and whispers are that individuals manning their own stations will soon be active over the amateur spectrum, using various modes of communication.

BHUTAN

The Ministry of Communications failed to renew amateur licenses in 1982. There were very few to be heard at any time and it is understandable considering the stringent examination of 28 words of CW per minute and a very extensive practical examination. Pradhan A61PN, would have no trouble, because of his profession, in such an exam.

It appears that Bharathi VU2RBI, of Laccadive Islands fame and of course the recent Andaman and Nicobar Islands effort, will try to lead a group under the auspices of NIAR. Bharathi, is an excellent ambassador for our hobby and it is trusted that the group she leads to Bhutan, may bring enough enthusiasm from the locals and the government to get the hobby back on the air from that country. Good luck Bharathi, if your expedition to Thimpu comes to fruition. If it doesn't it will not be because of your lack of enthusiasm for the hobby and your skills of being an expert in public relations.

REVILLA GIGEDO

Quite a few mutterings and grizzles over the last effort. Apparently the group had troubles but they still made over 15 000 contacts, which must bring it down on the wanted list.

YEOVAL AND YEOVIL

Joy VK2EBX, from Yeoval is an honorary member of the Yeovil Amateur Radio Club in Great Britain, who recently celebrated their 40th anniversary. The party was attended by the MP for Yeovil, Paddy Ashdown, and Mayor Joy Stanton. Both these personalities recorded a special message to the club's honorary member Joy VK2EBX, who is the only amateur enthusiast in the "sister" town of Yeoval, a town that was founded by Yeovil emigrants. Propagation and regulations combined, caused Joy to receive a cassette of the proceedings plus a copy of the article that appeared in a British newspaper, reporting the whole events and mentioning her name and association with the club. Also in the package was a beautiful Christmas card, signed by 30 members of the club. Congratulations Joy, this may be the start of becoming a media magnate. Who knows?

The unique commemorative QSL card, that unfortunately will never adorn a VKs collection, due to propagation on October 17, 1986.

The media photograph that was printed. Back row from left: G4JBH (hidden), G3MYM, G3NOF, G3OMH, Mayor Joy Stanton, the Hon Paddy Ashdown (MP for Yeovil), BRS10663. Front: G3GC and G3BEC holding the anniversary cake.
Photograph courtesy of G4PDG

CAYMAN ISLANDS

Joe WA6VNR and his wife Lois WB6MME, will be active under the call of ZF2AH from June 26, until mid-July.

BUREAU REOPENED

The H44 Bureau is open for business again. Apparently there is quite a number of cards, (in the vicinity of 1000) still to be claimed by ex-H44IA, ex-P29IA and ex-ZL2IA. It would be a safe bet to say that there would be a number of VK cards just waiting for the owner to pick them up.

The new address for the Bureau is: Solomon Islands Radio Society, PO Box 418, Honiara, Solomon Islands. Good luck folks!

ANOTHER AWARD

The heading is indicative of my personal enthusiasm, but *73 Magazine* has seen fit in their wisdom to offer the "73 MAGAZINE'S DYNASTY AWARD." This award is based on just under 400 countries and virtually every fly-speck on a world map is covered. If it creates band activity, which I imagine it is designed to do, then it will have served its purpose. Only countries contacted after 0001 UTC, January 1, 1987, are eligible to be considered for the award.

For those interested, a copy of the rules and country criteria is obtainable from DX Dynasty Award, 73 Magazine, WGE Center, Peterborough, NH 03458 for a SAE plus postage (three IRCs or US$1). A DX Map of the World is available for an extra US$5 (plus extra postage). Who will be the first VK to achieve 350 'areas'? On CW? SSB? RTTY? You do not have to submit QSLs for this award and there is no minimal signal report.

Regarding signal reports, I have always been under the impression that there was a minimum report for the ARRL OXCC. It appears that I may have been wrong as I have recently read that no report is necessary. I am amazed at some stations who give reports of 5x0, and some self appointed "policeman" listening on the side will chirp in that it is a good contact. If it is S0, how can it be R5. Think about it?

BURMA AGAIN

Reports have been received of a station signing XZ2A. As the hobby is completely banned in that country at the moment, the station is thought to be a pirate, so beware!

Jacek SP5DRH, who is well-known to VK DXers, uses a TS430S and wire antennas.

LIBYA

The good news is that Herbert 5A0A, is now the proud owner of a FT901M, donated by the European DX Foundation. Now comes the question as to when is he going to place a signal down into the Pacific area, to check the propagation within the terms of his licence? Quite a number of VKs and ZLs will gladly accommodate Herbert with a report! Herbert requests that there are no duplicate QSOs for obvious and various reasons.

COCOS ISLAND

Bob VK9YW (W5KNE) and Jim VK9YS (VK9NS), seemed to have had their troubles, with various equipment and antennas after their arrival. I feel sorry for people that spend a lot of money, time and effort in organising an expedition and it turns sour on them. It is like the family that saves up their 'pennies' to have a holiday in the sun and it rains every day, and that is talking from experience, unfortunately.

Bob, went home to the chores of editing the excellent DX newsletter *QRZ DX*, and Jim went on to Christmas Island, for a weeks stint there.

CHILE

Your ears were not deceiving you if you heard and logged the unusual call sign 3G87PAX. The prefix and suffix was a special that would be loved by all prefix hunters. The special call was to commemorate the visit of Pope John Paul to Chile. All QSLs to PO Box 72, Valpariso, Chile.

TOKELAU ISLANDS

Peter ZK3PM, is active again from this area. All QSLs to PO Box 7344, Wellington South, New Zealand.

DO NOT DESPAIR

Did you work G3JKI/5A on SSB many years ago? If you did Ann Koloboff F6CYL, advises that she still has the logs and some unused cards and would like to see those that need it for a new country, get their card. QSL to Ann's QTH, with three IRCs for Air Mail return. Thanks again Ann from all DXers, for all your efforts that have come to fruition. Incidentally if you worked G3JKI/5A on the key, you have worked a pirate as no CW was used.

DO YOU CONCUR? ? ?

At last someone has stood up and put some valid recommendations regarding the ARRL DXCC. It is no other than Jay O'Brien W6GO, who has written to John W4FRU, Chairman of the DXAC. Jay's suggestions (that have been abbreviated) include the following:

1 The basic DXCC should go on a yearly basis and on a log extract following the concept of the Golden Jubilee Award. This should be the only way to obtain a basic ARRL DXCC certificate.
2 To compete for the Honour Roll and to be listed in the DXCC country standings, the applicant would send all their cards to the ARRL DXCC desk as is presently done. Perhaps the quantity of countries could be set at 150 or more before cards are sent to the League. The lowest country level to be reported in *QST* would be 150, or what level was set.
3 To maintain good standing in the endorsed DXCC list (the "top" level) and the Honour Roll, one must submit a minimum of five new countries per year or qualify for the current year's DXCC.

Jay believes that this approach would heighten the interest in DX, bring in more DXCC members, while at the same time preserve the prestigeous Honour Roll and DXCC endorsements for those who have worked so hard to achieve the honour of being on the Roll. I, for one support your thoughts Jay and I feel that the committee under the leadership of John W4FRU, will explore all avenues and probably make the DXCC more interesting and rewarding for all amateurs throughout the world.

ITU DAY

Well it is that time again, ITU Day on the 17th of this month. It is predicted there will be many prefixes using the special suffix and one may pick up a new country or two.

I have had the honour of using the suffix and stations really came out of the woodwork to get a report and a card, so have a listen on all the bands and you are sure to pick up a few similar suffixes attached to various prefixes. Good luck!

BITS AND PIECES

Japan, now has a reciprocal licensing agreement with the United States of America, Canada, West Germany and of course Australia (see AR, page 42, March). ** **Korea** amateurs are planning a special station for the commemorative call **6K88AG,** to be used during the Olympic Games in Seoul. ** **CX0XY,** has been quite active from the **South Shetlands.** ** **SP5EXA,** aborted his plans for **Bouvet Island,** due to economics, and will be QRV from **Svalbard** from June to August. ** **JP1YEE,** is a repeater located on the **Ogasawara Islands,** which has an input frequency of 29.580 MHz and the output frequency is 29.680 MHz. It is actuated by a 88.500 Hz tone burst. ** **9V1TL,** is still looking for takers on 18MHz at around 1000 UTC daily. ** **George VE3FXT,** hoped to gain permission to operate from **Marion Island,** either with a ZS8 call or VE3FXT/ZS8, late last month but this has been delayed at least until nearly the end of the year with no reasons being given. ** **NE8Z,** hoped to be signing NE8Z/TI2 with **TI2CC,** for the **CQ WW WPX Contest** and staying on for a few days into this month. ** **FV6FIT,** will be active from the International Fair in Toulouse until May 7. ** **FS5IPA,** was the call sign used by the **International Police Association.** Some of the operators were **FD1LWS, FD6IRO, FD1AS** and **F9RM.** Probably a new prefix for those that seek them. ** The special prefix **FF6KFV,** will be aired from **Tatihou Island** by the Versailles Radio Club on the 9th and 10th of this month. It is not a DXCC country or IOTA island. ** **Marti OH2BH,** oper-

ated EA8RCT in the ARRL CW Contest. ** Joe WA6VNR and his wife Nancy KB6MME, have commenced their tour of the Pacific and hope to obtain licenses from some quite exotic areas. ** KC6CS was JE1JKL, and QSLs are via the JARL Bureau.

QSL DIRECT TO

3B8CA	Jacques Cantin, Grand Baie, Mauritius.
3B8OO	Herve Grome, 19 Bis Nicoles de Cere St, Beaubassin, Mauritius.
3O2MR	PO Box 271, Suva, Fiji.
4X5000	P Levy, 116-30 Shemuel Hanavi, Jerusalem 97355, Israel.
5H3RB	Roel, PO Box 9534, Dar-es-Salaam, Tanzania.
6V1A‡	PO Box 913, Dakar, Senegal.
6V1A‡	PO Box 971, Dakar, Senegal.
6W6JX	Antoine Baldeck, 7 Res du Val, Olianinville, F-91290, Arpajon, France.
8P9HG	Douglas Renwick, PO Box 50, Clavet, Saskatchewan S0K 0Y0, Canada.
8Q7CL	Hans Sunberg, Flygplatsv 3, S-78193 Borlenge, Sweden.
9Q5KK	Conrad Casserer, PO Box 68, Basankusa, Zaire.
9Q5NW*	S Harrell, PO Box 368, Stockbridge, GA 30281, USA.
BY0AA	PO Box 202, Urumqi, Xinjiang Urgur-Zizhigu, Peoples Republic of China.
CE0ZIP	Lastaria Fernando, Clovis Montero No 0255, Apt 31, Provencia, Santiago, Chile.
CX0XY	Ricardo Susena, Cebollati 1570 1-8, Montevideo, Uruguay.
C21FS	F Smith, PO Box 83, Republic of Nauru.
FH4EC/FR/G	FR5OO, PO Box 561, F-97473 St Denis de la Reunion Cedex, France.
FW4AF/FW8AF	F6ILB, 42 Avenue sara Bernhard, F-33510 Andernos, France.
HD2A	PO Box 5757, Guayaquil, Ecuador.
HH9E	PO Box 243, Fort Liberte, Haiti.
HS0B	RAST, PO Box 2006, Bangkok, Thailand.
IK1FOS/5N9	Enzo Tancredi, via Cattaro 11A, I-66023 Francavilla al Mare, Italy.
J6CQ	Bill O'Kain, 101 Baylor Dr, Oak Ridge, N 37830, USA.
J28EM	John Parrott W4FRU, PO Box 5127, Suffolk, VA 23435, USA.
J73PD	PO Box 104, Roseau, Dominican Republic.
J74Z	Richard Powell, Rt 1 Box 229, Zavalla, TX 75980, USA.
J79JC	PO Box 389, Roseau, Dominica, TWI.
JT0KAA	JT1BG Bator Sampu,PO Box 158, Ulan Bator, Mongolia.
KA2CC	C Carpenter, USACCJ Box 1133, APO San Francisco, USA.
KC6CS	Saty Nakamura JE1JKL, 3-16-6 Shibakubo, Tanashi City, Tokyo, 188 Japan.
LU6UO/Z	GACW, Carlos Diehl, 2025, 1854 Longchamps, Buenos Aires, Argentina.
N2GUV/KP2	Susan Tannenbaum KU2Q, PO Box DX, Cottekill, NY 12419, USA.
OD5YU	Sudat, PO Box 8, Tripoli, Lebanon.
P40GD	Howard Miller N2MM, 61 Mill Rd RFD 11, Vincentown, NJ 08088, USA.
T77E	Alvaro, PO Box 4, Dogana 47031, San Marino.
TK5UC	F6AOI, Andre Figon, Les Pas de Senes, F-06480 La Colle sur Loup, France.
V31CV	J L Poll, 9206 Canter Dr, Dallas, TX75231, USA.
VU4APR/. . .	NIAR, 5-B, P S Nager, Hyderabad 500-457, Andra Pradesh State, India.
VU4NRO/. . .	As above.
VP8BKK	PO Box 260, Mount Pleasant Airport, Falkland Islands.
VQ9HW	Wally Watts, PO Box 8-27, FPO San Francisco, CA 96686-1800, USA.
ZL7DE	Tony Magon, Radio Station, Waitangi, Chatham Islands.
ZY0SA/ZY0SB	Ron Costa Leite PV1BVY, Rua Presidente Backer 34/1502, 24220 Niteroi, RJ, Brazil.

NOTES

‡ Two addresses, presumably for individual operators for this station have been given, which was operational from Gores Island, located near Dakar. The operation is not valid as a new DXCC listing, but may stand up to scrutiny for IOTA Awards as it is classified as being IOTA AF 45. Good luck!

* This stations home call is N4NW. He has also operated as 5T5NW, TU2NW and ZS6USA. It is believed his attitude to QSLing is as follows — "Cards from stateside stations arriving via the bureau will be discarded. Stateside cards, without postage or donation will not be answered. If you WANT my card, send a SASE or postage money." (No comment — VK3AH).

** Baldur Drobnica DJ6SI, does not collect QSL cards. A brief note of the QSO from various calls he has held and a SAE, with IRCs is all that is needed.

** PJ9EE, unfortunately does not QSL.

QSL TO

4K0A:UA1MU, 4K1H:UY5OO, 5B4LP:F6FNU, 5H3RJ:SM7HKJ, 5L2GA:KB6EH, 5L2RL:DJ6SI, 5L2SI:DJ6SI, 5T5NU:F6FNU, 5V7SA:WB4CSM, 5W1FZ:ZL1CAO, 8P9MM:VE5RA, 8Q7CH:SM5DUC, 8Q7QL:YASME, 9J2EZ:I4FGG, CX0XY:CX2CS, HR6A:WB5VZL, J28EO:F6FYD, J73D:W2OB, K2SS/VP2V:WA6AHF, K8MN/OH0:OH2BH, KC6CS:JE1KL, OO5NG:*NQA, OO5QS:WA4VDE, P40GD:N2MM, PJ1JP:WA6PKN, PJ7/WA6PKN:WA6PKN, TU4CG:F2BS, V31DX:N5DO, VK0OX:VK9NS, VK0GC:VK9NS, VK9LM:OE1ZL, VK9XS:VK9NS, VK9YS:VK9NS, VK9YW:W5KNE, W7AWA/0Y:W7AWA, XF4OX:K9AJ, YN3EO:Y32KE, ZF2HM:K9QVB, ZF2KE:K9QFB, ZK1XC:DL8OG, ZK1XY:W0RLX.

NOTE *NQA: No QSL available.

SOME CARDS RECEIVED

5T5RA, 5V7SA, 9H1EU (via VK2AKP), BY4RO, C21NI, C53FH, FK8FA, FW0XN (1978), S92LB, UR2QD, VK9YW, XU1SS, YV6BJG (Direct card returned).

HEARD AND WORKED ON THE EAST COAST

28 METRES

3B8CA, 4N2AA, 4S7AVR, 5N3RB, 5N8HEM, 5V7SA, 7Q7LW, 8Q7QL, 9J2BO, 9K2SH, 9M2HB, 9M8GH, 9V1TL, A35SA, A01AB, A92EM, AX4XZM, BV2A, BV2B, C21RK, ED6BE, FT8WA, FT8ZA, J87CO, JY2RZ, JY3ZH, JY5YK, H44AF, HS0B, LA1H, S92LB, SU1ER, SU1FN, T32AN, TA3C, UP1BZZ, VK9LM, VK9YW, VU4APR/BL, VU4APR/MYL, VU4APR/RBI, ZC4NL, ZL2YL, ZL7AA, ZS2OM and ZS5YO.

WORKED ON THE WEST COAST

160 METRES

DL9KR, G3RFS, HL9AW, IT9ZGY, KC6CS, OH3TO, OH6NG, OK1DWW, ON4UN, ON5NT, SP5INQ, UA1OIL, UP1BZZ, UQ2PZ, VEs, Ws and ZS5LB.

80 METRES CW

9J2BO, OL1YD, DL3AU, EA7AZA, EA7ADR, F5QF, G4BWO, G4JNC, G4OBK, GM3PPE, HA6NA, HA6KUX, KC6CS, LA4DCA, LA8SOA, OE1ZL, OH2TQ, OH3WS, ON5NT, ON7PQ, OZ1NF, OZ2RH, OZ7YY, OZ8JO, PA0LVB, SM6CPY, SM6OIN, SM7WT, UAs, UBs, RL9MM, UR2RE, VEs, VU2OX, Ws, YU1AWW, YU1SB, YU1IF and ZS5LB.

80 METRES SSB

5B4TI, 9H1EU, CT3BM, CT3CU, CT3DL, HH7PV and ZC4IT.

40 METRES CW

3D6AK, 4K1H, 6Y5HN, 8P9HG, 9J2BO, N4RP/C6A, CO2HT, CO2VG, DJ0FX/CT3, FG5XC, NF5Z/J6L, W5PWG/J6L, KC6CS, TU4CG, K8WW/VP9, VU4APR, ZB2EO and ZY0S8.

40 METRES SSB

3C1M8, 5B4LP, JG1FVZ/5NO, 9K2KW, 9Y4AA, CO2AL, CO2KG, CT3OL, EA8AMK, GD4WBY, HK0HEU, HR6A, S92LB, SV5ADM, TA2AD, TR8SA, KK9A/VP2V and VU4APR.

THANKS

Sincere thanks to the Editors of weekly, bi-weekly and monthly publications such as: *ARRL Newsletter; BARG; CQ-QSO; The DX Family Foundation Newsletter; Inside DX; KH6BZF Reports; Long Island DX Bulletin; NIAR News Letter; Papakura Radio Club Bulletin; ORZ DX; RSGB DX News; QRZ DX, RSGB DX News* and *The W6GO/K6HHD QSL Manager List.*

Magazines including *Break In; cqDX; DX Post; JA CQ; JARL News; KARL News; Meteorological News; OST; Police Life; RadCom; Region 3 News, Veron; Weather News* and *Worldradio*, to mention but a few.

Individual contributors this month include VKs, 2PS, 2EBX, 3PC, 3YJ, 3YL, 4RF, 6NE, ON7WW, WB6GFJ and staff of the Lillydale Municipal Library.

Sincere thanks to one and all and good DXing.

DJIBOUTI — J2

Djibouti, officially the Republic of Djibouti, or to be really precise it should be called the Republique of Djibouti, was formerly the French Territory of the Afars and Issas, where amateurs then used the prefix of FL.

This small republic of 23 000 square kilometres, of which 90 percent is barren dessert, overlooks the Strait of Bab el Mandeb, commonly known as the Gate of Sorrow, that guards the southern entrance to the Red Sea, supports a population in the order of 350 000 who are bordered by the countries of Somalia and Ethiopia.

The land can be classed into particular areas from the coastal plains which rise to less than 200 metres to a contrast of the mountain ranges in the north of the country. It supports three sandy bottomed streams and a subterranean river, the Ambouli, which is an important source of water to the drought stricken land where the rainfall averages less than 100 millimetres on the coast per annum, to a maximum of 500 millimetres of precipitation in a good year, of which there are very few. Temperatures that range from 30 to 45 degrees Celsius are not conducive to growing anything but thorny shrubs and very little else, except for a small area in the mountain regions which are heavily wooded and a small array of date and castor oil palms, tamarind, and euphoria are found on the lower lying areas that is shared with the animal life consisting mainly of jackels, antelopes and gazelles with an occasional lynx being seen.

The country is steeped in history with two distinct factions being descendants of the Afars and the Issas, both races being traditionally nomadic in their habits. It is estimated that one-half of the population is under the age of 35, most being out of work, typical of the economics pertaining to the area, which is very dependent on outside assistance to balance the budget.

No article would be complete without a little history of this enchanting, yet desolate land. About 1500 years ago, immigrants from Arabia mainly settled in the north, with a smattering going southwards. The Afars or Danakil are descendants of these people. Later the Somali Issas moved in and forced the Afars to settle in the coastal regions. Over a 1000 years ago Islam was introduced to the area by various missionaries.

The Arabic nations controlled the trade with caravan routes until the Portuguese competed for it in the 16th century. The Arab nations and Portuguese kept up the battle until France entered the "fray" in 1862. France established the Cote Francais des Somalis in 1888. Djibouti, also spelled as Jibuti, became the capital in 1892. The year of 1897 saw a treaty signed that reduced the area of the country considerably. The area was effectively opened up by rail and road and heavily fortified after the invasion and conquest of Ethiopia in 1936, but in 1940 a neutral Vichy regime was established. After WWII, Djibouti lost most of its trade to the port of Assab in Eritrea.

French Somaliland in 1946, acquired the status of an overseas territory and this continued until 1958, when a vote was taken and it became a French Community under the Fifth Republic. It appeared that those who voted were mainly from the Afar and European communities, the Issas community either abstained or voted against the continuation of ties with France. This was affirmed by another election in 1967. Ten years later, the country gained independence and became a republic. Unfortunately the country is still torn between the factions which has dominated its history and of late has become a half-way house for transient refugees, making huge demands on its already fragile economic stability.

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AMATEUR RADIO OPERATORS "THIRD PARTY" MESSAGES TO VANUATU

Arrangements were recently made to allow Australian radio amateurs to relay Third Party messages to Vanuatu for the duration of the emergency caused by Cyclone Amu.

The special arrangements were made to allow the passing of messages of a health and welfare nature for the duration of the emergency.

This allowed amateurs throughout Australia to have their counterparts in Vanuatu pass on messages to other people. Such activity is normally prohibited by international regulations governing the use of the radio frequency spectrum, except where arrangements exist between the countries concerned.

It was hoped the arrangement would allow people in Australia wishing to contact relatives and friends living in the cyclone-affected area to make contact.

Some of the amateurs involved in this exercise were — VK2BSN, VK7RH, VK6AP and VK3CKK.

—Media Release from DOC

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Yours truly
H. Hertz

CENTENARY OF HERTZ'S BIRTH OF WIRELESS

Jim Linton VK3PC
4 Ansett Crescent, Forest Hill, Vic. 3131

It was a natural application of what was known.

USING A PRIMITIVE type of spark transmitter, young German physicist, Heinrich Hertz, caused a small spark to leap across a very small gap between two ends of a large resonant loop of wire placed near the transmitter.

This scientific breakthrough, which contributed greatly to the advance of knowledge, occurred exactly a century ago in May 1887, and could be described as the birth of wireless communication.

Hertz had, in fact, proved a theoretical prediction made some 22 years earlier by Scottish physicist, James Clerk Maxwell, who, at Cambridge University, was first to suggest that electrical waves could travel through space.

In theory, such waves would have the frequency and wavelength of water waves or sound waves, but would travel at the speed of light.

British physicist, Sir Oliver Lodge, reflecting on the Hertz breakthrough, later wrote a book called *Talks About Wireless*, in 1925 and said: "Hertz showed how to produce them practically, and what was more, how to detect them at a distance, in an elementary and purely laboratory fashion.

"Further improvement in detecting appliances were soon devised by many people, and in due time, they were amenable to practical and commercial uses by the energy and enterprise of Senatore Marconi and his co-workers.

"To a public ignorant of the work of Clerk Maxwell and Hertz, this application (Marconi's) came as a great surprise and seemed very novel and mysterious.

To physicists it did not seem so — it was a natural application of what was known."

Hertz, in a book *Propagation of Electric Action with Finite Velocity Through Space*, published in 1893, mentions similar experimental work carried out by others at the same time as his successful 1887 experiment.

He said there was scarcely any doubt that Lodge would have also succeeded in observing waves in air and proving the propagation with time of electric force.

Judging by the writings of Lodge and Hertz, there was nothing but a cordial and frank appreciation among physicists of the day.

Hertz, Professor of Physics in the University of Bonn, died on January 1, 1894, in his 37th year.

Another young man, Marconi, read mention of Hertz's experiments in his obituary, which set him on his course to make a practical use of Hertzian Waves.

Marconi, based on the work of Hertz and a number of other early radio experimenters, conducted short range practical tests in 1896.

In 1897, he sent and received messages over a distance of about seven miles, and by 1898 had established two-way wireless communications across the English Channel.

In 1901, Marconi, at St John's Newfoundland, received the Morse code letter S transmitted to him by Professor Fleming (later to invent the thermionic valve) from Poldhu, Cornwell, England.

As the 20th Century was dawning, the era of wireless experimenters had begun. Hundreds of radio amateurs in Europe, America and Australia, were inspired by news of Marconi's trans-Atlantic communication.

Rudimentary transmitters and receivers were constructed during the next decade.

The Wireless Institute of Australia was founded in 1910, and by the outbreak of World War I, the amateur radio movement was firmly established in many parts of the world.

Many years later, in an effort to pay a lasting tribute to Hertz, his name was adopted internationally as the unit for a cycle per second — thus we have Hertz, kiloHertz, MegaHertz, and GigaHertz.

Let us modern-way radio amateurs and shortwave listeners think for a moment of Heinrich Hertz, in this the centenary of his birth of wireless experiment.

Contests

Ian Hunt VK5QX
FEDERAL CONTEST MANAGER
Box 1234, GPO, Adelaide, SA. 5001

CONTEST CALENDAR

MAY

2 Utah QSO Party (Rules this issue).
2 County Hunters SSB Contest (Rules this issue).
9 Nevada QSO Party
16 — 17 Italian International Contest (Rules this issue).
23 — 24 UBA SWL CW Award
30 ARCI QRP CW Sprint
30 — 31 CQ WW WPX CW Contest

JUNE

13 — 14 South America CW Contest
20 — 21 VK Novice Contest (Rules this issue).
20 — 21 SMIRK (6m) QSO Party
27 — 28 ARRL Field Day

JULY

11 — 12 IARU World Championship
18 — 19 CQ WW WPX VHF Contest

The main contest of interest to Australian amateurs referred to this month is the *VK Novice Contest*, to be held on the third weekend of June. I would hope that conditions will be good for the Novice bands and that 80 metres will not be too noisy with QRN.

I would like to refer back to my notes in the May 1986 issue of *Amateur Radio* and quote as follows:

"I would certainly make a plea for Full Call operators to consider the advisability of reducing their output power in crowded band segments. Whether you are operating in the Novice segment or not should make no difference to the fact that you need only run as much power as is necessary to make your contact. At the same time, I would also appeal to those holders of a Novice call to realise that the Novice sub-bands are just that, a *sub-band* within an amateur band, and that they are ***not for exclusive Novice use.*** It would appear from my observations that quite a number do not understand this fact. The full call operator does have the use of all portions of the allocated amateur bands.

"Finally, on this particular note, I might point out to all, that we only occupy the spectrum made available to us as a privilege and not a right. It is certainly incumbent upon all licence holders to treat this privilege with respect and carry out our operations in a manner which will not jeopardise our existence as amateur radio operators."

One much lauded old Australian tradition is to give the other fellow a *fair go*. I would expect that this should apply to our amateur radio activities, however, some of the things I read and hear these days just make me wonder where the old *Aussie* spirit has gone to. Perhaps, as people who "communicate" we should be the ones to set the example and thus try to lead the community, in general, back onto the right path. I know there will be quite a few readers who will agree with me on these points and there will also be many who can accept that something is sadly lacking in general attitudes these days.

Albeit, I do hope that you will enjoy the *1987 VK Novice Contest*. I would also hope that there will be many more Novice Operators using some CW in this contest. It is a good chance to get on that mode and brush up your CW capability. Remember that the speed is restricted according to the rules and also that the other operator will be only too happy to slow down to your speed as he wants a contact from your station. You might also note that the rules are again unchanged for the third successive year.

There is not too much more for this month, so I will simply wish you all the very best for now.

—73 de Ian VK5QX.

VK NOVICE CONTEST 1987 — *RULES*

Contest Period — From 0800 UTC, June 20, 1987 to 0759 UTC, June 21, 1987.

Objects of the Contest — To encourage contest operation of amateur radio stations in Australia, New Zealand and Papua New Guinea, with special emphasis on contacts with Novice and radio club stations.

Stations Eligible — Only stations in VK, ZL and P2 call areas may enter. No stations outside these areas are permitted to be worked or entered in a log for the purposes of this contest. Except for radio clubs, no multi- operator working is allowed. Stations in the same call area may contact each other as well as contacting stations in other call areas.

Contest Bands — All operation must be confined to within the Novice frequency sub-band allocations in the 10, 15 and 80 metre bands. No crossband operation is permitted.

Modes of Operation — Only Phone or CW may be used. In the CW mode, operation must not exceed a speed of ***ten words per minute.*** This is to encourage the use of CW by all operators and to allow improvement in this mode by those operators who do not usually practice same.

Contest Sections — a) Phone — Novice/Full Call. b) CW — Novice/Full Call. c) Listeners.

Scoring —

Transmitting Entrants: for contacts with a Novice Station — five points; for contacts with a Club Station — 10 points; for contacts with a Full Call station — two points.

Listener Entrants: for Novice/Novice Contact — five points; Novice/Full Call Contacts — two points; Full Call/Full Call Contacts — two points; Any contact with a Club Station — 10 points.

Call Procedure — For phone operation call *CQ Novice Contest* and for CW operation call *CQ N.*

Contacts — Any station may be contacted only once per mode per band.

Number Exchange — On phone, stations must exchange a serial number comprising an RS report followed by three figures. The figures must commence with 001 and increase sequentially by 'one' for each contact up to 999. If 999 is reached the serial number is to revert back to 001 and the sequence recommenced. For CW, stations must exchange a serial number comprising an RST report followed by three figures on the same basis as described above for a phone contact serial number. Radio club stations must *add the letter 'C'* following the serial number.

Log Entries — Each log sheet should be laid out such as to provide columns in the order given as follows:

Date/UTC Time, Band, Mode, Station Contacted, Serial Number Sent, Serial Number Received, Claimed Score.

Total Claimed Score should be shown at the bottom of the Claimed Score column for each page. Each log sheet must also be endorsed at the top ***VK Novice Contest 1987.***

Front Sheet — A front sheet must be attached to each log entered and must carry the following information:

Name of Operator, Address, Call Sign, Section Entered, Claimed Score.

Declaration — The Front Sheet must also carry a declaration which states that —

I hereby certify that I have operated within the rules and spirit of the contest.

Each entry must carry the signature of the licensed operator of the station and be dated accordingly. In the case of a club station the entry must be signed by a responsible officer of the club committee or a licenced operator delegated by the committee to do so. In the case of multi-operator stations, the call signs of participating operators must also be shown on the front sheet.

Regulations — All stations participating in the contest must be operated within the terms of the station licence and applicable regulations.

Submission of Entries — Logs are to be forwarded to the Federal Contest Manager, c/- Box 1234, GPO, Adelaide, SA. 5001. Envelopes are to be endorsed ***Novice Contest*** on the front outside. Entries must be posted so as to reach the box number no later than July 28, 1987. Any entries received later than this date may be used as check logs only.

Certificates — Certificates will be awarded to the top scoring entries in each section at the discretion of the Federal Contest Manager and to any other entrant where meritorious operation has been carried out in the opinion of the Contest Manager.

Trophy — The *Keith Howard VK2AKX Trophy* will be awarded to the Novice entrant with the highest aggregate score from both the Phone and CW Sections of the contest. This trophy is a perpetual trophy and will be held by the winner until such time as it is awarded to a winner of a subsequent Novice Contest. Should two or more aggregate scores be equal, a decision will be based on a count back as to the greater number of Novice stations listed in each log entry. Should such a count also be equal, the log containing the greatest number of CW contacts will be preferred. In the event of a further tie, under these rules the log will be placed before a committee which will exercise a vote as to the neatest and most meritorious entry.

Disqualification — The Contest Disqualification Criteria, as published in each August issue of *Amateur Radio* shall apply. Any station observed during the contest as constantly departing from the generally accepted code of operating ethics, may also be disqualified.

UTAH QSO PARTY

From 0000 to 2400 UTC, Saturday, May 2, 1987.

This is a joint effort sponsored by the Utah ARC and the UTAH DX Association to make this rather rare state available for WAS and other awards.

Exchange — RS/T and QTH. County for Utah; State, VE Province, or DX Country for others. (Novice and Technician stations must identify by signing "N" or "T" after their call).

Scoring — Utah stations score five points for Novice or Technician contacts, three points for all other QSOs. Out-of-state stations score five points for Utah Novice or Technician contacts, three points for all other Utah QSOs.

Multipliers — States plus VE Provinces plus DX Countries worked for Utah stations. Utah counties per band for out-of-state stations (maximum of 29 per band).

Frequencies — CW: 1.810 MHz and 60 kHz up from bottom of each band. SSB: 1.860, 3.980, 7.280, 14.280, 21.380 and 28.680 MHz. Novice: 3.710, 7.110, 21.110, 28.110 MHz.

Awards — Certificates to the winners in each State, VE Province, DX Country, Novice in each State, and the top three winners and Novices in Utah.

Mailing deadline is June 1, to — Curt Wilbur K7CU, 907 East 250 South, Bountiful, Utah, USA. 84010. (Include a SAE, plus postage for a copy of the results).

COUNTY HUNTERS SSB CONTEST

From 0001 UTC, Saturday to 2400 UTC, Sunday, May 2-3, 1987. (Off: 0800 to 1200 *each* day).

This is the 16th annual contest sponsored by the Mobile Amateur Awards Club to increase activity for the County Awards program. The two four-hour rest periods are mandatory.

Emphasis is on mobile operation. Fixed stations may work other fixed stations, but only once regardless of the band. Mobiles may be worked from each county or band change. Mobile contacted on a county line count as one QSO, but two multipliers. QSOs made on a net frequency do not count.

Exchange — Signal report, County, and State; Country for DX stations. (Mixed mode contacts are permitted providing one station is on SSB).
Points — Contacts with a fixed W/K, one point (including KH6/KL7); W/K contacts with VEs, three points; W/K contacts with DX, five points; contacts with US Mobiles, 15 points.
Final Score — Total QSO points times total number of US counties worked.
Frequencies — 3.870-3.890, 7.225-7.250; 14.250-14.285; 21.360- 21.380; 28.570-28.600 MHz. The following frequencies are considered "Mobile Windows" — 3.875, 7.240, 14.270 MHz (± 5 kHz). Fixed stations must QSY after working a mobile station.
Awards — Plaques to the first and second placed US mobile, top scoring fixed US/Canadian, DX station, and Mobile Team. Certificates to the top 10 mobiles, and the the top scorers in each State, Province and DX station.

It is suggested that you send a large SASE for detailed rules and log forms to WA5DTK. All entries must be received by June 3, and should be sent to Barry Brewer WA5DTK, 1013 North Boulevarde, Universal City, Texas, USA. 78148. Winners will be announced in the MARAC Newsletter. (Include a large SAE and postage for copy).

THIRD ITALIAN INTERNATIONAL CONTEST

From 1600 UTC, Saturday, May 16, 1987 to 1600 UTC, Sunday May 17, 1987.

Amateurs world-wide must contact Italian stations including San Marino Republic, Vatican City and SMOM.
Classes — Single operator CW; single operator SSB; single operator mixed mode; multi-operator; SWL only single operator mixed mode. Multi-operator stations can use both CW and SSB.
Bands — 28; 21; 14; 7; 3.5; 1.8 MHz. Italian stations are allowed to use 1.830-1.850 MHz on 160 metres and 3.613-3.627 and 3.647-3.667 MHz on 80 metres. Bands can be changed only after 10 minutes operation on it.
EXCHANGE — RS/T plus QSO number beginning at 001. Italian stations will send RS/T plus two-letters (Province) eg 599MI, 59VE.
QSO Points — European stations: two points every QSO with an Italian station. Extra-European stations: four points for every QSO with an Italian station. The same station can be contacted on the same band once on CW and once on SSB.
Multipliers — One multiplier for every Province per band. San Marino Republic, Vatican City and SMOM are additional multipliers.
Final Score — The sum of QSO points from all bands multiplied by the sum of the multipliers from all bands.
SWLs — Take credit for only Italians heard. The same station can appear no more than three times on every band as a correspondent. The same station can be heard only once on CW and once on SSB.
Logs — Must contain date; time in UTC; band; mode; call sign; report sent; report received (including Province); QSO points and new multipliers. Include a summary sheet with your call sign, class of participation, number of QSO and multipliers on each band, final score and usual declaration. Please remember your full address, description of your equipment and your comments. Logs must be posted within 40 days from the end of the contest to: ARI Italian International Contest, c/- ARI, via Scarlatti 31, 20124 Milano, Italy. Participants are kindly invited to use the official summary sheet.
PENALTY — Logs without a summary sheet and a declared score will be considered as check-logs. A declared score of five-percent more than the actual score will mean disqualification. If the 10 minute rule is not followed, logs will not be accepted.
AWARD — Special awards will be issued to the top five of every class of participation. A certificate will be awarded to the top scoring operators in each country in each category.
WAIP — The Worked All Italian Provinces Award is issued to all amateurs for contacts with 60 different Provinces. This will be issued upon a written application in the log, and a separate list of the QSOs valid for the award. Only for the contest QSO, QSL cards are not required, but the award must be requested at the same time that the contest logs are sent. The cost of the WAIP Award is 10 IRCs.

—Contributed by Giorgio Beretta IIVXJ
ar

1987 COLUMBUS CONTEST

The Genoa section of *Italian Amateurs Radio Association* (ARI), supported by ARI, in co-operation with the *International Institute of Communications* (IIC), announces the *1987 Columbus Contest* (Sixth Edition).

The purpose of this annual competition is to remember the great Genoese discoverer of the New World, Cristoforo Colombo.

During the whole contest, from 0000 UTC, October 3, 1987 to 2400 UTC, October 4, 1987, a special station, with a special IO1IIC call sign will be active in Genoa.

RULES:
Call — SSB: "Columbus Contest"; CW, RTTY, SSTV: "CC".
Bands — All amateur bands are allowed, 80 metres excluded because of the heavy band restrictions for the Italian radio amateurs.
Type of Competition
—Single operator, single band in CW, SSB, RTTY, SSTV or Mixed.
—Single operator, all bands in CW, SSB, RTTY, SSTV or Mixed.
—Multi-operator, single band in CW, SSB, RTTY, SSTV or Mixed.
—Multi-operator, all bands in CW, SSB, RTTY, SSTV or Mixed.
Also, QRP for each type of class (power must not exceed five watts output).
In all classes, single transmitter operation only is allowed.
Valid Contacts — Among European and no-European stations; Italian stations may only contact other countries.
Number Exchange — RS/T plus ITU Zone number (Italians give RS/T plus Province.
Multipliers — For non-European stations; Italian provinces and each call area of all other European countries of the ARRL DXCC List.
Points — Three points for intercontinental contacts on 14, 21 and 28 MHz; six points for 1.8 and 7 MHz.
Scoring — The final score is the result of the total QSO points, multiplied by the sum of multipliers.
Pauses — Single operators must not operate for more than 30 hours; the 18 pause-hours must be divided in no more than five periods; each period cannot be less than 30 minutes.
Summary Sheet — Must indicate call sign, name, address, participation class, final and each band score, a signed declaration of respect of all contest rules.
Log Instructions
—All time must be indicated in UTC.
—No more than 40 QSOs for each sheet.
—Use a separate sheet for each band.
—Duplicate contacts must be indicated and not counted.
—Each pause period must be indicated with the beginning and ending time.
Disqualification — Normal Contest Disqualification Criteria applies.
Trophies and Plaques — Will be awarded to the first classified of each participation class.
Columbus Contest Award — Will be issued for all amateurs that have a minimum total of 100 QSO plus one contact with IO1IIC.
Special Prizes — Will be given for distinguished behaviour and amateur-spirit.
Logs to be forwarded to ARI, PO Box 347, 16100 Genova, Italy.

—Contributed by Franco Bartoldi
ar

JOHN MOYLE MEMORIAL FIELD DAY CONTEST

How many can claim a two-way phone contact on 10.320 GHz for the Field Day?

Through the expertise of Frank VK4CAU, Peter VK4FPE and Brian VK4QB, a contact was made at 0425 UTC on March 14, 1987 and later, by VK4WIR/P and VK4QB?P at 0455 UTC, a 5/9; 4/4 contact was made over a distance of 16.5 kilometres.

Frank was using an AUSSAT Dish with 8 mW power output, whilst Brian used a Dick Smith Dish

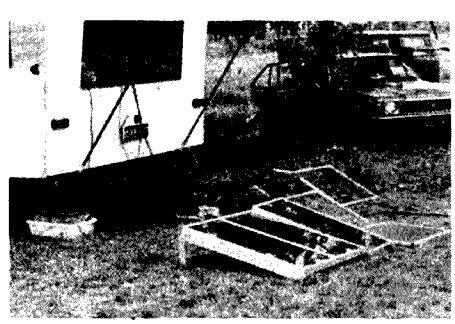
Frank VK4CAU, adjusts the Horizontal/ Vertical Two-metre Antenna assisted by Phil VK4TPK (left) and Ted VK4JTW.

(refer AR, November 1983 — article by Des VK5ZO on 10 GHz).

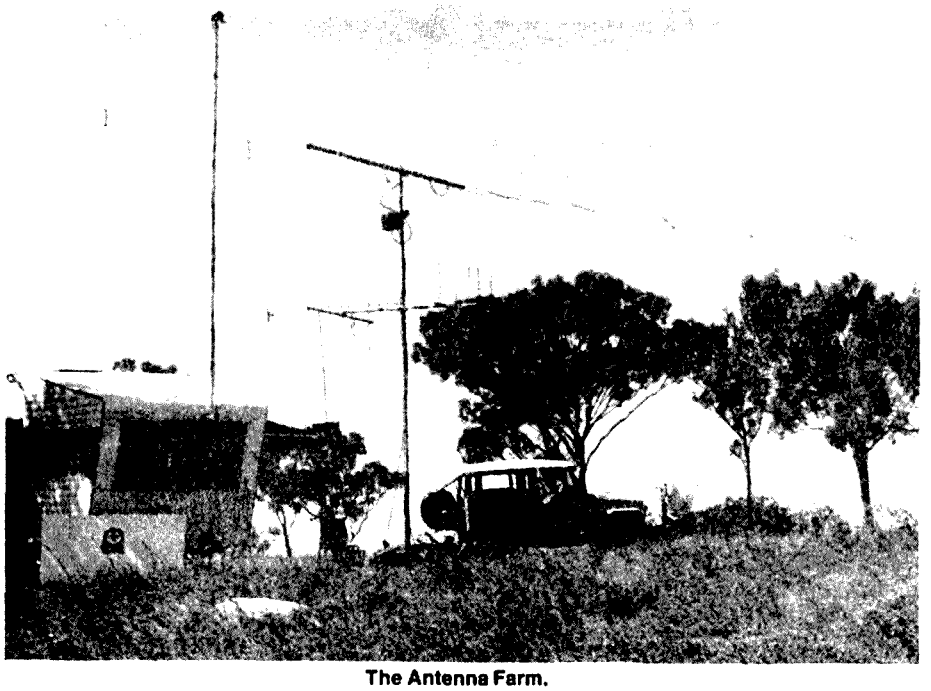
VK4WIR/SOLAR PORTABLE, at an elevation of 80 metres above sea level, was operating as a multiple operator/multiple mode field station at Bond Road, Alton Downs, the property of Phil VK4TPK.

The station was operated from the Rockhampton/Fitzroy SES Caravan and was powered by eight solar panels producing 20 amps continuous to five banks of 12 volts batteries.

Frank VK4CAU.



The Power Supply — Solar → Battery → RE



The Antenna Farm.

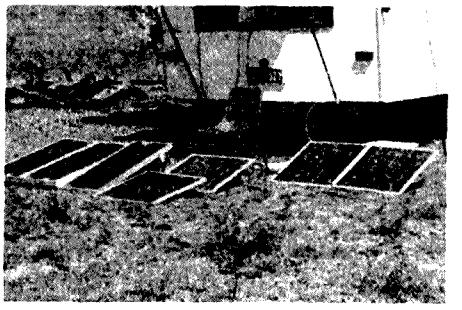
VK4WIR/P via VK4CAU contacts Brian VK4QB/P on 3 cm. Nick VK4NFL, "keeps the log."

Frank VK4CAU, with the 3 cm transmitter.

Brian VK4QB, makes some minor adjustments to the 3 cm dish.

Ted VK4QI (left) and Alister (son of Rob VK4TKA) at the Operating Console.

Rob VK4TKA.



Solar Cells.

Frank VK4CAU, with the AUSSAT Dish for 3 cm.

Setting-up the station began at 7 am on the Saturday morning, and the first contact was made at 0101 UTC with VK4FWA in Ayr.

The station was operated by Ted VK4QI (CW), Lyle VK4ALD (phone), Rob VK4TKA and his son Alister (phone), and Frank VK4CAU (3 cm phone).

Alister, under the guidance of Rob, had a busy time early on Sunday, with 11 144.100 MHz Simplex contacts in excess of 300 km.

An exhaustive list of equipment ranging the band was thus — three FT7s, IC271, FT680, IC490, IC290, FT2FB, FT77, and, just in case the solar failed and mains power had to be used, a FT102 and two TS520s.

The antenna farm consisted of a trapped dipole for 80 and 40, inverted Vee 40/20 dipole 20, multiband HF, 3 cm, 70 cm, 2m, 6m, and 28m.

Amateurs Phil VK4TPK, Ted VK4JTW, Bob VK4ZDB, Noel VK4ZAR, Glen VK4AEE and Karlyn VK4MPY, made up the team who ran coaxial cables, climbed the trees, and, with a little improvisation, put up the aerials.

Frank VK4CAU, also operated a TRS80 computer as a field log to prevent duplication of contacts. Frank's unit ran off the SES 3.5 kW generator, which also provided comforts such as refrigeration and lighting for the barbeque on Saturday night.

Just before closing down the station, the Local Controller for the Rockhampton/Fitzroy SES, Mr Rhyse Fraser, visited the site and was greatly interested in the activity and the professional way in which the station had been operated.

—Contributed by Nick Quigley VK4NFL

1986 — VK/ZL/OCEANIA CONTEST RESULTS

Jock White ZL2GX
NZART Contest and Awards Manager
152 Lytton Road, Gisborne, NZ.

CW SECTION

ASIA

JA1BNW	4692	JA1BSU	928
JA1JGP	864	JF1AIX	572
JP1TRJ	480	JO1OZI	462
JE1AER	336	JH1MTR	240
JA1AAT	112	JS1GHA	96
JK1CCO	84	JA1YWX*	10028
JE2YRO	10260	JA2ON	2352
JA2KPV	460	JH2XTV	72
JE2IEQ	30		
JR3BOT	7546	JA3ARM	418
JH3OEJ	308	JA3UWB	256
JA3YBF*	7644		
JE4VVM	7644	JR4ISK	2
JA6GU	1836	JA6GGD	462
JA2IIT/6	448	JH6YTO	234
JA6BWH	176		
JH7WKQ	8840	JA7KM	690
JH7AJO	476		
JA0DAI	9964	JH0NZN	1476
JA0UMV	1088		
VU2UR	72	HL1XP	2064

NORTH AMERICA

W0ZV	9180		
K6NA	80	AA6EE	50

OCEANIA

K1BAZ /DV1	2552		
YB2FEA	7866	YC4FSM	2800
YB2IA	1500	YC4GAP	1232
YB7KD	280	YB7HB	CHECK
YB4FN	320		

EUROPE

CT1YH	70		
DK3KD	272		
EA5CKP	70	EA3CLO	24
EA3CWI	2		
G5MY	270		
HA5LZ	864		
HB9IK	2548	HB9AOD	2548
LA7MFA	72		
OE1TKW	8		
OZ5KU	198		
OH3TY	1700	OH6YF	2
OH7NW	2		
PA0LDU	196	PA0TA	30
SM7ANB	296	SM6OOI	110
LZ1KVZ	728	LZ1NS	40
LZ1KNP	24	LZ2SO	18
YU2EE	70	YU7SF	6
UB4XWB	1156		
Y22UB	338	Y27QO	306
Y52TE	270	Y36TG	128
Y21TL/a	72	Y54ZA	48
Y58ZA	32	Y36SG	2
Y26LG	CHECK	Y23UH/a	CHECK
Y22HF	CHECK	Y21UC/a	CHECK

SWL

SP 0149 K1	16	OH1 100	60
OK1 30 464	690	OK3 13095	92
Y2 8887 G39	208		
YD2UOH	374		

PHONE SECTION

ASIA

JA1YWX	49868	JA1RZN	17040
JE1AER	1944	JA1BUN	544
JA1BNW	162	JO1RDV	50
JF1XOO	40		
JE2IEQ	6806	JA2YDC	5304
JH2SGC	126	JF2PTA	84
JR3BOT	11264	JH3OEJ	2408
JL3WSL	1296	JA3UWB	448
JR3CVJ	432	JI3GPC	286
JR3KAH	70		
JE4VVM	9374	JA4GXS	920
JF4LNO	18	JR4ISK	18
JR5HCY	4368		
JA6GGO	13886	JA6EFT	952
JA6QDU	120	JG6UHE	72
JA6BWH	8		
JA7GLB	34450	JA7YFB	30744
JH7WKQ	22784	JA7AQR	14194
JA7DOT	3512	JE7SLC	162
JH0NZN	3420	JH0SPE	1820
VU2UR	96		
HL1APR	374	HL1ABR	176

NORTH AMERICA

VE3COX	8154	K6SVL	15416
W0ZV	13392		

SOUTH AMERICA

PT2TF	96	LU4LAV	276
YV5BPG	64		

OCEANIA

K4YT/DU1	50424	K1BAZ/DV1	7784
JA2EZD/WH0	25560	YB5OZ	14112
YB5NOF	13860	YC4FSM	5390
YB2IDX	5290	YC7KL	1056
YB2IA	200	YB2EC	84
YC2BLR	30	YC4GAP	60

EUROPE

EA2COX	2	HA4XX	60
HB9BOU	3312	HB9IK	252
LA2AO	16	LZ1NS	416
OH6IU	380	OH6YF	342
OH1ZAA	300	OH3GO	18
OH6UC	2	OH7NW	2
OK2BBI	456	OK3YCZ	320
RA3OJC	520	PA3CEF	2
SM6OOI	68	SM6KMO	8
SM5BBS	CHECK		
SP2ZFJ	50	SP6DVP	2
Y21UC/a	1254	Y39TF	330
Y54NL	330	Y24XJ	144
Y52WG	70	Y39SH	32
Y44PF	30	Y36SG	18
Y23CO	CHECK	Y24NG	CHECK
Y55TJ	CHECK	Y51XE	CHECK
Y54TA	CHECK	Y41NK	CHECK
YO3OCO	18		
YU7SF	2		
UB4XWB	1296		

ASIA SWL

JA1 7777	608	JA8 3769	504

USSR RESULTS — CW

UA4RZ	3200	UA4HNP	2406
RA4PC	1512	UA4LYA	1230
UA6LTI	1218	RA3OX	900
UA4HLD	728	UA3SED	676
OK3IA/UA3	448	UZ3AXH	384
UA3XDS	364	RA1OQ	352
UA1NAY	154	UA3TCJ	CHECK
UA1ZD	CHECK	YA4YAQ	CHECK
UW3PU	CHECK	UZ1NWA	CHECK
UZ6LWT	CHECK	UB3IWA*	7920
UZ4LWU*	3782	UZ1ZZZ*	1020
UZ4WWB*	704	UZ4YWW*	510
UZ1TWB*	468	UZ4FWX*180	
RR2RW	1800	UR2QO	150
UR1RWX*	252		
UQ1GXX*	114		
UP2OU	112	UP1BZA*	2250
UP1BZO*	850	UP1BWW*	520
UP1BYL*	210		
UC2AA	510	UC1WWF*	570
RB5MF	1638	R85VB	320
UB5TN	144	UB5LCV	126
RB5IF	84	UB4MZL*	1520
UB5DAV	CHECK		
UO6OC	144	UD6OKW	2
UL7BY	1836	RL8PYL*	2132
UM8MIZ	40		
UJ8JA	1364		
UI8IAJ	646		
UI9AWX	828	RA9YG	448
UA9MX	308	UA9FAR	286
UW9UWU	180	UI96WE	160
UA9CFH	CHECK	UZ9SWW	CHECK
UZ9XXM*	8		
UA0SAU	11844	UA0LCZ	5206
UA0QO	2592	RA0JO	1920
UA0SMM	1344	UA0WOF	480
UA0SGJ	50	UW0CM	21
UA0KCL	CHECK	UA0FDX	CHECK
UA0ZC	CHECK	UA0BCK	
UZ0JWA*	9512	UZ0OWA*	4234
UZ0LWO*	3472	UZ0KWC*	3078

USSR RESULTS — SSB

UA4RZ	4224	UA4LU	2050
UA3SEO	1008	UA4HNP	660
UA4WE	200	UZ3AXH	198
UV3TE	CHECK	UB3IWA*	6300
UZ4WWB*	816	UZ4YWW*	308
UW1OWZ*	60	UZ3DXW*	CHECK
UA2FO	240		
UC2A	144	UC2AAO	CHECK
UC1WWF*	240		
UR2RNO	12	UR1RWX*	242
UP2BBF	40	UP1BWW*	CHECK
UP1BWC*	6888	UP1BYL*	780
UQ1GWW*	12740		
UO5OV	72		
RB5MF	1760	R85QZ	8
RB5NT	CHECK	UB4MYP*	676
UB4MZL*	672	UB4WZA*	640
UJ8JCQ	540		
UM8OX	660	RM8MA	644
UI8CO	180	UI8ZAA	25
UL8PYL*	10684	UL8LWA*	832
UA0LCZ	11920	UW0CM	90
UA0FDX	CHECK	UZ0OWA*	22288
UZ0JWA*	10160		
RW9UR	2240	UZ9OWO*	960
UZ9CYP*	128	UZ9XXM*	CHECK

USSR RESULTS — SWL

UA4 095 595	1350	UA3 137 988	140
UA4 156 871	56		
UP2 038 1580	9740	UP2 038 1580	2964
UB5 073 3135	13032	UB5 073 4075	CHECK
UO6 001 220	50		
UL7 026 586	352		

NOTE: * denotes Club Station.
VK and ZL results have been promulgated separately, see last month's AR.

The 1987 VK/ZL/Oceania DX Contest will be organised by the WIA.

VK and ZL CALL AREA LEADERS

SSB: ZL1AIZ, ZL2AFY, ZL3KR.
CW: ZL1AIZ, ZL2SQ, ZL3KR, ZL4QY.

SSB: VK1LF, VK2KL, VK3SM, VK4AQD, VI5SJ, VK6RG, VK8BE.
CW: VK2APK, VK3CGG, VK4XA, VK5GZ, VK7RY, VK8BE.

PLAQUES

These have been awarded to top scoring single operators as follows:

CONTINENT	SSB	CW
Asia	JA1YWX	UA0SAU
Europe	HB9OU	UA4RZ
North America	K6SVL	W0ZV
South America	LU4LAV	—
Oceania	K4YT/DU1	YB2FEA

Many thanks for your support in this Jubilee Contest. Congratulations to all participants and especially to the top scorers.

After over 40 years administering this contest, I will soon retire so this will be my last results!

NOTES

1. To celebrate the 60th Anniversary of NZART, special certificates were printed for the 1986 "VK/ZL/O" and plaques were prepared for continental winners on phone and on CW. . . .BUT. . .
2. Seldom have conditions been so consistently bad and this is obvious from the small number of logs received. NZART expresses gratitude to those who submitted logs — especially those with only a few contacts.
3. Plaques have *been* despatched (regrettably none to Africa and phone only to South America), while certificates have been awarded as generously as possible and Participation Certificates sent to those who requested them.
4. Receipt of Logs . . . even at this date — FOUR months after the final contest weekend, logs are still being received. If any miss the deadline of February 15, it is regretted but four months should be sufficient time for transit of logs.
5. These results bring to a conclusion my 40-years-plus period of responsibility for administering this contest for NZART. It is difficult to express my appreciation to so many with whom friendships have been developed, but I am most grateful to you all and trust that your enjoyment in this activity will grow with the years. Good cheer and 73, Jock.

ar

VANUATU TROPICAL CYCLONE AMU DISASTER

Jim Linton VK3PC
4 Ansett Crescent, Forest Hill, Vic. 3131

The devastation of cyclone Amu, which struck Australia's South Pacific neighbour, Vanuatu, was relayed by Tex YJ8OK, to listeners on 14 MHz in Australia, New Zealand and Alaska. He described the first accounts of the damage of Amu, which struck with full force on February 8.

Sam Voron VK2BVS, heard Tex while checking 20 metres for any contact with YJ8 after hearing news reports of the cyclone.

The graphic details of the widespread damage given by Tex, in the Vanuatu capital of Vila, were much sought after by the Australian news media. The eyewitness account featured in the media throughout Australia, including the front pages of at least the *Canberra Times* and *The Australian* newspapers.

Tex and his wife, Junia YJ8NJW, sheltered in a cupboard in the only part of their home which had not been unroofed.

Limited to battery power, Tex checked into the Australian Traffic Net (ATN), every two to five hours to bring news updates to the outside world.

The latest damage estimate to Vanuatu had been put at $A200 million in Vila alone, and little was known about the outlying areas of the nation which were also hit.

Sam Voron recalls that, after hearing news reports of the cyclone, he decided to listen for a call from YJ8, and was rewarded with a contact from Gaeton YJ8LT. Gaeton's native tongue was French, so he passed the microphone to an English-speaking non-amateur to assist.

"Two hundred kilometre winds last night, everything wiped out," made it clear a major disaster had occurred, said Sam.

The ATN was immediately set-up on 14.307 MHz to handle any emergency traffic — a long list of radio amateurs were involved — too numerous to mention specifically.

Sam said it was Sunday, and with Government departments closed, traffic had to be restricted to actual life and death situations. The ATN was on alert while attempts were made to gain third party traffic approval between Australia and Vanuatu.

On Monday, Dave VK2BBT, rang DOC to request such an agreement so health and welfare messages to and from the disaster area could be handled. All day, the Vanuatu radio amateurs were unsuccessful in finding an official to tie up their end for an agreement.

The Australian Department of Foreign Affairs advised DOC the next day that, under the circumstances, it authorised an immediate third party temporary agreement.

Vanuatu had, in fact, responded last year in principal to Australia's request for a permanent agreement — but the necessary paperwork had not been exchanged.

Sam advised the third party traffic nets in Israel, Canada and the US, that Australia was now in a position to link into Vanuatu any traffic they had for the disaster area. To provide access into the amateur service, a number of radio amateurs offered to have their telephone *number* broadcast over the local media. Commercial radio and television stations, the ABC and Special Broadcasting Service carried the numbers in their news bulletins.

There were numerous stories and interviews about how radio amateurs in both Australia and Vanuatu were helping out in time of crisis.

Radio Vanuatu, the local broadcaster initially put off air by the cyclone, also had regular bulletins on how the public could send their messages to Australia, and beyond, via amateur radio.

Because local telephone communications were severed, people were advised to go to the general store in the centre of Port Vila where radio amateurs were posting up messages they had received. The store owner, Robert Laelle YJ8VRL, helped the public fill out amateur radiogram messages for transmission to Australia.

Sam Voron comments, "You can imagine the pride of amateurs in Vanuatu at this time where they were able to help concerned people crowding round, looking for a message or wanting to send one."

The technical resource of the Amateur Radio Service was in demand in other areas. John YJ8JG, was trying to get the nation's computerised banking system operable again, and Jock YJ8JH, President of the Vanuatu Amateur Radio Society, was busy at Air Traffic Control.

All available members of the Society helped in the disaster recovery and welfare relief effort in the days following Amu.

Through the ATN, there were some 60 messages passed during a 10 day activation. One of the messages was from Jim VK2BPW/MM, on the Australian geoscience research vessel *United Venturer,* which carried a helicopter and was ideally fitted for survey and relief work.

Jim's offer of help in the disaster recovery was taken personally by Tex YJ8OK, to the Vanuatu President, whose response via the ATN was "Please come urgently, and immediately."

The *United Venturer* left Fiji, arriving eight days after the cyclone hit, and was the first foreign vessel to reach Port Vila.

On the Wednesday evening after the cyclone, Andrew H44AF, on the Solomon Island capital of Honiara, checked into the ATN to say he was prepared to assist the Solomon Island Red Cross in their desire to communicate with Vanuatu. He was informed the ATN would be happy to assist, but first there should be a third party agreement between the Solomon Islands and Australia. Next day, a Solomon Island official rang DOC, in Canberra, to give verbal authority, and at 0130 UTC, Thursday, February 12, a temporary H44-VK agreement was in place.

Sam Voron comments it was expected that permanent agreements with Australia, between both Vanuatu and the Solomons would be signed, and the importance of such agreements in international emergency preparedness was clear.

He said: "It means that, as with all other countries which already have third party agreements, a regular traffic net will be maintained with a known emergency plan.

"This will bring Australia and our partners to the immediate aid of each other in future Pacific disasters without the red tape delays.

"Assistance will be more effective because of the on-going communications preparedness which permanent traffic agreements foster."

NEW ZEALAND EARTHQUAKE — NO THIRD PARTY TRAFFIC

Radio amateurs in Australia and New Zealand were reported in newspapers, on radio and television news services on both sides of the Tasman Sea, as being upset at the New Zealand postal authority's refusal to let them send messages in the wake of New Zealand's earthquake which hit on March 2.

The New Zealand Government rejected offers to set up a third party net to handle health and welfare traffic, despite normal telephone services in the earthquake area, near Whakatane, south of Auckland, being out.

One report said all telephone lines within a 150 km radius of New Zealand's worst earthquake for 40 years had been cut.

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THE WIRELESS INSTITUTE OF AUSTRALIA (ACT) & THE IONOSPHERIC PREDICTION SERVICE PRESENT

A Short Course on the Ionosphere for Amateur Radio Operators.

Date:	Monday, May 25, 1987.
Time:	7.00 pm to 11.00 pm.
Venue:	The Griffin Centre, Bunda Street, Civic.

Literature and explanatory notes will be distributed by the lecturer. This will be of benefit to all amateurs, and will explain the nature of the ionosphere, how propagation occurs and how to correctly interpret propagation predictions.

All interested persons are most welcome, not just members of the Wireless Institute of Australia. As space is limited, please RSVP to:
Alan Hawes, President, on (062) 58 8115 or (062) 58 2568 AH, by May 18, 1967.

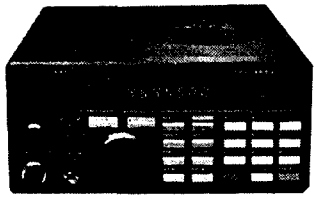
Please note that, due to the length of the course, the start time is 7.00 pm, an hour earlier than the usual start-time for WIA meetings, and it will run for approximately four hours.

—Contributed by Alan Hawes VK1WX, President, WIA (ACT Division) Inc

KEEPING AMATEURS IN TOUCH!

The Magnificent... Yaesu FRG-9600

All receivers should be built this way — but then, Yaesu know how to build the best! The FRG-9600 is THE all mode VHF/UHF Receiver for the serious minded amateur. Covers the complete 60-905MHz spectrum with manual or fully automatic scanning — the choice is yours! FM, AM, CW, SSB... it's all there. For more features and better value, you can't go past DSE and Yaesu!
Cat D-2825



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General Coverage FRG-8800

With an 8 bit microprocessor controlling all the tuning, mode selection, scanning, memory and clock functions you know the FRG-8800 can give you all the versatility you're ever likely to want. Covers the entire 150kHz-29.999MHz range PLUS it has inbuilt provision for VHF converter. Features 12 internal memories, keypad, dial or automatic tuning, all mode/selectable IF-BW... just about everything a general coverage receiver can have!
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FRG-8800 DC kit Cat D-2822 FREE with purchase of D-2820 — value $8.75

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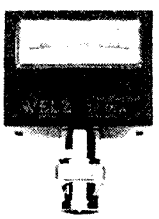
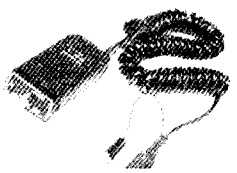
The Complete Amateur Station

For the amateur who wants everything in a transceiver — Yaesu developed the FT767GX. You want all bands? With 767 — you've got it! From 160 metres to 70 centimetres. Want that again? Yes, 1.8 to 440MHz in one transceiver. You don't know what features are till you've seen the 767 and once you've seen it — you'll own it!
Cat D-2935

At selected branches only $4995





The Best Test

The Oskerblock SWR-145 keeps you up to date! Designed to be left 'in-situ' for permanent readings. With a top range on two metres of 250 watts and, for VHF users, it needs very low power for full scale readings!
Cat Q-1341 $99

Hand-held Power Meter.

Weltz quality, the ultimate versatility and DSE value! Check the output of your hand-held accurately — just connect the TP-05X in place of your antenna and you've got it! 50-500MHz. Cat Q-1343

FREE with any VHF hand-held set $29

Simple hands-free operation

Give your FT-2700RH or your FT-270/RH virtual hands-free convenience with the SB-10PTT Switch Unit. Use with optional headset/boom mic etc.
Cat D-3519 $39.95

"We all know that the world's best selling Electronics Kits are from Heathkit..." Jack O'Donnell — M.D. Altronics. Thanks Jack: you're right of course.

The Weather Detector!

The Digital Weather Computer displays everything from wind chill factor to indoor/outdoor temperatures, to wind speed and direction with accurate 16-point compass resolution. It even has microprocessor controlled memory for data storage by date and time! But what's best is; You can build it yourself! Cat G-2000 $995

The best in the land — DSE KITS

UHF 40 Channel Transceiver $249

With the DSE Explorer 70cm needn't be out of your reach! For a fraction of the cost of commercial models you too can be out there on the air waves. It's not a beginners kit — but then it's not a beginners sport!
Cat K-6300

UHF 80 Channel Upgrade $12.95

Add another 40 channels in the band from 439-440MHz to your DSE Explorer. This simple circuit gives the Explorer extended coverage of the UHF FM Amateur Band. Simple and incredibly inexpensive! Cat K-6301

50 watt UHF Power Amp $279

This amazing kit will lift a 2 watt output rig to the 50 watt level! Use it with CW, FM and SSB modes. Features 10MHz bandwidth, harmonics better than -60dB, 12 volt operation for mobile or home use AND DSE value!
Cat K-6307

VHF Amateur Transceiver $199

Save a fortune and get yourself a quality VHF transceiver into the bargain! The DSE Commander covers the full 144-148MHz band in 10kHz channels with 5kHz offset and has full repeater facilities built-in. Comes with everything you need to get it up and running.
Cat K-6308

UHF Gasfet Preamp $89

Give your 70cm a real boost in the reception department! For the 430-480MHz bandwidth you couldn't ask for a better kick in the butt Ideal for both UHF CB and UHF amateur use! Easy to build and even easier to install.
Cat K-6309

2m Linear Amp $249

For the serious VHF DX'er here's a superb all mode high powered linear amplifier which will give you that access to the distant repeater! Suitable for both mobile and base operation. Designed for reliability! Cat K-6313

- **Frequency coverage: 144- 148MHz**
- **Maximum output: 120W (CW) for 15W input**

VHF Wattmeter $52.95

This could save you a fortune! Get the most from your equipment. The VHF Wattmeter measures the VHF power output and the efficiency of your antenna system by measuring the reflected power from your antenna. Cat K-6316

- **Useable Frequency Range: 144-148MHz**
- **Maximum Power: 150 watts**
- **Ranges: 0-150 watts, 0-30 watts**

DICK SMITH ELECTRONICS PTY LTD

Who gives the best price on Amateur gear? — DSE of course!

Awards

Ken Hall VKSAKH
FEDERAL AWARDS MANAGER
St George's Rectory, Alberton, SA. 5014

DIPLOMA REPUBLICA DE CHILE
(Republic of Chile Award

The Radio Club de Chile (CE3AA) was founded in 1922. It sponsors the following award for radio amateurs.

RULES

The award shall be forwarded to any licensed radio amateur who makes contact with 16 different CE radio amateur stations from any Chilean zone, to form the phrase "Replubica de Chile" with the last suffix letter of the call sign.

All contacts will be valid from January 1, 1986, on any band or mode.

Contestants must send the corresponding QSL cards or, preferably, a list of QSOs, duly certified by a IARU member society, including the following data:

Date, Station, Band, RS/T, Mode.

Cost of the award is eight IRCs.

Applications to Awards Manager, Radio Club de Chile, PO Box 13630, Santiago, Chile.

All QSL cards (when received) shall be returned simultaneously with the award. Remittance of the award shall be by air mail.

Radio Club de Chile declines all responsibility in case of missing QSLs.

Call signs must be sorted in order to read the requested phrase.

ARNHEM CERTIFICATE

This award is presented to confirm that a radio amateur has worked/heard the required number of members of the VERON, section Arnhem.

The certificate can be obtained in four classes, as there are:

CLASS A — HF five stations.
CLASS B — VHF/UHF/SHF amateurs 15 stations.
CLASS C — For Dutch D-licensed amateurs 10 stations.
CLASS D — SWL, all classes possible.

There are no mode or band restrictions, but 432 MHz QSOs count for double points and 1296 or higher count triple. Only contacts on or after January 1, 1980 count for the certificate.

Send full details, signed by two licensed amateurs and 10 IRCs or HflS to the Awards Manager, PO Box 4119, 6803, EC-Arnhem, Holland.

CRIMSON CRUSTACEAN AWARD
(See also AR, August 1985, page 46)

The Gladstone Amateur Radio Club's award is called *The Crimson Crustacean Certificate*, and measures 21 by 25 cm. It depicts bright red printing and a red crustacean on a yellow background. The Gladstone area is well-known for its mud crabs and fishing industry, which is only one part of the many industries in the Central Queensland harbour city.

The award is open to all amateurs and SWLs and the Club welcomes call-ins on its weekly net, every Thursday night, commencing at 0900 UTC on 3.570 MHz (± QRM). The Club call sign is VK4BPA.

Conditions for the GARC Award are as follows:

1. All contacts after March 11, 1985 count towards the award.

2. All contacts must be on the same band and in the same mode.

3. To qualify, a transmitting amateur or shortwave listener must show evidence of contact with —

a) the club station, VK4BPA, and eight different Gladstone Amateur Radio Club member base station
OR
b) the club station, VK4BPA, five different Gladstone Amateur Radio Club member base stations and one Gladstone Amateur Radio Club member station, portable or mobile.

4. Evidence in the case of clause 3 will be a certified copy of the log, stating call signs, times, dates, modes and frequencies.

5. The cost of the Certificate is $2.50.

6. The address for the award is: The Awards Manager, Gladstone Amateur Radio Club, PO Box 1030, Gladstone, Qld. 4680.

AUSTRALIAN DXCC LADDER
(as at December 31, 1986)

Number of current countries: 317
Number of deleted countries: 52, shown in brackets after the current countries score.
Overseas members are included in brackets.

CW SECTION

311 (43)	Frank Hine VK2QL
307 (33)	Austine Henry VK3YL
304 (48)	Dave Duff VK2EO
299 (31)	Ivor Stafford VK3XB
293 (24)	Fred Lubach VK4RF
292 (34)	Reg Ross VK3YD
280 (15)	Mike Bazley VK6HD
279 (34)	Col Wright VK7LZ
278 (25)	D Kiesewetter VK2APK
277 (21)	Mavis Stafford VK3KS
271 (42)	Jim Rumble VK6RU

PHONE SECTION

315 (49)	Jim Rumble VK6RU
(47)	Stuart Millowick VK5MS
(43)	Tom Mulder VK6MK
(34)	Bram Jellett VK5AB
(31)	Keith Schleicher VK4KS
311 (17)	Robin Lyon VK6LK
(10)	Gill Moody VK4AK
310 (14)	Ken Chiverton VK4VC
(13)	Fred Lubach VK4RF
309 (13)	Geoff Wilson VK3AMK
(11)	Mike Bazley VK6HD
308 (18)	Col Wright VK7LZ
(15)	John Heine VK3JF
307 (25)	Austin Condon VK5WO
(14)	Laurie Werner VK5XN
306 (15)	Bill Verral VK5WV
(10)	Neil Penfold VK6NE
(4)	Ken Jewell VK3AKK
305 (35)	Bill Hempel VK4LC
304 (4)	Peter James VK3AWY
303 (4)	Syd Upperton VK6HE
298 (22)	Bill Wells VK1WB
297 (4)	Steve Gregory VK3OT
295 (1)	Jim Joyce VK3YJ
294 (18)	Arthur Johnson VK4PX
(5)	Frank Beech VK7BC
293 (5)	Ray Miller VK3RF
291 (3)	Gillian Weaver VK6YL
290 (15)	Chas Taylor VK4UC
289 (23)	D Kiesewetter VK2APK
288 (4)	Stephen Chamberlain VK6IR
(2)	I G Haworth VK6IH
286 (5)	Andre Everts VK7AE
(2)	John Woodings VK6AJW
282 (11)	Ron Glassop VK4BG
281 (27)	Noel Hanson VK2AHH
279 (5)	Peter Cosway VK3DU
(4)	John Nakulski VK3BLN
(2)	Rowland Bruce VK5OU
275 (16)	Cardie McQuillan VK3ACD
270 (2)	Sam Galea VK2AKP

OPEN SECTION

315 (49)	Jim Rumble VK6RU
(43)	Tom Mulder VK6MK
(39)	Keith Schleicher VK4KS
(39)	Austine Henry VK3YL
314 (10)	Gil Moody VK4AK
313 (36)	A Shariand VK4SD
312 (18)	Mike Bazley VK6HD
311 (30)	Fred Lubach VK4RF
(24)	John Heine VK3JF
(19)	(Mary Ann Crider WA3HUP)
310 (35)	Col Wright VK7LZ
309 (13)	Geoff Wilson VK3AMK
308 (28)	Austin Condon VK5WO
306 (15)	Bill Verral VK5WV
(4)	Ken Jewell VK3AKK
303 (31)	Ivor Stafford VK3XB
(4)	Frank Beech VK7BC
301 (32)	Bill Wells VK1WB
(22)	Arthur Johnson VK4PX
300 (4)	Steve Gregory VK3OT
296 (32)	D Kiesewetter VK2APK
(3)	(Ruthanna Pearson WB3CQN)
293 (16)	Chas Taylor VK4UC
292 (22)	Syd Molen VK2SG
289 (14)	Ron Glassop VK4BG
287 (43)	J Anderson VK3JA
(30)	Noel Hanson VK2AHH
283 (4)	John Nakulski VK3BLN
278 (35)	George Luxon VK5RX
277 (10)	David Portley VK4DP
275 (16)	Cardie McQuillan VK3ACD
270 (2)	Sam Galea VK2AKP

WIA 75 AWARD RECIPIENTS UPDATE

700	Ismail BS, YC7BS
701	Sofyan Zainuddin YC7FT
702	Club Station YC7ZAC
703	Abdullah H Ali YC7BO
704	Drs Arif Asikin YC7FA
705	Charles Bersch KJ3R

QSP

ART COLLINS WOCXX (SK)

Arthur (Art) Collins W0CXX, founder of the Collins Radio Company, died on February 25, aged 77. First licensed as a radio amateur in the 1920s, Art formed the Collins Radio Company in 1931 to build quality transmitters principally for radio amateurs. When Admiral Bryd planned his 1933 expedition to the Antarctic, he selected Collins to build his transmitters.

There were two key inventions by Collins which helped make the company's transmitters superior to any other commercial manufacturer: the Autotune, a device which enabled the transmitter to be tuned instantly, and the permeability tuned oscillator (PTO).

In the 1930s, Collins began building transmitters for Braniff Air Lines, becoming the leading supplier of aviatronics equipment. By the 1970s, it was estimated that Collins equipment was used for communications or navigation by 80 percent of the free world's airlines.

Prior to WWII, the Collins Company won major US Navy contracts, which launched the company into large-scale electronic production. During WWII, there was Collins communications equipment in most Navy ships. Collins transmitters aboard the *USS Missouri* were used to broadcast the V-J Day surrender ceremonies.

To radio amateurs, the Collins Radio Company is best associated with its early work with single sideband. In 1955, its KWS-1 was virtually the first commercially manufactured SSB transmitter. For decades Collins equipment was the "top of the line" amateur equipment and it was a dream-come-true for many amateurs when they could eventually own it.

During his life, Art was given a number of awards and honours including the Navy Distinguished Public Service Award, the highest award the Navy can grant to a civilian, the Armstrong Medal from the Radio Club of America, the David Sarnoff Award from the Armed Forces Communications and Electronics Association, the Outstanding Achievement Award from the American Electronics Association, and three honorary Doctorates of Engineering.

After leaving the Collins Radio Company in 1971, he formed a research and development firm in Dallas, where he continued his contributions to the electronics industry.

—From *The ARRL Letter*, March 10, 1987

Electro-Magnetic Compatibility Report

Hans Ruckert VK2AOU
EMC REPORTER
25 Berrille Road, Beverly Hills, NSW 2209

EQUAL DUTIES, EQUAL RIGHTS

In a democratic country one would expect that all citizens have equal duties and equal rights, even if some duties are not popular with some people. Radio amateurs have the duty not to radiate more RF energy on frequencies outside the amateur band allocations, than technical standards permit, so that suppression is possible at reasonable cost. A critical case is the third harmonic of the 21 MHz amateur band which falls in television channel 2. The West German law on amateur radio states that the harmonic radiation — in the case of TVA — must not exceed 1.25×10^{9} watt, approximately 31 dB (pW). 1 pW = 10^{12} watt. This means that a 400 watt transmitter must suppress the third harmonic of 21 MHz (for example) by about 114 dB. Popular transceivers already provide between 52 and 80 dB third harmonic suppression at the 100 watt output level of the 21 MHz signal.

TESTS BY DL1BU, *CQ/DL*

IC-730: -66 dB; FT-7: better than -70 dB; IC-701: -52 dB; FT-901: -80 dB; TS-520S: -56 dB; TS-820: -65 dB.

It depends on the level of drive what happens to the third harmonic level in the final amplifier and the output tuned circuit. It become obvious that we have to use an effective low-pass filter directly connected to an RF-tight PA stage, which can attenuate the 63 MHz harmonic further by about 60 dB. This can be done, as tests on low-pass filters have shown:

Attenuation of some filters at 60 MHz —
LF30A (Kenwood, good to GHz) 57 dB
SP-30/500 (Haro, Germany) 73 dB
SPX-30LF (Haro, Germany) 76 dB
Auth (Germany) 67 dB
VK2AOU (several filters) 60 dB.

Here ends the responsibility of the radio amateur and what may be reasonably be expected of him (West German Law on amateur radio G-1239A, 2.6.1980, page 958).

If one owns a motor car, one is responsible that the car is compatible with its environment on the road. The manufacturer conducts some quality control tests during manufacture. He offers the dealer service free of charge with the same aim. Later the car has to pass some registration tests for which the owner has to pay.

Why should it be different with electrical/electronic appliances? Manufacturers and owners should be responsible for the compatibility of these appliances with other services using allocated RF spectrum sections (licensed transmissions). The law states in some countries, that radio listeners (long wave, medium wave, short wave, VHF and UHF) and television viewer have the same right. That means that the radio amateur has the same right as the television viewer as far as RFI is concerned. This means also that the television manufacturer and the television viewer are responsible (or should be) for the compatibility of the television operation with other services. Therefore the television set should not act as an unlicensed transmitter, causing severe RFI to shortwave reception every 15.625 kHz over a 4 kHz wide band. S5 signals and up to S7 (50 μV for S9) are experienced from television sets operating in the neighbourhood. The West German law on radio communication specifies that unwanted radiation from television sets must not exceed 44 dB (μV) at 75 ohms = 25 dB (pW) = 3.16×10^{-10} watt, which is a signal of about 150 μV at 50 ohm, measured at 3m distance using the substitution method (signal generator and dipole).

Design steps have to be undertaken to prevent this signal from reaching the television antenna. The signal from the high voltage line frequency oscillator, as radiated by the television chassis, peters out usually at 2-3m distance if the set was correctly designed — but this is unfortunately not always the case, as for example reported by K4SYP in *QST* December 1986 (see later). This case shows that duties and rights of the radio amateur are not treated fairly by the law makers. Quite a few VK amateurs seem to have the same problem, including this writer, whilst my own television set causes no line oscillator RFI. If we know the house where the RFI comes from, we should demonstrate the interference to our neighbour, who will not be aware of the trouble his television set is causing. We should write a letter to the manufacturer (see RFI-TVA assist list published earlier in AR). Have the letter also signed by the neighbour and ask that the television set be fixed free of charge, if possible. State that other makes and models of television set do not cause the RFI, which in many cases makes shortwave listening impossible. Is your own television set compatible with your shortwave amateur radio band reception? Some dealers have been known to say that our amateur band receivers are too sensitive, so that the RFI is the fault of the transceiver manufacturer. What would they say to a suggestion that television and radio manufacturers could learn from amateur radio transceiver manufacturers how to improve the dynamic range and intercept point of these appliances to avoid much of the RFI. We can only hope that standards and law makers apply equal standards as far as duties and rights are concerned. (Another possibility is that a practically third harmonic free 21 MHz signal may overload the television frontend, so that the television set generates the 63 MHz itself due to too low dynamic range).

"Living with TVI" (should be called TVA) by K4SYP, is definitely not the answer to electromagnetic compatibility. If your neighbour is a senior citizen (as in my case), who is watching television from the early morning hours to late at night, this method would be the end of amateur radio for me, and others too.

The method is of little use if the television set is correctly designed, since harmonics from the line frequency are not then heard at more than 3m distance from the set and are not radiated by the television antenna. Good will, by the radio amateur is not enough, to solve the EMC problem at the root.

LIVING WITH TVI

"I live in a small apartment building at a summer resort area. During the colder half of the year, I am the only occupant and have no TVI worries. As warm weather approaches, however, the other apartments start filling up. Three tenants have hand-me-down TV sets with poor antennas that are particularly susceptible to TVI. (My own set is free of TVI even when I use my amplifier. Thus my station emissions are clean. That doesn't cut any ice with the neighbours, however, who want to see their programs.) For my part, it is good practice to keep my neighbours happy. So, do I go QRT during all TV-viewing hours? Not on your life! I have set up a TV detector to determine when the neighbours are watching TV.

"If you live in an apartment building, perhaps you have noticed that your AM broadcast receiver is little better than useless when your (or your neighbour's) TV is on. This is the result of interference from the TV horizontal-sweep oscillator, and it is especially prevalent near the low end of the AM-broadcast dial. Such interference is much worse on longwave frequencies (150-300 kHz). All I do is tune my receiver near 150 kHz (the 10th harmonic of the sweep frequency) and a loud roaring noise can be heard when a neighbouring television set is on.

"My discovery does not cure TVI, but it does allow me to operate many hours when I would otherwise have to stay off the air."

—Robert J Panknen K4SYP/EA5CHT, Murcia, Spain, from *QST* December 1986

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HOME VIDEO PROGRAM DISTRIBUTORS

Executive has noted, with concern, the growing number of television program and VCR distribution devices being offered for sale to the public, most of which re-transmit on UHF and VHF television channels. In one instance, it has been reported that the device uses the 50 cm amateur band and in another, a control allows the user to make significant adjustment of the output channel frequency.

We have written to DOC advising the WIA attitude, namely that it is strongly opposed to use of such devices in the domestic environment which may exacerbate an already difficult interference situation. In particular, the use of a device which could increase un-necessarily the susceptibility of home entertainment units to amateur transmissions is to be deprecated.

We have also urged that action be taken to ban sale of such equipment and DOC is "proceeding urgently" with the issue of an appropriately stringent performance specification for distribution equipments which will enable action to be taken under the Radiocommunications Act against the sale of "sub-standard devices." In addition, DOC has undertaken to issue, as soon as possible, a warning to the public that such units as described are not approved and that interference problems are likely with those that are already in use.

The Executive is monitoring the situation and would appreciate advice via Divisions on any problems encountered by amateurs stemming from the use of home video program distributors.

—Prepared by Allan Foxcroft.

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COMPUTER TAX

TRIALS ARE BEING carried out on a system which will allow tax returns to be filed by computer.

Taxpayers will be able to prepare their returns on a home computer and lodge them by phone under the system planned by the Australian Tax Office.

First to have dial-up access will be most of Australia's 26 000 tax agents who already handle 60 percent of all tax returns.

FAX BUSINESS

FACSIMILE is overtaking telex as the most popular form of written telecommunications in Australia.

It is now estimated that about 50 000 Fax machines have been installed which exceeds the number of telex machines.

Australia ranks fourth behind Japan, the US and Britain as a major facsimile market with machines from 14 companies being sold.

WICEN News

Paul Walton VK3PW
5 Elgin Grove, Belgrave Heights, Vic. 3160

EXERCISE SOUTHERN LINK

—

COUNTER DISASTER EXERCISE

On the weekend, October 25-26, the Health Department of Victoria held a Counter Disaster Exercise, at the Portsea School of Army Health. The aim of the exercise was to practice communications skills, on- hands experience in use of equipment, rapid processing of information and decision making. Groups represented were hospital medical co-ordinators, ambulance co-ordinators, Telecom, Metropolitan Fire Brigade, Police, SES and WICEN.

The weekend began at 9 am on the Saturday, when everyone checked in at the base and found their allotted accommodation. A welcoming address by the Army Base Liaison Officer, Major Tony Haller, led to the briefing for the first exercise by Dr John Wettenhall (Exercise Director).

The scenario was "a scorcher of a summer has led to outbreaks of fires ranging from Cape Schank, on the Peninsula, through to the Toolangi forests, near Healesville."

The exercise practiced message handling in tiered layer format from the on- site ambulance crews and their controllers, Central Medical Co-ordinators and Emergency Operations Centre, located at the Frankston Hospital and the Ambulance Service Headquarters throughout the disaster areas. The co- ordinators at each level were given a set of circumstances as a guide to the creation of messages and dissemination throughout the system. All messages were to be passed by radio or magneto phones. (At one stage the phone network failed and had to be backed-up by WICEN).

To increase tension in decision making, the outbreaks of fires occurred at different times, as they would in actual circumstances, thus making it difficult for ambulance co-ordinators to predict where their services would be required. To add to their plight, the exercise was run in triple time where two hours real-time encompassed six hours of exercise time — the messages thereby came at an alarming rate.

Debriefing found that some of the medical personnel were unfamiliar with the phone and radio equipment provided, as well as not being too proficient with the most efficient means of communicating their given information. It was hoped the following days exercise would rectify these problems.

The remainder of the day consisted of presentations by Alan Bramfit, of Telecom, and Dennis Furlong, of WICEN. They demonstrated the type and uses of equipment available for various communications requirements.

Dennis VK3XP, Region 28 Co-ordinator of WICEN, looking over the Ambulance Movement Control Bus.

With exercise business concluded for the day, visits were organised to view the remains of the old artillery battery stands which were used during wartime to protect the Port Phillip Heads entrance. A guided tour was conducted through the quarantine station, which has been set up to depict how the station was used when it screened Australia from disease being carried in from overseas. Dinner for the evening was held in the Officer's Mess, followed by socialising at the Officer's Bar, a pleasant way to end the day's events.

Sunday morning warmed-up with talks from the Metropolitan Fire Brigade and demonstrations of their latest technology radios and on-site intercom/patch units. This was followed with Brian Frankish, from the State Emergency Service, who spoke on voice procedures to be used in effective communications.

Exercise II followed in which "a dense fog had caused a major traffic accident at the entrance to the Mornington Peninsula Freeway. The accident had occurred during morning peak-hour and involved a school bus, a tanker carrying toxic chemicals and numerous passenger vehicles."

Leigh VK3CDP, WICEN State Co-ordinator, assisting at the station of Paul VK3PW.

The tier structure for the co-ordinators remained similar to the previous days exercise. Logistics were required by the medical co-ordinators to ascertain the injuries sustained at the site and the possibility for further injuries from released toxic gas. Arrangements had to be made between the hospitals and the ambulance staff to ensure that they departed to hospitals which had the required facilities; ie intensive care beds.

Due to the nature and size of the accident, the MFB became involved along with the Department of Defence through the Premier, Mr Cain. This led to the co-ordinators having many avenues of assistance available provided they knew who to use and the most effective way of communicating through to them.

Debriefing of this exercise proved that procedures had run smoother and faster than the previous day, and that the "hands-on" experience had been beneficial to those who participated.

Dr John Wettenhall, concluded the weekends events by thanking everyone for attending and making the exercise the success it had been. He expressed that those who had participated had gained valuable experience in the handling of large scale disasters, along with the opportunity to see how the "other half" of their team would work. It had given people the opportunity to meet their counterparts from regional and metropolitan centres, thereby strengthening their ties should they become involved in a jointly fought disaster. John finished by hoping further exercises of this nature would be conducted to further these gains.

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Intruder Watch

Bill Martin VK2COP
FEDERAL INTRUDER WATCH CO-ORDINATOR
33 Somerville Road, Hornsby Heights, NSW. 2077

Opening the column this month, I offer a welcome to the new Intruder Watch Co-ordinator for the VK3 area. He is Philip Pavey VK3BHN, of 6 Bayview Road, Tooradin, Vic. 3980, who replaces Bill Wilson VK3DXE, who has had to vacate the post. Welcome to the IW, Philip, and let us hope that the VK3 boys and girls give you some support. (And girls, that applies to all States, not just Victoria — let's hear more of you.)

Speaking of support; those who helped out in January were: VK2DEJ, Mr G H A Bradford VK2-SWL, VK3XB, VK4s ZKX, BG, BHJ, BTW, DA, KHZ, OD, VK5s BJF, GZ, TL, VK6RO, VK7RH, VK8s HA and JF. Thank you one and all. January is traditionally a slow month for the IW, with people being away from the shack on holidays, etc, but all the same, 158 broadcast intruders were reported; 143 CW intruders; RTTY intrusions numbered 97, other modes totalled 65, and 33 intruders sent their call signs.

Some enlightening news from Joeke PA0VDV, the IARU Region 1 Monitoring System Co-ordinator. Joeke picked up a call sign on the Australian IW Report, which he assures us is not an intruder at all. I speak of UK3A, a call sign which was unfamiliar to me. This call sign belongs to a USSR Amateur Radio Club Station, and he sends amateur news and sometimes Morse practice tests. So if you hear this call sign, he is legitimate.

Information from Ulrich DJ9KR, the DARC IW Co-ordinator, tells me that "the Italian telecommunications authorities have reaffirmed their wish to monitor the radio spectrum, especially that of the radio amateurs. It is their will to enforce the fight against intruders. . ." — good stuff.

Some interesting (disturbing?) news from the UK. In *Radio Communication*, January 1987, the following:

"The Management Consultancy CSP International has been conducting research into the allocation of the radio spectrum. It is understood that the CSP report proposes that the Government relinquish detailed control of most of the radio spectrum not used by the military to Independent Spectrum Management Licensees (SMLs). Each SML would control a block of radio frequencies and "sell" them to users."

. . .the report goes on to say that "it appears that amateur radio *will not* be subject to these arrangements." MMmmm. . .

So *there is* something to think about as you chase the elusive DX . . . see you next month, and take care.

Acknowledgments: VK4BHJ and *Radio Communications*.

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POTS AND PANS ANTENNAS

THE SKYLINE IN DHAKA, the densely populated Bangladesh capital, was festooned with aluminium dishes, cooking pots and pot covers — all fitted to television antennas.

A new fad had developed to add metal to antennas when seeking to get better television reception from neighbouring India.

Home-made antennas were first the work of youths wanting to watch cricket test matches between India and Pakistan, on India's state-run channel. But the fad has now spread to other groups, most of whom want to watch Indian feature films.

AMATEUR RADIO PLAYS A PART

EASTERN ZONE REPEATER PLAYS A ROLE IN RESCUE

Eastern Zone WIA Victorian Divisional Repeater plays a role in the rescue of an injured four-wheel drive owner.

The Latrobe Valley two-metre repeater, VK3RLV, was used on Monday, March 9, to notify the Ambulance Service of an injured motorist on the Dingo Hill Track, north of Tamboritha, in Gippsland.

Whilst attempting to drive up a steep section of the track, the 4WD slipped backwards and crashed into a tree. The vehicle was badly damaged and the driver suffered severe bruising to the back of the neck.

The vehicle was so badly damaged that the doors of the vehicle had to be forced open and the other people in the group were worried about the possibility of spinal damage to the driver.

The people in the party had 27 MHz Citizen Band radios, but were unable to contact anyone outside the remote area to raise the alarm. Their CB call was received by another 4WD party in the vicinity. This party include a radio amateur, VK3XGQ. The two-metre repeater, VK3RLV, is one of the network of repeaters operated by the Victorian Division of the Wireless Institute of Australia, through their zones. The Victorian Division pays the licence fees, insures and helps run and co-ordinate all primary repeaters in Victoria. In so-doing, it ensures that the majority of Victoria, including the remote areas, have repeater coverage in times of disaster.

VK3RLV was used to liaise and direct assistance during the incident at Dingo Hill Track.

The Helicopter Ambulance used during this rescue is operated by the South Eastern Region, Victorian Helicopter Ambulance Service, which is part of a co-ordinated state-wide system.

National Safety Council Helicopter en route to the Dingo Hill Track.

The helicopter, pilot and crewman are provided by the National Safety Council of Australia. The Ambulance Officer on board usually comes from the district involved.

It is interesting to note that on Monday, three simultaneous helicopter ambulance rescues were performed by the South Eastern Region Service. These were:

At sea off Mallacoota (see below).
Dingo Hill Area.
Carrajung (south of Traralgon).

That is, three helicopters and crews were provided by the service.

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Col Pomroy VK3BLE
PO Box 218, Churchill, Vic. 3842

One of the Helicopters engaged in another facet of their work — dousing bushfires.

COOKIE CUTTER RESCUE

***Amateur radio operators participate rescuing the yacht* Cookie Cutter.**

At approximately 7.50 am on March 9, 1987, a Mayday call broke into the Net where Alan VK3ASB, Hal VK3AVH, Alan VK3BNZ and Fred VK3BYW, were engaged in their usual contact.

Alan VK3ASB, immediately returned the call and received a weak reply. At the same time, Hal VK3AVH, telephoned the OTC Coastal Station, in Melbourne, requesting they monitor the QSO between a distressed vessel and VK3ASB.

The message eventually received was as follows:

Call Sign — VE0MCQ
Location — 150 degrees East, 38 degrees South
Vessel has rolled 360 degrees losing mast
Two persons aboard
One person seriously injured

The signal was very weak, as no doubt the radio equipment, including the batteries had suffered in the roll-over. The marine radio, which is always used first, was evidently inoperative.

The Federal Sea Safety Surveillance Centre, Canberra, received the relevant information by teleprinter at 8.01 am, from Melbourne OTC radio, and proceeded with the rescue procedure.

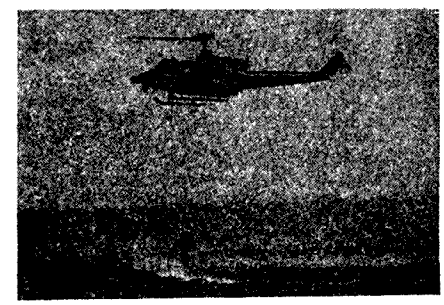
Harold Tribe VK3AVH
20 Morotai Street, Sorrento, Vic. 3943

There was a lapse of about 11 minutes only from the time the Mayday call was received by the amateurs to the time rescue procedures commenced in Canberra.

At the request of Canberra, the amateurs tried to maintain contact with the vessel, but unfortunately could not make contact.

Shortly after 8.00 am, Len VK3NPG, received a Mayday call from the yacht, *Cookie Cutter*, with the same information as the other group, but on 3.583 MHz. This message, which now included the name of the yacht, was phoned to Canberra at 8.15 am, thus reducing any thoughts of a hoax call.

Subsequently, Des VK3BSB, was called in because of his near location to the vessel, so he could monitor the frequency and relay the progress of the rescue procedure being obtained by Len VK3NPG, via telephone from the Canberra Centre. This information included a message to *Cookie Cutter* to turn on his EPIRB (radio beacon) to help with location. (Len knew the vessel's receiver was operational, even if the transmitter was not).



Air-Sea Rescue.

It is believed a Fixed-Wing Aircraft (F27) was airborne by 8.45 am attempting to locate the yacht.

Sometime later, a helicopter, with a paramedic and the necessary equipment to rescue the skipper, was above the vessel. The paramedic, from the National Safety Council, was lowered onto the vessel and assisted the occupants to clear the deck of the damaged rigging and they then made their way to the lee-side of Gabo Island. Lyle Chase, the skipper, was then flown to hospital on the mainland by helicopter.

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Sydney Amateur Digital Communications Group AX25-X3 Protocol for use in Amateur Packet Radio

Steven Blanche VK2KFJ
Secretary, SADCG
PO Box 231, French's Forest, NSW. 2086

Part 2: TNC PARAMETER DESCRIPTIONS

Here is a short description of each TNC parameter. This section should be read with reference to the parameter summary which follows in Part 3.

1 Command Escape Character
Set this parameter to the decimal number equivalent of the ASCII character which you wish to use to cause the TNC to enter command mode. A value of 0 will disable entry into command mode.

2 Echo
If echo is enabled, characters sent to the TNC will be sent back (echoed) to the terminal where they will then be displayed. If every character you type is displayed twice, your terminal is probably set to "half duplex" with TNC echo enabled. If you do not see anything as you type, your terminal is probably set to "full duplex" with the TNC echo disabled.

3 Data Forwarding
This parameter determines which characters from the terminal will cause a packet of data to be transmitted.

4 Idle Timer Delay
Each time you send a character to the TNC, the idle timer is restarted. If there is no more input to the TNC and there is still data in the TNC buffer to be sent when the idle time expires, the data will be transmitted automatically.

5 Flow Control to the TNC
This parameter controls the flow of data to the TNC. It allows the TNC to stop incoming data (from the terminal) when the TNC's internal buffers are full. This parameter is very important when sending computer files on the packet network.

6 Control of TNC Messages and Prompts
This parameter controls the sending of messages (including responses to commands) and prompts (including the command mode prompt).

7 Operation on Break
This parameter determines the TNC's response to a "break" signal from the terminal. A "break" is detected if the transmit data line from the terminal to the TNC is held in the "space" or logic 0 condition for more than one character time (including the stop bit).

8 Discard Output
Setting parameter eight to one will stop correctly received packets from being sent to the terminal.

9 Carriage Return Padding
This parameter controls the delay between a carriage return character sent to the terminal and the first character of the next line. The delay is achieved by sending the specified number of ASCII NUL characters (character 0). This will be most useful to systems using mechanical terminals (or printers) or electronic terminals which lose the first few characters of each line.

10 Line Folding
The TNC will start a new line after the specified number of characters have been sent to the terminal. This is useful if your terminal discards data which would extend past the end of the line. This parameter does not affect keyboard input

11 Binary Speed
Parameter 11 indicates the speed (bits per second) of the terminal. The value is set by the AUTOBAUD routines in the MASTER ROM and cannot be changed by the user.

12 Flow Control to the Terminal
This parameter allows the user to control the flow of data from the TNC to the terminal. If parameter 12 = 1, you may use the XOFF character (DC3 or control S) to stop data from the terminal and later use the XON character (DC1 or control Q) to resume.

13 Linefeed Insertion
This parameter controls when line-feed characters are inserted by the TNC. Be careful when transmitting computer files as setting this parameter to 2, 6 or 7 will insert line-feeds into the transmitted data which will cause the received file to differ from the original.

14 Linefeed Padding
This is similar to Carriage Return padding except that the time delay is produced after a line-feed character is sent to the terminal.

15 Editing
This parameter enables or disables editing while not in command mode. The editing characters are defined is parameters 16, 17 and 18. Parameter 16 (character delete) is always available in command mode.

16 Character Delete
Typing the character defined by this parameter will delete the last character in the buffer. If you try to delete past the start of the buffer, the terminal's bell will sound (if it has one). If parameter 19 = 1, a "/" will be displayed. If parameter 19 = 2, the sequence <backspace> <space> <backspace> will be sent to the terminal.

17 Line Delete
Typing the character defined by this parameter will delete all characters in the buffer. If parameter 19 is not 0, the TNC will send "XXX" and start a new line.

18 Line Display
If parameter 19 is not 0, typing the character defined by this parameter will cause the TNC to start a new line and display the current contents of the buffer. This is particularly useful when parameter 19 = 1.

19 Editing Service Signals
This parameter controls the displayed response to parameters 16, 17 and 18. If parameter 19 = 0, there will be no displayed response to the editing characters (the editing will still occur if editing is allowed by parameter 15).

20 Echo Mask
If echo is enabled (see parameter 2), this parameter allows you to stop the echoing of certain characters.

21 Parity Treatment
This parameter is not fully implemented. If your terminal is using parity, it will be detected during Autobaud. The TNC will then expect and generate the same parity conventions as the terminal. Any character received by the TNC with Incorrect parity will be discarded.

22 Page Wait
Output to the terminal will be paused after the specified number of lines. Send an XON (control Q) character to the TNC to resume output.

23 Buffer Cushion
When the TNC attempts to stop the flow of data from the terminal to the TNC, the terminal may still send one or more characters before stopping (some terminals will send the rest of the line!). The buffer cushion is designed to absorb these extra characters. Enough data must be successfully transmitted to empty the buffer cushion before any more terminal input will be accepted.

24 Linked Timeouts
If the TNC makes a transmission which is not acknowledged while linked to another station, a time-out will occur and the TNC will try again (a re- try). If the number of time-outs (re-tries) specified by parameter 24 occurs without any acknowledgments from the other end of the link, the TNC will return to monitor mode.

25 Unlinked Timeouts
This parameter is similar to parameter 24 except it controls time-outs while not linked. This affects connect and disconnect requests.

26 Line Timeout
This parameter sets the time-out period for parameters 24 and 25.

27 Duplex Line Control
When parameter 27 = 0, the normal half duplex mode is assumed — the TNC will not transmit if the channel is busy. If parameter 27 = 1, the TNC will ignore the carrier detect signal from the modem. This mode is used for operation on noisy HF or satellite circuits where a reliable carrier detect signal is not available.

28 Clear to Send Delay
This parameter controls the delay between RTS (request to send) to the modem and the beginning of the packet. It is useful for modems without a built in delay between RTS and CTS or for transceivers with very slow changeover from receive to transmit.

29 Link Control
If parameter 29 = 1, other stations will not be able to link to your TNC. Any station attempting to link to your TNC will display a "(CALLSIGN) busy" (resource unavailable) message. This feature was provided so that stations providing Remote Bulletin Board Services can temporarily take the system "off air" for system maintenance but still provide an indication that the system is functional.

30 Unused Link Control Parameter

31 Information Frame Callsign Display
This parameter controls display of call signs in the address field of information frames while your TNC is in the unlinked state.

32 Received Packet Forwarding
This parameter allows the user to ignore all packets that are received while not connected. Your screen will not be cluttered by traffic not intended for you. This may be useful to stations providing Remote Bulletin Board Services.

33 Maximum Packet Length
This parameter sets the maximum number ol data characters that will be sent in one packet. If this number of characters has been sent to the TNC, and no other condition to send the packet has been met (idle timer or characters defined in parameter 3), the packet will be sent. Short packets are easier to receive under noisy conditions but very short packets on a busy channel will increase the traffic unnecessarily.

34 Network Header Second Byte
Parameter 34 was provided to allow experiments with basic networking control. As such, it is not used in this implementation.

35 Digipeat Control
This parameter is used to enable or disable digipeating. The TNC will become a digital repeater If digipeating is enabled.

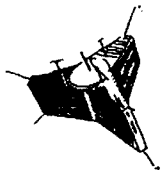
36 Unused Network Control Parameter

37 Unused Network Control Parameter

38 Unused Network Control Parameter

39 RLSD Line Control
This signal is found on pin 8 of the RS-232 cable from the TNC to the terminal. With parameter 39 = 0, it is held at the "true" logic level (+12 volts). With parameter 39 = 1, RLSD will be at the "true" level only while connected. While disconnected, RLSD will be at the "false" level of -12 volts. This feature is particularly useful to stations wishing to provide Remote Bulletin Board Services.

40 Data Mask
If you wish to mask the most significant bit (bit 7) of each character transmitted, set parameter to 127. Set to 255 for full eight bit operation.



AMSAT Australia

Colin Hurst VK5HI
8 Arndell Road, Salisbury Park, SA. 5109

NATIONAL CO-ORDINATOR
Graham Ratcliff VK5AGR
INFORMATION NETS
AMSAT AUSTRALIA
Control: VK5AGR
Amateur Check-In: 0945 UTC Sunday
Bulletins Commence: 1000 UTC
Primary Frequency: 3.685 MHz
Secondary Frequency: 7.064 MHz
AMSAT SOUTH WEST PACIFIC
Control: John Browning W6SP
Bulletins Commence: 2200 UTC Saturday
Frequency: 14.282 MHz

Participating stations and listeners are able to obtain basic orbital data, including Keplerian Elements from the AMSAT Australia Net. *This information is also included in some WIA Divisional Broadcasts.*

ACKNOWLEDGMENTS

Contributions this month are from Bob VK3ZBB, and the American Radio Relay League (ARRL) magazine *QST* January 1987. Thanks must also go to Ross Forbes WB6GFJ, for drawing my attention to this material.

Firstly, I would like to apologise for the delay in the promised second half of the article *OSCAR at 25: Beginning of a New Era*, by Jan King, AMSAT's Vice-President of Engineering, which was published in *QST*, January 1987. I had hoped that Colin VK5HI, would have returned from JA-land and, of course, the deadline slipped by as this one almost did for the same reason. From the article I quote. . .

S3: PACKET GATEWAY INTERCONNECT

Packet radio is generally acknowledged to be the area in which amateur radio is currently experiencing the fastest growth. Nearly 20 000 packeteers are now active, according to some sources. That's probably 10-15 percent of all active US amateurs. The proportion is expected to grow significantly in the last years of this decade. Local Area Networks (LAN) established around a digipeater hub have been linked to other LANs through VHF, UHF and even HF links. Coast-to-coast connectivity, albeit noninstantaneous, is now a fact. Messages dropped in specific packet radio nodes often reach an individual destination addressee in a day or less. And they arrive there error-free.

The growth of the terrestrial networks is progressing in a step-wise, part directed, part random pattern. Interconnec tion between widely separated digipeaters on the East Coast and West Coast and some places in between is now possible. But what if these LANs and groups of LANs could be linked by satellite into a continental or even multi-continental network? That's exactly what the S_3 Packet Gateway Interconnect transponder is about. It could link dozens, even hundreds of packet gateways together with a high-speed trunk. While our initial calculations were made based on a 19.2- kbits/s data rate, the trunk bandwidth could even be up to 56 kbits/s or more if projected-use estimates indicate more resource is warranted.

Recreational use of the packet gateway transponder would, of course, be part of its mission statement. But there is much more to it than merely the digital ragchew, even the DX digital ragchew. Just as the essential "justifying" rationale for the S_2 voice gateway interconnect transponder is the facility and capacity to provide unprecedented emergency communications capability, so, too, would the packet gateway interconnect transponder open new modes of public service. Today's amateur radio communicators are coming to well appreciate the tremendous benefits packet radio has over more traditional modes such as CW and even RTTY. Packet radio messages are error-free, high-speed and self-documenting. Traffic handling, routing, sorting, etc, can all be automated. The result is often remarkable improvements in traffic through-put, accuracy and, most important, communications effectiveness. Portable packet terminals installed on jeeps, rescue trucks and the like are now appearing in and among forward-thinking amateur radio emergency-communications communities.

The S_3 transponder aims to afford the emergency LAN a port to a wider community. As required, the field operations centre and even portables could communicate with regional or even national emergency-management centres to communicate status, request specific support and implement actions directed by headquarters via this channel. As with the S_2 voice gateway interconnect, S_3 would be available for recreational use, but earn its keep in providing unique emergency and general public-service communications resources as required.

S4: BROADCAST MODE GATEWAY INTERCONNECT

S_4 is not a separate transponder, but rather a different mode of employment of the S_2 voice gateway interconnect sub- transponder. By reallocating on-board resources, a broadcast capability of notable proportions could be established. As shown in Table 4, nearly 40 dB peak S/N ratio might be obtained using advanced SSB techniques. (Amplitude- compandored single sideband, ACSSB, is one means of achieving this very high level of S/N ratio performance). That's as good as, and in some cases better than, commercial telephone circuits.

The S_4 Mode might be used for many routine and public-service activities. In routine use, ARRL W1AW bulletins might be sent to groups of terrestrial gateway repeaters. Listeners would use their VHF or UHF hand- held radios to tune in the bulletins on their local repeater. Groups of repeaters could be addressed selectively, say by time zone, by tone-encoded addressing. When a given repeater heard its address on the S_4 Mode downlink, it would interconnect the gateway's downlink receiver to the repeater transmitter to retransmit the audio to the repeater's coverage area. Local repeater operators could, of course, over-ride the linking signal at will with local, manual intervention.

However, in the event of an emergency, groups of repeater gateways could be called up using the tone-activated alert scheme. In this way, news of regional or more general emergencies could be flashed to hundreds, even thousands, or repeaters in a few seconds. Imagine the improvements in emergency response afforded. When combined with existing emergency communications structures at the regional and the state level, the result could be unprecedented effectiveness in response to earthquakes, hurricanes, general tornado activity, sudden flood emergencies, and so forth.

On the more routine side again, the S_4 mode could help unify amateur radio by facilitating the teleconference radio net concept, which to this point has relied on terrestrial telephone network linking of a hundred or more repeaters several times per year. Imagine this concept expanded to several thousand repeaters on line. Moreover, the equipment requirements for a S_4 Mode Receive Only (RO) gateway are quite moderate. As shown in Table 3, a 1.5 metre dish with a single 2.4 GHz feed, a routine LAN and a mixer to a convenient IF are all that would be required. By the time the S_4 mode flies, one could likely establish an S_4 RO gateway facility for $300 or less!

S_v: THE MODE S VIDEO SUBTRANSPONDER

Advances in digital television and video data-compression techniques suggest to us there may at last be a good mesh between amateur television (ATV) and OSCAR satellites. Previously, constraints of power and bandwidth have made anything but occasional forays with slow-scan television (SSTV) impossible on OSCAR. Now, however, using video data compression techniques we believe it possible to include a transponder capable of relaying digital video at the rate of perhaps 500 kbits/s. Commercial and military developments using comparable rates are very encouraging. Thus, we have every reason to believe these leading-edge techniques will be available to advanced amateurs by the time S_v is on line.

A more general view of the S_v transponder is that it is a general- purpose, high-speed transponder and that it could (should) be configured to handle the amateur radio equivalent of the Integrated Services Digital Network (ISDN) now being fielded by telecommunications companies throughout the world. If this were done, bulk file transfer could be accomplished at astounding rates. The types of services that could be provided with the S_v transponder beyond these examples are numerous. Distribution of amateur radio software, articles and research papers are some examples that come to mind.

Using the S_v transponder as an ISDN facility for digital video, very- high-speed packet, digitised voice, file transfer, some combination of these or some new, presently unforecast mode is a matter for our study teams and the amateur radio community to decide. But it seems clear that this area could be as fertile as our collective imagination.

MICROWAVE EXPERIMENT

A further module that could be included on board Phase 4 is a microwave-beacon experiment. Much work is being done using narrowband emissions as high as X-band (10 GHz). Imagine having a permanent 10 GHz beacon aboard AMSTAR to align antenna feeds, tweak LANs and calibrate antenna positioning equipment. Such a field alignment tool might go far in advancing both interest and proficiency in the SHF bands. This experiment continues under study for possible inclusion.

CONCLUSION

Traditional OSCAR users have been a specialised lot. They have enjoyed many of the occasionally esoteric challenges becoming highly proficient on OSCAR involves. Tracking and figuring access are not bothersome chores but rather part of the fun to this dedicated bunch. But clearly the view of what's fun and what's not depends on one's interest. Certainly, an emergency communicator is less interested in calculating access to a satellite than communicating his emergency traffic! So unless something changes, OSCAR use will remain a special art practiced by a relatively small group of aficionados.

But it is now abundantly clear that the nature of the satellite game is about to change dramatically with the advent of Phase 4. These changes come about from two fundamental causes:

1) Maturation of OSCAR technology and technologists to where the media becomes transparent to the user, whereas previously the medium was in large measure part of the message (or reason for being on OSCAR). Thus, rather than evolve to further refinements of a traditional theme, OSCAR will be revolutionised to become a utility available to virtually anyone who wishes to participate. Acquisition of special equipment and skills will be minimised and, in essence, consolidated in the gateway concept. There, many participants can share the cost burden. The esoteric aspects of satellite communication can be offset and eliminated by more sophisticated engineering than has ever been incorporated. In sum, it is the highest form of the engineering discipline to make the inherently complex seem simple and generally accessible.

2) There is a growing, urgent need to make productive use of our incalculably valuable spectral resources. Where commercial interests see our UHF spectrum quite literally in terms of gigabucks (billions), you must be convinced the pressure to abscond with the heart of our hobby (our frequencies) will become enormous. We

simply *must* do better to justify our continued occupancy of the UHF bands, lest we lose them forever. Far from being the sounds of distant canons, the threat is clear and present. If we don't move now, we could very well face significant challenges for our spectrum at the next World Administrative Radio Conference (WARC) — or even sooner if the FCC opts to change those secondary allocations. An amateur radio satellite using key UHF frequencies in providing real, tangible, demonstrable public service on a regular basis is one of the best ways we know to ensure we retain our spectral resources. Building Phase 4 and using it for the general public benefit is not just a further expression of altruisism, then, but an element in the preservation of our most valuable resource — spectrum — for decades to come. We *must* make better use of our UHF spectrum soon or it surely *will* be gone!

The challenge of Phase 4 is this: Come to understand the potential for unprecedented levels of public service and technical achievement; develop the plan to implement the system that manifests the potential and wisely manage the powerful resource that results.

Is amateur radio up to this challenge? We obviously believe so, or we would not have brought this preliminary vignette to your attention. We sincerely believe Phase 4 will be operational in about five years and that it will forever change the nature of our hobby. To realise its full potential, however, substantial effort must be dedicated to first eliciting suggestions on meshing the strawman system with actual needs of the user community. For example, the operational requirements of the emergency communications community are best known by the emergency communicators. The direction and objectives of the packet radio activity are best known to the packeteers, etc. Thus, one of AMSAT's main challenges is to "network" (establish working relations with) its system architects and engineers with the user communities.

To that end, AMSAT is briefing leaders in various amateur radio communities regarding the nature of the project and progress toward specific goals. Conversely, AMSAT is actively seeking inputs on technical and organisational matters. Would-be participants should understand at the outset, however, that this is a long-term project that will require comparably long-term dedication by the participants. ATVers, microwave experimenters, repeater organisations, emergency communicators, traffic networks, packet radio users and all those with a long-term interest are invited to share their ideas on Phase 4 and potential applications. Invitations to participate in applications research studies will be issued in 1987 to individuals and groups who may contribute to the program. Expressions of interest may be sent to AMSAT, Phase 4 Program Manager, PO Box 27, Washington, DC 20044. (Please include a business-size SAE and postage if a reply is sought.)

Phase 4 can change amateur radio for the better by providing real public service while simultaneously providing space-age telecommunications to a broad cross-section of amateur radio. In that sense, it is not something that we would *like* to do, but rather something we simply *must* do!

AMSAT membership is open to the public. Members receive the bi-weekly newsletter, *Amateur Satellite Report*, and other benefits. To inquire about membership and how to get started in OSCAR, send an SASE to AMSAT Australia, c/- Box 1234, GPO, Adelaide, SA. 5001.

FUJI TRAFFIC SAMPLE

The following is sample FO-12 Mode JD traffic from late February collected and forwarded to ASR by DB2OS.

(February 26, 1987)

fm 8J1JAS to BEACON ctl UI pid F0 JAS-1 RA 87/02/26 20:00:06
263 557 730 735 794 879 892 864 003
379 646 002 614 631 618 617 616 617
688 001 698 699 703 697 835 676 926
492 000 000 010 111 100 000 100 000
001 100 001 000

(Further TLM-Frames are completely omitted to save space. . .)

fm D82OS to CQ OX ctl UI pid F0

fm ON6UG to TEST via PA3EFU ctl UI pid F0 (Ohhhh, a new station! ! !)

fm DB2OS to ON6UG ctl SABM + (Let's try to connect him)

fm ON6UG to OB2OS ctl UA (He has received my SABM)

(First ON-DL on FUJI! ! !)

fm OB2OS to ON6UG ctl 100 pid 00 (1st Information Frame)

hello dr om, this is peter from hannover

fm ON6UG to DB2OS ctl I10 pid F0 (1st message from ON6UG)

hello

fm ON6UG to DB2OS ctl I11 pid F0 (2nd info-frame from him)

name freddy

fm ON6UG to DB2OS ctl I12 pid F0 (3rd info-frame from him)

in Ghent (Control-Frames and retries now omitted. . .)

fm ON6UG to OB2OS ctl 113 pid F0
good copy

fm OB2OS to ON6UG ctl I41 pid F0
nice freddy 100% copy

fm DB2OS to ON6UG ctl I42 pid F0
no problem

fm DB2OS to ON6UG ctl I43 pid F0
you are the 2nd station on fuji! ! !

fm ON6UG to OB2OS ctl I44 pid F0
73s

fm ON6UG to DB2OS ctl I45 pid F0
bye

(next 5 minute period)

fm 8J1JAS to BEACON ctl UI pid F0 JAS-1 RA 87/02/28 12:10:02
188 596 714 718 776 880 890 864 003
371 647 002 616 631 625 621 622 623
688 001 723 711 726 719 695 676 926
546 000 000 010 111 100 000 100 000
001 111 001 000

fm OB2OS to G3RUH ctl SABM + (Let's try it again!)

fm G3RUH to OB2OS ctl 100 pid F0 (Oh, nice! Jim's first Information- Frame, but I missed his UA-Frame!)

fm D62OS to G3RUH ctl SABM (Next try to get an US. . .)

fm G3RUH to DB2OS ctl I00 pid F0

fm G3RUH to DB2OS ctl I01 pid F0

fm G3RUH to DB2OS ctl I02 pid F0
Hi! ! !

fm ON6UG to G3RUH ctl SABM (ON6UG also tries to
fm G3RUH to DB2OS ctl I01 pid F0 connect G3RUH)

fm DB2OS to G3RUH ctl SABM
fm G3RUH to DB2OS ctl UA (Now, here we are! ! !)

fm G3RUH to DB2OS ctl DISC (Oisconnect-Frame from Jim)

fm G3RUH to DB2OS ctl OISC
fm ON1KVH to CO stl UI pid F0 (Oh, another station from Belgium on FUJI! ! !)

fm OB2OS to G3RUH ctl SABM + (Again. . .try to connect G3RUH)

fm DB2OS to G3RUH ctl SABM +

fm DB2OS to ON1KVH ctl SABM + (. . .and try to connect ON1KVH)

fm OB2OS to G3RUH ctl SABM +
fm G3RUH to OB2OS ctl UA (Here it is. . .)
fm DB2OS to ON1KVH ctl SABM +
fm G3RUH to DB2OS ctl I00 pid F
fm G3RUH to DB2OS ctl I01 pid F0
Hi Peter! ! ! > >

fm DB2OS to G3RUH ctl I20 pid F0
hello jim!

fm OB2OS to G3RUH ctl UA
fm DB2OS to ON1KVH ctl SABM +
fm G3RUH to ON6UG ctl SABM

fm G3RUH to ON6UG ctl SABM
fm ON6UG to G3RUH ctl UA
fm DB2OS to ON1KVH ctl SABM +
fm G3RUH to ON6UG ctl I00 pid F0
Hi Freddy ! ! ! > >

fm G3RUH to ON6UG ctl I00 pid F0
Hi Freddy ! ! ! > >

fm OB2OS to HB9XJ ctl SABM + (Try to connect HB9XJ
fm DB2OS to ON1KVH ctl SABM + and ON1KVH. . .)
fm G3RUH to ON6UG ctl I00 pid F0
Hi Freddy ! ! ! > >

fm DB2OS to HB9XJ ctl SABM +
fm DB2OS to ON1KVH ctl SABM +
fm G3RUH to ON6UG ctl I00 pid F0
HI Freddy ! ! ! > >

fm DB2OS to HB9XJ ctl SABM +
fm ON1KVH to DB2OS ctl I01 pid F0 (1st I-Frame from ON1KVH)

godd day first qso

fm G3RUH to DB2OS ctl SABM (Jim connects me and
fm OB2OS to G3RUH ctl UA my TNC-1 answers. . .)

fm DB2OS to On1KVH ctl I00 pid F0 (my 1st I-Frame to ON1KVH)

hello om, name peter and qth near hannover jo42vg

fm ON1KVH to OB2OS ctl I12 pid F0

fm G3RUH to G3RUH ctl I00 pid F0
hi jim > >

fm DB2OS to ON1KVH ctl REJ0

(Fuji switched OFF Mode-JD, all QSOs are broken OFF! 1 I)

———————————————— next JD-Orbit. . .

fm 8J1JAS to BEACON ctl UI pid F0
JAS-1 RA 87/02/28 16:00:12
195 589 692 703 758 879 889 864 003
342 647 002 606 621 617 618 619 687
001 709 705 712 708 674 677 925 581
000 000 010 111 100 000 100 000 001
111 011 000

fm G3RUH to CQ via FO-12 ctl UI pid F0

fm OB2OS to CQ OX ctl UI pid F0 (etc. . .QSOs)

(next 5 minute period)

fm 8J1JAS to BEACON ctl UI pid F0
JAS-1 RA 87/02/28 16:10:00
204 583 703 707 763 878 891 864 003
351 647 002 606 619 615 612 613 613
688 001 714 708 711 711 663 678 926
583 000 000 010 111 100 000 100 000
001 101 110 000
fm G3RUH to OB2OS ctl SABM
fm ON6UG to CQ via VIA CH-3 JAS-1 ctl UI pid F0

fm ON6UG to G3RUH ctl SABM
fm G3RUH to ON6UG ctl DM
fm DB2OS to G3RUH ctl I00 pid F0
hello jim!

fm G3RUH to ON6UG ctl I00 pid F0
cGack again — what a handful! ! > >

fm ON6UG to G3RUH ctl I11 pid F0
qsb on jas ? ?1

fm DB2OS to G3RUH ctl I01 pid F0
yes, very hectic

fm DB2OS to G3RUH ctl I02 pid F0
i'm now on .850

fm G3RUH to ON6UG ctl I02 pid F0
Not much — abt 6 db > >

fm ON1KVH to CQ ctl UI pid F0

fm ON6UG to G3RUH ctl I22 pid F0
ok. . .here sometimes 10 db

fm ON1KVH to CQ ctl UI pid F0
fm G3RUH to OB2OS ctl DM
fm G3RUH to ON6UG ctl I32 pid F0
Peter is calling too > >

fm G3RUH to ON6UG ctl DISC

fm HB9XJ to H89XJ ctl SABM (First HB9-Station! ! !)

fm OB2OS to ON1KVH ctl SABM +
fm G3RUH to DB2OS ctl SABM
fm OB2OS to G3RUH ctl UA
fm HB9XJ to HB9XJ ctl UA

fm DB2OS to ON1KVH ctl SABM +
fm DB2OS to G3RUH ctl SABM
fm ON6UG to CQ via VIA CH-3 JAS-1 ctl UI pid F0

ok see you later bye

---------- next Mode-JD Orbit

(With first Path to USA!)

fm KA9LNV to G3RUH ctl SABM +
fm W3IWI to G3RUH ctl I21 pid F0
gud to wrk u

fm W3IWI to G3RUH ctl I22 pid F0
this stuff really does work

fm &.f1JAS to BEACON ctl UI pid F0
JAS-1 RA 87/02/28 20:01'10
212 579 680 686 739 877 889 862 003
333 647 002 591 617 615 612 612 613
688 001 714 709 713 709 655 877 925
626 000 000 010 111 100 000 100 000
001 101 110 000

fm KA9LNV to G3RUH ctl SABM +
fm G3RUH to KA9LNV ctl DM

fm G3RUH to W3IWI ctl I32 pid F0
errific A first? > >

fm DB2OS to W3IWI ctl SABM +
fm W3IWI to OB2OS ctl DM

fm W3IWI to G3RUH ctl I33 pid F0
has a cupple b4. this is first
intercontinental qso

fm G3RUH to W3IWI ctl I43 pid F0
Yea way out Howie Ga Tom > >

fm G3RUH to W3IWI ctl I44 pid F0
Gosh 4 conn r.'q > >
fm W3IWI to G3RUH ctl I54 pid F0
also see on6

fm KA9LNV to OnSUG ctl SABM +
fm ON6UG to KA9LNV ctl UA

fm DB2OS to KA9LNV ctl SABM +
fm KA9LNV to DB2OS ctl DM-
fm W3IWI to G3RUH ctl I55 pid F0
also db2os.

fm KA9LNV to ON6UG ctl SABM +
fm W3IWI to G3RUH ctl I56 pid F0
let me work him

fm W3IWI to G3RUH ctl I57 pid F0
73

fm G3RUH to W3IWI ctl I05 pid F0
Maywell be

fm W3IWI to G3RUH ctl DISC
fm ON6UG to KA9LNV ctl I00 pitl F0
name freddy qth gent

fm W3IWI to DB2OS ctl SABM
fm DB2OS to W3IWI ctl SABM +
fm D82OS to W3IWI ctl UA
fm W3IWI to DB2OS ctl UA
fm DB2OS to W3IWI ctl I00 pid F0
hello tom

fm W3IWI to OB2OS ctl I10 pid F0
hi we made it!

fm DB2OS to W3IWI ctl I01 pid F0
nice to see you

fm W3IWI to OB2OS ctl I11 pid F0
great!
fm O82OS to W3IWI ctl I22 pid F0
my 1st qso dl/w

fm D62OS to W3IWI ctl I23 pitl F0
great! ! !

fm D62OS to W3IWI ctl I24 pid F0
ufb

fm W3IWI to OB2OS ctl I22 pid F0
gud to wrk u peter

fm W3IWI to DB2OS ctl I23 pid F0
this is TAPR modem prototype

fm OB2OS to W3IWI ctl I32 pid F0
my 1st qso dl/w

fm W3IWI to D82OS ctl I23 pitl F0
this is TAPR modem prototype

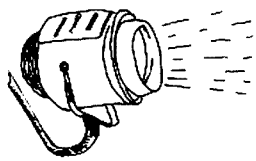
fm OB2OS to W3IWI ctl145 pid F0
many traffic now. . .hi

fm DB2OS to W3IWI ctl I46 pid F0
fine, im using original ja with some
your mods

fm DB2OS to W3IWI ctl I47 pitl F0
how many stations are active in usa on
fuji?
(End of transcript)

—de Graham VK5AGR

ar



Spotlight on SWLing

Robin Harwood VK7RH
52 Connaught Crescent, West Launceston, Tas. 7250

Well, we are right into Winter now and conditions have rapidly altered. Now we are hearing signals from Europe during our local daylight hours, while high frequency propagation has dropped off during the evening hours. It pays to keep an ear on the lower frequencies around 0200 UTC for signals coming in across Antarctica from Europe, with signals from DW and Radio Berlin International especially prominent. You will notice some auroral flutter on them, particularly on the 49 metre broadcasting allocation.

By now, many of you will have heard Radio KSDA, in Guam. This station, owned by the Seventh Day Adventist Church, has been plagued with delays caused by unseasonal weather in Guam, to the erection of antennas and installation or equipment. At deadline time, they had been heard with test- tones and expected to commence broadcasting in mid-March.

Another private American International Broadcaster, WCBN, in Massachusetts, USA, also should be operational by now. This station is owned by the influential Christian Science Monitor, in Boston. I believe that it will carry news and information. The same organisation also brought out Radio KYOI, In Saipan. This has been carrying contemporary rock and pop music, primarily to Japan, but they have indicated that they had no plans yet to link the two stations.

To get the current information as to the operating times and frequencies of these new stations, I would strongly recommend you check the various DX programs or consult the current *International Listening Guide*. The once current information I have is now out-of-date!

And, while we are on the ILG, some months ago I may have mentioned that they were going to publish a 320 page *International Broadcasting Handbook 1987*, due for release around January. Advance prices were quoted and a number of orders received. On February 12, *Media Network* announced the handbook was not going to be published this year, after all. Apparently printing delays were given as the principal reason why the project was cancelled. Bernd Fiedewald, the editor, has said that he would be handling refunds to those who had ordered in good faith. To quote the March edition of the *Australian DX News* — "It seems that there is more involved in DX publishing than meets the eye."

Several years ago, I was one of many DXers and SWLs caught in a subscription to a Finnish edited publication called *Voices*. It was primarily devoted to forthcoming programs over international radio stations. After about six months, it folded and was declared bankrupt, failing to get sufficient information or advertising to pay its way. Quite a number paid advance subscriptions through clubs, etc. Now I hasten to add that I am not implying this was the case with ILG, as they have had a very good track record with their quarterly *World Frequency Survey*. I do advise that you do check with experienced DXers and clubs before advancing subscriptions to some of the newer publications.

I was recently also caught with a local mail order firm with an order for non-technical books. The firm/bookshop went out of business while my order was being attended to. Another firm took the order over and partially filled it, yet I was caught making a double payment. It is doubtful if I will be able to recoup the over-payment as the original company has been dissolved. It does pay to be extra careful.

March 11, saw a very historic anniversary in the history of shortwave broadcasting. It was the first broadcast on telephony from Eindhoven, Holland. The Philips laboratory built an experimental 35 kW transmitter on *30.200* metres and commenced broadcasts on that date over station PCJJ. It was heard in Bandung, then in the Dutch East Indies (now Indonesia) and resulted in regular international broadcasts. Sixty years has now elapsed since then and *Radio Netherlands* still operates, although it has been independent of Philips for many decades.

I do not think it was the first broadcast on telephony over shortwave, as I have a very hazy recollection that the Empire Broadcasting Station, forerunner to the General Overseas Service, broadcast the *Remembrance Day Service* from the Cenotaph, Whitehall in 1924. As well, I think that the forerunners to our ABC aired descriptions of the 1925 Test Series in Melbourne over shortwave.

Just as I was preparing this column, I came across another clandestine station. It is hostile to the present regime in Iran. The call sign is *Radio-ye Zahmatkeshan — Irani, or* Radio Iran Toilers. It is in Farsi (Persian) and was observed at 0325 UTC on the unusual frequency of 10.870 MHz. According to the March *ADXN*, the station is sympathetic to the banned *Tudeh*, and is reportedly from Afghanistan. As most senders carrying Radio Afghanistan are based within the USSR I would consider this sender is also located there. The station is on 10.870, 6.125 and 4.775 MHz from 0230 to 0330 UTC and 1530 to 1730 UTC. The lower channels, presumably, would be better heard on the latter release.

Just in closing, I came across another DX program, Radio Prague in Czechoslovakia. I heard it at 0345 UTC, Friday, on 11.990 MHz in ENglish to North America. You can also try 7.345 MHz at the same time as Prague is coming in well on that channel as I write this column.

Well, that is all for this month. Until next time, the very best of 73 and good listening!

—Robin VK7RH

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SATELLITE ACTIVITY FOR THE MONTH OF JANUARY 1987

1. LAUNCHES

The following launching announcements have been received:

INTL NO —1987	SATELLITE	DATE	NATION	PERIOD min	APG km	PRG km	INCL deg
001A	Meteor 2-15	Jan 08	USSR	104.0	973	960	82.5
002A	Cosmos 1811	Jan 09	USSR	09.7	367	181	55.0
003A	Cosmos 1812	Jan 14	USSR	97.8	677	84w	82.5
004A	Cosmos 1813	Jan 15	USSR	90.0	307	208	72.8
005A	Progress 27	Jan 16	USSR	88.9	280	189	51.6
006A	Cosmos 1814	Jan 21	USSR	100.7	815	775	74.0
007A	Cosmos 1815	Jan 22	USSR	93.5	553	345	50.7
008A	Molniya 3-31	Jan 22	USSR	12h16m	40800	473	62.8
009A	Cosmos 1816	Jan 29	USSR	104.9	1024	979	82.9
010A	Cosmos 1817	Jan 30	USSR	88.4	224	192	51.6

2. RETURNS

During the period 21 objects decayed including the following satellites:

1986-007A	Cosmos 1792	Jan 05
1966-099A	Cosmos 1807	Jan 23
1986-010A	Cosmos 1817	Jan 31

In addition, a further 22 objects are now reported decayed in earlier periods.

3. NOTES

1987-005A Progress 27 carried expendable materials and *varied cargo* for the orbit station MIR.

1987-008A Molniya 3-31 has on-board communication equipment designed for long-distance telephone, telegraphic radio and television broadcasting.

1987-001A Meteor 2-15 has on board equipment for obtaining global pictures of cloudiness and of the underlying surface in the visible and infrared ranges of the spectrum.

—Contributed by Bob Arnold VK3ZBB

ar

Listening Around

Joe Baker VK2BJX
Box 2121, Mildura, Vic. 3500

Because of a shortage of shipping, it was impossible to collect us from Morotai until almost a year after the war was over. By the time we reached Sydney in the *Kanimbla* the cheering was all over. One of the last units to leave Morotai was the Army Amenities Broadcasting Unit (9AD). The Army newspaper *Table Tops* (1st Australian Press Unit) had been forced to close down when the newsprint rolls became saturated with water.

Sergeant Major Barnett was on duty for the last broadcast and the technical boys were gathered around the transmitter ready to take it apart as soon as the last strains of God Save the King had died away for the last time. They worked through the night and by morning, everything was in pieces ready to be placed aboard the *Kanimbla*. A portable transmitter, (10 watts) the *Voice of North Borneo* was already on its way by ship to Morotai, and for this reason, the military style cigar-shaped transmitting masts of 9AD were left in place.

Radio station 9AO was actually a ship's emergency transmitter which had been fitted into the back of a military truck and equipped with two turntables and microphones. Warrant Officer Spencer was in charge of this unit and he eventually went to the BCOF Forces in Japan.

All of our 2000 records were left for 9AO to use. (They probably included one which was played frequently on 9AD — Don't Fence Me In by the Andrews Sisters).

I still recall the trip back on the *Kanimbla*. We came back south of New Guinea through the Arafura Sea. As we left Morotai, the distant volcano in the Halmaheras could be seen smoking ominously. The three native boys who did our washing, Bernadoes, Martin and Senanggi, had bid us a sad goodbye just before we left. We had fitted them out with odd pieces of military uniform and boots and gone down to the shore where they packed everything in their lakatoi (native boat) and bid us a tearful farewell.

They left across the water to the island of Metita and were halfway across when they were forced to return because of a stormy sea. This meant they had to spend another night with us and the same procedure, with more tears, was repeated the next day.

The trip to Sydney took about two weeks and life aboard the *Kanimbla* was not as enjoyable as the outward trip on the American *Frederick C Ainsworth*, particularly the food aspect was not as good. On the American ship we were served counter-lunch fashion with divided trays and a choice of food. On the *Kanimbla* we had army mess tins and food like bully beef and dog biscuits. (Since my Army days I have steered well-clear of bully beef — which is quite expensive now anyway — and I certainly shy away from baked beans and dog biscuits!).

I well remember when we came within sight of Cape Yorke — a few trees which appeared to come down to the water line and not very much else. It was our first glimpse of Australia for almost a year and it did us a world of good to see that landfall.

I also remember the Army barbers aboard the *Kanimbla*. All that was required to qualify as an Army barber, and make some extra money to supplement the meagre pay, was to get yourself a stool for the customers to sit on, a comb, pair of scissors and mirror and you were in business. It was necessary to have a certificate from the Barbers Association, or whatever, and the charge made was usually something agreeable between yourself and your customer — usually about a "zack" (sixpence or 5 cents in decimal currency).

As we came down off the coast of Queensland, still within the tropics, some of the boys elected to sleep on deck and admire the stars.

As we journeyed further south we were told we could send *Marconigrams* from the ship so I sent a wire to my aunt, in Sydney, telling her that we were due to arrive at Walsh Bay in a day or so.

When we arrived at Walsh Bay there were very few people on the wharf to welcome the returning troops and my aunt was not among them. I found out later that my brother Frank, who was in the RAAF, planned to meet me but had mistaken the wharf! However, I spotted a newsboy nearby and arranged for him to telephone my aunt, but again by disembark time there was still no one to meet me. I also discovered, just before leaving the ship, that someone had stolen the American loudspeaker I had acquired on Morotai. (Not a very good homecoming!). However, I still had my Samurai Sword — and still have today, 40 years later.

We were collected from the wharf and I cannot quite remember where we were taken to. I may have been to the LTD (Leave and Transit Depot), at Adison Road, Marrickville.

Although the war was over, the Army held on to us and we were discharged on a points system. To fill in time whilst awaiting discharge I was posted to an Army Amenities Unit at 113 RGH Concord, which is now a hospital for civilians. My job here was to issue tennis racquets, cricket bats and other various types of sporting equipment to soldier patients who were able to walk. Also, I had to be in the wings when live concert parties entertained the patients at the hospital.

Here I came to see how Hal Lashwood and Roy (Mo) Rene did their ABC Press Gang Broadcasts. They were broadcast from the same theatre, sound effects men and all. These live artist shows by Roy Rene and Hal Lashwood were well received by the soldier patients.

Time passed and I was sent to the Sydney Showground Agricultural Pavilion to be released into "civy street." They had calculated my deferred pay and gave me a £6 Dedman suit (which was the standard type of suit everyone was given) to make up for the one lost when one enlisted.

I was discharged on a momentous day — July 4, 1940, American Independence Day, and I was left to make my own way along "civy street" — a personal war of my own which is another story.

MORSEWORD 2

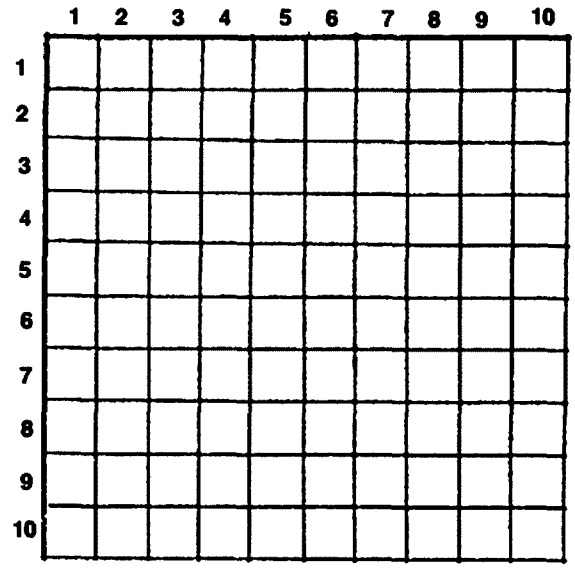
Compiled by Audrey Ryan
Wife of Joe VK3ABA

ACROSS

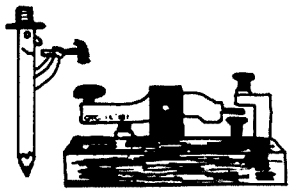
1. Some Italian notes
2. Perspiration
3. Vehicle
4. Shoot
5. Sphere
6. Tibetan monk
7. Extracts ore
8. Native of Turkey
9. Wage
10. Mature

DOWN

1. Egg on
2. Small ship
3. Keen
4. Lease
5. Payments for premises
6. Part of a bird
7. Move through water
8. Small nail
9. Happen afterwards
10. Soft food for babies



Solution page 62. . .



Pounding Brass

Gilbert Griffith VK3CQ
7 Church Street, Bright, Vic. 3741

I'll bet you "loonie tunes" out there think that I am a loony too! And you would be right. I mean, who goes without a beer all week just for a new piece of coaxial cable?

Not to mention all that expensive equipment in the shack, probably costing more than the family car. It is not just other amateurs who think I'm a little "nutty" though. I have been hang-gliding for 12 years as well! Trying to make people understand that taking off (called "jumping" off by the uninitiated) from Mount Buffalo Gorge is easy and safe is just a big waste of time. If you want to fly, you do the training and away you go.

Similarly, trying to get someone to learn Morse code is an uphill task. Comparing Morse with learning to walk is unfair, because we don't need Morse! How do you convince them that it is easy, quick and fun? Like jogging. You can't. Aside from a bit of bullying by the establishment in making CW a compulsory subject for a licence, there is very little you can do.

Let's face it, unless there is "something in it for them," is is almost impossible "learning" anybody anything.

If you are reading this you probably enjoy radio as a major hobby. If you are old enough, you may remember how radio started. Briefly, one would hear or see a radio in action and immediately rush home to build a crystal set — then rushing out again and asking questions left, right and centre because it didn't work. There were no kits, no television, and not much broadcast radio. You had to learn a bit of electronics or you didn't get off the ground.

The situation today is more like rush, rush, rush, earn, earn, earn, spend, spend, spend. Now that you are an amateur you may have sweated over the CW broadcasts and swotted up on the Regulations and then ticked a few boxes to get your piece of paper. Now, all of a sudden, it is two metre repeaters, DXing, satellites, EME, CW, HF, VHF, UHF, RTTY, ATV, packet, mobile, portable, contests, awards, intruders, conventions, field days, nets, scheds, home-brewing, antennas, test equipment, TNCs, computers, modems, third parties ... Help! ! ! Is it any wonder that Knights of the Key are a rarity? And how many amateurs do you know who get on the air as much as they would like to? Especially the "loonies" who also try to participate in the clubs, institutes, QSL bureaus, magazines, and JOTA. You hardly ever hear them. Even my CW is getting rusty, and I do as little as possible of the above!

Who are we to bully people into a pigeon hole at the expense of all others?

If most amateurs want to throw away the key as soon as they get their licence, forgetting their hard-earned knowledge, let them. I know it is a bit annoying when you are QRMed by a phone operator, and he can't remember enough CW to hear your QSY!

If ... there was a new class of licence that started with CW only it might pull in a few new members. Then they would discover for themselves what brass pounding means. Maybe the Russian system is better, who knows?

Wouldn't it be a snap to pass a CW only examination, with no SSB, nothing really complicated at all. But I wouldn't count on the computer groups going for it.

Boy Scouts (or Girl Guides) with a special, low power CW licence and say, 1.800 to 1.810 MHz of band to play with is my idea of a saleable idea. Home- brew equipment only with a cheap examination (taken by an amateur?) and no licence fee, because the knowledge is an asset for the whole country, not just for amateur radio, If I hear the 'top-banders' screaming, just have a listen to that segment of the band in the evenings, not a soul. And it is a challenging band. The more I think about it the more I think it is a good idea. Do you? If there was enough response we might actually get something done.

And now ... something you have all been waiting for.

Circuit modifications for the EA78 Accu Keyer (see AR February, page 6 for circuit).

1 Put a second diode in series with CR1.
2 Change C1 to .18 uF (add .082 uF).
3 Change C2 to 22 pF.
4 Change R1 to 150 k.
5 Change R2 to 150 k.
6 Change R3 to 270 k.
7 Change R4 to 150 k.
8 Try putting in a DPDT switch to change the sense of the paddles for working with your 'other' hand!

I also have a circuit for a weight control which I have not tried, I will describe this if there is an interest shown.

I am pleased to announce that I have received two letters so far (in mid- February) from brass pounders.

Neil VK3IJ, is concerned about the high failure rate in the code examinations and the large number of amateurs who do not use code. Hence this article.

And Steve VK3JY, is looking for a sympathetic ear for that all-important first CW QSO. (I will be phoning him tonight). I will attempt to compile a list of beginner nets for those, like Steve, who are extra shy about that first QSO, as I can only help a few myself.

Try having a list of things you may need to send, and keep it in front of you so that you can send from the printed word for the first few QSOs. By the time your nerves settle down you will be ready to send "off the top" and won't need the notes. I still write the occasional word down that is difficult to spell "off the top."

An easy way to start is to forget about calling CQ and tail-end someone who you find easy to copy. You can get away with this method of making-contact for years if you want, and it assures that you will be able to copy the other station without having to make up stories about ORN or families, etc.

Spend a few minutes every day sending to yourself, maybe out of a book you are reading. Better still, send to a tape recorder and see if you can copy the play-back. Don't *worry* about speed, but go as fast as you can without making too many mistakes. Then, when you go on air you can slow up a little and really send well.

Unfortunately, I cannot remember ever having worked Marshall on the air. But anytime you happen to hear me, do not hesitate to give me a call. If you can stand the mistakes I make, I will be more than happy to have someone to rag-chew with, together with those I already know. I really love those break-in rag-chews that sometimes go on for hours, with people dropping in to say hello or just to test a new antenna or even to spread a piece of gossip! Try it, you will find that nearly everybody on a particular band knows everybody else and even something about their families.

Maybe that is why we are 'Knights of the Key!'

I hope you can join in the fun.

—73, Gil.
ar

FACES BEHIND THE KEYS

On December 28, 1986, some of the 80 metre CW operators got together for an "eye-ball"-come-social occasion. This meeting was held at the QTH of David VK3DVW, who had prepared a sizzling barbeque and cold 'fridge. Needless to say, a grand time was had by all (including the wives). Most of the operators pictured are regulars on the Friday night CW net. The topic of conversation — Brass Pounding of course!

From left: John VK3PIZ, Bryan VK3BNO, Les VK3BPW, Harvey VK3AHU (Early Bird Net), Bob VK3AQF, John VK3CAL, Maurie VK3CWB and David VK3DVW.

Club Corner

SUNSHINE COAST AMATEUR RADIO CLUB

The Sunshine Coast Amateur Radio Club represents amateurs within an area, extending from Caloundra to Maleny/Mapleton and Tewantin/Noosa. The organisation has over 60 members, comprising in 1986 of — 34 Full Calls, 14 Novices, nine Limited/Combined and six unlicensed operators. The Club was formed in 1970 with the aim of promoting amateur radio in this area.

Following a recess, it was reformed in 1978 under the leadership of Colin VK4CY, who remained active within the executive until his untimely death in 1986. The Colin McCamley VK4CY Memorial Shield honours the former President, and is awarded annually for service to the Club.

The Club operates a weekly net each Thursday evening, at 0900 UTC, using the call sign, VK4WIS, under the control of Ted VK4AEM, Net Co-ordinator. The Club's "Pelican Award" can be obtained by calling in on this net. The WIA news is relayed by the club's VHF repeater each Sunday morning at 2300 UTC, followed by a call-back and club news under the direction of Jeremy VK4ZCC.

A repeater service is maintained on VHF and UHF using the frequencies of 146.850 and 438.075 MHz with the call sign, VK4RSC. An experimental digipeater is also operational. Call sign VK4RSA is yet to be confirmed by the DOC. The repeater systems use innovative technology developed by Technical Officer, Roy VK4ARU, and are all radio remote-controlled.

The annual club program has followed a set format for some years with the AGM in February. In June, the club receives a visit by representatives of the WIA Bookshop and the Federal Delegate, who reports directly to the membership. August is Club Auction Night, which is always popular.

The year ends with a Christmas barbeque.

Full use is made of video tapes with the subjects not necessarily related to radio.

Club President is Paul Dunford VK4BPD. Further information about the Club may be obtained by writing to the Secretary, PO Box 80, Nambour, Old. 4560.

—Contributed by Joe Ellis VK4AGL, Secretary
ar.

SOUTH EAST RADIO GROUP INC

The South East Radio Group will be holding its popular Annual Convention again in June this year. This is the 23rd Convention held by the group in Mount Gambier.

The convention attracts much Interest due to the many interesting trade displays kindly staged by the various companies involved in the retail of amateur related equipment. There are, of course, the ever popular competitions. Such events as fox hunts, hidden transmitter hunts and scrambles, to name a few, are available for those interested in competing for excellent prizes and the perpetual trophy. Of course, it should not be forgotten that the renewal of old acquaintances and the meeting of those faces behind the microphone is, to some, the most important part of all.

The convention starts on Saturday, June 6, with registration and a few events. The Sunday sees most of the serious competitions and the famous Lunch and Teas organised by the hardworking ladies. It really is a must to come along to Mount Gambier on this weekend and join in the fun.

Mount Gambier is situated on the side of an extinct volcano, the Blue Lake, about halfway between Adelaide and Melbourne. There is much to see and do in this lovely city, so come and stay a few days while you are in town for the convention. Accommodation is normally plentiful, but as the city plays host to many sporting events, etc, on this the Queen's Birthday Weekend, it is a good idea to book early.

For a full program, accommodation guide and any other queries, please write to the SERG Inc, PO Box 1103, Mount Gambier, SA. 5290.

—Contributed by David Edwards VK5FF, Secretary, SERG
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NORTH WESTERN BRANCH

Meetings of the North Western Branch are held on the second Tuesday of each month at the Penguin High School, beginning at 7.30 pm. Meeting are brief and are followed by an activity or topic of interest and supper.

Activity and club stations nights, club call sign VK7NW, are usually every second Friday at PHS, 8.00 pm.

Interests within the Branch include HF Operation, ATV, Special Communications, Antennas and Computing.

Visitors are welcome at meetings and activity nights.

For further information contact John Webster VK7KDR, President, or Tony Clayton VK7AH, Secretary, (phone 24 5375), or write to the North Western Branch, PO Box 194, Penguin, Tas, 7316.

—Contributed by Tony Clayton, Secretary, North Western Branch
ar

ANNUAL FIELD DAY — PORT MACQUARIE

Queen's Birthday Weekend, June 6-7, 1987 will unveil the 15th Annual Field Days to be conducted by the Oxley Region Amateur Radio Club, at Port Macquarie.

The two days of amateur radio activity will once again see a packed program of popular attractions. In fact, the Oxley Club will repeat last year's best-ever program with one or two additions.

OXLEY MOBILE AWARD

An excellent unique award, designed to encourage contacts with other stations whilst travelling to the Port Macquarie Field Days each year. It suits all contestants and a good concentrated effort is required to log 25 station and capture the award certificate. Not easy — but really worthwhile and good fun!

FOXHUNT CHAMPIONSHIP

The "Oxtales Cup" Foxhunt Championship will once again bring out the foxhunt boys complete with wizardry and know-how — plus all the excitement as the hounds charge off! There are four foxhunt championship events on Saturday and a further four on Sunday. A points score system applies and the trophy is great. The first championship event starts at 1400 on Saturday — be early please.

CW SENDING CONTEST

This is becoming a very popular event and is a test of ability to send CW accurately, irrespective of speed. You can enter between 1000 and 1500 on Sunday.

REGISTRATIONS

The Registration Desk opens at 1000 on Saturday and 0900 on Sunday. Super prizes are awarded for Lucky Registration winners with more lucky hour prizes each day.

SURPLUS GEAR SALE

The ever-popular Surplus Gear Disposals Sale runs continuously through both days. Oxley Club does not charge any commission and the disposals are made by personal negotiations. Buyers are usually ecstatic! Trade Stands and the WIA Book Stall are available too.

There is plenty of activity at Port Macquarie Field Days where the emphasis is on catering for the family. Home-brew, QSL card, old gear, handy kinks, computer programs are some of the other popular contests for amateurs.

Quizzes, crosswords, mystery objects, handycraft, lucky dips are the contests to keep the rest of the family happy. Coffee and tea are served continuously on both days — free of charge. Also, you will see an ideal QTH location for the Big Days. The RSL Youth Hall at Port Macquarie is situated right at Oxley Beach, with Oxley Sports Oval for the children to exercise nearby. A truly beautiful location.

PROGRAMS

A large *number of programs* are posted each year. Should you require a copy contact the Club Secretary, Lester O'Connell VK2BFP, at The Oxley Region Amateur Radio Club, PO Box 712, Port Macquarie, NSW. 2444, Phone (065) 83 1100.

—Contributed by Lester O'Connell VK2BFP, Club Secretary
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QSP

DELONG'S LAWS OF NETWORK PROGRAMS

1. Projects progress quickly until they become 90 percent complete, then they remain at 90 percent complete forever — it is called the transitional operations and maintenance (TOM) period.

2. One advantage of fuzzy project objectives is that they let management avoid embarrassment of estimating the corresponding costs.

3. Project teams detest progress reporting because it vividly manifests their lack of progress.

4. When project milestones appear to be met, management must have overlooked something.

5. If everything seems to be going well, you obviously don't know what's going on.

6. If project content is allowed to change freely, based on external requirements, the rate of change will exceed the rate of progress.

7. There is never enough time to do it right the first time, but there is always time to do it over.

8. Interoperable and back-up systems . . . won't; they just cost more to implement.

9. In consideration of reliability, fail-safe circuits will destroy all others.

10. Build a system that even a fool can use, and only a fool will use it.

11. It is Impossible to build a foolproof system because fools are so ingenious.

12. A system built to specifications will inevitably pass all system development tests and operational tests, yet fail to do the job the user needed.

13. The greater the importance of decisions to be made, the larger must be the committee assigned to make them

14. Everyone relies on committees, because if more than one person is responsible for a miscalculation, no one will be at fault.

15. The more urgent the need for decision, the less apparent becomes the identity of the decision-maker.

16. Enough research will tend to support your hunches, now called conclusions.

17. Concerning the need for network sustaining engineering, the more complex the concept, the more simple-minded is the opposition.

From *KH6BZF Reports* February 3, 1987

A genius unable to express himself is no better than a silent fool.

From *KH6BZF Reports* January 20, 1987

PUBLICATIONS OF INTEREST

The first edition of the *International Awards Guide* was printed on December 15, 1986. The guide consists of 434 large A4 size typed and offset printed pages. There are 1027 awards described therein (rules, size, colours, cost, address, etc), together with 371 illustrations and a listing of 116 valid stations, countries, cities, etc.

Cost of the guide is US$34 or 58 IRCs.

The *DX Bulletin* is issued 11 times per year (monthly, except August) by the Radioclub Ypres of Belgium. A regular issue has 12 pages with up-to-date coverage of DX events. New DX information is included in the bulletin up to two days before mailing.

A sample copy of the bulletin (air mail) costs US$1 or two IRCs. A subscription is US$10 or 17 IRCs for 11 issues (surface mail) or US$11 or 19 IRCs (air mail).

For further information or copies of the above publications, write to the Secretary, Radioclub Ypres, PO Box 32, B-8900 Ieper, Belgium.

—Contributed by Chris Vermote ON4ACV, Secretary, Radioclub Ypres

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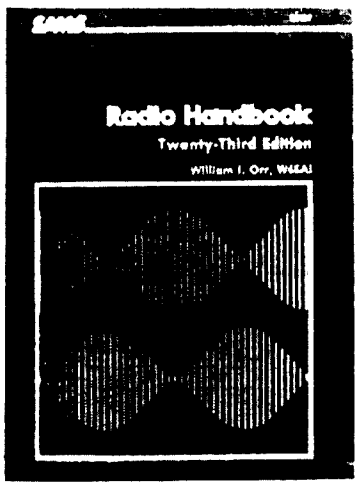

A MUST FOR THE AMATEUR SHACK

The latest edition of the legendary *Radio Handbook* by William Orr has just been released.

Completely revised and updated, this edition contains new material reflecting the latest technology on everything from HF-VHF amplifier design to interference for VCRs and video disc players.

Circuit diagrams, photographs, construction diagrams, tables and charts are all included for expert guidance and instant reference.

Topics include:

- Introduction to Amateur Radio Communications
- Communication Receiver Fundamentals
- Frequency Modulation and Repeaters
- Mobile, Portable and Marine Equipment
- Radio and Television Interference
- Equipment Design, Components and Controls
- VHF and UHF Antennas
- Transmission Lines and Matching Systems

William Orr obtained his amateur radio license in 1934. He is the author of many books, has written over 100 technical articles, and has been editor of the *Radio Handbook* since 1955. His handbooks have won world-wide popularity.

Howard W Sams and Company, a division of Macmillan inc, is a leading technical publisher of electronic, computer and engineering books. Sams and Hayden books are distributed in Australia by Pitman Publishing.

For further information please contact Sue Boundy at Pitman on (03) 699 5400.

The *Radio Handbook* — RRP $75.00.

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FIRST REAL POCKET PORTABLE

If it were any smaller, you would have trouble keeping sight of it! That is the new IC-u2A (micro-2) from Icom. The first *true* pocket-sized two metre portable amateur radio transceiver — a tiny package with all the features that have made Icom hand-held transceivers famous.

The world famous Icom IC-2A, the single biggest selling hand-held in the world, the transceiver that turned hand-held technology upside down with thumb-wheel synthesised frequency control, has evolved yet again to lead the portable race with the state-of-the-art equivalent to thumb-wheels, block control micro-switches.

The palm-sized IC-u2A, measuring just 58 x 140 x 29 mm (WHD), uses a series of three micro rocker switches to select frequencies in the range of 144 to 148 MHz in steps of 1 MHz, 100 kHz and 10 kHz, or by using the UP/DOWN scan button, this unit will scan the entire band in increments of 5 kHz.

Ten memories store your favourite simplex channels or repeater outputs. Standard repeater splits of -600 and +600 kHz are selectable from a rear panel switch. Memory channels can be easily recalled using another micro rocker switch on the top panel.

Frequency and memory channel in use are displayed on the large, easily read soft green LCD display. Night time use is enhanced with the inclusion of a display backlight, operated by a mini-switch conveniently located directly below the PTT switch. A slide switch adjacent to the PTT switch allows frequency locking to guard against accidental off-frequency operation.

The receiver circuit uses a dual conversion design with IF frequencies of 16.900 MHz and 455 kHz combined with a multiple stage FET front end for outstanding sensitivity (less than 0.25 uV or -12 dBu for 12 dB SINAD) and selectivity (plus more than 60 dB rejection of spurious signals).

The transmitter section uses a three stage power amplifier circuit to produce one watt RF output (selectable to 0.1 watts) into a very short, high efficiency, flexible antenna, for a battery pack power drain of only 600 mA on full transmit.

A 'power save' feature in the IC-u2A reduces idle receive condition power consumption to a tiny six milliamps by signal sampling after 30 seconds in the idle state. Normal functions are resumed immediately if the transceiver is operated or a signal is received on the monitored frequency.

A range of optional extras is available for the IC-u2A.

The ultra-compact IC-u2A is on display at your local Icom dealer now, where it will soon be joined by the IC-u4, a 70 cm version with the same outstanding features as its two metre counterpart.

For more information, contact your local authorised Icom dealer or Icom Australia, 7 Duke Street, Windsor, Vic. 3181, phone (03) 51 2284.

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GOOD THINGS DO COME IN SMALL PACKAGES

In today's world of high technology marine transceivers, small is beautiful. And Icom, with decades of experience in the manufacture of state-of-the-art mobile, portable and marine transceivers, leads the field in compact transceiver design.

A shining example of this is the new Icom IC-M55, an ultra-compact, go anywhere marine transceiver that is incredibly small, but packed with high technology features.

Measuring only 5.25, 1.75 and 6 inches (140 x 50.5 x 163 mm WHD), smaller than most SATNAV receivers, and weighing only 1.3 kg, the IC-M55 can be mounted almost anywhere for convenient and easy access.

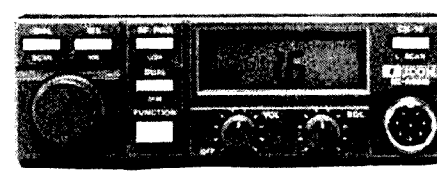
The IC-M55 compact marine transceiver covers the 78 international VHF marine channels and can be programmed for almost any authorised VHF marine channels. The 10 instant access memory channels can be used to store your most used marine frequencies.

A priority monitoring function lets you keep a listening watch on the emergency or your favourite communications frequency, even during a contact on another channel.

The fully synthesised IC-M55 can scan for signals on the 10 programmed memory channels or across the entire range of user-specified VHF marine channels.

A large, bright LCD readout makes it easy to read the display even in direct sunlight. A display dimmer switch lets you adjust the brightness of the display to suit your own preference.

A full 25 watts of output power makes the IC-M55 one of the most powerful VHF marine transceivers, for its size, on the market today. For close quarters operation, a one watt selectable low power output can be used.



With three watts of crisp, clean audio output from its internal speaker, or five watts from an external speaker, you will not miss anything, even in the worst weather conditions.

The rugged, die-cast aluminium chassis and plastic mylar moisture resistant speaker can take a lot of punishment. The IC-M55 is built to last.

See the IC-M55 at your nearest authorised Icom Dealer or contact Icom Australia, 7 Duke Street, Windsor, 3181. phone (03) 529 7582.

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BROADCAST STATION GUIDE

A new edition of the Department of Communication's guide to radio and television stations is now available.

The guide lists all the broadcasting services within Australia to September 1986, with their respective call signs, frequency, radiated power and site details.

The book titled, *Radio and Television Broadcasting Stations* is a valuable reference source for broadcasters, students of communications, and the general public.

It is available from Australian Government Bookshops for $14.95 each.

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PACKET RADIO

The Sydney Amateur Digital Communications Group wishes to announce the release of SADCG Digital Repeater (DR) software, version 2.3, which

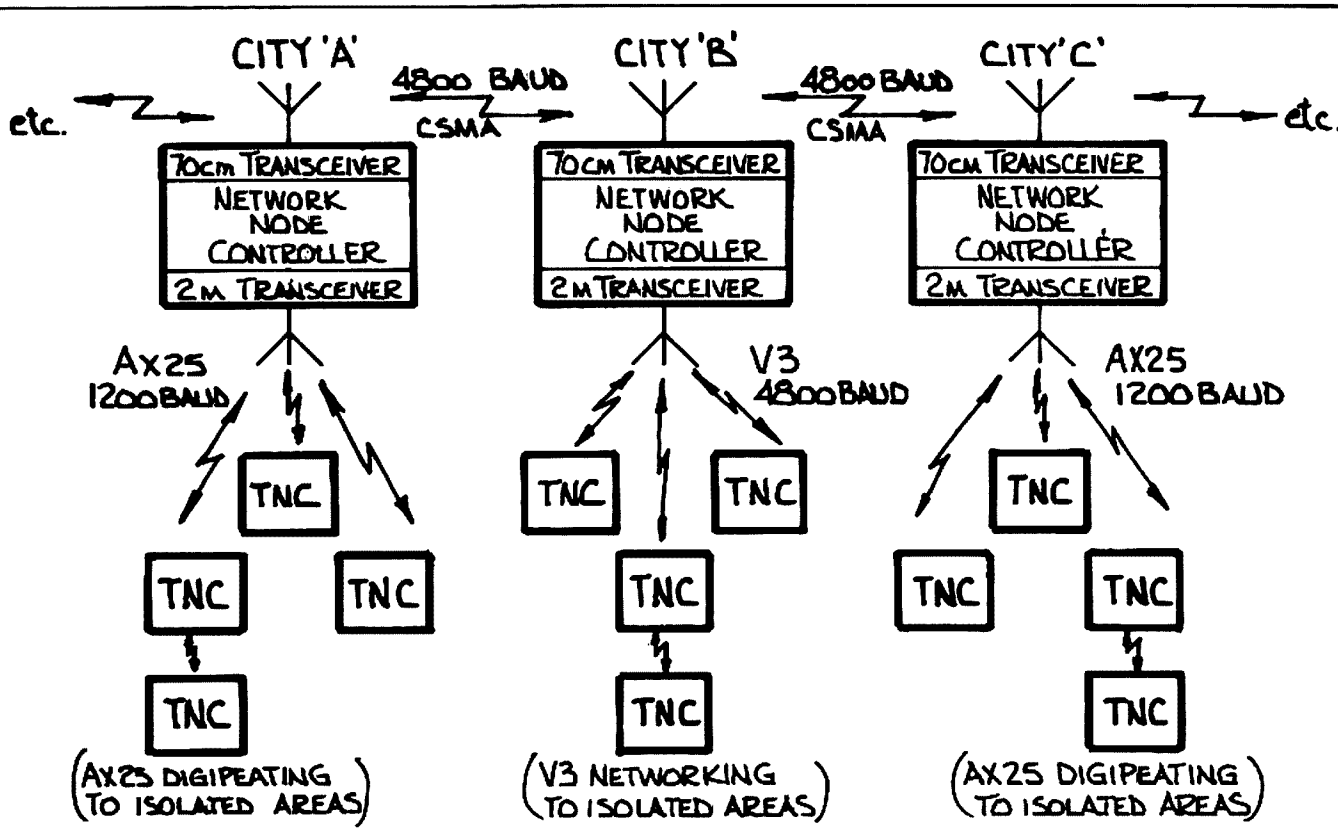

Figure 1: An example of a Packet Network for Australia.

is a result of the new DOC regulations announcement in November 1986, relating to the phasing out of Vancouver V2 protocol.

To meet the new regulations, there has been a release of Vancouver V3 protocol (which meets the DOC requirements) and a phasing out of Vancouver V2 protocol. It was decided to upgrade the SADCG DR to cater for Vancouver V3, plus provide functions to AX25 users, that were available to Vancouver V2 users, (refer to January issue of AR) except for those functions which do not apply to AX25.

The following functions are now available to AX25 users:

HELP	lists the available commands to the users.
TIME	gives the current time, along with DR identification and location.
STATUS	gives status report of DR including error log.
CLEAR	clears the Common Communications Area (CCA) of the DR.
SAVE	saves the previous channel activity into the CCA.
DUMP	displays CCA of DR in both Hex and ASCII format.

There are also control station commands, some of these are:

MSG	loads a short message, which is tagged to the DR time/ID frame.
TRAP	allows the control station to run a trace in the DR, used in remote diagnosis of DR problems, should they occur.

Of course, this software is only available to amateur radio groups, who are operating or planning a licensed Digital (Packet) Repeater and is presently only available for the VADCG TNC+.

* * * * *

The Hamilton Area Packet Network (HAPN), in Canada, have recently announced their 4800 Baud radio modem, for use in amateur packet radio. This revolutionary modem allows packets to be passed at 4800 Baud through a standard VHF/UHF transceiver.

The modem uses FSK techniques and can operate at higher speeds using transceivers modified for wide bandwidth, but for the application of providing cost effective network links in Australia, 4800 Baud, half duplex links, will be a starting point.

Two of these modems were obtained by the SADCG, in Sydney, for evaluation and have proved to be successful, operating on two metres, using both Vancouver and AX25 protocols.

The HAPN 4800 Baud modem PCBs are priced at Can$25 each, plus Can$3 p&p, and orders of three or more are Can$20 plus Can$3 p&p. They can be ordered by sending money orders to HAPN, Box 4466, Station D, Hamilton, Ontario, Canada, L8V 4S7.

Parts for the modem are readily available in Australia and total building cost is around $50, and it provides RS232 connection, plus prototyping area.

The HAPN modem could play a significant role in the implementation of an amateur packet network for Australia, because, to provide a cost-effective network, we will have to use Network Nodes that are linked to each other, by a common mode; eg 70 cm, half duplex, CSMA (Carrier Sense Multiple Access), with the highest possible Baud rate through a standard transceiver and, at present, the only modem, at an affordable price, is the HAPN one.

No doubt in years to come, there will be higher speed modems and wide bandwidth UHF/Microwave transceivers that will be available, probably on the commercial surplus market, but for the interim, 4800 Baud on a 70 cm simplex channel maybe the only financially practical alternative for an Australian network.

Figure 1 shows an example of how such a network might exist.

—Contributed by Steven Blanche VK2KFJ, Secretary, SADCG

Australian Ladies Amateur Radio Association

Joy Collis VK2EBX
PUBLICITY OFFICER, ALARA
Box 22, Yeoval, NSW 2868

JAPANESE BY RADIO

Surely amateur radio must be the only pastime that lends itself to so many variations and "sub-hobbies," communication being the theme that draws it all together.

One ALARA member has found a unique way of utilising her hobby of amateur radio to learn Japanese.

Joan Beevers VK3BJB, of Mildura, first started learning the Japanese language nearly three years ago, her teacher being Hishasi Watanabe JI2MPX/MM, and more recently, Mitsuhiro Motoo JE6AAQ, who is teaching her some new vocabulary every day, "so I don't forget" as Joan says.

Joan's Japanese lessons have been rewarding in many ways, one of them being the Japanese friends she has made along the way, notably Kyoko Yoshikawa JH6OCT, and her husband Nobuo JH6OCS, who visited Joan while on a fortnight's holiday in Australia. Joan was able to assist with their travel arrangements, and make their holiday an enjoyable experience, even though Kyoko's English is very limited.

In mid-December 1986, the Beevers travelled to Portland to meet Motoyuki Miyata JG6XLF/MM, when his vessel arrived to load wood chips. When it was discovered that the Captain, Koki Suzuki, was also an amateur radio operator (JR4SST/MM), the scheduled two-hour meeting turned into a six-and-a-half hour visit, with the Beevers being taken on an inspection of the vessel as the Captain's guests. Motoyuki speaks little English, but Joan's knowledge of the Japanese language enabled her to converse with him satisfactorily, and language proved no barrier.

Another important use was found for Joan's Japanese skills when she was asked by Captain Yoshinori Sasada JR5ACC/MM, to assist with marine mobile radio communications, especially relaying weather reports, position, etc, from yachts travelling from Japan for the Melbourne to Osaka Yacht Race, held in March. Captain Sasada has taught Joan the nautical and weather terms used by Japanese operators, as most of them speak no English.

Joan is the only Australian amateur radio operator who has been invited to help the controller of the Akera Net used by Japanese amateur radio operators on board leisure or competitive yachts.

Joan has been licenced for 18 years, and has hosted amateur radio friends from many countries, including America, Japan, South Africa, West Germany and England.

When Japanese exchange student, Shinya Isoi JG2RHT, studied at Merbein High School he was able to contact his father, Teruyuki JG2OTP, every week from Joan's QTH, and after he returned to Japan Joan and Teruyuki continued the weekly sched to keep in touch.

Joan says; "As you can see I keep very busy. It keeps the brain active I can tell you, and makes a nice change from the housework!"

Shirley WD8MEV.

Congratulations, Joan, on a very worthwhile achievement.

TRAVELLING IN THE OUTBACK

Bonnie VK3PBL, will be involved in an adventurous trip up the Canning Stock Route, in Western Australia, which runs approximately 2000 kilometres from south-west to north-east, across the Gibson and Great Sandy Deserts.

Five four-wheel-drive vehicles will be used, and the party, consisting of 10 people and one dog, hope to leave this months and anticipate taking three to four weeks to do the trip from Wiluna to Hall's Creek.

They hope to check into the Travellers' Net each day, and also contact Melbourne when possible.

ALARA GET-TOGETHER

Plans are well under way for the second ALARA Get-Together (details March AR). The OMs are welcome to come along too (I think we would be a little upset if they didn't!).

The last get-together was a very enjoyable occasion for all concerned, and we are looking forward to the next one.

I might be advisable to arm oneself with a plentiful supply of throat lozenges, though, to ward off the effects of laryngitis caused by too much talking! One of the "side-effects" of get-togethers.

Inquiries and registrations to Maria McLeod VK5BMT, 1 Hawkins Avenue, Flinders Park, SA. 5025.

Until next month, 73/33, Joy.

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Education Notes

Brenda Edmonds VK3KT
FEDERAL EDUCATION OFFICER
PO Box 883, Frankston, Vic. 3199

Very many thanks to all those who have offered comment or ideas to the debate about the future of the examination system. I am sorry that I have not had time to reply personally to the many contributors.

A very pleasing response was received, and all comments were noted. A summary of the responses will be published next month, and the range of proposals will be debated at the Federal Convention. Further items arising from this discussion will be published at a later date.

DOC has agreed not to take any further steps until after the Convention, at which Departmental officers will be present.

The debate surrounding the DOC examination devolvement proposal has again emphasised the range of points of view held by members. As with the arguments raised for and against the introduction of the Novice Licence, and the legalisation of Citizen Band, the opinions expressed by the more vocal, and often more biased, members tend to drown out the quietly presented, reasoned approaches.

This is not necessarily a situation which must be decided by majority vote here and now. We are looking at a major change to the amateur system, as big as those mentioned above. It is going to affect all new recruits to the hobby in a very short time. It will quite likely mean an increased workload for a number of members, and a financial commitment from the Institute. We must consider our capabilities both in the short term and over a period of years or decades.

So the voices which must carry most weight in the decision making are those emanating from the members who have the vision to plan a structure which can cater for both present and future needs, and who are prepared to put some effort into the building of such a structure.

We do not intend to stifle or ignore the "They ought to . . ." and "Why don't they? ? ?", but, please, let us know at least an equal and preferably an overwhelming response of "I will do . . ." "We can . . ." and "Let us try . . .".

My best wishes to those sitting for the May examinations. Remember, ***READ THE QUESTION*** — and ***ALL*** the answers, and I look forward to working you on air in the near future.

—73, Brenda VK3KT

ar

FREQUENCY HOPPING

THE AUSTRALIAN ARMY is field-testing prototypes of a frequency- hopping combat radio.

Australia and the United States are the only countries in the world at present introducing a sophisticated jamming-resistant radio system which also has the advantage of being difficult to locate.

The VHF radios are produced by Plessey Pacific Defence Systems Pty Ltd, and are part of a communications system project known as RAVEN.

Total cost of the system is expected to be more than $300 million once approval to proceed with full-scale manufacture is given later this year.

VK2 Mini-Bulletin

Tim Mills VK2ZTM
VK2 MINI BULLETIN EDITOR
Box 1066, Parramatta, NSW. 2150

30TH ANNIVERSARY OF VK2WI — DURAL

Permission was granted to the WIA in 1939 to conduct a weekly broadcast for those members unable to attend the regular meetings. Unfortunately, WWII intervened.

After the War, the VK2WI Broadcasts were conducted from the Eastlakes Chemist Shop of the late Jim Corbin VK2YC. There was a move in the early 50s to find a "Home for VK2WI." The present site was located on the (then) rural outskirts of Sydney and work commenced in 1953.

The official opening was performed on May 15, 1957, by the Hon Allen Fairhall MHR, VK2KB, who was Minister for the Interior.

The Council plans to celebrate the anniversary with a function at Dural. Final details will been given on the Broadcast leading up to the day. Part of the lead-up has been the conducting of a weekly quiz via the Broadcasts. The last day of questions will be May 10, and answers must reach the Divisional Office by Friday, May 15.

The anniversary celebrations will be on Saturday, May 16, afternoon and evening.

The Saturday afternoon at Dural will be a series of fox hunts and field events. The evening will be devoted to the Annual Dural Fireworks Display. On Sunday, VK2WI will be operated as part of ITU Day.

OXLEY REGION FIELD DAY

Further details of this event may be found in the *Club Corner* notes. The Field Day will be conducted as usual by the Oxley Region Amateur Radio Club at Port Macquarie over the June holiday weekend — Saturday and Sunday, June 6 and 7. As a prelude to this event, a quiz with the answers being given on the VK2WI Broadcasts on May 17, 24 and 31, is being conducted. Further details may be obtained by writing to the Secretary, Oxley Region ARC, PO Box 712, Port Macquarie, NSW. 2444.

VK2BOK MUSEUM STATION TO CLOSE

After some eight years of providing a display of amateur radio to the public, the Museum authorities have decided not to transfer the station to the next stage of the Power House Museum.

The display was first established in the original museum when it was in Harris Street. Then, when Stage One of the Power House Museum was established — VK2BQK — was redesigned and installed on the mezzanine floor of the display area. It was constructed in such a way that it could be relocated to another venue. this was to be the next section of the museum, but changes in concept and planning altered this approach. The facility is now to be dismantled and stored, pending investigation of alternative venues under the control of the museum. If *anyone has* any thoughts of a suitable venue, would you convey this to the Divisional Council.

DIVISIONAL COUNCIL

At the close of nominations on February 25, five nominations had been received for the seven vacancies on the Council for the year 1987- 88. The incoming Council has had to seek personnel to fill these vacancies. This is also the time of the year for the various sub-committees to have an input of new and additional *personnel. If you* can assist the Division carry out the many tasks, would you contact the Office with your offer.

CALL BOOK ENTRIES

It is again approaching that time of year to submit any corrections for this year's edition. The entries for Institute members, if not otherwise advised to the Editor, Is the same as that for the address label of AR. In the case of non-members, the details are those the Department has on their files. An entry which Is currently incorrect will remain that way until new information is forthcoming. Some changes of details which have been submitted to the Department do not appear to have been included in the update lists supplied by the Department for the Call Book. The introduction last year of the *SMIS* system to Department record-keeping should overcome these problems in the future. However, it will not correct any currently wrong entry.

When submitting any changes of details to the Department, it would help the Call Book Editor if a copy of the changes were made available to him. This can be done by sending it direct to PO Box 300, Caulfield South, Vic. 3162, or to the VK2 Divisional Office at the address at the top of this column. (Please submit alterations in writing).

TELEPHONE NEWS (02) 651 1489

This Divisional service appears to be settling in well. Should you find that you have missed either of the Sunday Broadcasts at 11 am or 7.30 pm, then call — out of broadcast hours — (02) 651 1489, for a summary of the weeks news.

NEW MEMBERS

A warm welcome is extended to these new members who were in the March applications.

K J Cavanagh VK2CAO	Gosford
I K Dunlop VK2AVS	Murwillumbah
B F Hammond Assoc	Coogee
R K Harrison Assoc	Carlingford
P Oger VK2NOK	Kingsford
W J Perry VK2XWP	Werris Creek
B Rewak VK2JJJ	Fairy Meadow
T B Sampson VK2TMB	Tamworth
P B Thompson VK2MAN	Kempsey

REPEATER NEWS

During the past year there has been much activity with VK2 systems. The level *of pager interference* has become worse, making it more difficult for systems above 147 MHz.

Liverpool RLD on 7375 is expected to change to 6625; ROT on 7075 at Paddington has a pager intermodulation signal on its input; Nowra RSD on 7200 is also reported to be suffering.

Central Coast is developing an ATV 70/50 repeater and packet on 7600; Summerland is adding RBB 7200 at Byron Bay; Tumut have been licensed on 6800 with RTD; Wagga have added 8675 to RTW; Hornsby is to change packet from 7575 to 4900; NSW WICEN may establish packet on 4850 in the Blue Mountains; Blue Mountains RBM 7050 may relocate; Gladesville are to relocate RGR 6925, RRS 8475 and RTV 50 cm ATV to a Chatswood location.

Westlakes is not proceeding with a RTTY system RPI on 6625; RTZ on 7100 is to relocate towards Scone in the Hunter Valley and to be replaced in the Newcastle region with (RWL) on 6775.

Oxley Region is adding 8525 and packet 7575 to RPM; Taree has indicated interest in establishing a service on two to cover the gap between Newcastle and Oxley (RPM); Newcastle UHF and ATV are to establish six metre RSN on 3625; RWI has been licensed for 3850, which is currently being constructed. The Division is also looking into establishing a packet bulletin board.

VK1 recently conducted packet tests on 7575 from Mount Ginini. License applications are pending for Coffs Harbour RCH, and Wollongong RAW, on 7575. Packet is a new mode from a repeater point of view and these systems are subject to change and/or relocation.

Broken Hill is currently developing a beacon — RBH — the channel is yet to be determined. WICEN RWS have installed a new 10 watt diplexed repeater on 7150 Chatswood, which replaces the original separate antenna system. The Chatswood sky-line is becoming congested with new high-rise (which means the lift on the outside of the BMA Building is losing some of its view). This may limit some of the WICEN coverage, but when current development is completed in a couple of years it will be time to determine the extent of the shadows. There is also some pager intermodulation to the system.

VK2 has about 60, or one-quarter of the country's repeater systems, so there Is always some changes going on.

Just a closing note to the various repeater groups. By now you should have received FTAC informations sheets to update the records for the data bank, as well as the next edition of the Call Book. Would you ensure that these are returned as soon as possible to the Federal Office, Po Box 300, Caulfield South, Vic. 3162.

30TH ANNIVERSARY OF VK2WI

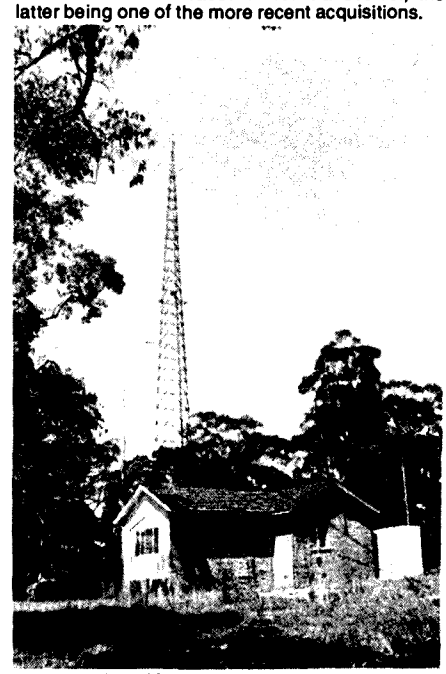
On May 15, 1957, Sir Allen Fairhall VK2KB, officially opened the transmitting station of the NSW Division, VK2WI. This month we celebrate the 30th anniversary of the event.

VK2WI is located at the top of a ridge at Dural, some 25 km north-west of Sydney, and Is the originating station for the NSW Division's Sunday Broadcasts. The station also houses the Division's beacons (VK2RSY) and repeaters (VK2RWI). The five acre bushland site is also used for a variety of activities, including the monthly barbeque and annual fireworks display.

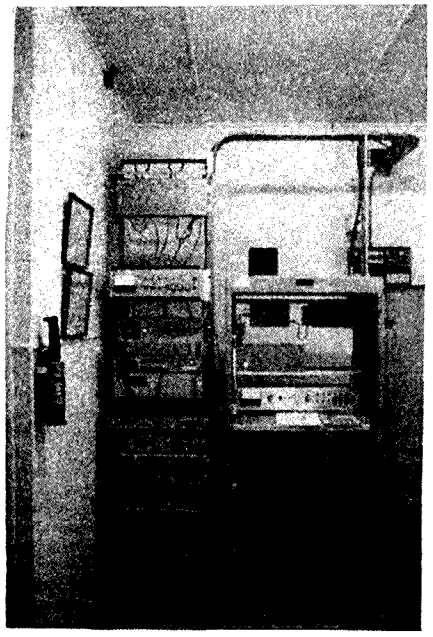
Over its 30 year history, the station has been refitted on several occasions, the most recent being the re-establishment of the broadcast facilities over the period 1978 to 1982. The station now broadcasts on 10 different frequencies in the 160 metre to 70 centimetre bands with a wide variety of equipment, some of commercial origin and some custom-made.

On 1.845, 3.595 and 7.146 MHz, the primary transmitters are AWA J54800s, each producing 500 watts of AM. These transmitters use a pair of 810s in the final, modulated by another pair of 810s, and have recently been upgraded with the fitting of solid-state sub-modulator units. The AM broadcasts on these bands continue to be popular in spite of the fact that SSB is now universally used for phone operation.

As backup for the AM transmitters, and for taking the call-backs following the broadcasts, there is a Collins 32-RS-1 fixed channel SSB transceiver and a Yaesu FT107 transceiver, the latter being one of the more recent acquisitions.



The VK2WI Building.



The Repeaters and Links.

The SSB transmission on 28.320 MHz is provided by a converted CB base station transceiver driving a 60 watt solid-state linear amplifier. This transmission provides good coverage of the Sydney region, and is intended particularly for Novice listeners.

On the VHF bands, a home-brew dual band crystal locked transceiver provides SSB transmissions on 52.120 and 144.120 MHz. This unit produces 20 watts PEP on six metres and 10 watts PEP on two metres from a common 9 MHz exciter.

There is also an FM transmission on 52.525 MHz, using an AWA BS50 transceiver. This is the oldest piece of equipment currently in service at VK2WI, and will be pensioned-off as soon as the six metre repeater is established.

On two-metres, a KDK FM transceiver is used to provide a broadcast link to repeaters in the Illawarra, Central Coast, Lake Macquarie (Newcastle) and Western Blue Mountains regions, and can also be used as a general purpose transceiver outside broadcast times.

The repeaters on 147 and 438.525 MHz share more than just the VK2RWI call sign. Both are controlled by a homebrew Z80 microprocessor based controller, which looks after both repeaters on a time-sharing basis. This controller provides all timing and identification functions, as well as continuous status monitoring and fault reporting. Remote control and telemetry facilities are also included. Details on the operation of these repeaters is given elsewhere in this issue.

The two metre repeater is fully home-brew, producing about 40 watts output from a B40-12 transistor in the final. A six cavity duplexer provides the necessary 100 dB or so of isolation between the transmitter and receiver, as well as protecting the receiver from the powerful Telecom paging transmitters located just 500 metres from the station.

The 70 cm repeater uses the transmitter from an AWA 15M transceiver, and the receiver from a Philips Westminster transceiver, neatly packaged into a small rack-mounting box. The transmitter and receiver are combined in a four cavity duplexer.

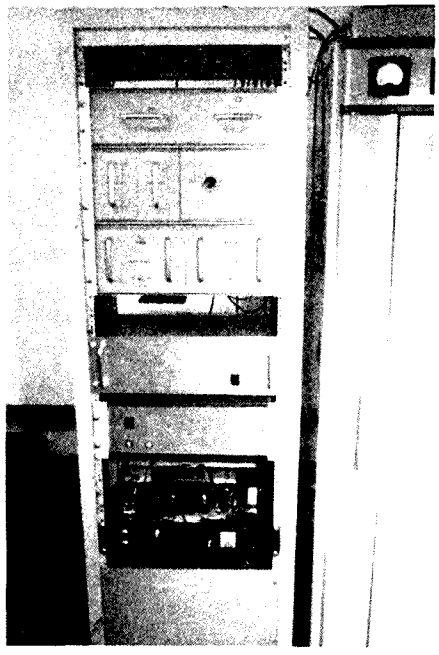
The repeaters also share a common power supply, which is fitted with 90 Ah of battery backup. The batteries are capable of running the repeaters for several days in the absence of mains power.

The station also houses the Sydney beacons, VK2RSY on 28.262, 52.420, 144.420, 432.420 and 1296.420 MHz. The 10 metre beacon uses on/off keying of the carrier and is vertically polarised, while the remaining beacons use frequency shift keying and are horizontally polarised. The beacons serve two purposes. For distant stations, they provide an indication of possible band openings or other unusual propagation, while for local stations they provide a constant reference signal for receiver or antenna adjustment. Reception reports have been received from all over the world, and are always welcome.

Since the beacons share their antennas with the broadcast transmitters on 10, 6 and 2 metres, it is necessary to turn these beacons off during broadcast times, namely 1045 to 1215 and 1945 to 2045 local time on Sundays. The 70 cm and 23 cm beacons operate continuously.

At the heart of the station are the two operator's consoles located in the studio. These consoles allow independent operation of up to 16 transmitters and receivers, under the control of a 2650 microprocessor. During the broadcasts the consoles are linked, with audio from the announcer's console being routed through the engineering console, giving the engineer full control of the station. For call-backs, the consoles are operated independently, allowing two groups of call-backs to be taken simultaneously.

To radiate all of this RF, the station needs several antennas. Three 20 metre tall wooden poles support the 80 and 40 metre dipoles, the 160 metre inverted Vee and the 10 metre halfwave vertical. The VHF and UHF antennas are spread over two self-supporting towers. On the smaller of



The Beacons.

the towers are the six and two metre and 70 centimetre beacons antennas, while the larger tower supports the 70 centimetre repeater antenna, the 23 centimetre beacon antenna, the two metre repeater antenna, the six metre FM antenna and various link antennas.

Looking to the future, we are currently developing a six metre repeater in conjunction with WICEN. One of the difficulties being encountered is providing sufficient isolation between the transmitter and receiver at this low frequency, and this is further complicated by having to also isolate the receiver from the six metre beacon. It may well prove to be impractical to operate the transmitter and receiver from the same site, and a split site system is being considered, at least as an interim solution to the problem.

Other projects being considered include solid-state replacements for the J54800 transmitters, using modern switch-mode techniques. Such a replacement will be necessary when our supply of spare parts, particularly 810s, for the J54800s dries up.

Additional beacons for the microwave bands are also being planned as long term projects, and modifications will be required to the 10 metre beacon in order to fit in with the change to time-sharing beacons on this band, due to be fully implemented by the end of the decade.

Visitors are welcome to inspect the station on Sunday mornings between 10.30 am and 12 noon, and, in particular, on the first Sunday of the month when the barbeque is held.

DURAL REPEATERS

The Wireless Institute of Australia, NSW Division, operates repeaters in the two metre and 70 centimetre bands from its Dural site, under the call sign VK2RWI. Following is a description of the operation of these repeaters.

GENERAL INFORMATION	TWO-METRE	70 CENTIMETRE
Output frequency	147.000 MHz	438.525 MHz
Input frequency	146.400 MHz	433.525 MHz
Output power	40 watts	10 watts
Antenna gain	10 dBi	8 dBi
Antenna pattern	Cardioid (max south)	Omni

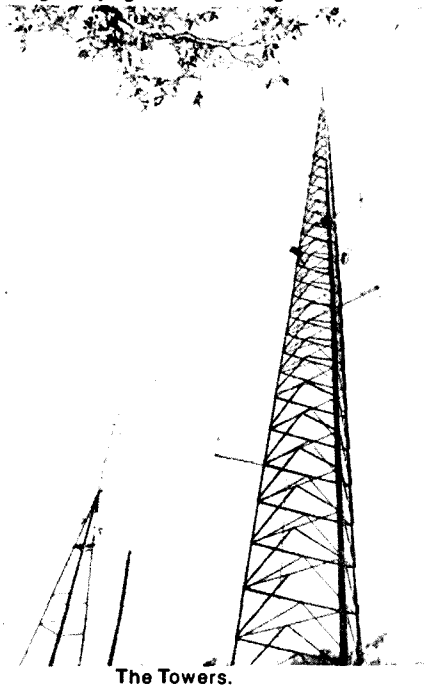
Control Functions

Both repeaters are controlled by a central microprocessor and operate as follows:

TAIL — normally 0.6 seconds, but extended to 1.2 seconds on weak signals.

TIMEOUT — 3.5 minutes. Timeout is indicated by a 1 kHz tone transmitted for one second. This tone, preceded by an identification, is sent every two minutes while the repeater is timed out. When the incoming transmission ceases, the repeater sends a "raspberry" followed by an identification. Note that the timer resets at the end of the tail, so allow the repeater to drop out fully between overs. Timeout is inhibited automatically at broadcast times, and may also be manually inhibited at other times, and this mode is indicated by a short 1 kHz tone burst at the end of the tail. Timeout is reduced to 20 seconds when the battery voltage is low.

ANTI-BUTTON-PUSH — all incoming transmissions are checked for modulation content. After four transmissions lacking suitable modulation the repeater shuts down. This is reset on receipt of a suitably modulated transmission — the recommended procedure is to announce your call sign. Note that button- pushing, as well as being annoying to those listening, contravenes the



The Towers.

Beacon Antennas.

regulations relating to identification of transmissions, ie don't.

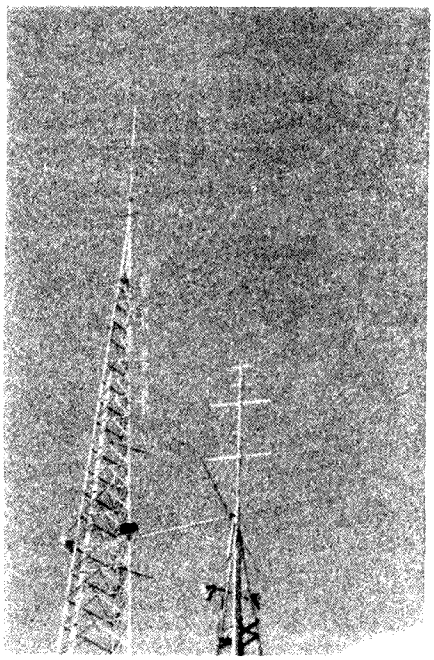
OFF-FREQUENCY INDICATOR — transmissions more than 2 kHz off frequency receive a tone during the tail — a high tone (1.6 kHz) meaning high in frequency and a low tone (600 Hz) meaning low in frequency. This function is disabled when timeout inhibit mode is activated, as a result of abuse during broadcast call backs.

LOW POWER (2m only) — when switched to low power mode (10 watts), the call sign is sent using 600 Hz instead of the normal 1 kHz tone.

FAULTS — the performance of the repeaters is continually monitored and abnormal operation of the power supply or transmitter is indicated by a "B" (for battery) or "F" (for fault) respectively being sent at 80 second intervals. The pitch of the tone used indicates the nature of the condition as follows:

	600 Hz	1 kHz	1.6 kHz
POWER SUPPLY ("B")	Low voltage	Mains failure	Battery charging
TRANSMITTER ("F")	Low output	High transmitter current	High SWR

MAINTENANCE — these repeaters are maintained by the WIA Dural Committee, and extensive remote control and telemetry facilities have been provided for this purpose. Note that maintenance and testing operations have priority over normal use (other than emergency traffic). Routine maintenance includes battery cycling several times each year.



Beacon and Repeater Antennas.

CLUB PORTRAIT

Jim Linton VK3PC
4 Ansett Crescent, Forest Hill, Vic. 3131

LAND FORCES AMATEUR RADIO GROUP

LAND FORCES AMATEUR RADIO GROUP

The LFARG was formed on January 29, 1986, to fill an eligibility gap evident in other groups for ex-service personnel.

Sam Galea VK2AKP, says for some years he considered forming a group which all ex-soldier and soldiers could join for friendship.

To test the waters and see if anyone else was interested in forming such a group, he put a notification in *Amateur Radio* magazine.

John VK1NCO, (President), Vic VK3CQP, (Vice-President) agreed with Sam's thinking and the trio worked together setting the foundations for the group.

Sam says: "There's Air Force and navy amateur radio societies, and an Army society for people who served or were associated with signal regiments.

"I thought 'what about the poor soldiers' who are excluded from these other groups."

To be eligible for LFARG membership, a radio amateur, or SWL, must have served in an Army unit and had a regimental number allocated. Sam explains it does not matter whether a person served in a Regular, Reserve, Citizen Military Forces (CMF), Territorial (TA), National Service or any other type of army service.

"The aim is to foster fellowship among members and ex-members of the Land Forces of any country — to promote discussion of mutual interest.

"Our group is open to anyone, it doesn't matter whether he or she was in enemy armies."

The LFARG is truly reflecting the hobby, amateur radio, which transcends all national boundaries, religions, race, colour, creed and political ideologies.

It deserves to grow, and has a keen committee hoping to attract the vast number of potential members.

During the LFARG weekly nets on Wednesday's at 1000 UTC, on 3.595 MHz, a discussion with a military flavour is held.

The topic is announced a month or so in advance to allow members time to borrow books from their local library and read up on the matter to be discussed.

To allow Novices to participate in the net, 80 metres was deliberately chosen.

The LFARG net, with its lively discussion on the military, is well worth a "sandbag" listen.

The group is seeking Incorporation in the ACT, plans to issue a regular newsletter, and members receive a numbered membership certificate.

Crossed swords and a world globe feature on the group's logo which is published for the first time at the head of this Club Portrait.

Readers interested in the group and seeking more Information may write to LFARG Secretary, Sam Galea VK2AKP, "Hadidu", 57 Fairview Road, Canley Vale, NSW. 2166, or join the weekly net.

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VK3 WIA Notes

Jim Linton VK3PC
IMMEDIATE PAST-PRESIDENT
WIA VICTORIAN DIVISION
412 Brunswick Street, Fitzroy, Vic. 3065

ANNUAL GENERAL MEETING

The WIA Victorian Division AGM will be held at the Divisional Headquarters, on Wednesday, May 13, starting at 8 pm.

Apart from the formal corporate matters and requirements under the Articles of Association, as advised in an Insert in AR last March, the AGM gives members an opportunity to question office-bearers on the WIA's activities and policies, or to raise any matter of concern.

The Victorian Divisional Council for 1986-87 has made important decisions related to the Division's overall financial management.

It has issued a policy statement on the Inwards QSL Bureau, and an Interim Policy on the proposed devolvement of examinations by the Department of Communications (both published in full in the VK3 Notes last month).

The year has been a busy one for Council, which I am sure the retiring President, Alan Noble VK3BBM, will outline in his Annual Report.

To learn first hand what the Council — the Division's board of directors — has done for you, the member, and for the furtherance of our hobby, attend in person at the AGM.

The AGM will also see presentations being made, including the Harry Kinnear Trophy, for contributions to AR magazine, and the perpetual Fox Hunt Trophy.

INTRUDER WATCH CO-ORDINATOR

The job of stimulating and co-ordinating reports on intruders in the exclusive amateur bands is now in the hands of Philip Pavey VK3BHN.

The important task of Intruder Watch helps the Amateur Radio Service defend and protect its allocations from intrusions by commercial, government and military stations.

All radio amateurs and shortwave listeners are requested to give Philip their support.

He can supply Intruder Watch Report Log Sheets, and general information on how to report, including a list of frequent intruders. Philip Pavey VK3BHN, can be contacted QTHR.

RADIO MASTS

In recognition that the issue of radio masts and local government would be an on-going area of concern, the WIA Victorian Division Council has appointed Rob Hailey VK3XLZ, to the position of Radio Masts Co- ordinator.

The function of this new position has been carried out since 1980 by Alan Noble VK3BBM.

Council notes that there is a growing number of cases where municipal councils resist applications for radio masts, and force their applicant into the appeal process.

The wise thing to do if you are thinking of erecting a mast, is to seek advice first, from the WIA Radio Masts Co-ordinator.

Rob Hailey may be contacted by those seeking advice on how to apply for a permit for a radio masts — his address is PO Box 425, Carnegie, Vic. 3163.

PENSIONER RATES

Some inquiries have been received recently concerning the pensioner rate of membership.

The current policy of the Victorian Division is as follows:

"Recognising that there are a number of members over the age of 65, who are on fixed incomes of about the same level as the full aged pension, the Division will allow persons over the age of 65 to elect to pay either the pensioner rate or the full rate of membership according to their income."

This policy for members aged 65 and over relies on the integrity of those members and the Council expects that the spirit of the policy will be honoured.

Members under the age of 65, who seek to pay the pensioner rate of membership should apply to the Council enclosing a photostat copy of their full pensioner benefit card.

NEW MEMBERS

A warm welcome to the following members who were accepted by Council on February 26, 1987. Robert Briggs VK3BVS, John Chippendall VK3UO, William Dunkley, Anthony Falla VK3KKP, Colin Gamble VK3AFY, Darren Hibberd, Russell Holdenson, Hans Jost, Brett Leslie VK3PNA, Kevin Nunan, Mark Pinches VK3XBX, Robert Redshaw VK3DRR, Brian Richardson VK3CCR, Roderick Taylor VK3XRW, Bruno Tonizzo VK3NXO, and Karl Walla VK3AUH.

ar

Five-Eighth Wave

Jennifer Warrington VK5ANW
59 Albert Street, Clarence Gardens, SA. 5039

160 METRE BROADCAST

An inquiry was made recently as to why our broadcast was in the middle of the "DX Window" since the new agreed band-plan. Discussion at the time that the band-planning was being carried out, brought forward the following points.

That DX on 160 metres was mainly confined to a period around Sunrise and Sunset, known as "Grey-line" times and that, as such, the chances of our broadcast, at 9.00 am, clashing with any possible DX was highly remote and that the higher up the band we go, the harder it is for people to "tweak their trannies" with any degree of success. As this is one reason we still use AM, it seems reasonable not to make it any more difficult for those listeners. In VK2, they shifted frequency as their evening broadcast might have interfered with the DX.

Thank you to all those who have taken the trouble to comment on our 160 metre broadcast quality. Yes, we know we have a problem, and new ways of improving matters, particularly with regard to the transmitter and antenna systems, are being looked at.

NEWS FROM DARWIN

A new-look slimmed-down copy of *Groundwave* (the Darwin ARC's magazine) passed across my desk (as they say in the classics!) the other day. I suspect that the new editor, Henry VK8NHN, can take some (If not all) of the credit. It is still informative and entertaining reading, but I suspect that, like this Division, they have had to take a long, hard look at the cost of printing and distributing a magazine.

Also, like this Division, they are running a Novice Course with numbers well down this year, I wonder if this trend is the same in other Divisions? Like us, also, they are looking seriously into the devolvement of examinations by DOC. The Club will be celebrating it's 21st birthday this year and I'll keep you informed of future activities as they come to hand.

. . . Just one question fellas, what happened to the piece on Samuel Morse? Mine finished five lines down, in mid-sentence! Perhaps it suffered the same fate as the CW article which was swallowed by the Editor's computer, never to be seen again. Anyway, keep up the good work "up there In the Top End" and keep the *Groundwaves* coming.

DIARY DATES

Tuesday May 26 — Speaker Kevin May VK5IV, *Life, Solar Power and Amateur Radio in Irian Jaya.* Meeting starts at 7.45 pm.

JUBILEE 150 AWARDS (continued)

1205	KI6EU	1206	W5WQN
1207	VK5POT	1208	VK2KEW
1212	VK2PQI	1214	VK4VFZ
1215	VK2PTE	1216	VK3BYE
1217	VK4KHM	1218	VK5AOP
1219	VK2EF	1220	VK2CVR
1221	W9ZGP	1222	VK6NAU
1223	VK2CJH	1224	VK8LF/5
1225	VK6YF	1226	VK5ZNJ
1227	VK5ZDJ	1228	VK4MIA
1229	VK3NDH	1230	VK2PZX
1231	VK4NCM	1232	VK7FO
1233	VK5WV	1234	VK5KF
1235	VK6NBF	1236	VK4NGF
1237	VK2API	1238	VK7NMH
1240	VK2NPX	1241	VK4NBO
1242	VK4NMA	1243	VK5PBC
1244	VK5ZAJ	1245	VI5VU
1246	VK5KLH	1248	DU1AUJ
1249	AH2F (1st AH2)	1250	VK5KOE
1251	VK5NCR	1252	VK3YB
1254	VK8PT	1255	VK4BKM
1256	VK4VC	1259	VK5OR
1265	VK5NT	1266	VK5NGL
1267	VK5PDL	1271	YC1CED
1272	A4XKJ (1st A4)	1273	A4XKL
1274	YB5AK	1275	G4STZ
1276	VU2LBW	1277	YC2ZAB
1278	YU3HR (1st YU)	1279	YB08L
1280	IT9TQH (1st IT9)	1281	YC8GH
1282	YZ7AA	1283	SM0LCK
1284	VU2XX	1285	DJ8BK
1286	I2JQL	1287	G4SVB
1288	VU2ACK	1289	GOFVF
1290	CU3AA (1st CU3)	1291	G4VPN
1292	F6GMT	1293	VU2EVR
1294	G4ZYP	1295	ZL1UFO
1296	EABALY (1st EA8)	1297	H44JL (1st H4)
1298	JE4RBR	1299	VK2NNK
1300	HA6NF (1st HA)	1301	9M6MO (1st 9M6)
1302	C21RK (1st C21)	1203	VU2NUO
1304	W1VY	1205	WS5O
1306	DL4FP	1307	W5FS
1308	9K2RA	1309	WO5O
1310	VK2KLS	1311	G4JBH
1312	ZL1AJI	1313	OE5CA
1314	HC1RF (1st HC1)	1315	G0AQF
1316	UA1 169738 (1st USSR SWL)		

ar

ANARESAT REPLACES HF

A new satellite communications system has ended 30 years of geographic isolation for the people at the Davis Base Australian Antarctic research station.

The Australian National Antarctic Research Expeditions Satellite (ANARESAT) system replaced the previous high frequency radio service — often subject to interruption because of atmospheric conditions — with around-the-clock reliable and high quality voice and data connections.

Australia is the first nation in Antarctica to install, on a permanent basis, state-of-the-art satellite communications to its research stations.

Davis now has faster and more efficient communications to transmit meteorological and scientific data to Australia, and the new links will help ease feelings of isolation at the base.

Satellite earth stations will be installed at the Casey, Mawson, and Macquarie Island bases over the next two years at a cost of $4 million. —

VK4 WIA Notes

Bud Pounsett VK4QY
Box 638, GPO, Brisbane, Qld. 4001

The Gosford Field Day — a Queensland photographic perspective by Peter Hadcraft VK4APD.

Disposals paying point.

BARCFEST '87

The Brisbane Amateur Radio Club extends an invitation to all amateurs to visit *BARCFEST 87* on Saturday, May 9, which will be held at the Indooroopilly High School from 9 am to 4 pm. There will be something for all the family — arts and crafts, retail displays, specialist groups, antique wireless and much, much more. Also plenty of disposals.

Brian VK4AHD, receiving an offer he could not refuse.

"What exactly do you do with secondhand computer parts, Haddy?" (Peter VK4APD).

Stowaway working his passage home. (Peter VK4NGK).

Kevin VK4KGF; pondering his next move.

Mick VK4BMT, sleeping on a good deal.

Jim, Steve, the boys from real-time-land, and the Ballina boys.

NEW AMATEUR RADIO CLUB IN QUEENSLAND

The Central Highlands Amateur Radio Club was formed on the air and its members also hold their meetings on-air. (See Club Corner, March AR). Amateurs from the Central Queensland coalfields area, Moranbah, Clermont, Dysart, Middlemount, Tieri and Glendon, hold their meetings each month on 3.620 MHz at 0700 UTC, on the third Wednesday. Visitors to the club on 3.620 MHz are more than welcome. Members are planning a get-together at a central venue for their Annual General Meetings, so they can see what one another look like!

—Bud Pounsett VK4QY

GOSFORD FIELD DAY — a Queensland perspective

Emtronics arranged for a subsidised bus trip for VK4s to attend the Gosford Hamfest, departing at 5 pm, Saturday, February 21, and returning in the early hours of Monday, February 23, (so the "trippers" would arrive at work on time!).

An enthusiastic team of 11 Queenslanders set off from the Stones Corner Office, with the bus crew of two, Jim and Steve, introducing everybody to the delights of bus travel.

At Ballina, four VK2s joined the group for dinner and continued on to Gosford. Harold VK2CHM, kept the party entertained with lines like:
"So there I was with my boots full of Palmolive, in Yokohama harbour" and "You want to try being in a whale-boat with a bunch of Novices and a Harley-Davidson in a rough sea."

Sleeping on the bus was not easy. There was talk of new equipment, an occasional ribald joke, then everyone would lapse into slumber. A couple of hours later, someone would stir, there would be more conversation and the whole cycle would repeat itself. This procedure continued throughout the night.

Another problem was — the bus seats were hungry. They swallowed, in turn, Mark's wallet, David's "rubber ducky" (which he'd taken to bed with him), and most of John's small change.

Next morning, 40 minutes north of Gosford, Harold discovered the batteries in his two-metre hand-held were flat, so the driver turned around and regressed. The entourage managed to convince *him* to forget about *it* and pull into a roadhouse for breakfast instead. (Now, when they tell you, "Here's a chance to have a feed and a shower" always ask how many showers there are! I never did find out how many actually used that one *shower* in the short time available.).

Arrival time at the Gosford Showgrounds was 6 am real-time (7 am local time) so the bargain hunters wouldn't miss out. Gosford is much like the Gold Coast Hamfest with trade displays, competitions and a bus trip to view the hinterland. There was a quiz for the intellectuals with questions like:
Who invented the first practical VTR?
Who invented the IC?
and so forth. . .

A big feature of the day is the sale of disposals. All items are tagged by the club committee with price, seller and lot number and laid out on trestles beforehand. At 10 am, the doors are opened to the hordes and it is a free-for-all like a department store's end-of-season sale. The club receives 10 percent of any sale. Unfortunately, if you want to dicker, you have to locate the article's owner first.

Everyone started to get hungry around noon and the hamburger stand did a roaring trade, as the liquid refreshment stand, but a XXXX would have been nice! By 4 pm, real-time, everyone was ready to head back to good-old- Brisbane, expecting a quite sleeping trip home. This was not to be. Only 30 minutes out from the tea stop at Bulehdelah, halfway up Sullivan's Gap, we came upon a truck by the side of the road. Its cabin was well alight with molten plastic dripping on the road and black smoke billowing into the still air.

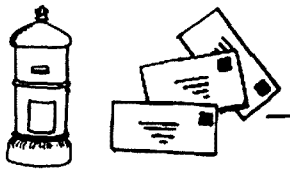
David VK4ZET, immediately called on the Newcastle 6900 repeater with his two-metre rig and Don's newly acquired 100 watt after-burner. The silence was deafening, so David broke into a conversation on 7100 and VK2AKX replied. A call on the land-line, and the police arrived within 15 minutes. Happily, by this time, the fire seemed to be burning itself out and was no longer licking at the cargo compartment which contained some hypochlorite (pool chlorine).

We left and had an otherwise uneventful trip for the rest of the way. All declared it a great day!

—Contributed by Peter Hadgraft VK4APD

ATN ANTENNAS

Unfortunately, a fire at the factory of ATN Antennas has caused considerable damage and production has been severely affected.



Over to You!

SINCERE THANKS

Having upgraded from Novice to AOCP I wish through the courtesy of AR to express my sincere thanks and gratitude to one to whom many amateurs owe their licence in West Australia.

His dedication to his students is of the highest order. One could approach him with a problem after class, on the phone, or at his residence, where he would gladly assist.

His personality endeared him to all he came in contact with. As a Radio Engineer he was a credit to his profession, also as a teacher he has no peer.

When on considers that students would travel long distances to attend his classes it shows how he was held in this regard.

It will be a sorry day when eventually he has to retire as the teaching profession will lose one of its ablest. I refer to Mr David Couch VK6WT.

To you, David, may I offer my sincere thanks and gratitude for all your assistance over the years as it has been most appreciated, and last but not least to your wife, Olive. Many thanks for all her hospitality at all times.

Graham Millard **VK6GK,**
Unit 19,
64 Hastings Street,
Scarborough, WA. 6019.

ar

EX-POWs

Last year, members of the ex-POW Association of Australia held a wonderful reunion on the Gold Coast.

In an effort to retain some of that good fellowship, Tom VK4OD and myself would like to hear from ex-POWs of any theatre who have an amateur license.

Let us know your operating habits and we will circulate that information so we may meet each other on the air sometimes and perhaps get-together at the next reunion?

We look forward to hearing from you.

73,

Peter Brown **VK4PJ,**
16 Bade Street,
Balmoral, Old. 4171.
TELEPHONE: (07) 399 2881.

ar

THANKS

Just a short note to thank you for editing and printing the obituary notice for the late Alan Heath VK5ZX, in the February 1987 issue of AR.

I was personally impressed at how the notice read and much was due to the editing. Several have made similar comments to me, including my mother.

Thank you also for returning the photographs.

Yours sincerely and best 73,

Christopher Heath VK5ZZX,
Box 202,
Kapunda, SA. 5373.

ar

THIRD PARTY SOLICITING AND THE ATN AN OPEN LETTER TO DAVID BELL VK2BBT

With reference to your open letter to the Department of Communications In AR of February 1987 concerning Third Party Traffic.

Unfortunately, your letter contains many errors, misconceptions and exhibits a lack of knowledge of the regulations applying to the Amateur Radio Service.

For instance, in sub-paragraph 1:

The stated policy of the DOC at the time of the authorisation of Third Party Traffic was and still is that: "Amateurs are not permitted to solicit for Third Party Traffic from the general public."

What happens in the USA does not alter the regulations or departmental policy in this country.

Your statements in sub-paragraph 4 are incorrect. It has been pointed out to your ATN Group and Sam Voron VK2BVS, several times by other amateurs that you were often in breach of the regulations.

All you had to do was to telephone your nearest district radio inspector and ask some simple questions.

If you were not aware of the regulations or departmental policy regarding Third Party Traffic, then I am sure that gentleman would have explained everything to you, including the fact that the regulations in the current handbook are still in force unless otherwise altered or amended in the new RADCOM ACT.

Your complaints in sub-paragraph 2 only confirm what everyone would expect; ie that the general public are not Interested in having their personal and private business broadcast over radio for all to hear!

Most of the 'Hullabaloo' raised by Sam and the ATN about Mexico City was, as pointed out by Syd Molen VK2SG, in AR of October 1986, totally unnecessary as there was direct amateur *radio* communications on teletype and AMTOR with Mexican amateurs in that city, and these systems were far more efficient and private than that used by the ATN.

Your statements in sub-paragraph 3 and 5 are also incorrect since any amateur interested in emergency communications and in need of training only has to join a WICEN group.

WICEN is still the only amateur radio organisation recognised by the DOC for handling of emergency communications and that includes Third Party Traffic.

Your sincerely,

Ted Gabriel VK4YG,
PO Box 245,
Ravenshoe, Old. 4872.

The foregoing has been slightly abbreviated. As this topic has now had more than sufficient discussion, no more letters on it will be published for the time being. —Ed.

ar

OBLASTS

The article by VK5BS, concerning USSR call signs mentions the existence of some anomalies in call signs which do not appear in the list given in the article. A full list of USSR amateur call signs with the corresponding oblast names and numbers was published in the 1982-83 WIA Call Book (page 71). This list was translated by myself from an original article in the Russian magazine *Radio* in 1981.

There have been some minor changes since that time, but, as yet, no updated list has appeared in *Radio.* Some of the calls such as UK3A, UK3B, UK3F can be found in the 1981 list under Moscow, Oblast number 170 and thus are not really "anomalous", although perhaps no new calls with these letters are being issued. Also, calls such as UA1DZ, UH8DA with two-letter suffixes were issued prior to the present oblast identification system utilising three-letter suffixes, hence it is not possible to identify their oblast location.

Incidentally, all USSR club stations have UK prefixes, the K indicating "kloob" (club), and EZ prefixes are used by fourth category novice stations. R prefixes indicate "ultra-shortwave" stations (28 MHz and above).

73,

Bob Hancock **VK5AFZ,**
PO Box 361,
Port Elliot, SA. 5212.

ar

NATIONAL PARKS AWARD

I consider the VK3 National Parks Award, named in honour of the late Keith Roget, one of the best-conceived awards available.

As many readers know, it is based on QSOs with or from National Parks. It Is thus an encouragement to mobile or portable operation, as well as bringing amateur radio into interaction with the splendours of unspoiled nature.

However, the stay-at-homes can also win the award. One sunny, summer, Sunday afternoon I called "CO National Parks" through several two metre repeaters and scored three points towards the award — from stations in the Brisbane Ranges, Grampians and Wilson Promontory National Parks.

I also got some calls from amateurs who thought they were in National Parks, but were in fact in other nature reserves, such as state parks and coastal parks. Only National Parks count.

When the rules for the National Parks Award were drawn up there were 31 such parks in VK3 and you must score QSOs with 16 of them — which is a majority.

However, the award manager now faces problems analogous to those faced by the DXCC custodians with regard to deleted countries and admission of new call sign areas. Last year, the Victorian Government announced that the Organ Pipes National Park would lose its status, and be reclassified as a different kind of nature reserve. Further, three or so new National Parks are due to be proclaimed.

I leave it to the Award Manager to determine the exact date after which the Organ Pipes ceases to count, and the dates on which the new National Parks are accepted for award purposes. Also, if there Is a net addition of two new National Parks in VK3, maybe the rules should be changed to make 17 QSOs the qualification.

Life wasn't meant to be easy, as somebody once said.

Cheers, 73,

Ken Gott **VK3AJU,**
38A Lansdowne Road,
Saint Kilda, Vic. 3183.

ar

ANOTHER DISCUSSION PAPER

". . . and heard great argument
About it and about; but evermore
Came out by that same door as in I went."
The Rubaiyat.

I have studied the great arguments about the future of amateur radio and I have not reached any definite conclusion. I do believe however that all of the following are possibilities.

Every individual amateur will continue to enjoy amateur radio in the way she or he prefers and all of those people in a position to influence the course of amateur radio will concentrate their effort on protecting the freedom of radio amateurs to enjoy amateur radio in the way they prefer.

WIA office bearers will not prejudice that freedom by acting as mere "yes men" to officialdom. They will support each other and every member with a grievance and do their utmost to obtain redress of each and every grievance.

All radio amateurs will oppose the present 'conventional wisdom' which favours de-regulation because when a government and its public service surrender the regulation of the usage of a natural resource it is reacting to pressure from self-interested parties who want to exploit the resource for profit. Governments rarely if ever originate an idea.

Members of the amateur service will abandon their attempts to convince the community that there is value in retaining the service because of its usefulness as a stand-by communication service, and will concentrate on selling the innovative potential in 'self education and technical investigation.'

Governments and the ITU will withdraw support of the amateur service and reclaim the amateur bands for other purposes because the primary purpose — 'Self education, technical Investigation and communication with other amateurs' can no longer be justified.

Amateur experimenters and amateur communicators will have to purchase spectrum space or time slots in spectrum allocations owned or leased by private organisations. The cost; 'market value.'

The amateur service will be 'self regulated' ie controlled by organisations such as the WIA, which will decide eligibility for entry and police performance according to its own by-laws.

The consequence of 'self regulation' will be a rebellion against the by- laws and a return to 'poaching' such as occurred on the 11 metre band. Conflict will be resolved by a return to common sense and the present happy situation; which is just outside the borders of anarchy, which is how it should be.

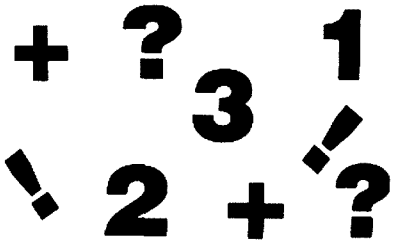
Readers will be disappointed if this verbiage doesn't end with a quotation. Here is a modern quotation from an address by a senior UK public servant.

> "Any moment it (the radio spectrum) stands unused because of regulatory constraints when somebody could be using it is an opportunity wasted — an opportunity cost or loss that makes the community that much poorer."

We must convince the community that the wasted opportunity for profit in the amateur service is a worthwhile cost.

Lindsay ('Stirrer') Lawless VK3ANJ,
Box 112,
Lakes Entrance, Vic. 3909.

ar



THE PROBLEM WITH DIGIPEATERS

by Tom Clark W3IWI

I am sitting here in the shack feeling very frustrated. I am watching the activity on 145.010 (although the problem is just as severe on 145.050 or any of the other frequencies in use in the area) watching WA4xxx tying up the frequency for the greater portions of Northern VA, MD, WVA and EPA, trying to connect with a BBS in Pittsburgh using SIX(I) digipeaters. He is having no luck and undoubtedly is wondering why. The basic answer is very simple: *Packet radio doesn't work through more than two or three digis! ! !*

Oh yes, I hear you saying "You are wrong — the AX.25 protocol permits me to use up to eight digis!" That is a true statement, but just because something is permitted doesn't mean it will work. And here is why —

Assume that you are station ABC at one end of a long string of digis trying to send out a packet through digis DEF, GHI, JKL, MNO, PQR, STU and addressed to station XYZ (fake calls are used to protect the guilty!). Thus your intended path is expressed by the following connect command

CONNECT XYZ VIA
DEF,GHI,JKL,MNO,PQR,STU

Your outgoing packet then should take the path

ABC = > DEF = > GHI = > JKL = > MNO = > PQR = > STU = > XYZ

At every step along the way, there is a finite chance that the packet is going to be hit by QRM. My observations are that on the very best paths about five percent of packets get clobbered on any single hop. For the example we are using, this means that 95 percent of the ABC = > DEF packets make it to DEF, and then 95 percent of them successfully navigate the DEF = > GHI path, and so forth. Thus at the destination XYZ we have

.95 * .95 * .95 * .95 * .95 * .95 * .95 = .70

Only 70 percent of the data you send out makes it all the way to XYZ.

But wait — there's more! ! !

AX.25 packet protocols require XYZ to send you back an "ack" (acknowledgment) packet which then has to unwind itself back through the same route. The same probability arguments apply and 70 percent of the acks get to you. Thus on a high-quality 95 percent link through six digis, only .7 * .7 = .49 of your packets are successful through six digipeaters! A Las Vegas gambler could make a very good living on 51/49 guaranteed odds.

But wait — there's more! ! !

We took 95 percent as the probability of each link working. I know of very few paths that are that good except perhaps at 4 am when nobody else is on the frequency. Links you tend to think of as "pretty good" probably have 10-20 percent of your packets trashed on any given hop. And I know of a number of links where the probabilities are no better than 50 percent. For the general case, if P is the link probability on all links, and N digipeaters are involved, then PA = the aggregate probability of success will be given by the formula

PA = (P) * * (2N + 2)

But wait — there's more! ! !

Every time your packet gets clobbered, you try again to push it through. If 50 percent of your packets get hit, on average you will try/retry your packet two times. In general the number of tries/retries that will be required is

TRIES = 1 / PA

But wait — there's more! ! !

You and everybody else who is on packet spent a lot of money to be able to ragchew and send messages (or data, or nudie pictures, or ? ? ?) at 1200 baud. But the packet gurus lied to you. Your data doesn't really flow at 1200 baud — there is some overhead associated with headers that are appended to each and every packet you send, plus some time wasted in getting that all important ack back, plus some time for your radio to change from transmit to receive and back to transmit, plus time waiting for a hole to open up on the channel. At best you can transmit say 600 baud. But for every digipeater you use, another set of similar delays is added at each step along the way. So if you had a perfect set of links through N digis, your average baud rate would drop to something like

DIGIPEATED BAUD RATE = 600 / (1 + N)

But wait — there's more! ! !

Each time your packet gets clobbered, it is retried, until it get through (or until you time out). So the real effective baud rate is slowed even further until it is given by this formula

EFFECTIVE BAUD RATE = 600 * PA / (1 + N)
= 600 * [(P) * *(2N + 2)] / (1 + N)

But wait — there's more! ! !

Every time you take over the channel with an unsuccessful packet, somewhere along the chain you have prevented some other hapless individual from using that time slot.

YOU HAVE HOGGED THE FREQUENCY!

We might express you channel usage efficiency as the ratio of the baud rate that you actually achieved to the baud rate you would have achieved if you had simply used a piece of wire, ie

EFFICIENCY = EFFECTIVE BAUD RATE / 1200

More instructive than seeing this factor as a simple numerical ratio is to express it in dB as what I like to call the "Hog Factor" —

HOG FACTOR = 10 log (EFFECTIVE BAUD RATE / 1200)

This factor even includes the 3 dB "loss" for a perfect AX.25 link due to the overhead we discussed earlier.

But wait — there's more! ! !

So far I have only used a few numbers to introduce the concepts. The accompanying four tables tell the whole story. I have worked out a number of cases for links ranging from perfect (P = 1.0) to pretty scuzz-ball (P = 0.50) and for 0 through eight digipeaters. My experience shows that P = 0.95 is a pretty rare case, but outside of "prime-time" hours P = 0.90 is fairly typical. In the evenings when everybody is on the channel P = 0.80 is not unusual. Paths involving "DX" digipeaters (like K3LZ-1 or WB4APR-6 or WA4FRB-3) degrade to P = 0.6 or P = 0.7 in the evenings simply because they hear so much stuff. And we always have the user in a poor location, running an HT with a rubber duckie who is lucky to have P = 0.5!

My advice to all users is that they not even attempt to use a path for which PA < 0.5 (or on average > 2 tries/retries). I have put those "bad" combinations in parentheses to highlight them. Unless you have an exceptional path (better than P = 0.95), these tables clearly show that using more than one or two digipeaters is an exercise in futility which will make you very unpopular with your peers ('Hog Factor' poorer than -10 dB) and drive you to distraction (with effective bauds rates slower than about 100 baud). Have I proven my premise from the start of this tome?

Packet Radio Doesn't Work Thru More Than 2 or 3 Digis! ! !

—From *Amateur Satellite Report*, Number 141, January 26, 1987
—Contributed by W T Scott VK4XP

ar

Link Success Probabilities Per Hop

N =	P=1.0	P=.95	P=.90	P=.85	P=.80	P=.70	P=.60	P=.50

PA = Aggregate Probability of Success

No of Digis								
0	1.0	0.90	0.81	0.72	0.64	(0.49)	(0.36)	(0.25)
1	1.0	0.81	0.68	0.52	(0.41)	(0.24)	(0.13)	(0.06)
2	1.0	0.74	0.53	(0.38)	(0.26)	(0.12)	(0.05)	(0.02)
3	1.0	0.66	(0.43)	(0.27)	(0.17)	(0.06)	(0.02)	(0.00)
4	1.0	0.60	(0.35)	(0.20)	(0.11)	(0.03)	(0.01)	(0.00)
5	1.0	0.54	(0.28)	(0.14)	(0.07)	(0.01)	(0.00)	(0.00)
6	1.0	(0.49)	(0.23)	(0.10)	(0.04)	(0.01)	(0.00)	(0.00)
7	1.0	(0.44)	(0.19)	(0.07)	(0.03)	(0.00)	(0.00)	(0.00)
8	1.0	(0.40)	(0.15)	(0.05)	(0.02)	(0.00)	(0.00)	(0.00)

Average number of Tries/Retries before Success

0	1.0	1.1	1.2	1.4	1.6	(2.0)	(2.8)	(4)
1	1.0	1.2	1.5	1.9	(2.4)	(4.2)	(7.7)	(16)
2	1.0	1.4	1.9	(2.7)	(3.8)	(8.5)	(21)	(64)
3	1.0	1.5	(2.3)	(3.7)	(6.0)	(17)	(60)	(256)
4	1.0	1.7	(2.9)	(5.1)	(9.3)	(35)	(165)	(1 024)
5	1.0	1.9	(3.5)	(7.0)	(15)	(72)	(459)	(4 096)
6	1.0	(2.1)	(4.4)	(9.7)	(23)	(147)	(1 276)	(16 384)
7	1.0	(2.3)	(5.4)	(13)	(36)	(301)	(3 545)	(65 536)
8	1.0	(2.5)	(6.7)	(19)	(56)	(614)	(9 846)	(262 144)

Equivalent System Baud Rate

0	600	542	486	434	384	294	216	150
1	300	244	197	157	123	72	39	19
2	200	147	106	75	52	24	9	3
3	150	100	65	41	25	9	3	1
4	120	72	42	24	13	3	1	0.1
5	100	54	28	14	7	1	0.2	0.02
6	86	42	20	9	4	1	0.1	0.01
7	75	33	14	6	2	0.2	0.02	0.001
8	67	26	10	4	1	0.1	0.007	0.0003

Channel "Hog Factor" In dB

0	-3	-3	-4	-4	-5	-6	-7	-9
1	-6	-7	-8	-9	-10	-12	-15	-18
2	-8	-9	-11	-12	-14	-17	-21	-26
3	-9	-11	-13	-15	-17	-21	-27	-33
4	-10	-12	-15	-17	-20	-25	-32	-40
5	-11	-13	-16	-19	-22	-29	-37	-47
6	-11	-15	-18	-21	-25	-33	-43	-54
7	-12	-16	-19	-23	-28	-37	-48	-60
8	-13	-17	-21	-25	-30	-40	-52	-67

Silent Keys

It is with deep regret we record the passing of —

MR R J BERRY	VK2BQD
MR W J GOW	VK5NQF
MR K H MCINTOSH	VK2BIZ

Obituaries

WILLIAM (BILL) DEAGUE VK2BBN

After a long period of ill-health, Bill — a true Officer and Gentleman — passed away in early February.

Bill saw service in the RAAF over the war years, and then, as a result of a road accident, had spent many years in and operating from a wheel chair.

He came to Sydney from Brisbane and it was my pleasure to have had a number of contacts with Bill. His Victorian and Queensland contacts were of great interest to him, and he always could be relied upon for a contact whenever I was operating mobile from different locations.

Bill thoroughly enjoyed amateur radio and did marvelously well considering his handicaps due to medical conditions.

A true friend, he will be sadly missed. Deepest sympathy is extended to his family.

Gordon Lanyon VK2AGL
ar

ALFREO CLAUDE GOVER VK4NAD

Alf Gover was born on January 28, 1922. During WWII he served in the RAAF as a Wireless Operator. Whilst serving in the islands, like many others, he suffered from Malaria. Neither the interest in radio nor the after effects of the Malaria ever completely left him. He retained a strong interest in CW and in radio generally.

A French Polisher by trade, Alf sat for the NAOCP on March 4, 1983, and received the call sign VK4NAD. A member of the Brisbane North Radio Club, he was prevented from regular attendance at meetings by deteriorating health, but was often heard on the club net, and more frequently by club members and others on the CW end of the band. A keen sense of humour made a QSO with Alf a rewarding experience.

Alf's wife, Audrey, found time to study radio also, and in August 1986, they intended to sit for the DOC examinations — Alf for his full call and Audrey the Novice, in the hope of carrying on the VK4NAD call sign. Health problems however, intervened and the opportunity was lost and Alf became a Silent Key on December 22, 1986.

The story does not end there, Audrey is studying again for the NAOCP and hopes to pass the examination within the two years that DOC will hold the call sign. If you hear this call, (probably on CW), please give her a call in memory of Alf.

John Rahmann, Praaident, Brisbane North Radio Club
ar

BOB JORDAN VK7IL

It is sad to record the passing of Bob Jordan VK7IL on March 9, aged 88 years. Bob was a WWI Returned Soldier and passed away at Royal Hobart Hospital after being transferred from King Island District Hospital following a short illness.

One of Bob's greatest memories was when, as a young man, he witnessed Marconi's set-up at Port Lonsdale for the first communication to Tasmania. From this, his interest in radio grew.

He received his first call sign, VK3IL, around 1938, an was active with this call sign until 1944, when he moved to Currie and became VK7IL.

Bob was a Lighthouse Keeper on Gabo Island when he first became licensed and he used batteries for power to run an old valve unit.

He was also stationed at Cape Everard, Cape Otway, and Cape Schank prior to moving to Currie, King Island, where he remained after he retired in 1963.

Bob is survived by his wife, Elsie, children Bob VK7JR, Lawry VK2ALV, Jack, Ena, Pat and Janet, 13 grandchildren and 22 great-grandchildren.

Elva and Bob Jordan VK7JR
ar

BOB SMITH VK2AWD/VK2ERR

Bob VK2AWD, and more recently VK2ERR, passed away on December 30, 1986.

For the past 12 years, Bob was a resident of the Barouroka Caravan Park, Fingal Bay, where he kept in regular touch with his old mates from his shack in the van. He had, in latter years, taken a great interest in computers and was a regular source of information at the Nelson Bay Computer Group.

Most old timers will remember Bob as one of the unsung heroes of the disastrous floods which hit Wagga Wagga in the late 1950s. Using his amateur radio skills he kept the town in touch with the outside world for 10 days, almost without a break. He was highly praised for his endurance by the then Governor General, but he modestly declined the offer of an Imperial Honour. In his own quiet way, Bob was one of those who encouraged the young and constantly upheld the best traditions of amateur radio.

Bob was only 69 when he died and he leaves his wife, Marion and two children and their extended families. He will be greatly missed by all who knew him and valued his friendship, both on and off the air.

—Les Daniels VK2AXZ
ar

ROBERT AMOS BLYTH VK2BOB

Having spent most of his life in the Belmont area, it is understandable that Bob Blyth VK2BOB/ZL1BKO would be known as "Belmont Bob." When he came on the air in the early 1960s, the name spread far and wide, as did Bob's reputation for good humour and a ready, helpful hand to all. It came as a terrible shock when, on March 3, he died, aged 65, from a heart attack. The greatest tragedy was that, only six days earlier, he had returned to retire in Australia from New Zealand, where he had worked for almost 16 years. His long-planned rest and reunion with family and friends was so short.

Belmont Bob was an intensely practical man. He was a wizard with radio and an ace CW operator. Born in Prestonpans, Scotland on August 24, 1921, he came to Australia as a boy of five.

Bob always worked hard and was an entirely self-made man. In 1962, he decided to try for the AOCP As always, his approach was thorough and he arranged classes in his garage at Government Road, Belmont. Those who attended formed the core of the soon to be established Westlakes Radio Club. Founder member, Bob, was one of the first Morse instructors. When, in 1972, he left Australia to take up a post with Allied Electronics in Auckland, he kept his links with Westlakes and still retained his VK call sign.

Belmont Bob is survived by his brothers, Peter and Arch, sister Effie, daughter Sandra, son Robert and their families. Those who came to know him through amateur radio will remember him as a true friend, the like of whom they may not find again. We mourn his passing like that of a brother.

—Keith Howard VK2AKX
ar

Solar Geophysical Summary

JANUARY 1987

Solar activity was low, with no energetic flares being observed. Despite the low solar activity, there were a number of small sunspot regions visible on the solar disk for much of the month. The sun was without sunspots only during the periods 8-13, 16 and 30.

The value of the 10 cm flux ranged between 70 (9-11), with a high of 76 (22).

The regions visible on the sun during the month were a mixture of old cycle and new cycle regions.

The month was extremely quiet in the terms of the number of geomagnetic disturbances. Only on January 1, did the A index climb above 15 to reach a value of 17. The second most disturbed day was the 20th, when the A index was only 14.

Monthly averaged A index was seven, probably the lowest since the last solar minimum period, 1976-7.

1986 MONTHLY VALUES

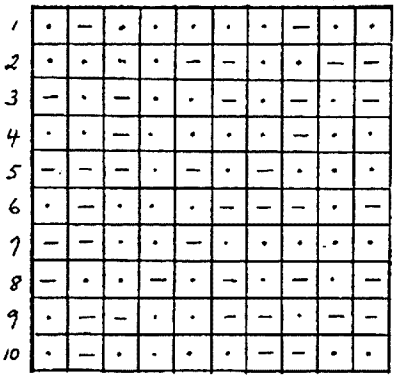
1/86	73.5	2.3	13.9	11.5
2/86	83.9	23.6	13.2	23.4
3/86	77.1	15.7	13.1	11.1
4/86	75.2	20.4	13.8	7.3
5/86	72.7	13.1	14.5	11.1
6/86	67.5	0.8	13.9	9.3
7/86	70.3	17.8	13.8	8.9
8/86	68.6	7.4		12.8
9/86	68.7	3.9		14.6
10/86	83.0	35.7		9.0
11/86	77.3	14.7		10.0
12/86	72.6	6.4		7.5
1/87	72.6	9.8		7.0

—From data supplied by the Department of Science IPS Radio and Space Services, January 1987
ar

MORSEWORD 2 SOLUTION

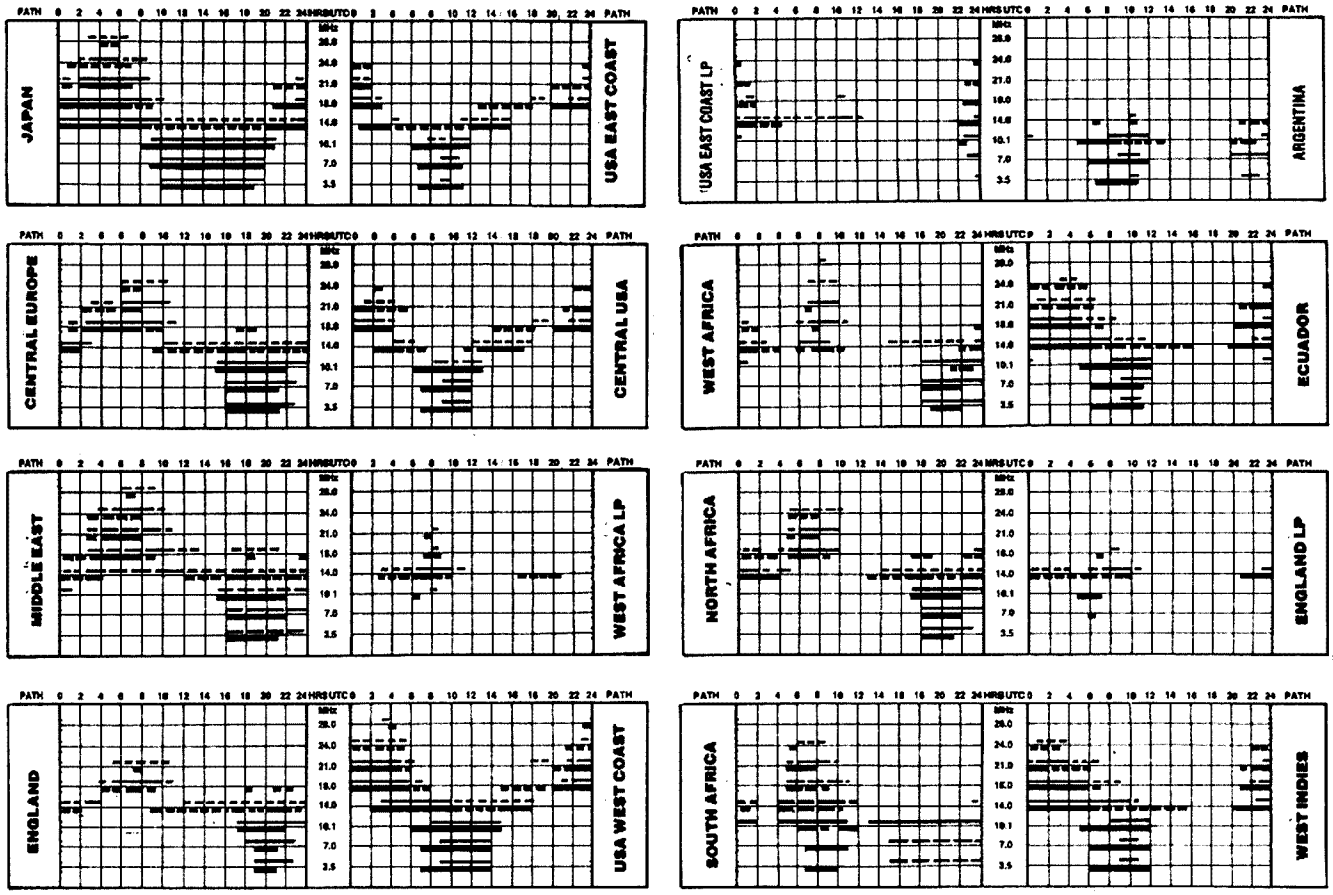
Across: 1 lire 2 sweat 3 cart 4 fire 5 orb 6 lama 7 mines 8 Turk 9 pay 10 ripe

Down: 1 urge 2 boat 3 eager 4 hire 5 rents 6 wing 7 swim 8 tack 9 ensue 10 pap



Ionospheric Predictions

Len Poynter VK3BYE
14 Esther Court, Fawkner, Vic. 3060



LEGEND

From Western Australia (Perth)

From Eastern Australia (Canberra)

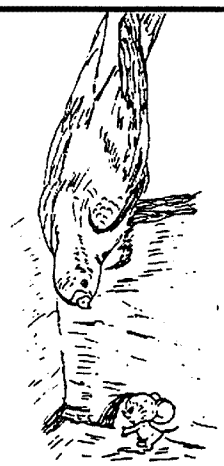
Mixed mode dependent on angle of radiation (long broken lines).

Better than 50% of the month, but not every day (continuous lines)

All paths unless otherwise indicated; (ie LP = Long Path) are Short Path.

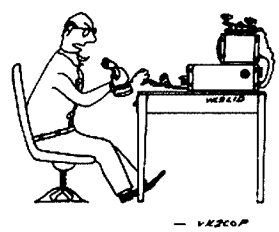
Less than 50% of the month (short broken lines).

Predictions are presented courtesy of the Department of Science, IPS Radio and Space Services, Sydney.



DEADLINE

All copy for inclusion in the **July 1987** issue of *Amateur Radio*, including regular columns and Hamads, must arrive at **PO Box 300, Caulfield South, Vic. 3162**, at the latest, by **9 am, May 22, 1987.**



"DX? — DX? ! — All I can raise is the wife on the intercom! !" —VK2COP

Hamads

PLEASE NOTE: if you are advertising items FOR SALE and WANTED please write ***each*** on a separate sheet of paper, and include all details; eg Name, Address, Telephone Number, on both sheets. Please write copy for your Hamad as clearly as possible. ***Please do not use scraps of paper.***

- Please remember your STD code with telephone numbers
- Eight lines free to all WIA members. $9.00 per 10 words minimum for non-members
- Copy in typescript, or block letters — double-spaced to ***Box 300, Caulfield South, Vic. 3162***
- Repeats may be charged at full rates
- QTHR means address is correct as set out in the WIA current Call Book

Ordinary Hamads submitted from members who are deemed to be in the general electronics retail and wholesale distributive trades should be certified as referring only to private articles not being re-sold for merchandising purposes.

Conditions for commercial advertising are as follows:
$22.50 for four lines, plus $2.00 per line (or part thereof)
Minimum charge — $22.50 pre-payable
Copy is required by the Deadline as indicated on page 1 of each issue.

TRADE ADS

AMIDON FERROMAGNETIC CORES: Large range for all receiver and Transmitting Applications. For data and price list send 105 x 220 mm SASE to: **RJ & US IMPORTS**, Box 157, Mortdale, NSW. 2223. CLOSED DURING JUNE (No inquiries at office . . . 11 Macken Street, Oakley). Agencies at: Geoff Wood Electronics, Lane Cove, NSW. Webb Electronics, Albury, NSW. Truscott Electronics, Croydon, Vic. Willis Trading Co, Perth, WA. Electronic Components, Fishwick, Plaza, ACT.

EXCHANGE — NSW

APPLE IIE LOOK-A-LIKE COMPUTER: green screen monitor, 64k memory, 80 column & RS232 card, joystick, manual & software. Exchange for station equipment or sale. Mervyn Beamish VK2PEH. Ph:(02) 80 2045.

MFJ ATU: 30-300W. 4 aerial terminals SWR-Power meter. Swap for Bencher type keyer or similar. Also consider semi-auto bug type. VK2CT. Ph:(02) 670 2696.

WANTED — NSW

ELECTRONIC KEYER: Ten-Tec Type 670. (Ten-Tec only). Antenna tuner Ten-Tec (only) with 2-gang capacitor internal as in earlier types. VK2KSD, QTHR (02) 456 1577.

CHART RECORDER: any type, as long as it is working or easily repairable, and paper is still available. John VK2DVW, QTHR. (02) 57 6567 AH.

FC-707 ANTENNA COUPLER: FV-707DM Digi VFO. Frequency counter late model, no kits please. Valve type GDO. Data & reference books on ICs, transistors, PLL chips, late model 35 MHz dual beam CROs. Items would have h/books & be in 1st class cond. A Walsh L20181, QTHR. Ph:(048) 61 2092.

MACTRONICS M650: RTTY/SSTV/CW Pel interface manual &/or software. All expenses paid. Mervyn Beamish VK2PEH. Ph:(02) 80 2045.

TH6 BEAM: Also Cushcraft 147/11 beam. Also 2m sampler for Oskerblock SWR. VK2AVS, QTHR. Ph:(066) 72 2462.

VALVES: 813 with sockets & 6146B. Phone (02) 29 1768 BH or (02) 498 2259 evenings.

YAESU FT-200 HF SSB TCVR: & manual. Reasonable price paid for good unit. VK2DC, QTHR. Ph:(047) 39 2782.

WANTED — VIC

14AVQ VERTICAL ANTENNA: or similar. Must be in good working condition. Ron VK3QP, QTHR. Ph:(03) 598 4504.

BITS & PIECES: circuit information or any other material on Icom Digi VFO, DV21. Alternatively, complete unit working or not working. Circuit diagram &/or manual for Marconi UHF sig gen, model TF 1060. Will pay cost, postage, etc. Roy VK3AOH, QTHR. Ph:(03) 49 6462.

CIRCUIT, HANDBOOK OR COPIES: for BC-348R rx. Also, wave- change knob. Copy of surplus radio conversions, Volume 1. Ken VK3ZFI, QTHR. Ph:(03) 580 5347.

CRYSTALS FOR FT-75B: CW section of the bands preferred Vic. VK3DND, QTHR. Ph:(051) 57 0236.

INFORMATION ON REPAIRS TO: Wireless Set No 62 Mk II. (ZA 30714 PC No 92177). Operates from 1.6-4 MHz and 4-10 MHz. Please contact Jaimie, Wednesdays to Sundays after 8.30 pm on (03) 45 4281 or write to 14 Mossman Drive, Heidelberg, Vic. 3084.

LOAN OF SERVICE MANUAL: for TR2400. Needed to locate broken PCB inter-connecting wires, etc. Will pay all costs & return. VK3BJO, QTHR. Ph:(058) 52 1147.

SERVICE MANUAL: also circuit diagram for BWD501 oscilloscope & also four 811A valves. Ph:(03) 726 7137.

WANTED — OLD

FRB-707 RELAY BOX: Also 6m resonator for Yaesu mobile antenna system (RSL 145). Please contact VK4KHQ QTHR. Ph:(077) 43 4508.

HALLICRAFTERS MODEL HA-10: LF/MF tuner (matches SX117 Rx). Any condition. SX117 RX for spare parts. Manual or circuit (at least) for Hallicrafters S40A (any model). Sweep generator (Advance or similar) providing for centre IF freq of 50.75, 450-500, 1600-1700 kHz & 6.0-6.5 MHz & higher (Don't mind fixing). L40017, QTHR. Ph:(07) 399 5765 or 40 Quirinal Crescent, Seven Hills, Qld. 4170.

RCA TX TUBE MANUAL: IC-RM2 remote controller for IC-211. High voltage filter capacitors 5 ~ 6 kV working. Any obsolete broadcast station equipment inc cart machines, audio consoles, etc. Large ceramic or glass tx tubes suitable for display. Circuit diagram for broadcast tx 10 ~ 50 kW using PDM (Harris) system of modulation. All costs refunded. David VK4BGB. Ph:(07) 892 1631 or 222 4322 or PO Box 275, Booval, Qld. 4304.

RF AMMETERS: 0-2 amp, 0-1 amp, 0-0.5 amp. Contact Len VK4JZ, QTHR. Ph:(07) 398 2002 AH.

FOR SALE — NSW

AMT-1 AMTOR, RTTY, CW TERMINAL UNIT: Commodore 64 computer, C2N cassette, ICS EPROM software for AMTOR-RTTY-CW & auto unattended AMTOR, RS232 interface. $550. Hitachi green screen VDU. $100. Seikosha GP100VC printer with approx 1000 sheets fanfold. $225. Kenwood SP930 loud-speaker with 3 audio filters. $80. George VK2EZA. Ph:(047) 30 1666.

COAX CABLE: similar to RG213 only better. Same physical dimensions, double screened, single centre conductor. Some long lengths available. Adrian VK2ALF Ph:(0648) 23 112 (BH), (0648) 24 338 (AH).

COMMUNICATIONS RX: National Panasonic DR48, RF 4800B. As new. $400. Info-Tech 300c keyboard. $490. Info-Tech M200F code rx converter. As new, imported from USA. Top level Hi-Tech equipment. $680. Kenwood TS520S & DG5 display. Looks & performs as new. Goes with mic & both manuals. A bargain at $600. Ph:(02) 958 5412.

FT-200 TCVR: with mic, handbook, H/B PS. Excellent cond. No mods. Some spare tubes. $200 ONO. VK2ALZ, QTHR. Ph:(069) 47 2198.

FT-757GX GENERAL COVERAGE TCVR: orig packing, manual & mic. Part exchange considered. $1100 ONO. VK2EVB, QTHR. Ph:(066) 52 7160.

ICOM IC-04A UHF HAND—HELD TCVR: mint cond. $400. ICOM IC- 2KL HF linear amp. New, never used. $2200. Peter VK2CIM, QTHR. Ph:(060) 25 4066 (AH) 25 1843.

ICOM IC-22S 2M TCVR: Fitted with packet freqs. Good cond with digi readout. $225. Dave VK2FFK. Ph:(043) 67 6629.

IC-720A, ALL—BAND, ALL-MODE HF TCVR: Top condition $750. Tono Theta-777, RTTY, AMTOR, CW etc. New, box never opened. $500. Alec Dan VK2ABU Ph:(02) 212 3833, (02) 328 1261 (AH).

KENWOOD TS-430S HF TCVR: with PS-430 power supply, CW narrow & AM filters, FM board, MC42S scan mic, DC lead, manual, flawless cond. Suit new buyer. $1450. Max VK2GE, QTHR. Ph:(043) 92 4900.

MICROWAVE MODULES: 2m/70 cm transverter + 30W home-brew linear. $200. 2m to 10m rx converter (VK3AFQ design). $60. Yaesu YD148 desk mic — switchable impedance, suits all Yaesu rigs, $35. EPROM programmer, ETI 668. Suits Microbee, c/w cable & ZIF socket. $40. David VK2DXP Ph:(02) 654 1473 AH.

MULTI 7 2M FM TCVR: 12 channels tilted. $140. VK2DC, QTHR. Ph:(047) 39 2782.

SATELLITE AERIAL CONTROLLER PCB: as per AMSAT-Aust newsletter #22 Jan 87. Paperwork includes instructions, circuit, PCB layout & parts list. Send $20 + $1.35 p&p. VZ-200/300 RTTY-CW interface, adjustable 45-99 Baud. 170-850 Hz shift, 5-99 WPM CW. Paperwork incl instr, circuit, PCB layout, PCB & parts list + free software, Send $20 + $1.35 p&p plus good quality C10 cassette (or add $2 for cassette). Rudy VK2FIM, QTHR.

STEEL TOWER: Triangular girder construction. 17m in three sections. $120 ONO. Maurice VK2DFJ, QTHR. Ph:(02) 605 9127 (Home) (02) 708 9487 (BH).

TRIBAND HF BEAM: TH3. Swan 10-80m tcvr. Digital B/I P/Sp speaker. $250. Demonstrate on air. VK2AVS, QTHR. Ph:(066) 72 2462.

TS-820: good condition $500 ONO. Auto antenna tuner, Diawa CNA1001, 500W PEP, cross needle power SWR meter. Good condition. $280 ONO. VK2CXX. Ph:(02) 918 8147.

YAESU 2M HH FT207R: Case, nicad, additional antennas, 12V charging cradle, + PK. $260 (incl insurd post). VK2KSD, QTHR. Ph:456 1577.

FOR SALE — VIC

ALUMINIUM TUBING: 18'1" OD 16'7/8" OD. Slide fit to 33'. As new. Multiband ant 80, 40, 20, 15, 20m. 300 ohm slotted ribbon. 2m 75 ohm coax. 4:1 balun. Will explain CCT & details. Ring after 5 pm & wk ends. $50. VK3FT, QTHR. Ph:(03) 882 4853.

AMATEUR TRAP VERTICAL ANTENNA: Hi Gain 14 AVQ, covers 40/10 metres. Excellent order with full instruction manual. $80. John VK3ZAB. Ph:(03) 232 4212.

BEAM: 20m full size beam, Hy Gain TH6DX. Jaybeam 10 el 2m beam, Diawa rotator/control box. $180 the lot. Inquiries VK3IZ. Ph:842 8822 (BH) 715 1164 (AH).

HYGAIN TH3MK3 10, 15, 20M YAGI: with BN86 balun, manual & stainless steel hardware. Good condition. $250. VK3BCY, QTHR. Ph:(03) 438 3393.

ICOM 735 HF MOBILE/BASE RIG: Brand new in carton. Full warranty. New price $1769 — sell $1300. Unwanted gift. Can arrange freight. VK3EW, PO Box 208, Ringwood, Vic. 3134. Ph:(03) 616 4485 (BH).

NALLY CRANK-UP/TILT-OVER TOWER: excellent condition. Will discuss price & method of disposal with those interested. Also, Chirnside CE35DX (6m boom) 3 el triband Yagi. Excellent condition. $240. Ron VK3QP, QTHR. Ph:(03) 598 4504.

POWER/SWR METER: Swan WM1500, 5W 50W 500W & 1500W ranges, peak & average readings, 2 to 50 MHz. $65. Helray PEP wattmeter, LED display, 500W, 1.5 to 30 MHz, $55. VK3ARZ. Ph:(03) 584 9512.

REALISTIC DX400 PORTABLE HF RX: 150 kHz-29.999 MHz, AM, SSB, FM broadcast. Two scan speeds + memory LCD display — Analogue S/S meter. VGC. $300. Micronta Autorange Digi Multimeter. LCD display — auto shutoff. 10 Mohm input. Folding screen. VGC. $100. John Abrim L30479, 11 Halpin Crescent, Shepparton, Vic. 3630. Ph:(058) 21 0846.

RTTY GEAR: Tono 7000E Comm Computer + Tono Monitor CRT-10 $600. Tono Dot Matrix Printer, w/full box paper $475. All perf cond. Extra RTTY info books incl. Jobber Drills, Frost Aust, Set No M-3, High Speed Steel, 1-13 x 0.5 mm. New $45. Drill grinding attachment ETC, cap 3-19 mm, new $25. Converter 2m, Parkes Model 144-1, GC $50. 1296/28 MHz converter, VHF Assoc Model EXP, GC. $60. Valves 4X150A (2) new $25 ea. Megacycle Meter & power supply, 420-940 MHz, consist of Model 590 VHR isc unit & power supply, 240V on 50 cycle, can be used on a multiplier of measurements at UHF PC $150. 432 MHz Parkes preamp, Model 432-2P $30. Marshall II power control unit for electric train set. Fair cond. Best offer. VK3BRE, QTHR. Ph:(055) 62 6016.

TONO 7000E COMMUNICATION COMPUTER: Rec & send Morse & RTTY, no interface required, connects direct to radio. $725. John VK3BIL, QTHR. Ph: 762 2119.

YAESU FT-707: in as new cond. Complete with manual, WARC bands. $700. Later model costs about $1600. Ken hand-held 2m, 6 channels, Xtals on Rpt 2-4-8 & 3 simplex channels. Nicads & charger. Good order & it works very well $80. Kyoritsu SWR meter. $30. Keith VK3SS. Ph: 47 2265.

FOR SALE — QLD

SIGNAL GENERATORS: Hewlett Packard 608D 10/420 MHz $200. Marconi TF144H/4 Standard 10k/72 MHz $150. Matrix 931H Standard $150. ZD00783 85k/32 MHz AM/FM $75. Ratcliffe D205 45/180 MHz $75. Gerlsch FM3-DM3 Freq meter, AM/FM 20/1000 MHz $75. Marconi FM No2 deviation meter 2.5/100 MHz $75. Ratcliffe 600 FM monitor 100/250 MHz $75. Hewlett Packard 5253B solid-state 50/500 MHz converter $75. Marconi Marine Sentinel 1004 LF/HF rx $350. VK4QY. Ph:(07) 396 0886.

FOR SALE — TAS

ICOM IC745 TCVR: with heavy duty power supply PS30 & external spkr. FM, electronic keyer, Xtal marker fitted. As new, only 6 hours use. No mods. Orig packing. $950. Ian VK7JY. Ph:(003) 27 2011 AH.

Advertiser's Index

KENWOOD

paceseffer in Amateur radio

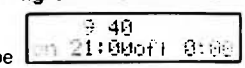
NEW!

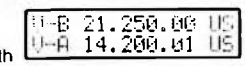
"DX-cellence!"

TS-940S

The new TS-940S is a serious radio for the serious operator. Superb interference reduction circuits and high dynamic range receive combine with superior transmitter design to give you no-nonsense, no compromise performance that gets your signals through! The exclusive multi-function LCD sub display graphically illustrates VBT, SSB slope, and other features.

- **100% duty cycle transmitter.** Super efficient cooling system using special air ducting works with the internal heavy-duty power supply to allow continuous transmission at full power output for periods exceeding one hour.
- **Programmable scanning.**
- **Semi or full break-in (QSK) CW.**
- **Low distortion transmitter.** Kenwood's unique transmitter design delivers top "quality Kenwood" sound.
- **Keyboard entry frequency selection.** Operating frequencies may be directly entered into the TS-940S without using the VFO knob.
- **Graphic display of operating features.** Exclusive multi-function LCD sub-display panel shows CW VBT, SSB slope tuning, as well as frequency, time, and AT-940 antenna tuner status.
- **QRM lighting features** Remove "rotten QRM" with the SSB slope tuning, CW VBT, notch filter, AF tune, and CW pitch controls.





- **Built in FM plus SSB, CW, AM, FSK.**
- **High stability, dual digital VFOs.** An optical encoder and the flywheel VFO knob give the TS-940S a positive tuning "feel".
- **40 memory channels.** Mode and frequency may be stored in 4 groups of 10 channels each.
- **General coverage receiver.** Tunes from 150 kHz to 30 MHz.
- **1 year Guarantee.**

KENWOOD ELECTRONICS AUSTRALIA PTY. LTD.

4E WOODCOCK PLACE, LANE COVE, SYDNEY, N.S.W. 2066. Ph. (02) 428 1455.

Further, beware of dealers not listed in this advertisement who are selling Kenwood communications equipment. All Kenwood products offered by them are not supplied by Kenwood Electronics Australia Pty. Ltd. and have no guarantee applicable.

YOUR DEALER BELOW WILL GUARANTEE SATISFACTION

N.S.W.:

EMTRONICS — 94 WENTWORTH AVENUE, SYDNEY (02) 211 0988
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Amateur Radio

VOL 55, No 6,
JUNE 1987

JOURNAL OF THE WIRELESS INSTITUTE OF AUSTRALIA

- *51st Federal Convention Report*
- *Approach to Antenna Tuning*
- *UK Proposed Deregulation*
- *Equipment Reviews*
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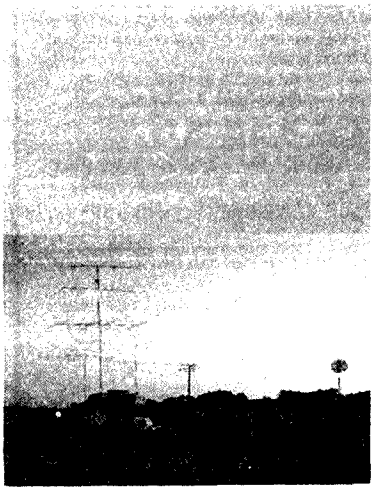

FRONT COVER: "Dawn at the John Moyle Memorial Field Day". The station of Peter Green VK5ZPQ, Andrew Russell VK5ZUC and John Brayley VK5AJQ, was operated 50 km south of Adelaide near Victor Harbour.

Photograph courtesy John Brayley VK5AJQ

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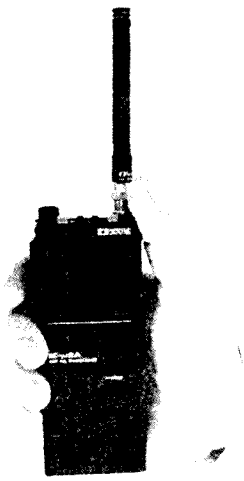

Regular Features

DEADLINE

All copy for inclusion in the August 1987 issue of Amateur Radio, including regular columns and Hamads, must arrive at PO Box 300, Caulfield South, Vic. 3162, at the latest, by 9 am, June 19, 1987.

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Editor's Comment

IMAGE PROBLEMS

In a radio-oriented journal like this, one might think the title would apply to a discussion about receiver intermediate frequency, whether the oscillator should be above or below the signal, and related matters.

But no! Numerous letters which have come to us over the last few months, mostly resulting from the request for opinions about our proposed handbook, have shown a widespread need among you, our members, for more information about the management of the WIA. One writer in particular would like to see much more published in AR of the discussions taking place at Executive meetings, and also at Club Conventions and Divisional Councils, not to mention Federal Conventions and meetings with DOC. A common theme is that these various discussions result in actions and decisions which affect all members, and yet few members even know what is being discussed. In most members' minds these management councils are seen as debating clubs, largely out of members' control, and from which few results or conclusions are ever seen to percolate down to the membership. This seems to be one image of the WIA; and if most of you share this image, then we do indeed have an image problem!

I'm sure the WIA is not unique among organisations in having such problems. On a small scale, it mirrors the representation of the people in State and Federal Parliaments. We, as electors, send our representatives to Parliament to defend our individual interests; but how many of us actually tell our MP's what we want? A very small minority may be stirred enough to write letters or organise meetings, but the vast majority simply hope for the best. As to what our MP's actually say in Parliament, how many of us listen to the broadcast debates? How many read Hansard? (Both State and Federal?). How many even read newspaper accounts of the more entertaining discussions? Most of us know little and care less. We depend on our MP's to know what we want, or even more clearly, what we don't want!

The WIA operates in a very similar way, except that we don't have live broadcasts, Hansard or newspapers. We do have weekly Divisional broadcasts, and we do have AR. If we ask the right people we may even be able to see the minutes of some meetings. But we do have a communications problem, basically because the amount of material to be reported is far more that can be handled by these means.

Each month, each Club, each Divisional Council and the Executive each produces minutes of its meetings. Club and Council minutes may cover two or three pages. Executive usually spreads over six or more. Every quarter Executive and DOC get together. Another six pages! Annually, each Club Convention (in the States which have them) may run to 20 or 30 pages. The Federal Convention record (complete with reports from all office-bearers) involves hundreds of pages. We are submerged in an ocean of paper. Yet most of you never see it! Does it matter?

Perhaps the important point is not whether or not you see all this verbiage. What is important is that it is there. You can always ask to see it. Even if you never do so ask, the fact that you can is an ever-present thought in your representatives' minds. All are potentially accountable to the membership. It may not seem very democratic, but it could be a great deal worse!

Bill Rice VK3ABP
Editor

LICENCE CANCELLATION

David Wardlaw VK3ADW, President of the Wireless Institute of Australia, today congratulated the Department of Communications on its successful action to help clean up the Sydney voice repeaters.

"It was unfortunate" said David "that a very small minority persisted in using foul and abusive language on air. Apart from being an offence under the Radiocommunications Act, it was a real abuse of the privileges of the Amateur Service."

David Wardlaw went on to say that many amateur operators were refraining from using repeaters rather than suffer the offensive behaviour.

The Wireless Institute's 51st Annual Convention has spent some time discussing this decline in behaviour on the Amateur Bands.

Advice was received that Mr Robert Lear VK2ASZ, was issued with a notice of cancellation of his licence on Thursday, April 30, 1987.

The Department of Communications have also expressed their concern about the level of anti-social behaviour by some amateur operators in Sydney.

"The Department of Communications has acted on our complaints" David said. "This is the first licence cancelled under the new Radiocommunications Act and on behalf of the Institute I would like to extend our appreciation for the work of the Radio Inspectors involved and we hope that this action will act as a deterrent to all those amateurs who wilfully disrupt repeater operations."

David Wardlaw said that the investigation had been conducted extremely quietly. "Todays announcement of the action taken is a real relief for those who were so upset and angry at the constant disruption to our hobby."

At the conclusion of the Convention discussions on this topic, the following resolution was carried unanimously:

"That this convention recommends:

(a) the Institute supports education in appropriate operating techniques and its conduct with training courses.

(b) the Institute publishes and distributes information statements on operating techniques and conduct. This information should, wherever practical, be incorporated within a widely available "Getting on the Air" information package.

(c) this Institute strongly recommends to its members to support the DOC in whatever manner in its efforts to control blatant and serious offenders against long standing codes of conduct."

(Signed) David Wardlaw,
Federal President,
Wireless Institute of Australia,
May 2, 1987

HIGHLIGHTS OF THE 51ST FEDERAL CONVENTION

Discussion of Examination Devolvement, Institute Structure to be Revised? Novices to be Granted use of the Two-Metre Band?

The 51st Federal Convention of the Wireless Institute of Australia was held over the first three days of May 1987 at the usual venue, the Brighton Savoy Motel, in Melbourne.

Each of the seven Divisions was represented by at least its Federal Councillor and one other delegate. VK4 and VK5 each had delegations of four people.

The Federal President, David Wardlaw VK3ADW, was Chairman. With the eight other Executive members, 29 people were involved in about 23 hours (excluding meal and coffee breaks) of exhaustive formal discussion of 16 reports from office bearers, 26 Agenda Items and the Budget.

Four other office bearers, plus sundry visitors were present part of the time and the Department of Communications was represented by Mr David Hunt, Manager Regulatory Section, Operations Branch, Canberra. Mr Hunt spoke for over an hour on Friday morning covering a wide range of topics, and was again present on Saturday, to answer questions.

EXAMINATION DEVOLVEMENT

Mr Hunt spoke at some length on the background to the DOC intention to divest itself of the financial burden of administering the amateur certificate examinations. Other organisations besides the WIA have indicated interest in this area. Subsequently, most of Friday afternoon was spent debating this topic, and a great deal of guidance was provided to Executive in its continuing negotiations with DOC.

One contentious item had been that examination of licence candidates in Morse code sending be deleted from the requirements. This was defeated, one valid point being that both receiving and sending qualifications are required by the ITU regulations.

The result of this debate was that Executive was instructed to seek accreditation as an examining authority, possibly as the sole authority, and if successful in obtaining accreditation, that an examination co-ordinator and committee be established.

DOC VIEWS ON OTHER TOPICS

In Mr Hunt's Friday morning address, he high-lighted a number of aspects of administration of the Amateur Service. These were:

a The effective and positive consultation between DOC and WIA which has contributed to the increasing self-regulation of the Service.

b A need for the WIA to respond quickly in presenting its viewpoint on controversial or provocative issues to the Department and the media.

c Commercial pressure on the RF spectrum and need for the Amateur Service to justify its requirements.

d Firm prohibition of amateur soliciting for Third Party Traffic except in emergencies.

e Undesirability of individuals attempting to negotiate with overseas governments rather than through the normal WIA-DOC and thence diplomatic channels. Individual action could be counter-productive and might lead to loss of privileges.

f The computerised Spectrum Management Information System (SMIS) being introduced by DOC, and its effect on issues such as licence terms of more than one year and the allocation of call signs. No long term problems are anticipated, but there could be some "transitional hiccups."

STRUCTURE OF THE WIA

Many thoughts were expressed during a lengthy discussion of the complexities and inadequacies of the present Federal/Divisional Structure, with the Divisions all differing in their own organisation, as to the mix of Zones, Branches and Clubs, and the degree of management centralisation. The discussion was initiated on a motion by VK3, and seconded by VK4. Reference was made to the recommendations of the 1976 Arnold Report, and it was agreed that most of these have been followed, except for structural reorganisation. The motion arising directs the Executive to review the Institute's role, aims and objectives, structure and management in detail, appointing a consultant if necessary.

FINANCIAL SITUATION

The report of the Treasurer, Ross Burstal VK3CRB, indicated impending problems, mainly due to the rapidly increasing costs in the magazine publishing area together with decreasing advertising revenue. Membership is also tending to decrease. A sub-committee met on Saturday afternoon to review the problems of producing AR and its recommendations will be covered in the Editorial for next month. The Budget for 1988 was presented, showing an overall anticipated deficit of figures $10 000. It is to be hoped that the reality will be much less, but it was appreciated by all that this would only happen by reducing expenses and increasing membership.

FEDERAL OFFICE

The newly appointed General Manager, Mr Tony Heawood, was present throughout the Convention and was certainly "thrown in at the deep end" by being introduced to the management of the WIA at this annual peak in its activity. The necessary action to implement many of the Convention recommendations will be his responsibility. Unfortunately he will not have the benefit of an executive assistant as was proposed by one agenda item, due to the stringency of the financial situation. Nevertheless, the experience of his two part-time assistants, Mrs Ann McCurdy and Mrs Helen Wageningen, will help greatly, and the President commented in introducing his report that the Institute was fortunate in their ability to "hold the fort" after the previous manager, Earl Russell VK3BER, was forced to resign on medical advice.

NOVICE PRIVILEGES

At last year's Convention, a proposal to permit Novice licensees use of a portion of the six-metre band was discussed and referred to a committee, but no further action has occurred. Two items submitted by VK3 this year were that negotiations commence immediately regarding a six- metre allocation, and that the possibility of a two-metre allocation be discussed. An important factor is that under recent reciprocal licence arrangements with Japan, it is possible for Japanese visitors having a grade of licence below VK Novice standard to operate on two-metres, from which VK Novices are excluded.

During Mr Hunt's question and answer session this situation was discussed. For reasons mainly involving interference it was indicated that DOC would prefer to see an expansion of two-metre activity rather than six- metre. Influenced by this viewpoint, the Convention decided, after considerable discussion, to drop the request for six-metres, and to support one for two-metres. Supporting speakers mentioned the need to encourage candidates for the Novice licence and that a voice-FM privilege would attract many present UHF CB operators. From this discussion a motion arose that DOC should be approached immediately for extension of Novice privileges to include the 144-148 MHz band with all presently authorised Novice modes and power limits plus voice-FM. This was carried, with only VK1 dissenting, and a letter of request was immediately drafted.

CALL BOOK IDENTIFICATION

Last year the Convention decided that Call Books should include an identifying mark for members of the WIA. It has become apparent, since its implementation, that many amateurs, both members and non-members, are embarrassed by this identification. Some have not only complained to the Institute but to DOC. In response, this year the Convention voted, only VK5 dissenting, to rescind last year's decision.

FUTURE OF AMATEUR RADIO

Discussion under this heading and also that of Forward Planning was extensive. Many speakers contributed their ideas over a period of about two hours on Sunday morning. Such aspects as age distribution, financial limitations in a family context, competing attractions (computers, etc), tower permits (and refusals), public relations, need for Morse code, and many more, were debated at some length. The result was a comprehensive set of guidelines for future action by the Institute.

CONCLUSION

This report has been prepared quickly, and may have therefore omitted some important areas of discussion. Many items of limited and specialist interest have had to be left out due to space constraints.

We hope, nevertheless, that this account has been of use to most members. If you want to know more ask your Federal Councillor, and most urgently, if you know people interested in electronics or CB, introduce them to amateur radio.

If you know amateurs who are not WIA members, tell them what the Institute can do for them and persuade them to join. More members will solve all our problems.

Report compiled by Bill Rice VK3ABP

POWER LINE INTERFERENCE — A DEPARTMENT OF COMMUNICATIONS VIEWPOINT

R D (Rodney) Champness

V H (Volker) Pleuger

Introduction

With new technology comes new techniques for overcoming related interference problems. There are, of course, many potential sources of interference in our complex, technically-orientated society which can involve mechanical, electro-mechanical, electrical and electronic devices — all of these are capable of producing unwanted radio frequency energy. Of these sources, it is a fact of life that power line interference (PLI) constitutes more than 50 percent of all complaints received for investigation each year by DOC in all States.

DOC's current policy is to provide a cost effective service to the public, consistent with available resources in identifying sources of interference. The diagnosis in and location of PLI is complex and time consuming, resulting in a great deal of DOC's limited resources being used in this activity. Regrettably, it is impractical for DOC to investigate cases of PLI to the amateur service, unless there is the presence of significant interference to broadcast or television reception from the same source. All interference complaints may be lodged at any of DOC's Radio Frequency Management Offices throughout Australia.

It is an unfortunate fact that all power lines radiate radio noise. It must be regarded as impossible to prevent radio interference from power lines entirely, if not from a technical, at least from an economic point of view. Satisfactorily resolving PLI and other interference problems is often a matter of effective negotiation and education. In this context it is pleasing to note that the activities of the WIA's EMC committee and other contributors of constructive magazine articles can only enhance the understanding of interference problems in general.

In the following article on PLI, we will be discussing primarily the Victorian situation, for the sake of convenience. While there may be some differences of power line construction and climate among the States, these should not significantly affect the basic problems encountered.

High Voltage Power Line Interference

Overhead high voltage power lines have been a significant source of interference to radio, television and radio communications reception for many years. The current interest in the continuing problems of PLI has prompted the need to further enhance an understanding of such problems. The following article looks at how the interference is generated and the present methods of detection and interference reduction, including how modern construction trends on High Voltage lines are minimising interference.

DOC's Radio Frequency Management Division is responsible for detecting sources of interference to broadcasting and radio communications services. Once a particular interference source is located, DOC advises the owner of the offending equipment and suggests what remedial work is necessary to overcome the problem. If required, the equipment owners are assisted on site to successfully suppress the offending equipment. Such assistance may be needed since interference suppression can become quite complex. Recently, DOC has been working with the Standards Association of Australia on particular standards which, when introduced under the *Radiocommunications Act 1983*, will help to progressively reduce interference levels.

DOC's interference investigators, called Radio Inspectors, identify sources of PLI and recommend remedial action to the relevant power authority. At least 90 percent of PLI is generated by sparks, that is, interrupted arcing, in the variable leakage paths between phases, sometimes via the earth or neutral conductor on the high voltage reticulation system. It should be understood that when referring to 'sparks', the start and finish of each 'arcing burst' is the responsible mechanism for the interference heard. Incidentally, it is a widely held misconception that common arc welders cause interference. This is just not so. Arcing, when such welders are in use, is normally continuous and is quenched in any case. Power line voltage fluctuations may, of course, occur, and in severe cases could cause some instability in appliance operation when the line voltage regulation is poor. In fact, only the more sophisticated 'pilot arc' welders can cause interference. Usually these would be found only in industrial premises.

Voltages of 6.6, 11, 12.7, 22, 33 and 66 kV are variously used in Australia to distribute power around suburbs, towns and rural areas before being transformed down to 240-415 volts AC. The main feeder reticulation systems are usually 220, 330 or 500 kV, and these will be disregarded in this article as PLI problems on them affect relatively few people. The most common high voltage power lines in Victoria are 22 and 66 kV. They share similar construction techniques with the most obvious differ-

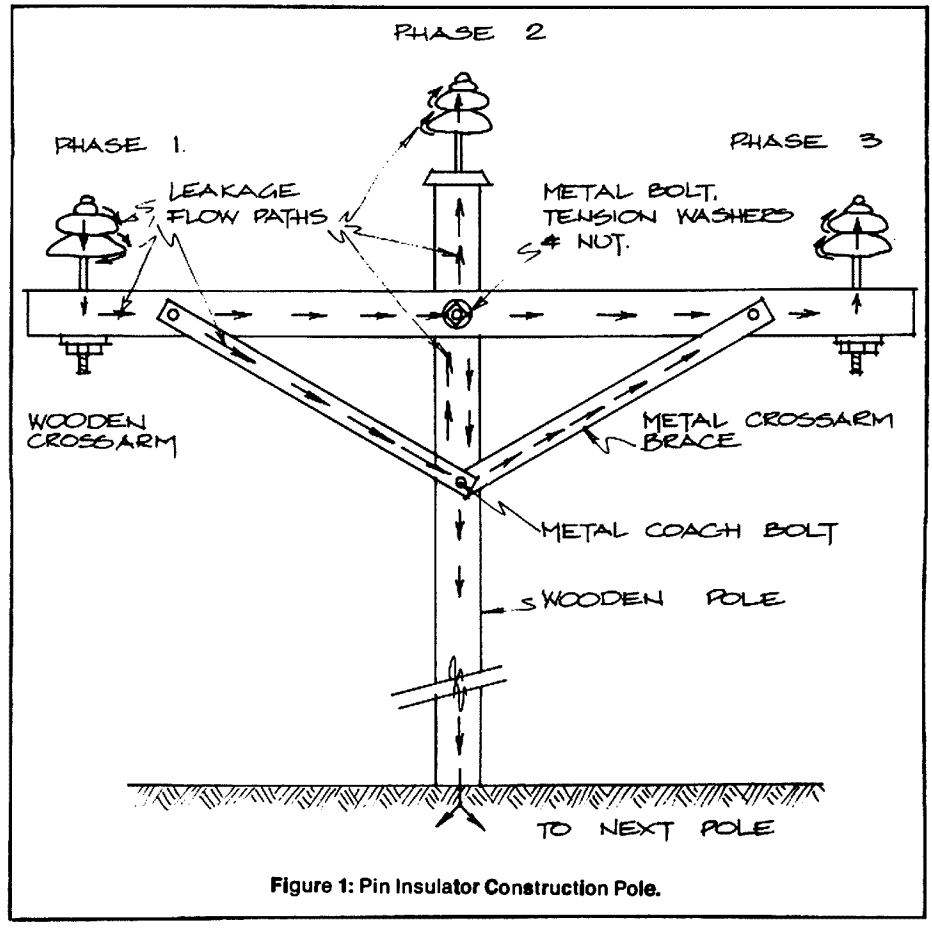


Figure 1: Pin Insulator Construction Pole.

ence being in the size of the insulators (See Figure 2).

By referring to Figure 1 and the following information, it will be clear how most high voltage PLI is produced. No insulator is perfect. Recognising this makes much easier an understanding of how interference is produced. Since no insulator is perfect, it is clear that a small current flows between each high voltage phase. This current will combine purely resistive current and 'capacitive' current components. Figure 1, shows the leakage paths from phase one to the other two phases as an example. Contamination on the surfaces of the insulator or a faulty and possibly cracked insulator, will increase this leakage current quite significantly due to a reduction in the resistance across the insulator. This leakage, in itself, does not cause interference. Interference will only be caused when there is some discontinuity in the leakage path or paths. Where this condition occurs, sparks will jump across the gap and thus interference is produced. The interference level is governed largely by the level of the leakage current peaks.

The typical high voltage distribution pole as shown in Figure 1 is mostly made of wood, with a wooden cross arm and metal braces. The insulators in this type of system are mounted on metal pins which are bolted to the cross arms. When first installed, all of the 'hardware' that is nuts, bolts, braces, and so on, is tight, so it is unlikely that any discontinuity will exist in the leakage paths. However, in time the wood shrinks and the whole of the structure at the top of the pole will become loose. Additionally, the metal-work will corrode and will have some contaminates on its surface as well. These may act as poor quality insulators, usually at reasonably high insulation resistance, but with low dielectric strength.

Since the leakage currents travel throughout the high voltage structure, as shown, it should be clear now that at some points where there is a looseness in the structure, discontinuity in the leakage path can occur.

A similar phenomenon can be observed when plugs and sockets on electronic equipment are loose, with resultant crackles and variable performance. The effects of corroded connectors in antennas are well-known. A check of continuity across such corroded connectors shows that the resistance varies from about zero, when making good contact, to a very high value if the corrosion is the only path for the ohm-meter testing current.

Returning again to our power pole line support structure, it is obvious that hardware looseness acts very much like the poor join in the antenna. However, the signal voltages on the antenna are low, whereas the voltage across any part of the loose hardware on a power pole, where an open circuit exists, rapidly reaches several thousand volts. If the spacing across the open circuit gap is not great, sparking will occur at a rate of 100 times per second or twice 50 Hz, which accounts for the two bands of dotted interference lines sometimes seen on a television screen. A single leakage path from one phase to earth may also produce a single band of dotted lines on a television screen. In the most severe case of leakage between all phases, up to six noise bands may be seen theoretically, although it is more likely that these would merge in practice and be seen as one very broad interference band covering most of the screen.

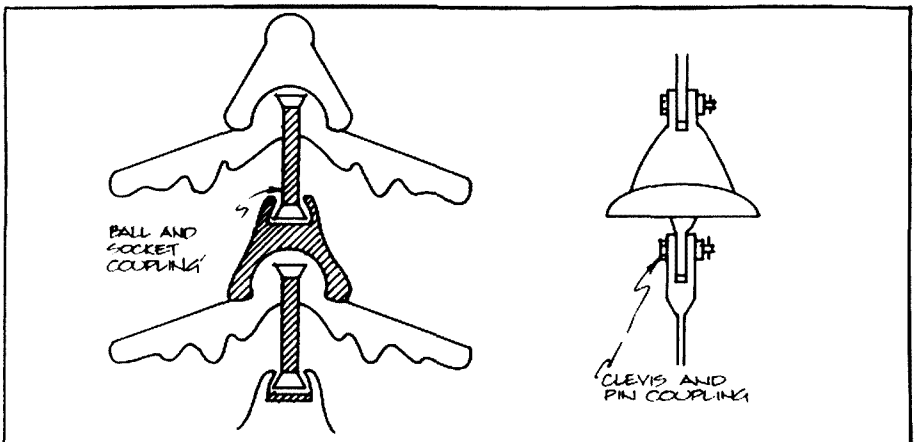


Figure 3: Types of Flexible Couplings. The flexible coupling being either the ball and socket or the clevis and pin are designed to move as the line moves under the windy conditions, they also provide for ease in line construction. Unfortunately, the metal to metal coupling collects surface deposits of oxides and dust which builds up an insulating layer around them. The electric field between the metal coupling endeavours to complete the circuit and a spark is formed. The movement of the line in windy conditions results in an intermittent 'Zapping' as the coupling contact is made and broken. Disc insulators used on slack spans and intermediate poles are more troublesome because of the low mechanical tension applied to the metal coupling.

Another common type of high voltage construction which causes considerable interference is the suspension disc insulator type construction (see Figure 3). This system is often used on both 22 and 66 kV lines. There are usually two disc insulators on 22 kV lines per phase and four disc insulators per phase on 66 kV lines where wooden poles and cross arms are used (see Figure 2).

Disc insulators are joined together, either by flexible ball and socket joints with a retaining 'W' pin, or clevis and pin coupling. This is a 'loose mounting' arrangement and, as such, it is free to move with wind pressures and so on. This freedom of movement in the assembly of these disc insulator strings, makes them prime sources of interference due to the numerous potential discontinuities in the flexible couplings between insulators. In cases where the mechanical strain on such coupled insulating systems is great, the potential for PLI is reduced since a reasonably reliable and continuous contact between couplings can be maintained.

It should be mentioned that, where possible, Victoria's power line authorities are often replacing the more troublesome disc construction poles and sometimes wooden poles, with ferro-concrete poles. Usually these have metal cross arms and the modern ribbed-post insulators mounted on them, thereby overcoming any of the interference problems ascribed to loose hardware and coupled disc insulators. Having explained the mechanics of how most cases of PLI are generated, the methods of interference detection now will be described.

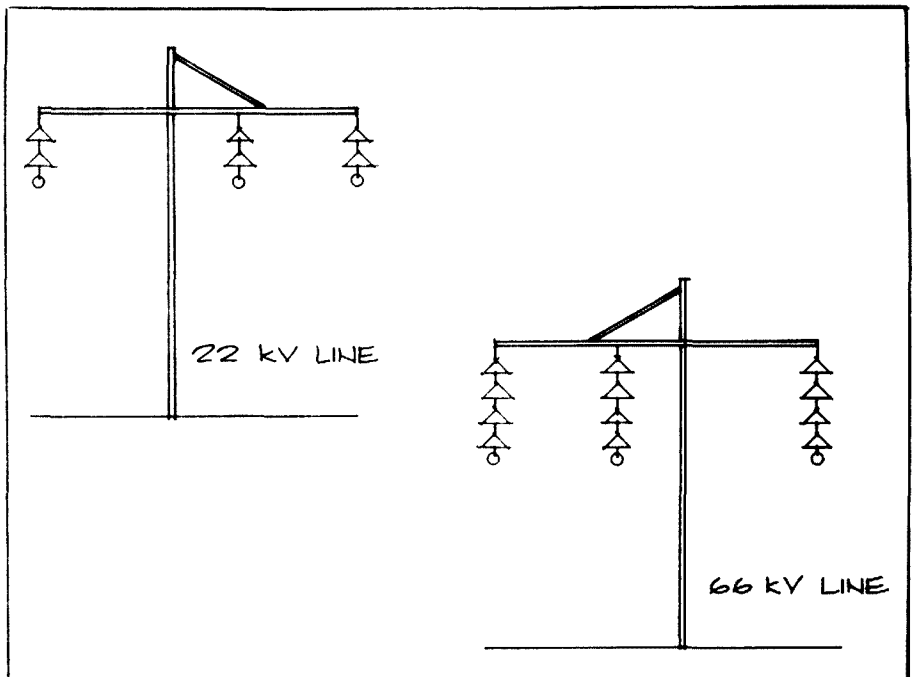


Figure 2: Victorian Suspended Disc HV Construction.

Tracing Interference

The first step in tracing interference is to make sura that the affected receiver and associated antenna systems are in good order, as received

interference problems are often made worse by antenna deficiencies. Once satisfied that the receiving installation is in good order, the next step is to observe the interference. If it is not present at the time of the visit, the Radio Inspector will endeavour to find out the nature of the interference and when it is likely to reappear by analysing the symptoms and obtaining information from the complainant. Video or sound recordings of the effects can often assist in this process. It is important to know when the interference is likely to be present, as some interference occurs intermittently. 'It stopped just before you came' or 'It came on just after you left last time' are common statements made by people who suffer interference to their reception.

Having determined that the interference is externally generated and likely to be due to high voltage power lines, the DOC officer listens with instruments located in his vehicle, usually at the highest frequency on which the interference is still detectable with the relevant radio or television frequency band. Sometimes the DOC officer cannot detect a particular interference because the antenna on his vehicle is, obviously less efficient than one installed on the roof of a home. It is necessary then to move to a location where interference can be heard and to locate the most likely source of the interference if multiple sources are detected. It can be quite difficult to locate the correct source of interference when it is not heard outside the DOC vehicle. The experience of the DOC officer will mean that in most cases the correct source of interference however can be found. The greater the overall sensitivity and bandwidth of a receiving installation, due to a combination of high gain antennas, low noise receiver and perhaps a masthead amplifier, the more likely it will be prone to interference, whether its source is PLI, CB or amateur transmitters. In country areas, where reception from capital city television stations may be quite marginal, use of a low noise masthead amplifier means that the distance to the interference source could be a kilometre or more, while some high frequency interference sources may be several kilometres away. The effects of a nearby narrow spectrum radio frequency interference source such as a CB transmitter can, of course, be overcome by fitting a suitable radio frequency filter at the input to the masthead amplifier and the television set.

Interference Intensity

The intensity of the interference will vary with the distance from the source as shown in Figure 4. Interference at medium frequencies may be heard for many kilometres along a *power line* with no *clearly* defined peak. There may be standing waves however which can give the impression that the peak has been found, when in fact, the actual peak is some considerable distance away. By comparison, in the Ultra High Frequency (UHF) region, interference may only be heard over a distance of a few hundred metres when using high gain antennas and sensitive receivers. This makes tracing the interference source much easier and more positive, providing the actual interference does in fact have a UHF component. As a general rule, interference peaks are more pronounced the higher the frequency range affected.

Having determined from where the interference emanates, various methods are used to isolate the source. These methods may involve shaking a guy wire or gently tapping a high voltage power pole with a wooden maul, while listening for any change in the interference level or tone on the detecting receiver. In some cases it is necessary to determine whether the interference is on the 22 kV or the 66 kV reticulation system, as these can be mounted on the same pole and two groups of linesmen can maintain the systems separately. Determining which line is at fault in such cases is difficult but can be accomplished by using UHF Radio Frequency Interference guns; Very High Frequency (VHF) beams and interference location receivers; or in some cases, an ultrasonic detector. Skill is needed to detect the slight difference in sound and interference level which gives a Radio Inspector that vital clue to accurately locate the problem. It is, of course, possible that both lines are causing interference simultaneously.

Ultrasonic Detectors can, at times, be ideal for determining the exact location of PLI. However, it is often found that interference is present on a pole which gives no ultrasonic output at all. Conversely, an ultrasonic output can be heard from a pole from which no significant radio frequency interference is emanating. The ultrasonic detector hears the ultrasonic component of a spark. If this spark is within direct 'visible' range of the detector, it can be heard. However, if the spark is obscured inside an insulator, behind a cross arm, or on top of the cross arm, it will not be heard.

Clearly, such a unit can be a very handy device when used in conjunction with radio frequency detection instruments to verify a PLI source, but should not be relied upon in every case.

Having identified the problems on a specific pole, it is then necessary to advise the relevant electrical supply authority of the corrective measures needed to overcome the interference. With installations as shown in Figure 1, tightening the hardware at the top of the pole will usually overcome the problem. As the timber shrinks and expands *from* summer to winter, it is recommended that conical spring washers be used under each nut of the mounting hardware to maintain tension and hence reduce the likelihood of recurrence of PLI *from this source.*

Overhead high voltage power lines, using disc insulators in the suspension mode where physical tension between each insulator is low, are highly likely to generate interference. The *lower* the tension on the ball and socket *joint* or clevis and pin joints the higher is the likelihood of interference being generated. Single Wire Earth Return lines rarely generate PLI since the disc insulators are being used normally, that is, under significant mechanical strain.

To overcome interference generated by looseness of the disc insulator assemblies, power authorities commonly fill the coupling with conductive graphite grease or silicon grease. This grease is difficult to insert and has a relatively short life, preventing interference for a few months only. Disc insulators, with a bonding strap connected across the flexible couplings, have been used with success, but are not seen very often. It is economic to replace all existing disc insulators with the bonded variety to overcome the problems of interference.

A more successful method of interference reduction introduced in the last few years involves stainless steel brushes about 2 cm in diameter and about 3 cm long, looking much like small bottle brushes. These are inserted into the disc insulators flexible ball and socket joints. The ends of the brushes are sharp and hard, biting through the corrosion, thereby making good contact between the adjoining ball and socket. They are easier to install and usually last several years without falling out of the joint. They are very effective at eliminating interference. *The use of these brushes, together with conical tensioning washers,* has proven to be *the most effective remedial measure against PLI on existing power line systems over the last 10 years or so.*

As mentioned earlier, there are also some new construction techniques which do not produce interference. Namely, the use of reinforced concrete poles, with metal cross arms and ribbed-post type insulators, along with some simplified constructional techniques. In some areas, underground power systems are used as well. These have been gradually coming into use over the last 10 to 12 years. With the improved remedial methods of overcoming interference on existing high voltage power lines and the new types of construction, interference is being brought under control gradually.

Once the DOC Radio Inspector determines the source of interference, the electricity supply authority is advised in writing of the recommended corrective action. If necessary, electricity supply authority linesmen and a DOC Radio Inspector will attend an interference problem together. This occurs where a very severe PLI problem exists, or when something out of the ordinary may be causing the interference. A number of live-line crews

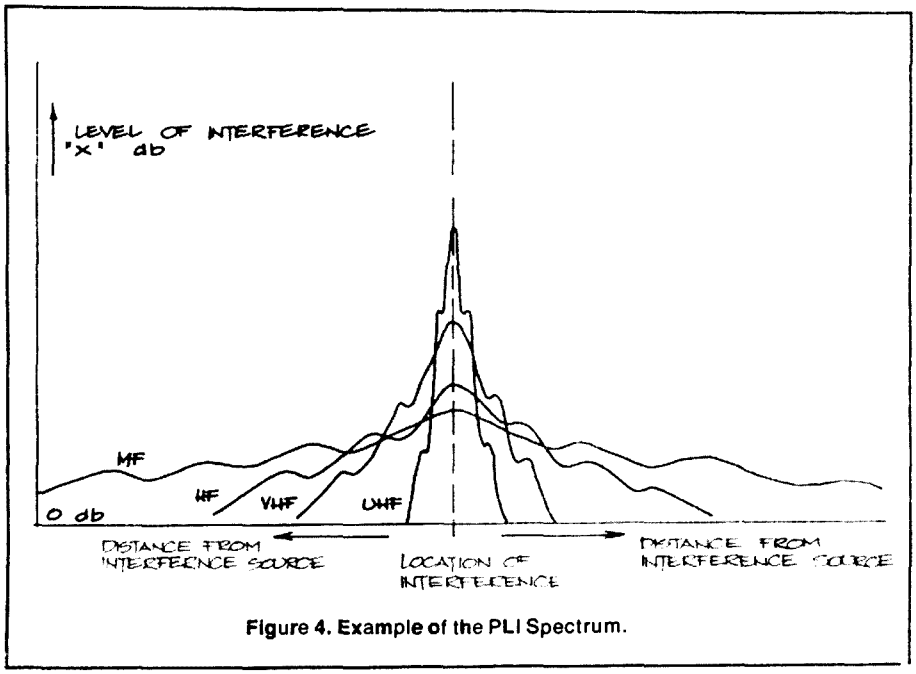


Figure 4. Example of the PLI Spectrum.

have small VHF air band AM radios or small portable television sets, which assist them in assessing the efficiency of their interference suppression work.

For example, it may be found that pole number 335 is causing the interference today. Tomorrow it may be that the neighbouring pole, number 334, is causing interference. The next day neither pole, but the following day, both poles are causing interference. Various tests may be conducted and neither pole may radiate interference when tested, although most poles can be persuaded in dry conditions to produce interference. For these reasons, it is possible for a DOC radio inspector to 'miss' some interference even though he has found interference on a number of poles. When this happens the person reporting the interference wonders, whether, in fact, the DOC Radio Inspector has found the interference and whether the electric supply has, in fact, fixed the fault. In reality, of course, the interference found at the time, has been fixed and another source has developed subsequently. This does happen, and quite often. It is possible to advise the electricity supply authority of many poles likely to be emanating some PLI from time to time.

It is, however, not cost effective for the supply authority to be going around tightening up every loose nut or bolt on every pole within a kilometre of a viewer or listener on the off chance that it might case interference. Often poles are found that have considerable loose hardware on them which have never caused interference and so there is no point in reporting them. In these instances, the leakage paths obviously suffer no discontinuities and therefore no interference is generated.

The most common sources of interference on overhead high voltage power lines have been covered in this article. Before concluding, however, we should look at a few lesser *known* problems, and explore a few facts and fallacies.

On Single Wire Earth Return lines, most interference can be attributed to defective surge diverters or lightening arrestors. Due to the style of construction on these lines, loose hardware rarely causes a problem. Disc insulators, being under so much tension in these circumstances, make reliable contact via the couplings. The leakage path therefore is continuous.

While other wires, such as Telecom lines, are common-poled it is quite possible to induce many thousands of volts into them. Consequently, poor joins or leakage paths in these or similar nearby wires, can create interference just like the leakage paths on high voltage lines.

On the lower end of HF bands it is quite possible to hear interference many kilometres away from power lines, either by direct radiation or by reflection from the ionosphere. The power lines may contain resonant lengths at HF frequencies, and therefore are very good radiators. Under these circumstances interference is unlikely to be found directly, but in the course of solving someone else's interference, perhaps some severe television interference, it may be solved.

Interference from high voltage power lines may be detected over a wide range of the electromagnetic spectrum from quite low frequencies — up to many hundreds of megahertz. The upper limit is not known, although PLI is very rarely heard above 500 MHz. In general, PLI will peak at around 40 MHz.

PLI may be conducted for many kilometres along a line and low frequencies will not radiate a great deal at any one point, but will travel only a short distance at VHF frequencies along the line, and radiate most strongly very near the interference source. At low frequencies the line acts as a transmission line that is slightly lossy, but at VHF it acts as a very lossy transmission line.

PLI due to corona discharge occurs more so on higher voltage lines, and is exacerbated by any sharp projections on the line, such as upright cable-end tail. It is not a major cause of interference, and when heard on radio, is softer than normal interference, generally increasing the background level of interference, in an area.

Often PLI will increase towards and during the early evening and then will suddenly stop. At nightfall, moisture or dew will form on the insulators and PLI from the whole high voltage supply line structure will increase due to the reduced resistance of the leakage path between phases. In time the moisture penetrates into the areas where sparks occur and bridge the spark gaps, quenching the sparks and hence, the interference.

Transformers, which are normally very visible, are often blamed for causing all manner of interference, yet they are remarkably trouble-free. Only a handful are found to be defective in any one year; sometimes none at all. However, due to the quantity of hardware on poles carrying transformers, the likelihood of interference on such a pole is certainly increased. Interference caused by power transformers can occur throughout the normal radio and television frequencies or may only be detectable up to a few megahertz.

Finally, we should not forget that related to high voltage PLI are interference problems caused by neon or sodium street lights and their associated automatic switching systems. When these lights are near the end of their service lives, they produce an interference characteristic, which can be radiated or conducted via power lines and may severely affect broadcast radio and, sometimes, television reception. Domestic fluorescent lights can, of course, cause the same interference problems, which *may* be *overcome* by fitting appropriate suppression components. The more usual course of action is to replace the offending lights because they will have lost efficiency. Equally, interference can be caused by the street light sensing switches, commonly known as photo-electric cells, which control the lights depending on ambient light conditions. These photo-electric cells may become faulty, like a thermostat, and fail to switch correctly or remain in an arcing condition.

Postscript

This approach to interference problems and prevention has had to be fairly broad. No doubt it will be apparent that many sources of RFI exist in our modern society, apart from high voltage PLI, which are likely to affect us individually at some time.

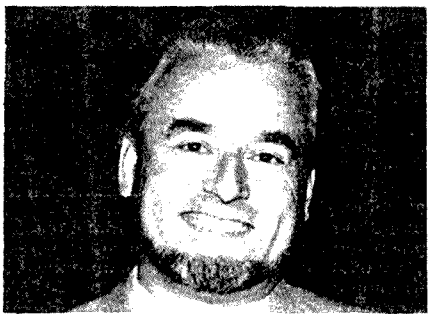
These sources include:

- Computers, calculators and microprocessor/controlled business or domestic machines.
- Citizen Band, commercial radio communications or amateur radio services.
- Industrial process control and radio frequency systems, including medical radio *frequency* heating systems, for example diathermy machines.
- Common domestic equipment, such as small electric appliances and tools, even some solid-state temperature control systems used with water beds.

DOC's role is to equitably manage the shared use of the radio frequency spectrum for the common good. This means that there need to be reasonable rules concerning the levels of wanted and unwanted radiation from devices capable of transmitting radio frequency, as well as standards of immunity against the unwanted effects of radio frequency. Electromagnetic compatibility between electronic devices operating in a reasonable proximity to each other is obviously important. *For this reason DOC already has a number of technical standards, applicable mainly to radio-communication systems under the Radiocommunications Act 1983 to, among other things, control interference problems.*

Interference suppression can be complex or simple, but it is fair to say that all radio frequency interference can be suppressed or overcome in some way. However that's another story.

About the Authors



Volker (Vic) Pleuger is the DOC Radio Inspector for the Bendigo District, which covers the central, northern and north-western areas of Victoria.

He joined the Department in 1975, after having worked for 17 years with the radio and television broadcasting sections of the former PMG Department (now Telecom Australia).

Mr Pleuger was officer-in-charge of the DOC Radio Equipment Type Approval Laboratory, and spent a year as assistant manager, regulatory, at the Department's Victorian State Office.

He worked in various positions as senior technical officer and principal technical officer after joining Radio Frequency Management in the Department's Melbourne Central Office.

He was appointed District Radio Inspector at Bendigo in 1985.

In his spare time, Mr Pleuger is an amateur radio operator and assists with program production for a local community radio station.

He is married with one son and three daughters and lives at Faraday, near Bendigo.

Rodney Champness is DOC Radio Inspector for the Benalla District, which is bounded to the north and east by the Murray River, to the west approaching Echuca, and to the south as far as Kyneton.

Mr Champness joined the Department in 1970 after working as a radio, television and two-way radio serviceman; radio supervisor in the Antarctic; and broadcasting station technician.

He has worked in the Radio Frequency Management area in the positions of: interference investigation officer; State Marine radio surveyor; Commonwealth marine radio inspector; equipment type test officer; and examinations officer.

Mr Champness was appointed District Radio Inspector at Benalla in 1977.

In his spare time he is an amateur radio operator who contributes articles on the subject to amateur radio magazines.

He is a member of the Wireless Institute of Australia (being a past member of the Publications Committee), and belongs to a local radio club.

Mr Champness is married with two children and lives in Benalla.

BUILDING BLOCKS REVISITED

— Part Two

Part 1 of this series described the background to the HF Building Blocks and listed the functions contained on each circuit board.

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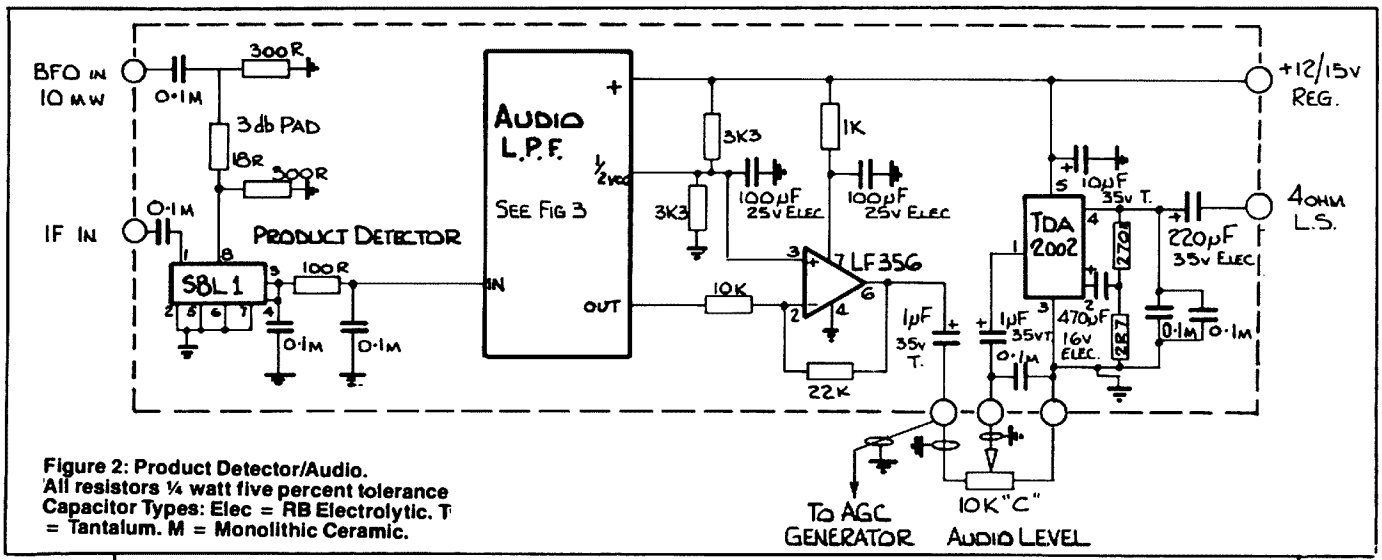
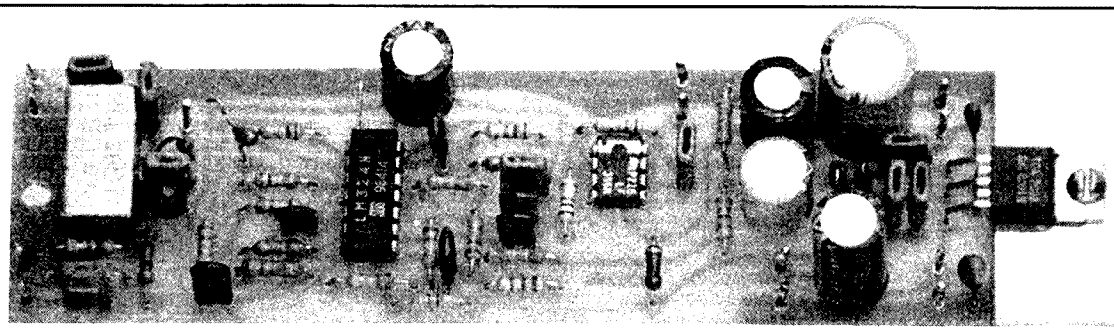
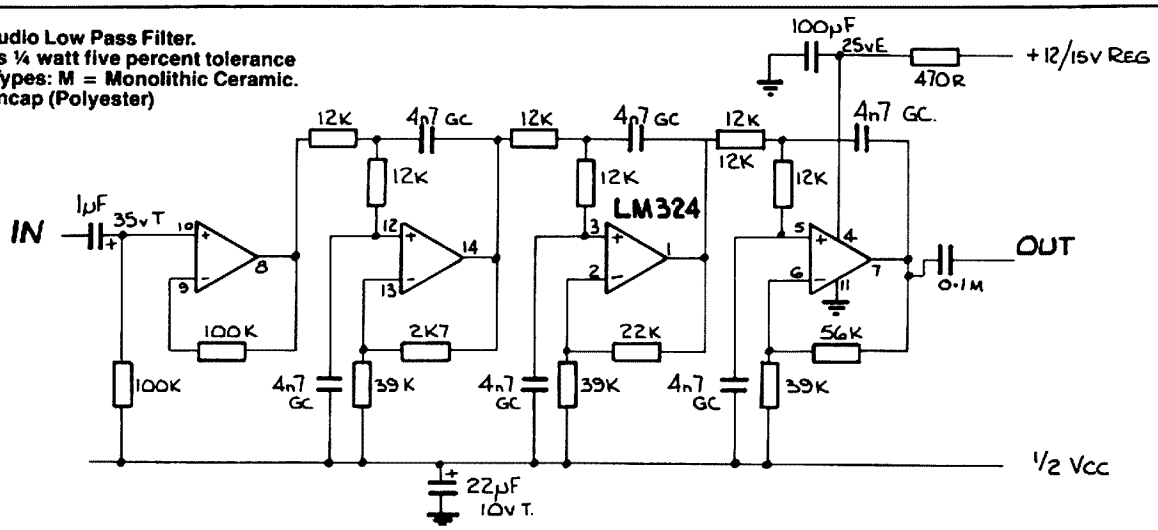


Figure 2: Product Detector/Audio.
All resistors ¼ watt five percent tolerance
Capacitor Types: Elec = RB Electrolytic. T = Tantalum. M = Monolithic Ceramic.



Made-up Product Detector/Audio Board.

Figure 3: Audio Low Pass Filter.
All resistors ¼ watt five percent tolerance
Capacitor Types: M = Monolithic Ceramic.
GC = Greencap (Polyester)



Each module will now be examined in detail, starting at the audio end of a receiver and progressing through to a transmitter power output stage.

MODULE 4 — PRODUCT DETECTOR/ LOW PASS FILTER/AUDIO

Figure 2 gives the circuit diagram of the module and Figure 3 the circuitry of the LPF Figure 4, shows the component layout and Figure 5 gives details of the audio output heat-sink.

A — Audio stages

The audio stages consist of a LF356 FET input op-amp as a preamplifier and a TDA2002 audio output stage. This combination is capable of generating over 2.5 watts into a 4 ohm load with a 13 volt supply and over 4.5 watts into 4 ohms with a 15 volt supply. The nominal drive requirements in both cases, is under 10 mV RMS.

Whilst it is improbable that the full output capabilities would be required under normal listening conditions, the excess capability has some advantages. It provides insurance against gross distortion when conditions require a higher than normal output level, but more importantly, it guarantees low distortion levels under normal listening conditions.

This general approach of providing excess capability has been adopted throughout the series and contributes significantly for the performance of the finished product. The conventional amateur approach of tuning everything for maximum smoke has not been adopted!

The LF356 can be replaced with a CA3040 or any other op-amp having a FET input stage and a slew rate of around 10-12 volts per microsecond. The ubiquitous 741 should not be substituted.

The TDA2002 can be replaced with an LM383, but it may be necessary to modify the heat-sinking, if this is done.

B — Low Pass Filter

The audio stages are capable of a response to well over 100 kHz and unless some steps are taken to limit this, then the high frequency hiss generated in any IF amplifier and/or product detector will be faithfully reproduced, which will be unpleasant to the ear. Besides which there is just no point, in an amateur receiver, having audio components that contribute nothing to the information being conveyed.

For this *reason* a low pass filter having a "knee" of around 2700 Hz and a sharp roll-off thereafter has been included.

The filter design has been lifted directly from Don Lancasters excellent *Active Filter Cookbook* and is described as a six-pole maximum flatness filter. The active device is a LM324, a quad op-amp.

The first section is used as a buffer with the filter proper being built around the other three sections. With the component values given, it has a - 3 dB point of 2700 Hz and a roll-off approaching 35 dB per octave. Resistors of a five percent tolerance are the "norm" now-a-days and should present no supply difficulty. The six 4n7 greencaps should ideally be sorted out on a capacity meter, with the aim of getting them as close together in value as possible, say ± two percent. Generally, it has been found that if six identical looking units are chosen from the bin at the local emporium, it is highly probable they will have capacitance values sufficiently close to do the job.

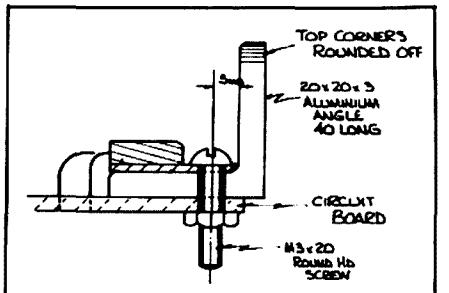


Figure 5: Detail of TDA2002 Heat Sinking.

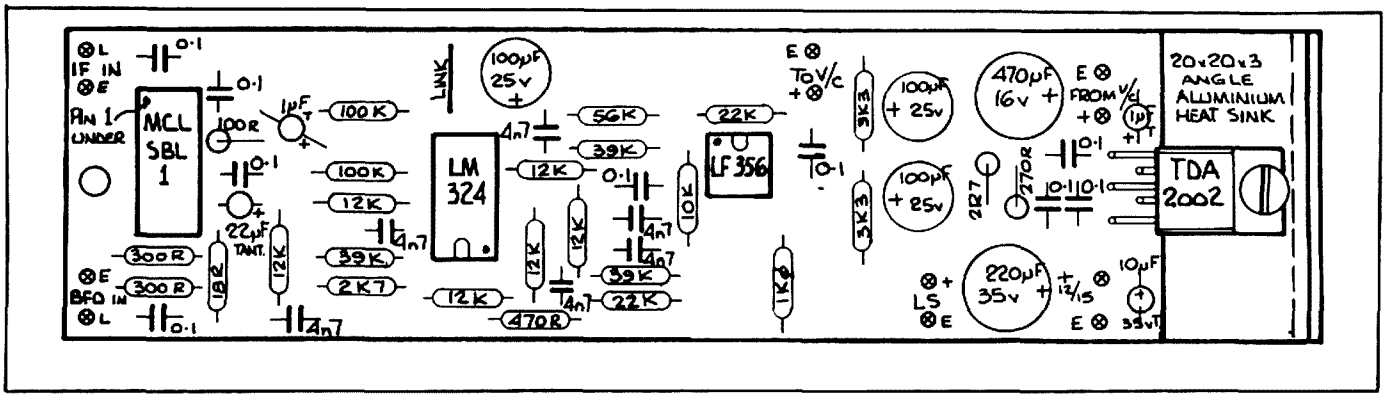


Figure 4: Component Layout on Audio Board.

The filter has an overall voltage gain of four times or around 12 dB.

C — The Product Detector

The product detector uses a Mini Circuits SBL1 doubly balanced diode mixer. These are in common use now-a-days as passive mixers at RF, and their good modulation and signal handling capabilities warrant their use in the product detector position. Provided they are terminated in 50 ohms at each port and the drive input requirements of 5 mW to pin 6 are met, the design will accommodate oscillator and signal input frequencies of up to 500 MHz.

The 3 dB resistive pad into pin 8 helps establish the required 50 ohm source impedance. The BFO is thus required to provide an output of 10 mW into 50 ohms.

Note that pin 1 of the SBL1, is identified by blue insulation on the underside. Pin 2 is under the M of MCL stamped on the top of the case.

CONSTRUCTION

It is suggested that the audio stages are first made and commissioned, then the low pass filter and finally the product detector.

Construction itself should present no difficulties and, provided the ICs are put in the right way around, polarities observed for the electrolytic and tantalum capacitors, and a check made for poorly soldered joints, the unit should work first time.

Access to an audio signal generator would assist commissioning. Alternatively the station's two-tone test oscillator switched to a single tone output, could be used as the signal *source*. Failing all this, the time honoured "wet finger" on the input will at least establish the unit is alive and working.

As a guide to those with adequate testing equipment, the LPF/Audio stages should give the following results:

Vcc	13.0 volts
Load	4.7 ohms
Input	8.0 mV RMS (1000 Hz)
Undistorted Output	2.7 watts
-3 dB points	260 and 2700 Hz
Response at -20 dB	55 and 4300 Hz

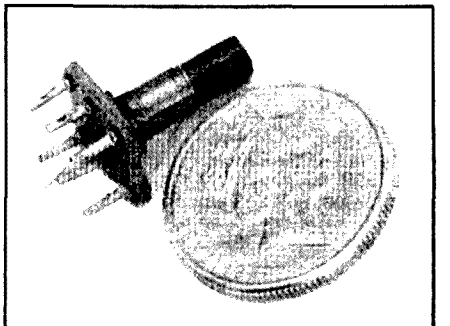
With the product detector in circuit and a 10 mW 8 MHz oscillator feed, the minimum detectable RF signal (background audio noise rising by 3 dB), was 15 microvolts at 8 MHz.

MODULE 6 — BFO/BALANCED MODULATOR/MICROPHONE AMPLIFIER

Figure 6 gives the circuit diagram, whilst Figure 7 shows the placement of parts on the circuit board.

Figure 8, gives the detail of an RF probe, which, in conjunction with the station multimeter, is an essential *commissioning tool. It is* recommended that this probe be made before trying to commission any of the modules.

The probe uses two hot carrier diodes in a "voltage doubler" circuit. The (pulsating) DC voltage developed by the diodes charge the 470 pF capacitor to some peak voltage. The 12k resistor acts as a load for the system. The DC across the load, is filtered by means of the 33 microhenry choke and 100 ohm series resistor. The screened cable connects the probe to the multimeter.



One of the Coils compared in size to a *dollar* coin.

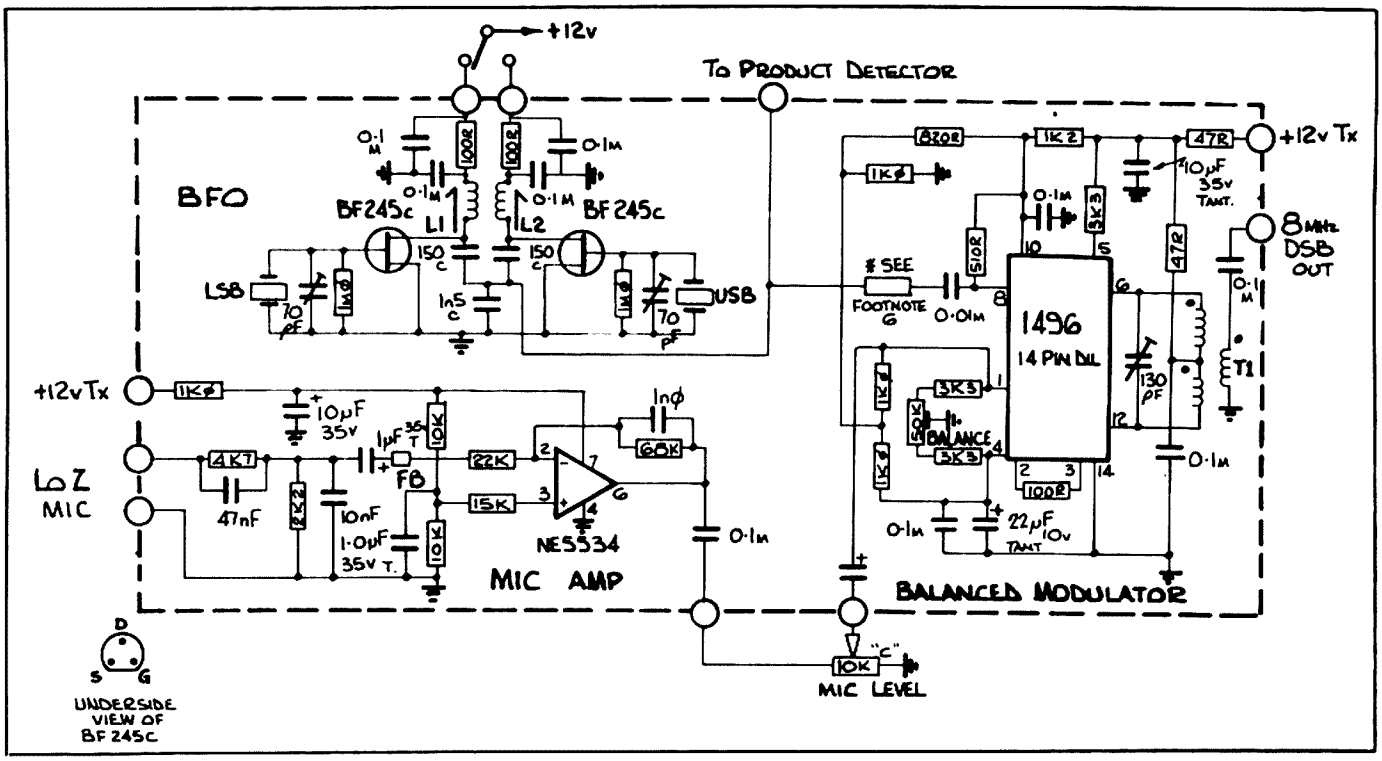
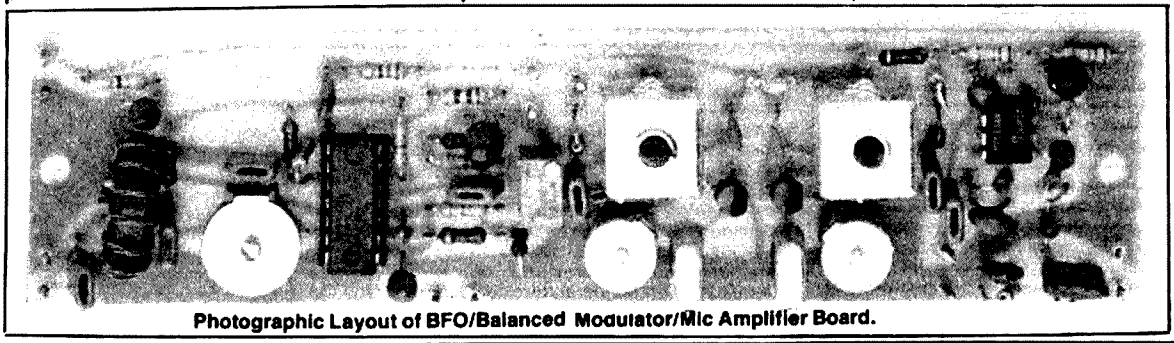


Figure 6: BFO/Balanced Modulator/Mic Amplifier.
1. All fixed resistors ¼ watt five percent. 50k balance pot is a 10 turn upright mounting, top adjustment, triangular lead arranged type
2. C = Ceramic Disc or Ceramic Plate. M = Monolithic Ceramic
3. L1/L2 — 27 turns No 32 B and S (0.25 mm) enamel, close wound on a Neosid Type A former with a F29 core
4. BFO 70 pF and balanced modulator 130 pF trimmers are Philips Type 2222- 808
5. T1 consists of 13 trifilar turns of No 26 B and S (0.45 mm) enamelled wire on Amidon 68/2 toroid
6. Nominal 1k5. Adjust to give 100 mV RMS at pin 8 of the 1496



Photographic Layout of BFO/Balanced Modulator/Mic Amplifier Board.

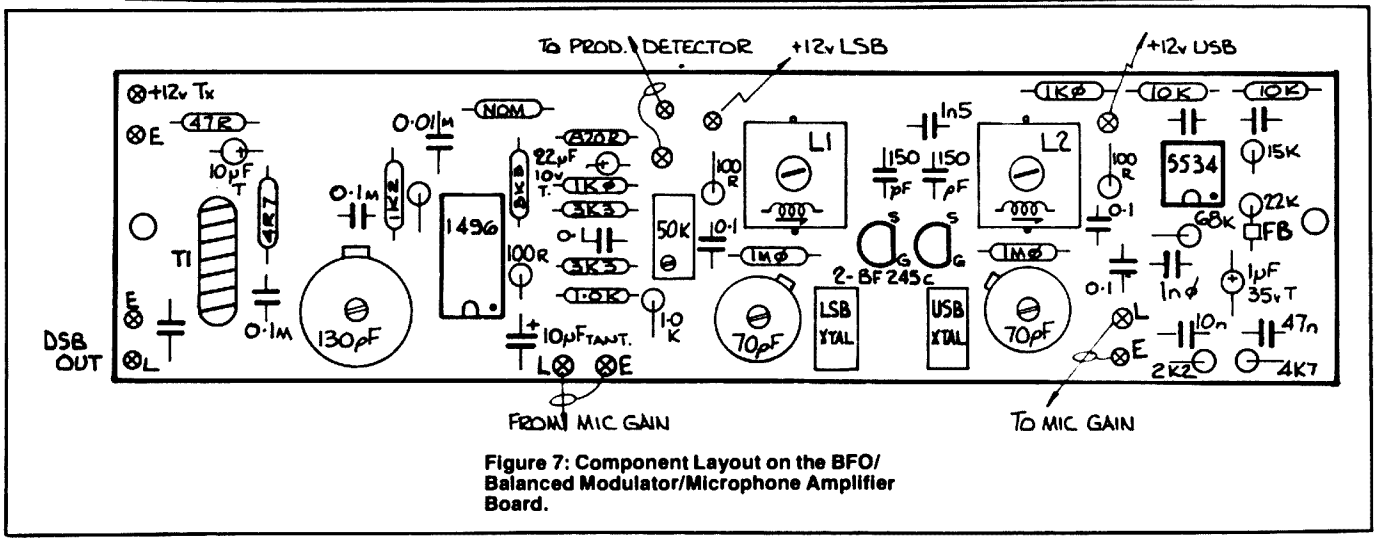


Figure 7: Component Layout on the BFO/ Balanced Modulator/Microphone Amplifier Board.

Note that this is not a precise measuring instrument at low RF levels, although it becomes so over about 1.5 to 2 volts RMS of RF

The main purpose for recommending the device is to provide a simple and easy means of comparing the results found by the constructor with the levels specified in this series of articles.

The probe is made on a 6 x 0.5 inch (153 x 13 mm) piece of single-sided circuit board. This board is made by cutting the copper with a sharp knife and removing the unwanted copper between the lands by "stroking" with a hot soldering iron. The slightly raised edges of copper left by this technique are flattened down with the edge of a steel rule, the copper polished with fine dry steel wool and the now clean board given a light coat of protecting lacquer.

The components are soldered to the appropriate lands, using the minimum lead lengths. The screened cable is tied to the circuit board at a couple of points, to remove strain from the cable connections.

Germanium diodes may be substituted for the hot carrier diodes specified, with a small loss in sensitivity. Silicon diodes should not be used.

A — THE BFO

Since the IF frequency for this series of modules has been set at 8 MHz, the tuning component values given in Figure 6 are for this frequency. However, by changing the number of turns on L1 and L2 and/or the values of the 150 pF and 1n5 capacitors, the BFO can be put on any of the conventional IF frequencies such as 10.7, 9.0 or 5 MHz.

It is suggested that the BF245C FETs specified be used, mostly to ensure that the BFO develops the required 10 mW of power needed to drive the product detector on Module 4.

Selection of the required sideband is by switching the supply to the appropriate oscillator.

Output is taken from the junction of the 150 pF and 1n5 capacitors, as this point has an impedance approximating to 50 ohms.

To test the BFO, a 51 ohm resistor is temporarily connected between the output (marked "To product detector" on Figure 6) and earth. Using the probe described above as an indicator, adjust the coil tuning slug for maximum reading. This should be close to 1.0 volt DC.

B — BALANCED MODULATOR

A MC1496 (Motorola) or LM1496 (National) active double balanced mixer is used in this position.

The circuitry used is entirely conventional except that the value of the resistor feeding pin 5 has been reduced from the usual value of 10k to 3k3. The resulting increase of current through the device, improves signal handling capabilities, especially with regard to intermodulation performance.

The tuned output circuit uses a trifilar winding on an Amidon T68/2 powdered iron toroid. Do not substitute any other specification toroid in this position, although the wire used can vary a gauge or so either side of specification, without any problems. The impedance at the output (secondary of T1) is close to 200 ohms.

COMMISSIONING PROCEEDS AS FOLLOWS

Temporarily connect a 220 ohm resistor across the output. Put a shorting link across the audio input.

Apply power to both the BFO and balanced modulator. Using the diode probe, measure the voltage at pin 8. It should be around 0.15 volts. If not, adjust the size of the resistor in series with pin 8, until the required reading is obtained.

Turn the 50k ten-turn balance trimpot until it is at one end of its range. Using the probe, measure the voltage across the temporary 220 ohm output load. Adjust the 130 pF trimmer for the maximum reading. The actual value of this reading is unimportant.

One turn at a time, take the 50k balance potentiometer to the other end of its travel, noting the output reading at each setting. The output indication should drop from its initial value to zero and then rise again to its initial value. Readjust the trimpot, so that it is midway between the two settings, where the output voltage reading JUST reached zero. The modulator is now roughly balanced. Final balancing will be done, when a higher level transmit signal is available from later modules.

C — THE MICROPHONE AMPLIFIER

A low noise op-amp, the Signetics NE5534, provides the small amount of gain necessary to drive the balanced modulator. Substitution of other types is not recommended.

The input network suits most low (500-2000 ohm) impedance microphones. Whilst ideally a second low pass filter should be used to ensure a controlled cut off above 3000 Hz, it has been omitted deliberately. Instead, the 1n0 capacitor between pins 2 and 6 of the NE5534 provides a less steep cut off above 3000 Hz. Individual constructors may care to provide their own switching to bring the receiving low pass filter into play, in the transmit mode.

Note that the 22k resistor into pin 2 of the op-amp is mounted vertically. The RF suppressing ferrite bead, shown on the circuit diagram is slipped over one of the leads of this resistor, before it is soldered into place.

SUPPLIERS

All of the components used were obtained from Stewart Electronic Components Pty Ltd, 44 Stafford Street, Huntingdale, Vic. 3166. Telephone: (03) 543 3733.

However, other suppliers are known to handle specific items. For example, Ian J Truscott's Electronic World, in Victoria, and RJ and US Imports, in New South Wales, both of whom advertise in this magazine, are known to stock Amidon products. Daneva Australia, of 66 Bay Road, Sandringham, Vic. 3191. Telephone: (03) 598 5622, are known stockists of the SBL1 double balanced mixers.

It is understood, that the Frankston and Mornington Peninsula Amateur Radio Club, PO Box 38, Frankston, Vic. 3199, will be making PCBs and kits available for this project, as a service to constructors who find shopping around for the correct items a little difficult.

The writer will be happy to answer technical questions (SASE please), but prefers not to become involved in supply problems.

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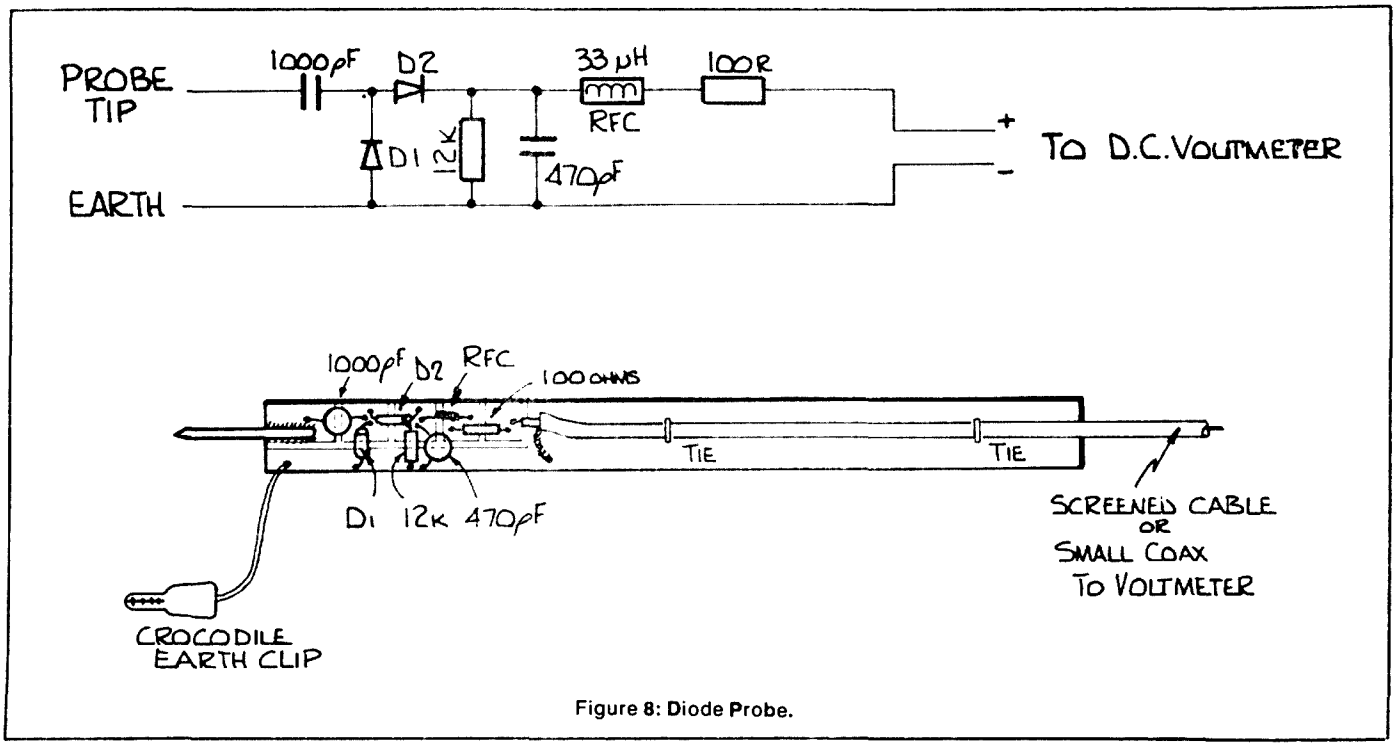

Figure 8: Diode Probe.

AN APPROACH TO ANTENNA TUNING

Lloyd Butler VK5BR
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Some ideas are presented on how to match the transmitter to the complex impedance of the antenna circuit and an examination is made of the tuning range needed for matching components.

As a preliminary exercise to designing a new tuner, the writer set out to find out what tuning components would be needed and how they might best be connected. What follows is essentially a paper exercise making use of a computer program to simulate a wide range of tuning conditions. From the results, some interesting curves have evolved leading to a few ideas on tuner application.

The function of the antenna tuner is to transform the complex impedance presented by the antenna, or its feeder system, to a resistive value suitable to load the transmitter. This resistive value (R_s) is normally 50 ohms and throughout the discussion which follows, this value is assumed.

The spread of resistive and reactive components which must be matched depends on the type of antenna system used. Where antennas are carefully matched to transmission lines, the spread is limited, but where feeder lines are tuned, or compromise antenna systems are used, a wide range of values has to be accommodated.

Precisely what range of values should be designed for, is difficult to decide, but the writer initially decided to aim for the following specification:

Frequency Range — bands 1.8-28 MHz inclusive.
Resistance Range — 1 to 1000 ohms.
Reactance Range — -1000 to +1000 ohms.
Peak Power Rating — 400 watts PEP.

This turned out to be quite a tall order, not because of any theoretical problem, but because on the low frequency bands particularly large values of variable inductance and capacitance are required.

A MATCHING PRINCIPLE

The first approach was to make use of a principle described by the writer in *Amateur Radio*, December 1985. Referring to Figure 1, a network is made up in two sections, an antenna phasing section which cancels any antenna reactive component and an impedance matching section which transforms the remaining resistive component to a value equal to R_s (50 ohms).

The impedance matching section is illustrated in Figures 2 and 3. Where the load resistance R_A is less than the source resistance R_s, the circuit and formula of Figure 2 is used. In this case, capacitive reactance X_{C1} is at the input. Where R_A is greater than R_s, the circuit and formula of Figure 3 is used. In this second case, capacitive reactance X_{C1} is at the output.

The antenna phasing section can simply be a series reactance equal, but opposite in sign, to the antenna reactance (X_A), that is, a capacitor to balance inductive reactance, or an inductor to balance capacitive reactance.

Using the principles described, the tuner as shown in Figure 4 is evolved.

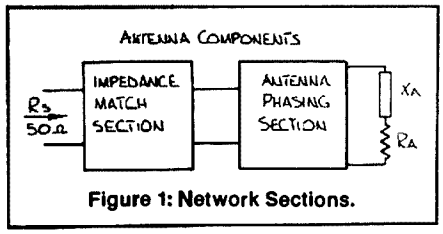


Figure 1: Network Sections.

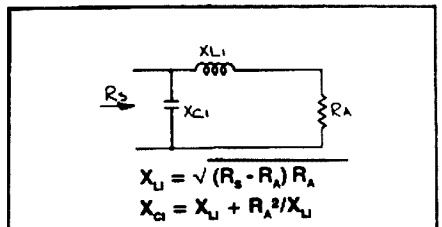


Figure 2: Impedance Match RA < RS.

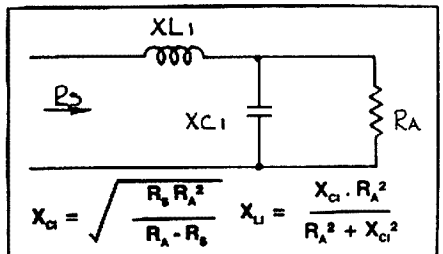


Figure 3: Impedance Match RA > RS.

COMPONENT VALUES

The writer set out to determine the range of values of C1, C2, L1 and L2 in the circuit (Figure 4) over the frequency and impedance ranges previously discussed. As many permutations were required, a computer program was set up to produce tables of results which were used to prepare the curves Figures 5-7. Figure 5 shows the capacitance of C1 plotted as a function of R_A for each of the principal amateur radio HF bands. The figure illustrates the very large capacitance required for low values of R_A, particularly on the low frequency bands. Figure 6 shows the inductance of L1 plotted as a function of R_A for each of the bands.

The value of phasing capacitance C2, or phasing inductance L2, can be read off as a function of X_A for each band from Figure 7. The very large value of C2 is also illustrated for low values of antenna inductive reactance (X_A).

PARALLEL ANTENNA PHASE CORRECTION

The antenna impedance, in the form of a resistive and reactive component in series, can be transformed to two other components of resistance and reactance in parallel, as shown in Figure 8 using the formula included with the diagram.

As an alternative to phase correction by series tuning, as shown in Figure 4, the reactive component can be cancelled out by a parallel reactance equal but opposite in sign to the equivalent parallel reactance. This method of phase correction has a number of attractive features as follows:

1 The equivalent shunt reactance is much higher than the series value (X_A) and if the antenna is inductive, a smaller value of phasing capacitor is needed to tune it out.

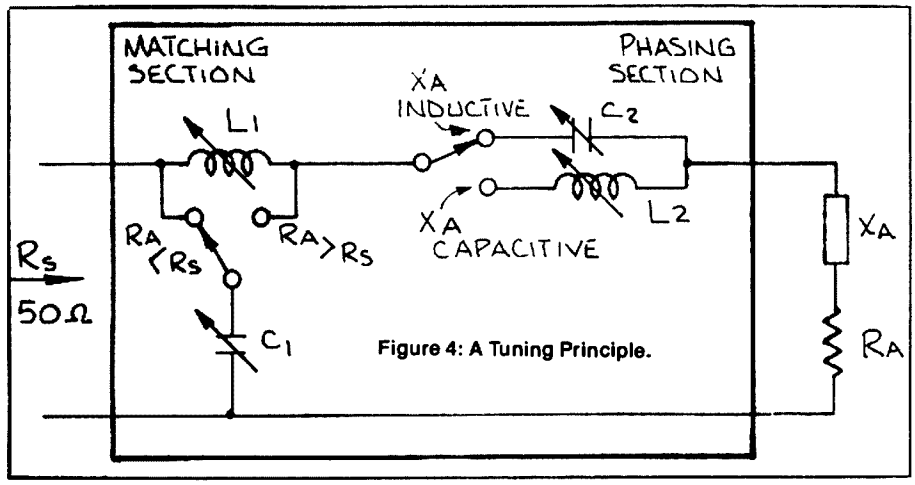


Figure 4: A Tuning Principle.

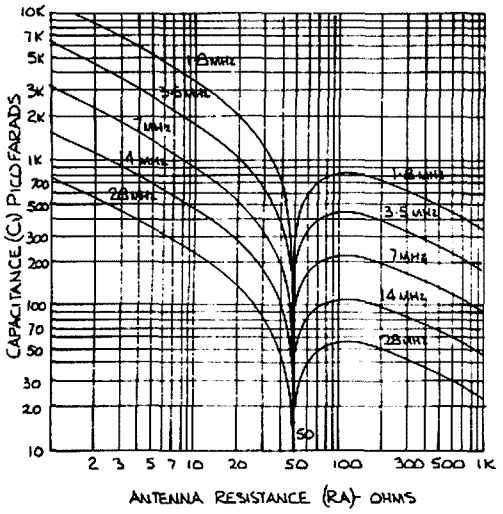


Figure 5: Matching Capacitance as a Function of Antenna Resistance.

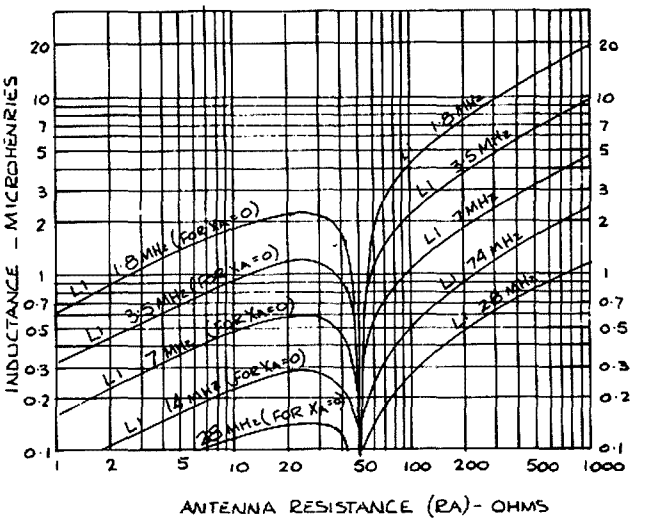


Figure 6: Matching Inductance as a Function of Antenna Resistance.

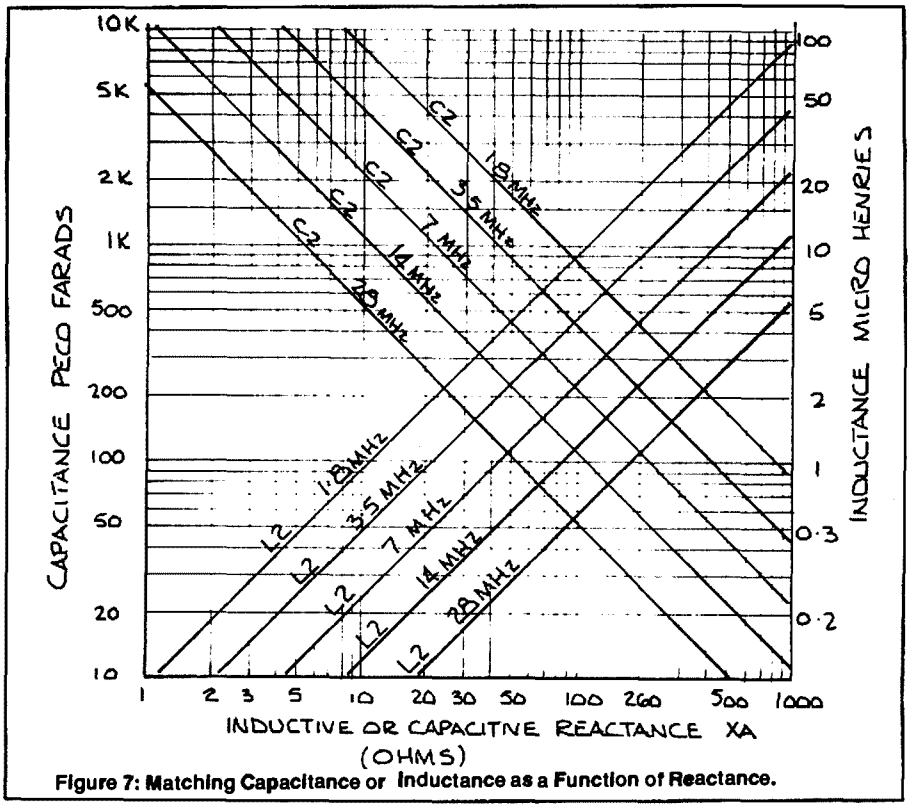


Figure 7: Matching Capacitance or Inductance as a Function of Reactance.

(It does mean, however, that a larger value of inductance is needed to tune out the reactance of a capacitive antenna).

2If the tuner is to couple to a balanced circuit, series components must be balanced in each line leg and the number of series components is doubled. With parallel tuning, a duplication of components is not required.

3Referring back to Figure 5, we see that the capacitance required in the matching circuit decreases as the antenna load resistance (R_A) is increased. The effect of parallel tuning is to present a new value of load resistance (R_A^1) higher than the value of R_A and hence the size of the capacitor in the matching section can be reduced.

On the negative side, the increased antenna circuit impedance does increase the voltage developed for a given power and hence the voltage across the parallel tuning capacitor.

Figure 9 plots the equivalent parallel resistance (R_A^1) as a function of series resistance (R_A) for different values of series reactance (X_A). Figure 10 plots the equivalent parallel reactance (X_A^1) as a function of series reactance (X_A) for different values of series resistance (R_A). Figures 9 and 10 are a graphical representation of the formulae shown in Figure 8.

Figure 11 illustrates the application of parallel phase correction. Capacitor C2 combines the function of matching capacitor for $R_A^1 > R_S$ with the function of phase correction for an inductive antenna. Capacitor C1 provides matching for $R_A^1 < R_S$ and is set to minimum for $R_A^1 > R_S$.

Another idea is to use parallel phase correction for an inductive antenna together with series phase correction for a capacitive antenna, as shown in Figure 12. This gives a lower value of phasing inductance (L2) for the capacitive antenna as well as a lower value of phasing capacitance for the inductive antenna.

The curves of Figures 5 and 6 can be used to calculate the matching sections components using parallel antenna phasing with the series antenna resistance (R_A) substituted by equivalent shunt resistance (R_A^1).

PRACTICAL VARIABLE INDUCTORS AND CAPACITORS

At this point, an examination of practical values of the components will be made. It is one thing to calculate a range of tuning inductance and capacitance but another thing to obtain the components to do the job.

As far as the inductors are concerned, it is not too much trouble to construct 25 to 30 microhenries of inductance suitable for fitting with switchable taps. A value discussed later is 28 microhenries and this can be achieved with 35 turns, one inch radius and spaced to a length of three and a half inches. Inductance can be calculated using Wheeler's formula which follows:

$$L \text{ (microhenries)} = \frac{a^2N^2}{9a + 10l}$$

where a = radius in inches
N = number of turns
l = length in inches.

This becomes:

$$L = \frac{a^2N^2}{2.54(9a + 10l)}$$

for dimensions in centimetres.

Reference to Figure 6 shows that 28 microhenries is more than sufficient for the matching circuit. Reference to Figure 7 shows that 28 microhenries can phase correct a capacitive antenna of X_A = -300 ohms at 1.8 MHz and X_A = -600 ohms at 3.5 MHz.

Considering now the tuning capacitance, its maximum value is considerably restricted by the maximum voltage applied across its plates and hence the necessary spacing of the plates. The larger the plate spacing required, the more difficult it is to achieve a high value of capacitance. Where a capacitor is connected across a resistive load, the voltage developed across its plates is proportionally to the square root of both the load resistance and the power; ie $E_{PEAK} = 1.4\sqrt{PR}$.

When tuned correctly, the capacitor facing the transmitter is across 50 ohms; however the capacitor across the antenna circuit could be facing a much higher resistance particularly if parallel antenna phasing is used. Typical voltages could be as follows:

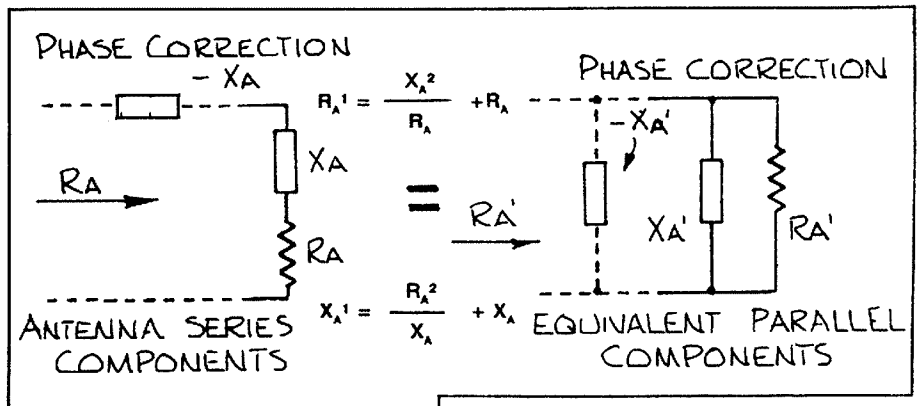


Figure 8: Parallel Equivalent of Antenna Circuit.

P = 100 W	R = 100 ohms	E_{PEAK} = 140 V
P = 100 W	R = 1000 ohms	E_{PEAK} = 442 V
P = 100 W	R = 5000 ohms	E_{PEAK} = 990 V
P = 400 W	R = 100 ohms	E_{PEAK} = 280 V
P = 400 W	R = 1000 ohms	E_{PEAK} = 885 V
P = 400 W	R = 5000 ohms	E_{PEAK} = 1980 V

According to *ITT Reference Data for Radio Engineers*, an approximate rule for uniform fields is that the breakdown gradient of air is 30 peak kilovolts per centimetre or 75 peak kilovolts per inch.

Large values of variable capacitance can be made up using old style receiver tuning gangs. (If you can get them, Ed). Each section of these usually has a maximum capacitance of about 450 pF making a total capacitance of 990 pF for two gang sections, or 1350 pF for three gang sections. The plate air spacing on these seems to average around 0.01 inch, which on the ITT approximation, has a breakdown voltage of 750. Referring to the curve of Figure 13 (also from the ITT handbook) a slightly higher voltage is indicated providing there are no sharp points to concentrate the field, (possibly 1000 V). Based on this assumption, the receiver type gang could be satisfactory for a 100 W transmitter but could arc over when using higher power (say 400 W from a linear amplifier). Operation in the writer's own radio shack has verified this prediction.

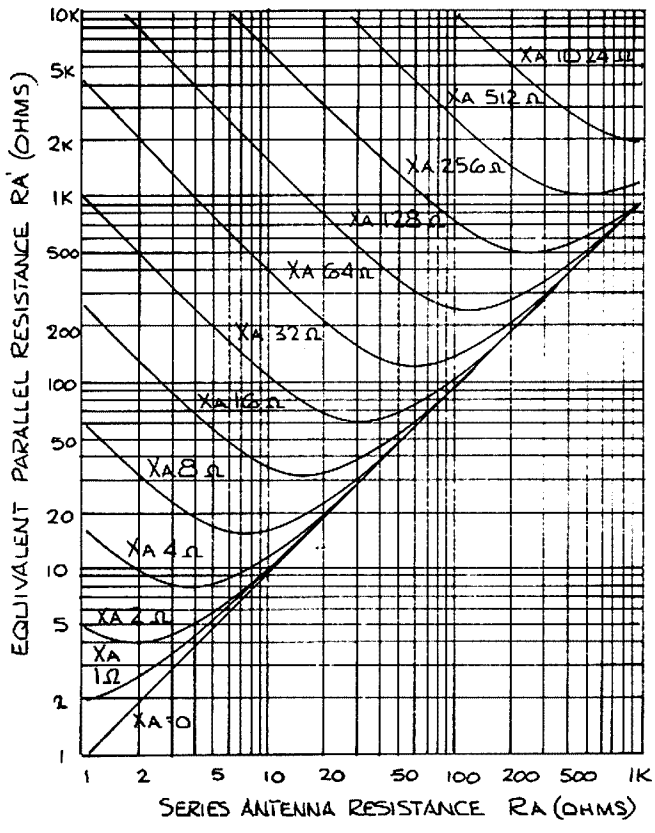


Figure 9: Equivalent Parallel Resistance as a Function of Antenna Series Resistance and Reactance.

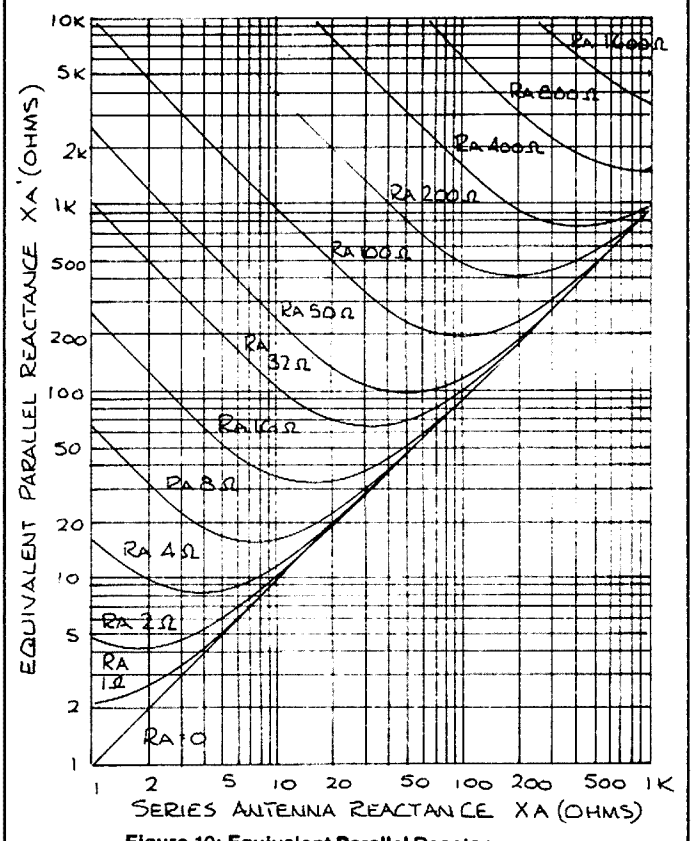
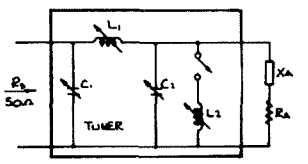
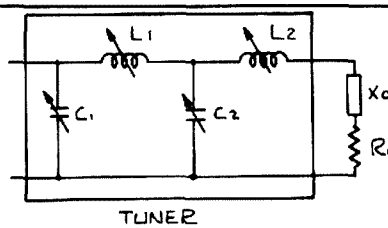


Figure 10: Equivalent Parallel Reactance as a Function of Antenna Series Resistance and Reactance.



C1 Matches for $R_A' < R_s$
C2 Matches for $R_A' > R_s$ and also balances out X_A' for inductive antenna.
L1 Is the matching inductance.
L2 Balances out X_A' for capacitive antenna.

Figure 11: Use of Parallel Antenna Phase Correction.



C1 Matches for R_A (or R_A') $< R_s$
C2 Matches for R_A (or R_A') $> R_s$ and also balances out X_A' for inductive antenna.
L1 Is the matching inductance.
L2 Balances out X_A for capacitive antenna.

Figure 12: Use of Combined Parallel and Series Antenna Phase Correction.

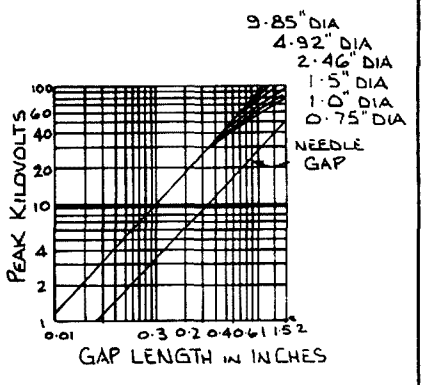


Figure 13: Spark Gap Breakdown Voltages.

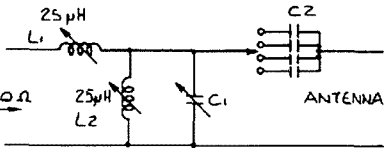
Tuning capacitor plate spacing of at least 0.02 inch would seem necessary to operate 400 W PEP, and for this spacing, suitable capacitors above 200 to 240 pF are difficult to find. A tuner design aimed at reducing the range of capacitance tuning would clearly be an advantage.

REDUCTION OF MATCHING CAPACITANCE

Referring back to Figures 2 and 5, the largest values of matching capacitance are required when R_A is less than R_s, with the capacitance connected at the input of the network. If R_A could be artificially increased above R_s, for all antenna impedance conditions, the need for the input capacitor would be eliminated. Use of parallel antenna phasing results in an increased value of antenna load resistance (R_A'), but for low values of X_A, R_A' is still lower than R_s.

Examining Figure 9, it can be seen that R_A' can be kept higher than R_s by ensuring that X_A is always higher than 30 ohms (or less than minus 30 ohms). This can be achieved by adding lumped reactance to the antenna circuit with an inductor or capacitor.

One circuit simulated on the computer used series capacitance switched by incremented steps into the antenna circuit. For each antenna impedance condition, a capacitance was selected which made the antenna circuit look at least 30 ohms capacitive. For an inductive antenna, the added capacitive reactance was made equal to the inductive reactance plus approximately 30 ohms.

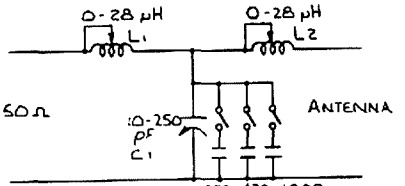


	C1
1.8 MHz	280 - 900
3.5 MHz	80 - 450
7.0 MHz	25 - 225
14.0 MHz	13 - 115
28.0 MHz	11 - 57

	C2 Fixed Capacitance Values Incremented Each Step 1.4:1 Range —
1.8 MHz	47 - 4700 pF
3.5 MHz	39 - 2200 pF
7.0 MHz	20 - 1500 pF
14.0 MHz	10 - 1200 pF
28.0 MHz	10 - 820 pF

Figure 14: A Circuit with Parallel Antenna Phase Correction and Added Series Capacitance (see text).

The elements of the circuit are shown in Figure 14. Component bank, C2, is the added series capacitance selected to eliminate the matching circuit input capacitor. Parallel inductance (L2) resonates with the effective antenna shunt capacitance up to the point where the inductance limit of 25 microhenries is reached. C_2 has a wide capacitive range but need not be continuous in its coverage, that is, switched fixed capacitors substitute for a prohibitively large variable tuning unit. Switched capacitors, incremented in a ratio of 1.4 to 1, have been found to be satisfactory. Trimming between switched steps is corrected by adjustment of matching capacitor C1. This capacitor also adds extra capacitance to resonate with L2 when L2 has reached its limit of 25 microhenries.



	C1
1.8 MHz	300 - 2000 pF
3.5 MHz	150 - 750 pF
7.0 MHz	40 - 300 pF
14.0 MHz	20 - 120 pF
28.0 MHz	10 - 50 pF

Figure 15: A Circuit with Parallel Antenna Phase Correction and Added Series Inductance. Only One Variable Capacitor is Required. (see text).

A further circuit is shown in Figure 15, in which the antenna section is made to have at least 30 ohms of inductive reactance, by simply increasing the value of series phasing reactance (L2) until this condition is satisfied. The circuit is, in fact, a development of the principle discussed relative to Figure 12, but with the antenna tuning constants altered to achieve elimination of the input matching capacitor. Only one variable capacitor (C1) is required which combines the function of impedance matching capacitance with that of a capacitance to equalise the shunt reactance reflected across it from the antenna circuit.

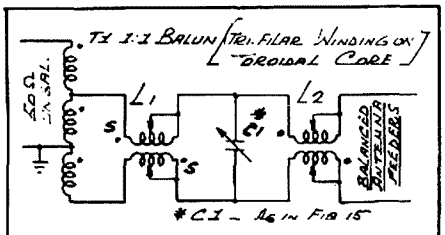


Figure 16: Balanced Tuner Using Mutually Coupled Inductance Between Each Leg of the Balanced Circuit.

Table 1 shows the range of antenna impedances which can be matched and the variation of L and C components needed for each of the main amateur bands. The table is based on a maximum component inductance of 28 microhenries and an effective antenna inductive reactance set at a minimum of 65 ohms at 1.8 MHz. This value of reactance has a considerable effect on the value of all three tuning components and 65 ohms (increasing a little as frequency is raised) works out to give a better compromise for all component values than the 30 ohms originally nominated.

Table 1 is, of course, a theoretical conclusion based on simulated conditions using perfect inductors and capacitors. No allowance is made for the effect of loss resistance in the components themselves. (For example, an antenna resistive load of 2 ohms might be considerably increased by the loss resistance of the tuning inductor in series with the antenna).

The range of reactance is not quite as great as that aimed at in the original specification, but as indicated earlier, that specification was a little over ambitious.

To tune up to 1.8 MHz, C1 needs a tuning range to 2000 pF. In the diagram a variable capacitor with a maximum value of 250 pF has been assumed and three fixed capacitors have been included which can be switched in various combinations to extend the range to 2000 pF.

BALANCED TUNING

If the tuner is to feed balanced lines, a balanced tuner is required. Series components should be split so that half of each component reactance is placed in each balanced line leg. If tapped (and switched) variable inductors are used (as distinct from roller inductors) mutually coupling the inductor halves in each leg, seems an attractive idea, as shown in Figure 16. In this arrangement, the same combined inductance with the same number of combined turns, is achieved as with the single inductance in the unbalanced circuit. The idea is to cut the coil at its centre and connect one half in each line leg, making sure that the sense of connection gives additive and not subtractive combined inductance (refer to Figure 17).

A balun transformer is required to interface the unbalanced transmitter output circuit to the balanced circuit. The primary reactance of the balun should be at least four times the circuit impedance at the lowest operating frequency,

FREQUENCY (MHz)	RANGE OF ANTENNA RESISTANCE R_A (OHMS)	RANGE OF ANTENNA REACTANCE X_A (OHMS)	RANGE OF SERIES INDUCTANCE L1 (MICROHENRIES)	RANGE OF SERIES INDUCTANCE L2 (MICROHENRIES)	RANGE OF SHUNT CAPACITANCE C1 (PICOFARADS)
	2 to 6	-250 to 60	20 to 28		1600 to 1700
	6 to 20	-250 to 130	14 to 28		1000 to 2000
1.8	20 to 70	-250 to 250	6 to 28	0 to 28	700 to 1700
	70 to 300	-250 to 500	6 to 28		500 to 1250
	300 to 1000	-250 to 1000	12 to 28		300 to 600
	1 to 5	-500 to 128	14 to 28		510 to 650
	5 to 20	-500 to 250	10 to 28		250 to 750
3.5	20 to 150	-500 to 500	4 to 23	0 to 27	200 to 770
	150 to 1000	-500 to 1000	4 to 23		150 to 300
	1 to 3	-1000 to 150	14 to 21		200 to 213
	3 to 5	-1000 to 300	10 to 21		100 to 230
7.0	5 to 20	-1000 to 500	5 to 28	0 to 27	70 to 250
	20 to 1000	-1000 to 1000	2.5 to 17		40 to 300
	1 to 8	-1000 to 500	10 to 20		30 to 90
14.0	8 to 1000	-1000 to 1000	1.5 to 15	0 to 13	20 to 120
	1 to 5	-1000 to 500	7 to 14		10 to 50
28	5 to 1000	-1000 to 1000	1 to 10	0 to 7	10 to 50

Table 1: Range of Antenna Impedances Tunable and Range of Inductance and Capacitance Required for Circuit of Figure 15.

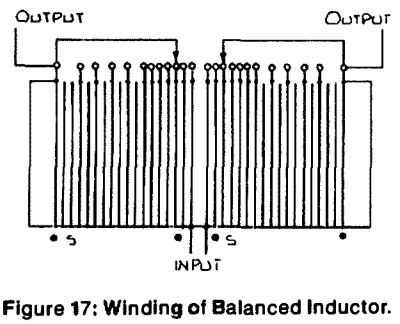


Figure 17: Winding of Balanced Inductor.

that is, four times 50 ohms or 200 ohms. At 1.8 MHz, this *means* a minimum inductance of 17.6 microhenries. A shunt reactance of 200 ohms across the 50 ohm circuit reflects an equivalent series reactance of about 17 ohms (ie one microhenry) to the matching circuit. This will affect the matching circuit but only to a minor degree.

The wideband balun transformer is easily constructed, using a tri-filar winding on a suitable toroidal core, selected for the frequency range and with sufficient core cross section area to prevent core saturation.

The minimum number of tri-filar turns is calculated as follows:

$$\text{Turns (T)} = 25\sqrt{L/A_L}$$

where L = minimum primary inductance in microhenries

A_L = number of turns per 100 microhenries from manufacturers specifications.

The operating flux density (B_{OP}) is calculated as follows.

$$B_{OP} = \frac{E_{RMS} \times 10^8}{4.44\, fNA_c} \quad \text{GAUSS}$$

where $\sqrt{PR}$ = 140V (for 400W in 50 ohms)

E_{RMS} =

f = frequency (Hz)

N = number of turns

A_c = cross-section area of core in square cm.

The flux density should be much lower than the saturation value (about 10 000 gauss for iron powder cores).

A suitable toroid for the high power case is the Amidon T200 (2 Mix Red). Its cross-section area is 1.33 square centimetres and it has an A_L factor of 120 turns per 100 microhenries. Twelve tri-filar turns on this core is satisfactory for 1.8 MHz.

One might question why the balun could not be placed at the output of the tuning system allowing the whole system to be unbalanced. The problem here is that the transformer would not only have to be designed for a wide range of frequencies, but it would also have to be made to operate over the wide range of output impedances, a somewhat difficult proposition.

FIXED CAPACITORS

Some care must be taken in selecting fixed capacitors. If high impedance feed systems with high powers are anticipated, voltage ratings in the order of 1500 to 2000 volts should be considered. In high power RF work, voltage is not the only consideration as capacitors made for this purpose are also given a maximum current rating. At low frequencies, voltage is the limiting factor, but the reactance of a capacitor decreases with frequency and hence for a given voltage, current through the capacitor increases with frequency to a point where current is the limiting factor. At the highest operating frequency, the current, calculated by dividing the maximum expected voltage by the reactance, should not exceed the capacitor current rating.

Another factor, particularly relevant to ceramic capacitors, is the need to reduce voltage and current ratings when temperature rises to any extent, due to internal heating of the capacitor. Ceramic capacitors generally have considerable loss resistance which can produce heating of the dielectric when high RF currents are passed through the capacitor.

The best bet for amateurs is to acquire high voltage mica capacitors from discarded radio transmitters.

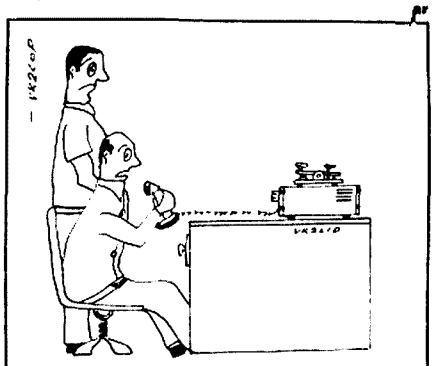
CONCLUSION

The curves included give a lead to the order of components needed to match the transmitter to a wide range of antenna impedance loads. On the low frequency bands, the range of tunable capacitance needed becomes a problem. This range can be reduced by parallel phase correction of the antenna circuit rather than series phase correction.

The circuit, Figure 15, makes use of part series and part parallel phase correction. By enforcing a condition of inductive reactance in the antenna circuit, a single tunable capacitor element of fairly large (but not intolerable) range is achieved. The circuit of Figure 15 (and perhaps the balanced version in Figure 16) appears to be an attractive proposition for a wide range tuner. Of course, the proof of the pudding is in the eating and it must be emphasised that practical application of the idea has yet to be tried.

A few pointers have been thrown in with the discussion concerning the selection of suitable components. Availability of these is another real problem.

There are all sorts of ways of matching a transmitter to an antenna. What is written here should give some food for thought on this subject.

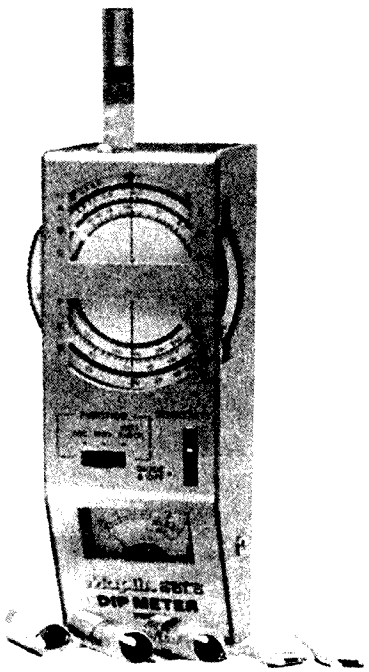


"Someone come in please. I have a friend in the shack!" —VK2COP

Equipment Review

Gil Sones VK3AUI
30 Moore Street, Box Hill South, Vic. 3128

MAPLIN DIPMETER



Photographs courtesy Betken Productions

The Maplin Dipmeter performs well. It is neat and easy to use. There are no false dips on any but the highest VHF range. The false dip on the highest VHF range does not mask a real dip.

The dips on all ranges are deep and definite. No need to be afraid of blinking at the wrong time.

The frequency accuracy is good. However, as with all similar instruments there is some influence from the surrounds of the item being checked. The need to couple to other circuits for operation limits the accuracy of all such instruments.

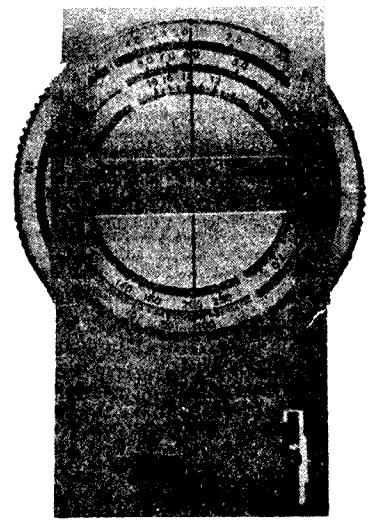
The highest frequency coils are of printed circuit board construction, all coils being covered in shrunk plastic for protection from damage due to handling.

The instrument uses a nine volt transistor radio battery, which is provided. Access to the battery is by splitting the case. A screwdriver is required for battery changing.

A convenient attribute is that the oscillator can be modulated, which aids in finding the signal on a receiver. Checking the frequency with a receiver is one way of removing any doubt as to the calibration.

The 'dipper' may be used for its primary purpose of checking the resonant frequency of tuned circuits. To use it primarily for this purpose is to seriously under use the instrument.

Using known standards of inductance and capacitance, both capacitors and inductances may be checked for their value. With just a few high quality known capacitors, the unknown value of an inductor can be determined or conversely with a known inductance the value of a capacitor can be readily determined.



Controls of the Unit.

Aerials and feedlines are another area where the instrument may be put to good use. The resonance of lengths of feedline can be found, velocity factors calculated and aerials may be checked for resonance. The whole of an antenna system, including the feedline can be checked for wanted and unwanted resonances.

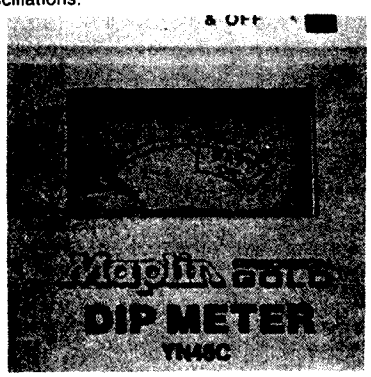
The dipmeter is a very versatile tool. The Maplin Dipmeter that was reviewed, was well constructed, easy to use and is a fine example of its type of instrument. A useful 'shack' accessory.

The review instrument was supplied by William Willis & Co Pty Ltd, 98 Canterbury Road, Canterbury, Vic. 3126 who are the Australian Agents.

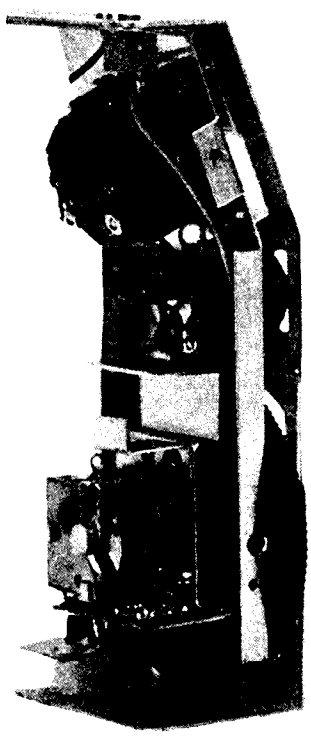
ar

The Dipmeter is one of the basic items of amateur test equipment. Once it was called a Grid Dip Oscillator but that name can no longer be used. The basic instrument relies on the detection of energy absorption by another coupled tuned circuit when both it and the oscillator are on the same frequency.

The detection circuitry can be used as an absorption wavemeter, if the oscillator is disabled. Very useful to find the oscillator frequency and to check the output frequency of a transmitter. The frequency of parasitic oscillations may also be determined. The last use is often of great importance in designing measures to deal with parasitic oscillations.



Close-up view of the Meter Movement.



Internal view when the Back Cover is removed to fit the provided Battery.

HOUSES WITH BUGS

In Los Angeles, some houses with bugs are selling faster.

These bugs are of the electronic variety, legal cousins of the species we associate with spies and detectives. Tune them in on your car radio and you can hear a prerecorded message about the house for sale.

Outside the house, a "For Sale" sign tells you which frequency to tune in. Inside the house, a small cabinet houses a cassette player, a microphone and the transmitter.

The device sells for about US$200 and is seen as a natural for other businesses too — a theatre might broadcast its current features and show time; a supermarket can announce its current specials; a shopping mall could promote its tenants — the range is endless.

Hundreds of LA-area home owners have bought a device. Next thing you know, someone will find a way to add programs to these commercials! !

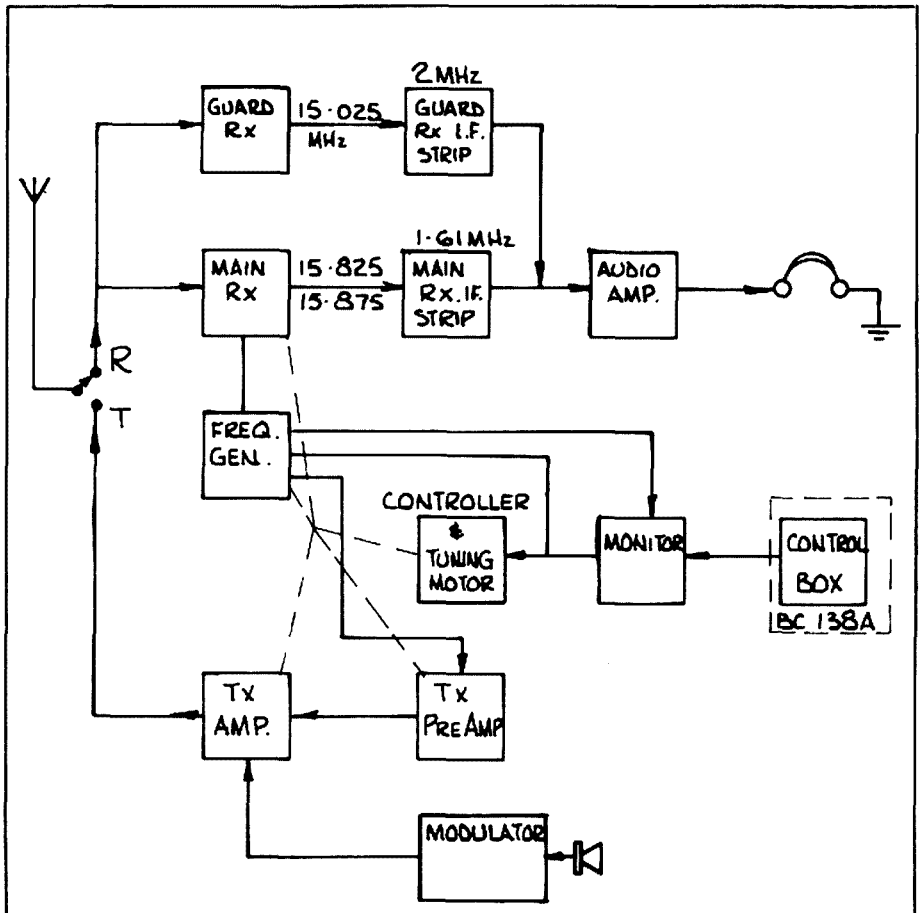
—Adapted from *Gernsback's Outlook*, February 1987

CLASSIC COMMUNICATIONS EQUIPMENT

The TR-AP-22 A TRANSCEIVER

Colin MacKinnon VK2DYM
52 Mills Road, Glenhaven, NSW. 2154

Last month the TR-AP-21 A was described. The TR-AP-22 A is a high power companion unit. It comes from the same manufacturer, "Omera- Segid," and was also fitted to the RAAF Mirage III fighters.



Block Diagram of the TR-AP-22 A.

The TR-AP-22 A covers the same UHF military frequency range from 225 to 400 MHz, with an output of 15 watts maximum. It was designed around the same time, 1960, but unlike the smaller unit, it contains its own power supply dynamotor.

The components are the transceiver itself, the ER-68 A, and a control box, BC-138 A.

Technical specifications are:

Frequency Range	225 to 399.95 MHz
Channel Spacing	50 kHz minimum (RAAF — 100 kHz)
Stability	± 20 PPM (about 6 kHz)
Preset Channels	20 — using the BC-138 A controller
Power Required	28 volts DC at 13 to 23 amps
Power Output	10 to 15 watts (depending on frequency)
Modulation	Amplitude modulation and MCW
Weights	ER-68 A . . . 24.1 kg BC-138 A 1.7 kg
Limitations	same as the TR-AP-21 A

This transceiver also contains a second receiver unit on a fixed frequency, called a "guard channel," that is used for emergency or group command communication. It is also possible to use the set as a relay station for other aircraft, to achieve greater ranges. An automatic direction finding facility was not used in the RAAF Mirages.

The range is basically line-of-sight and obviously dependent on aircraft altitude.

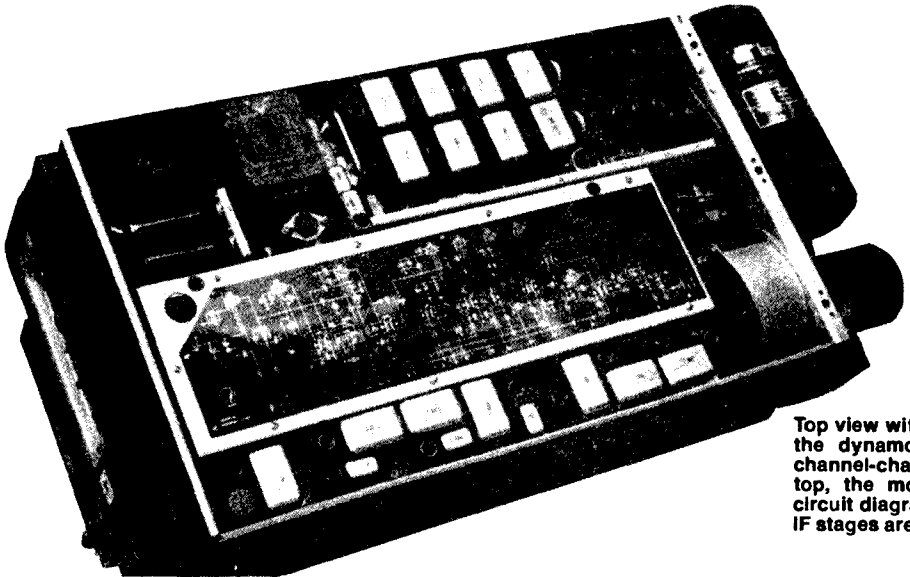
As with most aircraft equipment, the construction is of aluminium, with a number of modules plugged onto a main chassis. Each module can be tested in situ, and can be replaced quickly if required. There are test sockets and controls on the front panel to assist operational checking. The dynamotor and a fan are mounted at the top rear of the unit. The main connection to the aircraft harness is on the rear and made as the set is slid into its shock mount.

This unit contains a total of 75 sub-miniature and miniature valves (75 is correct!). You will note from the photographs that the circuit diagram of each module is printed on an attached plaque, and is handy, if your read French.

It will help to refer to the previous description of the ER-68 A and the block diagram below to follow the circuit description.

On reception, the signal passes from a conventional T/R relay to an RF amplifier thence to the first mixer. The other mixing frequency is supplied from a complex frequency generator to be described later. Following an IF amplifier stage at 18.825 or 18.875 MHz, the signal is mixed with one of two crystal oscillators to give a second IF frequency of 1.61 MHz. The signal is then detected and goes through a noise limiter and squelch circuit to an audio amplifier. AGC from the detector stage is applied to the RF IF and audio stages.

The guard receiver is an almost identical setup in parallel, but has its own oscillator for it's first mixer, and only needs one crystal at the second mixer oscillator. The audio output from the guard receiver feeds to the common AF amplifier.



Top view with cover removed. At top rear is the dynamotor with the fan below. The channel-change Ledex switches are at the top, the monitor in the centre (note the circuit diagram on the cover), main receiver IF stages are at the bottom.

On transmit, the frequency generator provides a signal which is amplified and tripled to the output required, and the audio signal from a microphone amplifier and clipper circuit modulates the final two RF stages. A side-tone circuit picks off a little RF and provides a signal to the AF amplifier for checking the CW transmissions.

The frequency generator for both transmit and receive is a complex combination of additive mixers, doublers and treblers to achieve 3500 channels from 25 crystals. The development of IC phase lock loops and digital dividers must have been a god-send to later designers! Omera actually calls the frequency generator a "monitor" as it provides feedback signals to the tuning mechanism to lock onto frequency. A detailed description of the frequency generation process would take a page or two, so I will just say, "Trust me, it works!"

The monitoring provides switching for the tuning motor, brake and reversing mechanism so that the tuning gang rotates and comes to rest in tune, for each frequency selected.

At one stage, before I fully understood the functioning, I couldn't work out why the motor would suddenly come to life and whiz the tuning gang back and forth for no good reason, sometimes for 30 seconds. I found it was caused by the circuit sensing an out of phase condition which is only slightly off, but just enough to activate the motor. The set can be adjusted to minimise the effect.

The control box BC-138 A has a 20 channel preset dial *but* also has five *other* dials to select any channel within the tuning limits; eg dial one, on the left, selects 200 or 300 MHz; dial two selects 0 to 99 MHz (it is only marked 0-9), dial three selects 0 to 9 MHz, etc. The controller also adjusts volume and selects the operation of main and guard receivers.

The dynamotor, DY-21 A, is attached to the transceiver and provides 120 volts and 320 volts, which is dropped to 125 volts regulated in the body of the ER-68 A. There is also a mechanical regulator to provide a regulated 20 volts as needed.

Both the TR-AP-21 and TR-AP-22 illustrate the tremendous design difficulties of providing multi-channel coverage in a sophisticated, critical environment. Just think of the possible spurious signals that all those oscillators and multipliers could generate! The quest for reliability is demonstrated by the high quality components and gold plated fittings used. Ease of maintenance is aided by plug-in modules and test sockets on each sub-assembly.

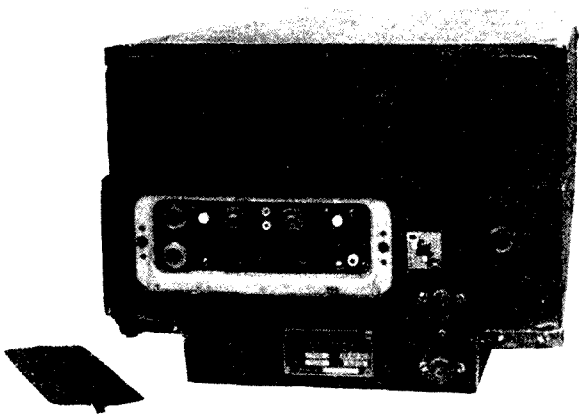
As a comparison, look at the following specifications of a recent Collins aircraft transceiver, the AN/ARC-182 (V) to see the progress that has been made:

Frequency Range	30 to 88 MHz FM 108 to 156 MHz AM 156 to 174 MHz FM 225 to 399.975 AM/FM
Channel Spacing	25 kHz
Stability	± 1 PPM (about 300 Hz)
Preset Channels	28
Power Required	28 volts at about 1.5 amps
Power Output	10 watts AM, 15 watts FM
Weight	4.5 kg

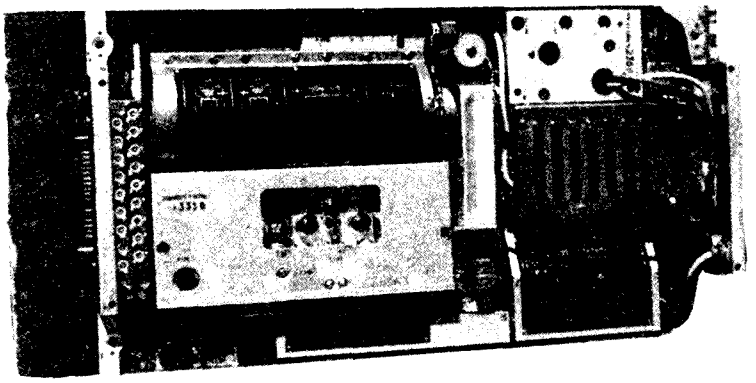
The whole transceiver fits into the space taken by the BC-138 A control box!

Now somebody is going to ask how to convert type TR-AP radios for the 70 cm amateur band. To be honest, it is not worth the effort. They are AM, draw up to 630 watts for 10-15 watts output and make a great racket when running. I did not mention earlier that the filament leads of the RF amplifiers are fed through copper tube tuning coils so you would have quite a job reducing the coils turns to tune up to 432 MHz.

Why not just clean up the set and put it on the coffee table as a conversation starter when guests call?



Front view of the TR-AP-22 A showing the air filter across the top preset controls and test points are behind the front cover. N-type antenna connector on the right end.



Bottom view — RF stages with tuning capacitors are top-centre, tuning motor controller is lower left, guard receiver is top right and main connector plug is on the *left* end.

THE TIME

L'E TEMPS

Jim Linton VK3PC
4 Ansett Crescent, Forest Hill, Vic. 3131

It affects our daily lives but the average person takes time for granted without a thought about its origins, development and many uses. This story covers GMT, UTC, and Zulu Time, Daylight Saving, History of Standard Time Zones and Accurate Time-keeping using Atomic Clocks and Satellites.

Anyone who has been a QSL manager, operated from a rare DX location, responsible for issuing a special event QSL card or award knows only too well that there is some ignorance about time.

GET THE TIME RIGHT

With dozens, hundreds or thousands of incoming QSL cards it becomes a frustrating task to confirm from the log a QSL which does not have the correct UTC time and/or date.

Instead of getting a QSL for a DX contact, the wrongly timed card is likely to be returned marked "Contact not in the Log."

All that fighting through a dog-pile, getting on a list, waiting in a net or other circumstance resulting in a DX contact could be a waste of time if you do not get the time and date right.

There has been considerable praise from overseas given to Australian Novices for their general operating standard, but one criticism has been incorrect times on their QSL cards. However, to be fair, it is not only novices who have this failing.

When organising activation of the Victorian 150 Commemorative Call Sign, VI3WI, it became clear some of the willing WIA members wanting to put the call on air lacked an understanding of how to use UTC.

Well, what is UTC? Firstly, we need to learn about Greenwich Mean Time (GMT).

GMT has been an ailing corpse for some years but it was only recently buried. The Royal Observatory at Greenwich, near London, started keeping time in 1833, firstly for trading ships, but later, with help from the telegraph, Greenwich time signals were sent to train stations and cities in England and Europe.

In 1884, GMT became the world standard of time measurement and remained unchallenged during the next 40 years.

The GMT day before 1925 began at noon, and not midnight, because traditionally time had been based on the position of the sun at noon.

The International Astronomical Union decided that the time/day should start at midnight, and the new midnight-based time at Greenwich was called Universal Time, or UT. This then became Co-ordinated Universal Time — UTC is the abbreviation of the French words "Universel Temps Coordonne."

UTC, while based on the Zero Meridian (Greenwich) is kept by the International Time Bureau (Bureau Internationale de l'Heure), in Paris. Because UTC is based on the time at the Zero Meridian, that time standard is also referred to as Z, or phonetically Zulu-time.

Now that we have established what it is, let us discuss how to calculate UTC for correct log book entries, times on QSL cards, tracking satellites or making scheds.

Knowledge of the 24 hour time system of expressing time is needed — for those unfamiliar with this system the following table will explain:

1 am	0100	1 pm	1300
2 am	0200	2 pm	1400
3 am	0300	3 pm	1500
4 am	0400	4 pm	1600
5 am	0500	5 pm	1700
6 am	0600	6 pm	1800
7 am	0700	7 pm	1900
8 am	0800	8 pm	2000
9 am	0900	9 pm	2100
10 am	1000	10 pm	2200
11 am	1100	11 pm	2300
Noon	1200	Midnight	2400

Therefore, 1.15 am is expressed as 0115 whilst 1.15 pm is 1315, 15 minutes past midnight is 0015, an so on.

UTC is the mother of al world standard times — the reference used by all time zones — originally 24 each being an hour apart.

In Australia there are three time zones — Australian Eastern Standard Time (AEST), Central Standard Time (CST) and Western Standard Time (WST). AEST is 10 hours ahead of UTC, CST nine and a half hours and WST eight hours.

At midnight UTC it is 1000 hours AEST. Think about that for a minute! That is a concept which has to be fully understood to avoid using the wrong date in relation to UTC. Between midnight AEST and 1000 AEST is the day before in UTC which is 10 hours behind — a grasp of this will ensure the correct UTC date is calculated.

Those living in South Australia, Northern Territory and Western Australia should relate the above explanation to the conversion of their own time zone to UTC.

Some radio amateurs simply calculate the conversion to UTC in their head. Others make up a table converting their local time to UTC and refer to it when necessary, whilst another solution is to have a clock in the shack always set to UTC. This can make an interesting talking point when visitors query the time on the clock.

The accuracy of your clock can be checked against the time pips heard on most commercial and ABC radio stations on the AM broadcast band, or the Telecom "Dial the Time" service.

A number of countries, including Australia, provide time signal broadcasts. The future of the Australian service, under the call sign of VNG, was in doubt at the time this article was written.

The United States service, WWV from Colorado and WWVH Hawaii, broadcasts on 2.500, 5.000, 10.000 and 15.000 MHz — WWV also transmits on 20 MHz.

Other time services using these frequencies include JJY Japan, RWN USSR, ZUO South Africa and LOL Argentina.

DON'T GET CAUGHT BY DAYLIGHT SAVING

Mention must be made of Daylight Saving Time — which can be a trap for new players in the UTC conversion game.

UTC does not change in relation to Australia's three standard time zones, when most states turn their clock ahead for one hour during Daylight Saving. UTC remains 10 hours behind AEST (or 11 hours behind Australian Eastern Daylight Time (AEDT)), nine and a half behind Central Standard Time (10½ behind Central Daylight Time (CDT)) — Queensland, Northern Territory and Western Australia do not adopt Daylight Saving.

During World War One, Daylight Saving was adopted in Australia, Britain, Germany and the USA, to conserve fuel by cutting the need for artificial light. It was re-introduced in Australia and elsewhere during Worid War Two, and

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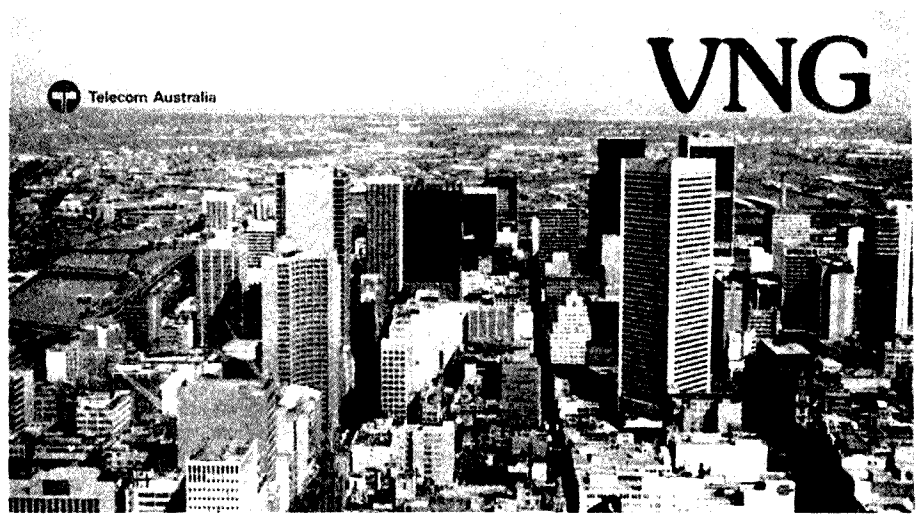
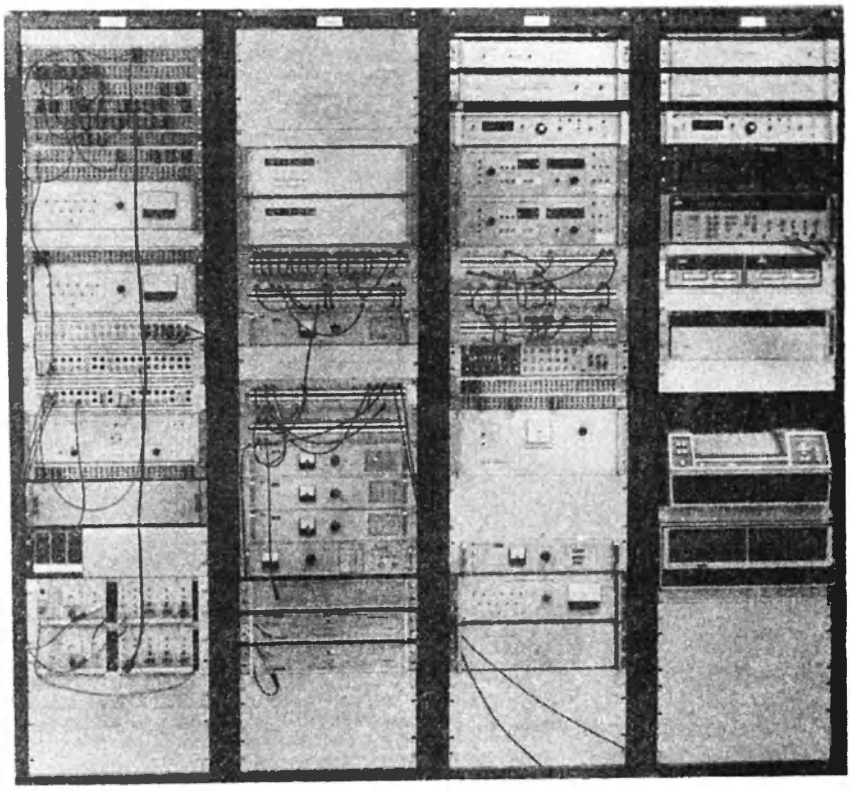
VNG Time Signal Transmission Schedule.

Times of Emission UTC	*Frequency MHz*
0945-2130	4.500
2245-2230	7.500
2145-0930	12.000

VNG welcomes reception reports and does QSL. For general Information and QSL cards write to the Reference Measurements Section, Telecom Research Laboratories, Box 249, Clayton, Vic. 3168.





Distribution Rack.

some countries had Daylight Saving all year round for several years in a row.

In the summer of 1967, Tasmania brought in Daylight Saving for the first time post-war as an energy conservation measure. This resulted in a renewed interest on the mainland and in October 1971 it was adopted for a trial by the Australian Capital Territory, New South Wales, Queensland, South Australia and Victoria.

The scheme was unpopular in the "Sunshine State," Queensland, which dropped it after the summer of 1971/72. Controversy continues in Queensland on Daylight Saving with recent suggestions for it being given another trial.

Western Australia adopted it only briefly and it has not been used in the Northern Territory, post war.

HISTORY OF STANDARD TIME ZONES

Time for early man consisted of daylight and darkness, the changing lunar phases and the seasons.

Astronomers, through their observations of the skies, found that the sun moved slowly eastward among the stars to make one full cycle around the sky in one cycle of the seasons.

Historians cannot agree on who first divided the days and nights into hours — the Babylonians, Egyptians and Greeks get the credit in various references. The Egyptians and the Romans also share the credit for dividing hours into minutes and seconds.

In the early days of Australia, each town, indeed each family, kept its own time as indicated by the sun.

State Historian of Victoria, Dr Bernard Barrett has done considerable research on the significance of clocks and time in the development of Australia. He said the first public clock in any Australian town was probably one which a jeweller displayed in his window. But should there be more than one jeweller, their clocks would differ in time.

Dr Barrett said it was the practice, in such circumstances, for a public meeting or event to be advertised as "starting at 8 pm by Mr Smith, the jeweller's clock."

He said clocks and time began to become more important in the 1850s with the development of railways. "The railways had to have the same time at both ends of the line — this was Melbourne time — not Geelong or Ballarat time.

"Development of the telegraph in the 1850s enabled Melbourne time to be flashed throughout Victoria — even so a country town could find that its Post Office Clock and Railway Station Clock frequently did not agree," Dr Barrett said.

In the second half of the 19th century, economic and technological developments made life more complicated and there was an increased reliance on time. Factories, stores, and schools all had their arbitrary and standardised starting and finishing times. Towns and suburbs built splendid town halls with a clock tower to give an increasingly necessary standard time for all citizens.

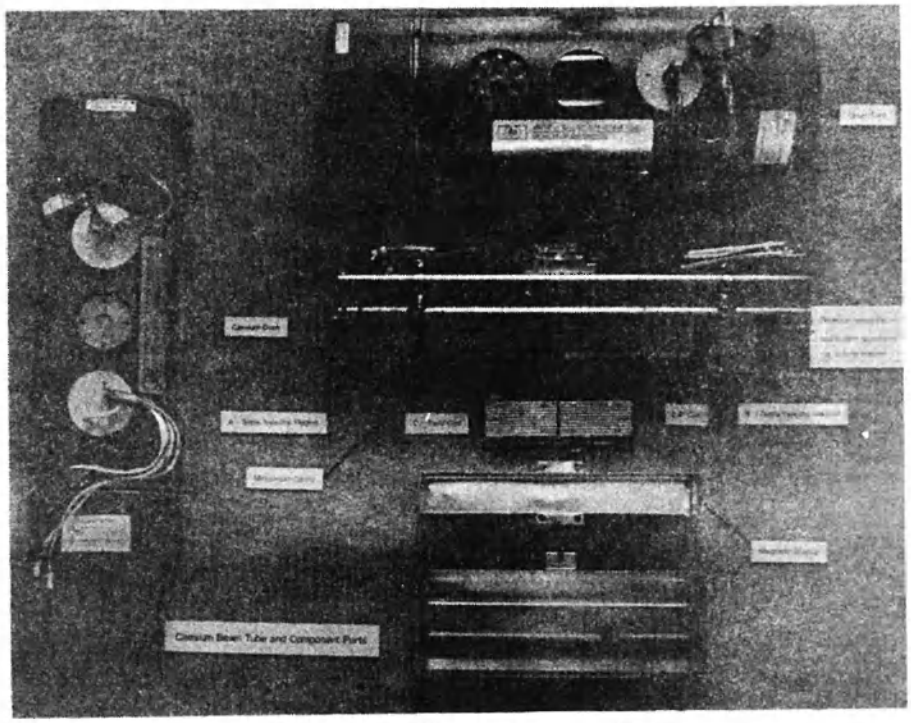
Dr Barrett said: "Pocket watches, a status symbol on well-fed waistlines, became popular, and it was a daily ritual to set your watch by the town hall clock." However, it was still possible to miss a train or the post because of the lack of complete synchronisation between clocks.

In the 19th century, each Australian capital city had its own local time — six capitals with six times. This was solar time — the difference came about because the sun rises earlier in Sydney than in Melbourne and even earlier still in Brisbane.

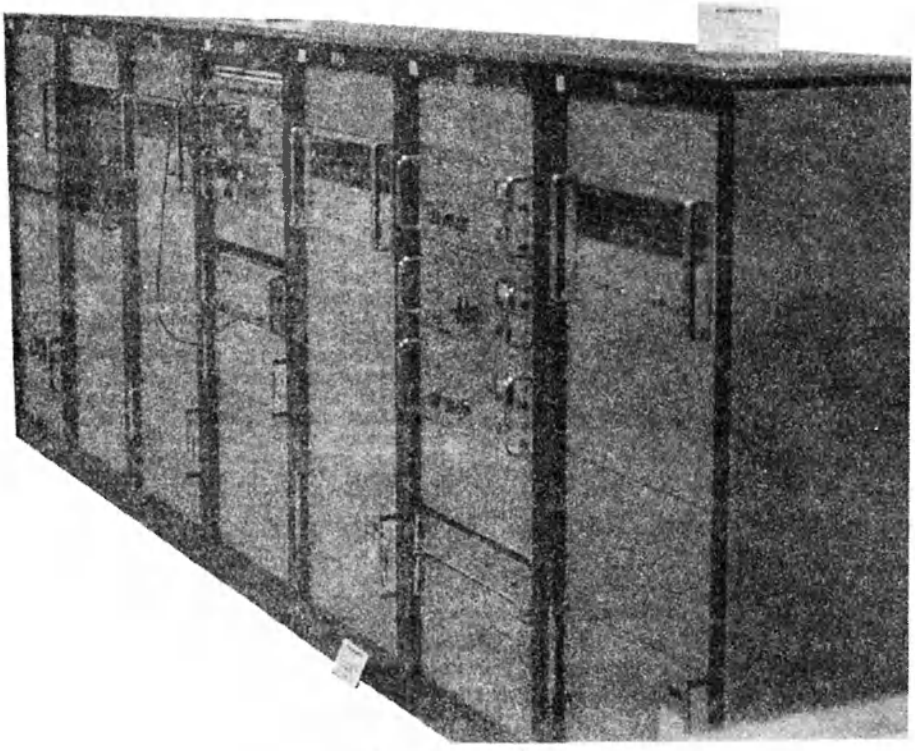
Dr Barrett said that was not so much of a problem in the early days because the six colonies were really six different countries, with customs barriers at Albury-Wodonga and other places.

The idea of standard time zones based on Greenwich Mean Time originated in the 1870s. This began first in the USA and Canada, stimulated by the development of railways stretching ultimately from coast to coast.

In Australia, interstate railways linked Albury in 1883 and at the Victoria/South Australia border in 1887.



Caesium Beam Tube and Component Parts.



Caesium Beam Frequency Standards.

At Albury railway station there were two clocks, one for Melbourne Time and the other Sydney Time.

At an international conference held in Washington DC in 1884, attended by 25 nations, the concept of Standard Time was adopted with every clock to have the same minute and second, only the hour would be different. This resulted in the world having 24 Standard Time Zones, 15 degrees longitude or an hour apart, starting at Zero Meridian Greenwich.

Dr Barrett said government surveyors from the six Australian colonies agreed on this system in 1892. He said Australia was to have three zones — Western Australia was eight hours ahead of GMT, South Australia nine hours ahead and the Eastern States were 10 hours ahead.

The six colonies legislated accordingly in 1894/5 — but South Australia amended its time zone by half and hour in 1898 — nine and a half hours ahead of GMT. The change by South Australia was due to the geographic closeness of Adelaide to Melbourne.

South Australia's time zone was originally based on 135 degrees east, near Port Lincoln, but was moved to 142.5 degrees E, which runs through Broken Hill. Australian Eastern Standard Time is based on 150 degrees E (Gabo Island in far eastern Victoria on the New South Wales border, and Western Standard Time is based at 120 degrees E (between Perth and Kalgoorlie).

It is interesting to note that solar time varies by a minute for every 13 kilometres you travel east or west — or for every one degree in longitude it changes four minutes.

ACCURATE TIME-KEEPING

The International Conference of Weights and Measures in 1967, defined the second as the time interval taken for an atom of Caesium-133 to oscillate 9,192,631,770 times. *The Penguin Dictionary of Science* describes Caesium as a highly reactive silvery-white metal.

Atomic clocks use Caesium atoms placed in a resonant cavity tube which are subjected to an electro-magnetic field. The atoms flip back and forth from one magnetic pole to the other and keep doing this at a fixed rate as long as the field is at the exact resonant frequency of 9,192,631,770 Hertz. The count of the flipping atoms is fed back to the RF oscillator tuning varactor providing the field frequency which results in a high degree of stability.

A Surveyor at the Astro-geodetic Observatories, Division of National Mapping (Department of Resources and Energy), Dr John Luck said modern clocks use a 5 MHz crystal oscillator which is multiplied (synthesised) to get the required field frequency.

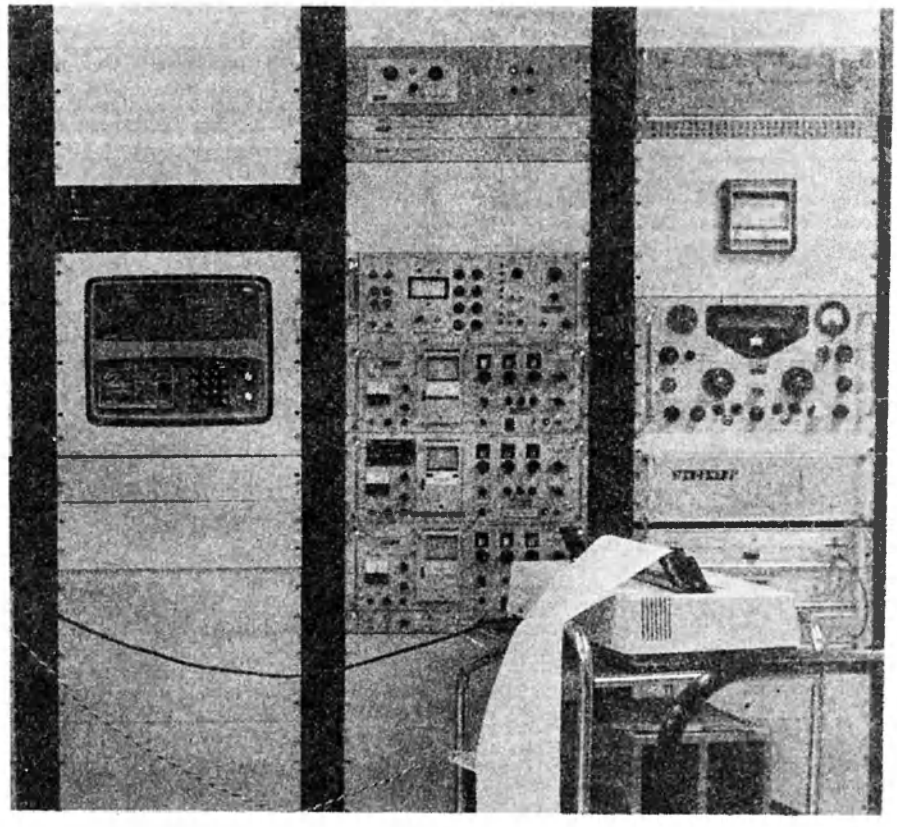
Dr Luck explained that pulses for time-keeping are taken off the 5 MHz oscillator through a divider network. He said atomic clock technology was introduced in Australia in 1967 at the Mount Stromlo Observatory, near Canberra — its function has since been taken over by the Division of National Mapping. Dr Luck said at the same time the CSIRO National Measurements Laboratory (NML) and Telecom (then the PMG) acquired atomic clocks.

The NML has the statutory responsibility for keeping UTC Australia and does so with assistance from National Mapping and Telecom.

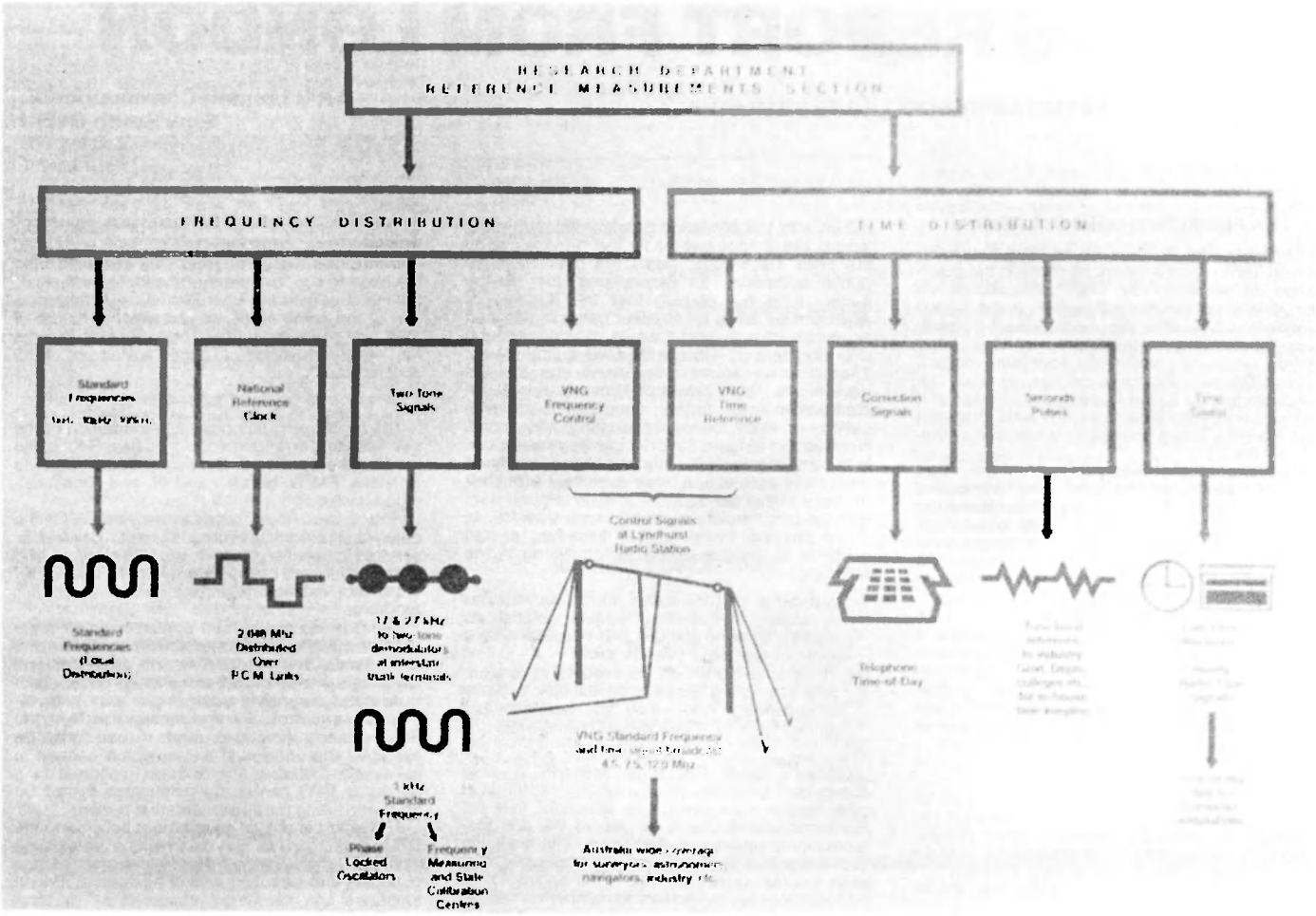
Dr Luck estimated there were about 50 atomic clocks in Australia including those used for military and space tracking purposes.

Experimental scientist, John Thorn, who looks after the NML clocks, said Australian atomic clocks compare one second pulses daily. He said the CSIRO checks its time with the US Naval Observatory (USNO) in Washington, DC, via the Global Positioning Satellite (GPS) system, and using the satellite a 100 nano-second accuracy was achieved between USNO and CSIRO. Mr Thorn said the system enabled an accuracy between clocks within Australia of 10 nano- seconds.

He said before GPS, time-keepers relied on a "flying clock" travelling to an "ensemble of clocks" around the world.



Receiver Rack.



Telecom Australia — Time and Frequency Services.

UTC was determined by a majority voting system — almost a consensus of clocks — producing a mean or "paper clock" as it is called.

Every so often a "leap second" is added to UTC to take account of changes in the earth's rotation, or astronomical time. UTC is kept within an 0.9 second of its relationship with astronomical time and leap seconds when needed are added to the end of a month.

Telecom, in an information booklet, said the Bureau Internationale de l'Heure gave its first preference for leap seconds to be added when needed at the end of December and June, and second preference is for March and September.

The last minute of the chosen month has 61 seconds — the sequence is 2359.59 UTC, then 2359.60 which marks the start of the leap second that ends at 0000.00 UTC on the first day of the following month.

Advance warning of leap second adjustments is included on most time signal broadcasts.

In 1972, there were two leap seconds. Apart from 1980 and 1984, when there were no such adjustments, each year since 1972 has had a one second adjustment.

The general public have access to time through Telecom's Reference Measurements Section. Assistant Director, Standards and Laboratory Engineering, Geoff Willis said time pips on radio stations originate from Telecom clocks through signalling equipment in capital cities.

Telecom also provides a "Dial the Time" telephone recorded information service and the VNG broadcasts. Mr Willis said: "The accuracy of these services are to about one 50th of a second due to delays in transmission.

"The master clocks in Telecom are kept within one millionth of a second."

Finding answers to the question *What is time*? has been time- consuming. The author of this article hopes your time reading it has been time well spent.

FOOTNOTE:

South Australia will switch to Australian Eastern Standard Time at the end of the current daylight saving period in March 1987.

In a proposal to be put before Parliament, South Australia would also divide into two time zones during the summer months with the western half of the State — areas west of the 137 degree Longitude Line (which includes the towns of Port Lincoln and Ceduna and has a population of about 40 000 people) — being exempt from daylight saving.

The move is aimed at helping businesses trading with the eastern sates and will be welcomed by farmers who complain daylight saving costs them time and money.

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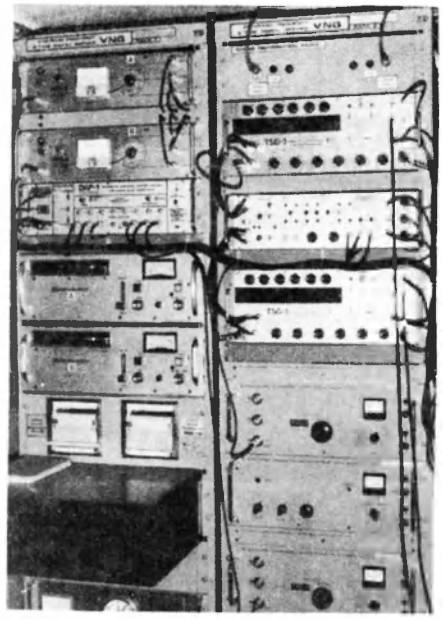

VNG Racks.

NEWS REPORT FROM LONDON

AR'S London Correspondent,
Tony Smith G4FAI
1 Tash Place, New Southgate, London, N11 1PA, England.

UK PROPOSED DEREGULATION

Britain's Minister of State for Industry and Information Technology announced, April 2, the publication of a report by CSP International on Deregulation of the Radio Spectrum in the United Kingdom. CSPI, who are management consultants "specialising in telecommunications, information technology and radio spectrum usage," were commissioned to undertake a study on spectrum pricing by the Department of Trade and Industry, and throughout the study were overseen by a Steering Group chaired by a senior economist from the DTI.

Part one of the report concerns the fixed services, mostly in the UHF and microwave frequency bands. The second part examines the fixed satellite service, and the third looks at all other areas of spectrum usage, including private mobile radio, broadcasting, amateur and CB radio, emergency services and other specialised needs.

The report recommends that for substantial portions of the spectrum a new form of licence, a "Spectrum Management Licence" (SML) should replace existing licences to operate radio equipment. Such a licence would be issued to Frequency Planning Organisations (FPOs) who would be primarily concerned with sub-licensing use of the spectrum on commercial terms to end users.

• • •

UK amateurs have awaited the publication of the report with some apprehension because of the possibility of finding themselves in direct competition with big commercial users for use of radio frequencies in a "market-place" type situation.

The report's comments on amateur radio are as follows:

Amateurs and citizen's band users

We accept the argument that the spectrum allocation process should make some room for access by members of the public for non-commercial users, and for such use to be available on non-commercial terms. An analogy can be drawn with the allocation of land; although most land is allocated to owners for their private use by the price mechanism, parks are maintained by public authorities for recreational use by the public. It is our opinion that the quantity of spectrum set aside for amateur use is larger than economic considerations would dictate, although this judgment is difficult to prove quantitatively. Therefore, we would recommend that the UK government apply pressure in international discussions to avoid further increases in this allocation, or even to reduce existing allocations. However, so long as the principle of amateur use is to be recognised, the implication that amateurs must have access at a price consistent with their amateur status (as opposed to a price consistent with the commercial opportunity cost) must follow.

We propose therefore that amateurs should continue to enjoy a degree of protection in the following way:

— applicants for SML status should be required to accept the existing amateur allocations within their band (primary and secondary) for a minimum period of five years
— FPOs should also be required to accommodate any future amateur allocations, primary or secondary, when they are internationally ratified following WARC/RARC decisions.

Citizen's band (CB) radio presents a case somewhere between that of a amateur and that of other mobile radio users, Like amateurs, they are hobbyists whose use is (or should be) primarily recreational rather than functional. The similarity between citizens band and amateur radio has been increasing recently, due to the acquisition of amateur licences by increasing numbers of people with much lower technical skills (and a different motivation and orientation) than the traditional amateur radio enthusiast.

Nevertheless, we believe that the distinction between amateur and CB radio users is important, and should be reflected in their spectrum licensing status. The arguments for granting amateurs a degree of isolation from market pressures apply with less force in the case of CB radio, and we do not conclude that they should be insulated from the need to pay for spectrum used. Nevertheless, the fact that they are unprotected users (irrespective of the commercial, or recreational nature of their use) gives them lower priority as candidates for early transition to the status of FPO sublicensees.

• • •

The report recommends implementation of the new licensing arrangements in rounds. Round one would take in Fixed Services, Fixed Satellite Services, PMRs, Bands I and III, and Broadcasting Services.

Round two should begin three years after the date of the initial allotments and cover CB, services ancillary to broadcasting, and frequencies used by the entertainment industry for other than making broadcast television and music programs.

The process would then continue for 10 years until the majority of spectrum in the VHF, UHF and SHF bands, and selected bands at higher and lower frequencies have been allotted under spectrum management licenses.

Amateur radio is not specifically mentioned in the proposed timetable, and it can only be assumed that individual bands which happen to fall within a part of the spectrum allotted to a particular FPO can be taken into the system at any time during the implementation period.

The report is not yet government policy, and the DTI is inviting views and comments from existing and potential users of the spectrum, service providers and manufacturers of equipment. British amateurs can hardly be reassured by the proposals. Protection for just five years, coupled with an expressed opinion that they have too large an allocation of spectrum, and a recommendation that the government should seek to reduce allocations in future international discussions, should ring warning bells in every amateur shack, ***not only in the UK but around the world.***

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RECIPROCAL LICENSING

Following is a copy of a letter dated March 12, 1987, sent by Mr D Hunt, Manager Regulatory Operations Branch, DOC in reply to the Ministry of Posts and Communications of the Solomon Islands.

This letter concludes almost three years of negotiations with regard to Licensing and Third Party Traffic arrangements.

Please note that, while the Third Party Traffic Agreement was already in force at this time, the Reciprocal Licensing arrangement did not come into effect until May 3, 1987.

Dear Mr Misi

I would like to refer to your letter of 3 February 1987 on behalf of the Ministry of Posts and Communications of the Solomon Islands government, concerning arrangements for the reciprocal granting of authorisations to permit licensed amateur radio operators of either country to operate their stations in the other country.

I have the honour to confirm that the above proposal is acceptable to the Department of Communications of Australia and that accordingly your letter together with my reply concurring with this proposal may be taken to constitute an arrangement between the Ministry of Posts and Communications of the Solomon Islands and the Department of Communications of Australia, to be effective two months from the date of this reply and to remain in effect until the expiration of six months after either party gives notice to the other of its intention to terminate this arrangement.

To this end, I confirm the reciprocity levels contained in our letter of June 11, 1986, which reads as follows:

DEPARTMENT OF COMMUNICATIONS

Solomon Islands Licences	Australian Licences
Amateur Radio Licence (Unrestricted)	Full Privilege Amateur Licence
Amateur Radio Licence (Restricted)	Limited Amateur Licence

I should also like to express my gratitude for your concurrence, as indicated in your letter of February 12, 1987, to permit third party traffic between amateur radio stations in the Solomon Islands and Australia.

Yours sincerely
(Signed) D Hunt
Manager Regulatory
Operations Branch
Department of Communications
3 March 1987

LICENCE CONDITIONS

In reference to the licence conditions which apply to relaying, recording and replaying of transmissions by amateur stations (paragraph 6.55 and 6.56 of the *Amateur Operators Handbook* refers).

Under existing licence conditions, Australian amateur stations are not permitted to relay the transmissions of another amateur station. Recording and replaying of transmissions back to the originating station is permitted subject to certain constraints. The exception to these provisions is for relays associated with approved Wireless Institute of Australia news broadcasts.

As readers will be aware, provisions have existed for sometime whereby, provided an amateur station licensee announces the station's identification, third party traffic can be originated via a telephone patch. Similarly, provided the station is under the "control" of a qualified operator who announces the station identification, any person may operate the station.

Recognising the aspects outlined and the parallel with retransmissions of other amateur stations, the Department of Communications has decided to relax the conditions applying to relays, recording and replaying transmissions. Accordingly, from March 25, 1987, Australian amateur stations may engage in retransmission (relays), recording and replaying of transmissions subject to the following conditions:

1 When retransmitting another amateur stations transmissions the licensee of an amateur station shall:
a) not do so without the originating stations consent;
b) remote the originating stations call sign from the retransmissions; and
c) insert their own station identification before and after each transmission indicating that it is a retransmission of another station.

2 If the originating station is recorded for subsequent retransmission purposes the licensee shall ensure that such retransmissions comply with conditions 1 a) to c).

The above is an extract from a letter from Mr D Hunt, Manager Regulatory, Operations Branch, DOC.

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VI5JSA — Aeronautical Mobile

Jeffrey Thornton VK5BJT
29 Helmsman Terrace, Seaford, SA. 5169

Two ordinary, everyday amateurs carried the Special Event Call Sign, VI5JSA, aboard a Cessna 172 for three hours.

Here I was, listening to the weekly Sunday Morning Broadcast, when Graham VI5AQZ, mentioned during his Jubilee 150 update how great it would be to have VI5JSA in the air (on the air!). The call sign had been on almost every other mode of transport — train, paddle steamer, Clydesdale, Navy frigate, Grand Prix, etc — so the air was the next step.

Thoughts started to run wild in my head and after the 80 metre Callback, I went up to the Jubilee 150 80 metre frequency (3.586 MHz). There I met John VI5SJ and Graham VI5AQZ and volunteered for the job. My father, who happened to be in the shack at the time, thought it would be great fun (he has a Private Pilots License, you see!).

PREPARATION

After a few calls to Graham, a date, December 20, was decided. As I only had a novice call sign, a full call operator had to come too, so I phoned a good friend, Trevor VK5ATR, and convinced him that flying really was fun! ! ! (not really, he accepted readily).

The first thing to be done was to assemble suitable equipment. My HF rig was being repaired, but fortunately, although we had several stand-by rigs, was back in plenty of time for the flight.

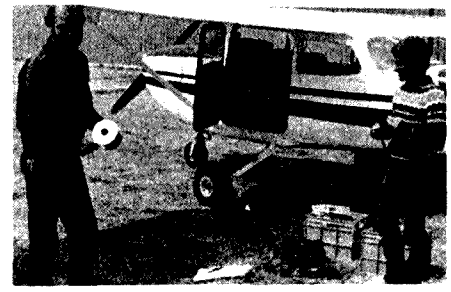
Trevor brought two metres so he could work into the repeater. The aerial for HF posed a problem at first, but Dad suggested using a piece of wire trailing behind the plane. This was standard practice for aircraft HF communications, although you can be assured that their system is a little more elaborate than ours (but, after all, we are only amateurs). A 66 feet (20 metre) length of wire was threaded through a 4 feet (1 metre) piece of PVC tubing. The trailing end has a brick tied on to it for weight and the radio end was tied inside the plane with enough length to reach the ATU.

The final preparation was to ensure a plane for the necessary three hours on Saturday morning.

The Crew that Flew in VH-RFQ (from left) Trevor VI5ATR, Jeffrey VI5NTK (now VK5BJT), Michael (Dad) the pilot.

SATURDAY

After a fairly late night on Friday (no . . . not a party but acting as the J150 Net Controller using the South Coast ARC call sign, VI5ARC), I woke bright and early on Saturday. After breakfast, the car was packed, ensuring all the necessary bits and pieces were there, and Dad and I set off for the Aldinga Airstrip to meet Trevor at 6.30 am. Whilst Dad prepared the plane, Trevor and I adjusted the aerial and stowed the equipment on board. Once in the air, we slowly lowered the long wire and Trevor began using repeater 7000 (8). He quickly discovered that, at 2000 feet he could easily work everyone (in the suburbs) direct. Line of sight was much easier to obtain from the air.



After the Flight — assembling the equipment into some sort of order.

I began working on 3.586 MHz, tnen moved to 7.095 MHz (7.086 was busy) finally concluding with 21.186 MHz. I worked into VK2, VK3, VK4, VK5 and one ZL.

After a constant three hours it was time to get back to terra firma. About 80 stations had been worked.

CONCLUSION

As so many people talked to us, I must assume the exercise was a success. Sorry to all those who missed out, but better luck next time (in the year 2036? ! ?).

Thanks to our pilot, Michael (my father), Trevor VK5ATR, John VK5SJ, Graham VK5AQZ, and everyone who participated in J150. Thanks for making it great!

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Setting up the Aerial — on the ground! ! !

Printers Devil

The 'Printers Devil' didn't understand one of the calculations in the middle column of page 15 of the May issue and tried to obliterate it from the printing press plate. The calculation is reprinted below. Apologies to all and please amend your copy now.

$$NEP_{bg} = \sqrt{\frac{2\pi h c (\Delta f) W_{bg}}{\lambda}} \quad \text{watts}$$

Where Δf = Audio bandwidth (Hz)

JUNCTION FIELD EFFECT TRANSISTOR AMPLIFIERS

Don Law VK2AIL
RMB 626 Adelong Road, Tumblong, NSW. 2729

In the "olden days" it was common practice to trim meter multipliers by filing the side of solid carbon resistors.

In the earlier days of amateur radio, when we built most of our equipment, it was common practice to trim meter multipliers by filing the side of solid carbon resistors with a half round file (see Figure 1). The more you filed, the higher the value went; and the lower the meter current. If you went too far it meant starting again, with a new resistor.

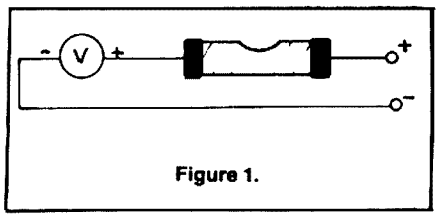

Figure 1.

What if the width of the conducting path could be electronically controlled? The device would then be able to amplify signals. Suppose the resistor were made of lightly doped silicon; that conducts and, like the carbon rod would have a voltage gradient along its length as a result of any applied potential difference. Assuming the rod or bar to be N- type Si, what would happen if a more heavily doped piece of P-type Si were fused into the side near the centre? (Figure 2.)

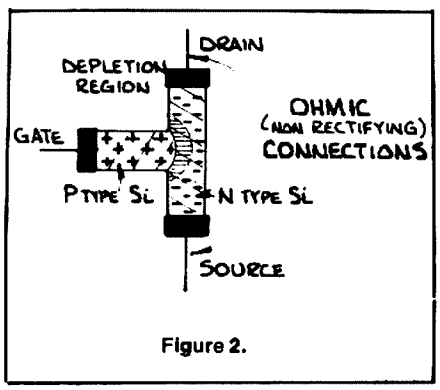

Figure 2.

Although both materials are conductive, on the bench (or in the bin) the junction would be a little like a dry joint. Holes from the P- type material migrate into the N-type and electrons from the N-type material migrate into P-type, creating a depletion region where no conductivity takes place. As with any Si P/N junction (diode) it would require a potential difference of approximately 0.7 volts, positive at the P-type Si to overcome this barrier and cause current to flow through the junction. But we are not interested in junction current, rather, current through the bar. Because the bar is less heavily doped than the P-type Intrusion the depletion region extends further into the N-type bar than the P-type material. It narrows the conduction path and reduces any current that may be flowing. So far, we have done little more than a bit of electronic 'filing'; conditions are static. Let us examine what we can do with It. (Figure 3.)

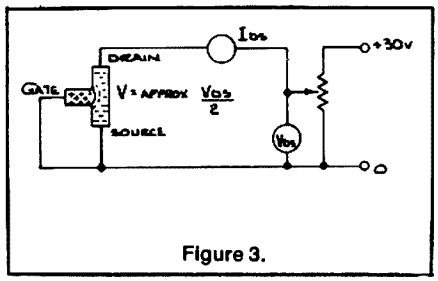

Figure 3.

The set-up allows us to examine how the current through the bar (Drain/Source Current (I_{DS})), varies with the Drain/in/Source Voltage (V_{DS}) and it should be noted that, since the junction is approximately halfway up the bar, the intrinsic 0.7 volts is augmented by about half of V_{DS} due to the voltage gradient across the bar. (Most J-FETs work okay with the drain/source connections reversed due to the junction being effectively mid-way).

In consequence, as V_{DS} is increased, a value is reached where the depletion region extends across the width of the bar and current through the bar is "pinched off" at some fixed value. Further increase of V_{DS} does not substantially increase I_{DS} above this value. (Figure 4.)

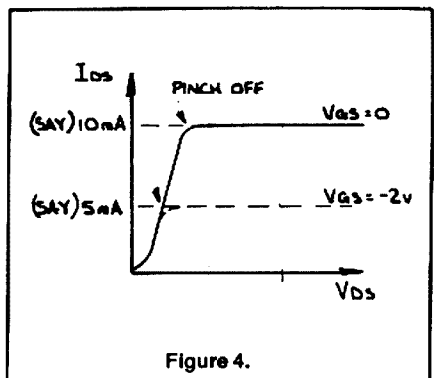

Figure 4.

This may be a current of from eight to 20 mA for a BFW10 and occurs at V_{DS} = 15 and V_{GS} = 0 (as shown in Figure 3). Figure 5 shows V_{GS} set at -2 volts. As V_{DS} is increased from zero, pinch-off will occur earlier due to the extra two volts reverse bias adding to the positive voltage at that point on the bar. Since V_{DS} is lower than before, the current through the bar will be smaller. A whole family of curves may be plotted using a range of bias values. (See dotted curve, Figure 4).

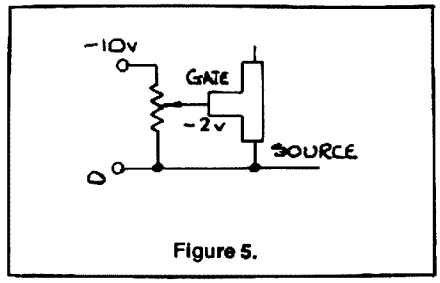

Figure 5.

It follows that, with an input signal swinging from zero to minus four volts, I_{DS} would swing from 10 mA to around zero and that the inclusion of a load resistor R_D would provide a voltage output and gain; an amplifier.

Because gate current is not allowed to flow, the input impedance is extremely high and, since the device normally operates in the 'plateau' region, Z out is also quite high. (Refer to Figure 4).

The I_{DS}/V_{GS} or mutual conductance characteristic (Figure 6) illustrates how amplification is possible.

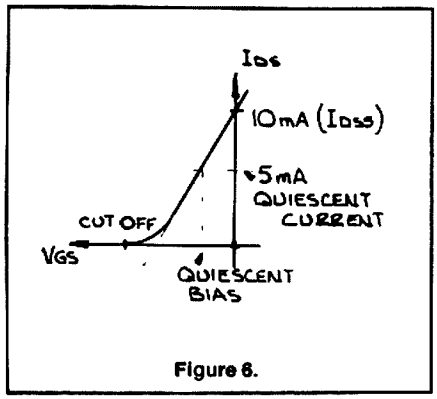

Figure 6.

It shows how the drain/source current (I_{DS}) varies with gate/source voltage, (V_{GS}) and clearly defines cut-off. (Some texts indicate pinch-off where the curve crosses the zero bias line (I_{DSS}) but clearly, operating within the plateau region, the device is surely 'pinched-off" for the entire curve).

Since the shape of the curve is common to all J-FETs it may be used to determine circuit values. Most important is the fact that the linear part of the curve projects to approximately half the cut-off bias value and that the operating bias is half of this, or $V_{GS(cut-off)}/4$. Manufacturers parameter spreads are so wide for J- FETs that accurate design becomes a problem. Figure 7 shows a typical circuit employing a source

resistor for biasing which, due to negative feedback (DC), affords a large degree of independence of these vagaries. (Similar to the use of an emitter resistor in BJT circuitry).

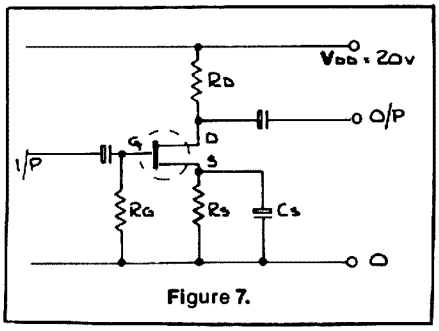

Figure 7.

Figure 7 illustrates a complete audio J-FET amplifier. Let us look up the data for a 2N5459 (Courtesy of Dick Smith's Catalogue).

$V_{GS(OFF)}$
= 2 to 8 at V_{DS}
= + 15,

I_{DSS}
= 4 to 9 mA at V_{GS}
= 0,

Yfs
= 2000 to 6000 μmhos.

Due to the effect of R_S it is satisfactory to use mean values, ie

$V_{GS(OFF)}$ = 5,

I_{DSS} = 6.5,

Yfs expressed as Gfs = 4 mA/volt.

$$\text{Thus } R_S = \frac{V_{GS(OFF)}}{4} \div \frac{I_{DSS}}{2} \text{ (see Fig 6)}$$

$$= \frac{5}{4} \div \frac{6.5}{2}$$

$$= 0.384 \text{ k } (390\ \Omega \text{ pref})$$

$$\text{and } R_D = (V_{DD} \text{ (say 20 V)} - V_{DS}) \div \frac{I_{DSS}}{2} = \frac{5}{3.25}$$

$$= 1.538 \text{ k } (1.5 \text{ k pref})$$

(Note that I_{DSS} refers to I_{DS} at V_{GS} = zero).

Because I_{GS} is 1 μAmp or less, R_G may be very high. (1 Megohm or more). Since no direct current flows through R_G there is no volt-drop across it and V_G (quiescent) = ground zero.

The unloaded stage gain is:

Gfs X R_D = 4 X 1.5 = 6,

V_S = +1.25,

V_D = +15.125

The maximum undistorted output voltage swing is nearly $10V_{(p\text{-}p)}$.

Where BJTs bottom, (V_{CES}), at less than a volt, because of the intrinsically high channel resistance and the conditions for 'pinch-off' J-FETs do not. As a straight out AF amplifier, the BJT leaves it for dead regarding voltage gain but it does have a very high input impedance, a reasonably high output impedance and a low output Z as a source follower. It may be used to advantage in conjunction with BJTs. As an RF amplifier, where the DC resistance of the load, (tuned circuit, etc), is very low, the MPF102 will work quite satisfactorily on a nine volt supply. (The calculation for R_S is as for AF usage).

Coupled with very low noise figures and large input voltage handling capabilities is its extreme linearity. A useful front end device to counter cross-modulation. It has its place in numerous signal processing circuits including low level television modulators.

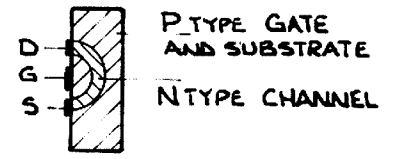

Figure 8.

Of course, the J-FET is not made as a bar with a slug in the side, but as drawn in Figure 8. The principle of operation remains true.

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RADIODES

A TIMELY THOUGHT

Official time is not the same as that which nature planned,
The sun when at its zenith doesn't mean midday at hand.
There's many a name to indicate the variations used,
And some folk say than none of them can really be excused.

The difficulties multiply when travelling at speed,
Provided moving east and west is really what you need.
The time you start may soon become the time you arrive,
Or else time will go twice as fast no matter how you strive.

When using rays that travel just as fast as those of light,
The various times in use can really put us in a plight.
For then we are two-timers though so honest we may be,
And my time is not your time if you're far across the sea.

So when making timed appointments for meeting on the air,
Remember that in all the world there's but one sun to share.
When in Sydney evening shadows are so long upon the lawn,
Folk in London, just awaking see the glimmer of the dawn.

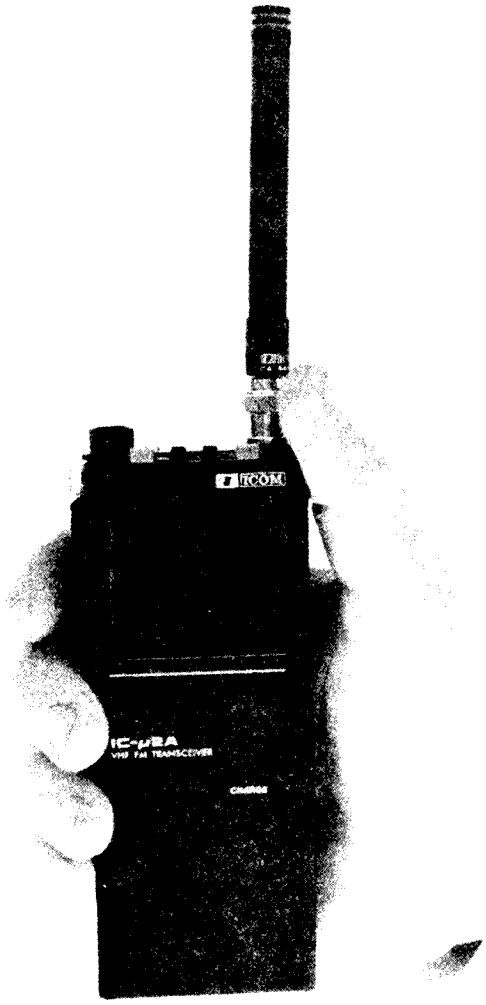
For many years we have agreed that Greenwich time is best,
To use as handy reference between the east and west.
This means that from all different times we are at least set free,
As long as we can calculate the hours in GMT.

—"Hambard" (Originally printed in the Nigerian ARS Newsletter 1970s)

Equipment Review

Ron Fisher VK3OM
3 Fairview Avenue, Glen Waverley, Vic. 3150

ICOM MICRO 2A — 2 METRE FM HAND-HELD TRANSCEIVER



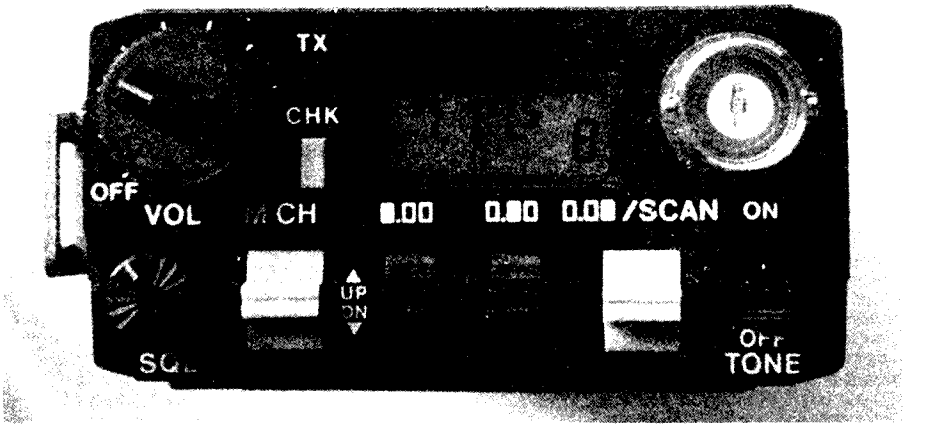
It seems that similar to most equipment these days, hand- helds are getting smaller. The first of these to reach our test bench is the new Icom IC-μ2A. It is not clear at the present if this will replace the long-running IC-2A, which has been around since early 1980. There is no doubt that the 2A is the most popular hand-held ever to have been produced. The new Micro 2A looks set to continue that tradition. When the original IC- 2A was released, I stated in the review (September 1980 AR) that 'The size is impressively small. It will fit easily into a shirt pocket and is certainly the smallest two metre hand-held on the local market.' I am not sure if shirt pockets are smaller in 1987 but if so, the new micro will fit with ease.

As a comparison, here are the overall dimensions of each, complete with the supplied antenna and battery pack. The IC-2A: 34.5, 6.5 and 4 cm (HWD). The weight, 470 grams. The Micro 2A is 25.5, 6, and 3 cm (HWD), with an all up weight of 370 grams. Part of the difference is in the use of a shorter flexi-antenna on the new model.

Out are the old thumb-wheel frequency switches, now replaced with three spring loaded up/down scan switches for MHz, 100 kHz and five kHz selection. The basis of operation is via 10 memories, the frequencies for these being selected by means of the three up/down switches. There is then a fourth up/down switch to select the required memory channel. Frequency display is from a small, but very readable LCD display, which also indicates the memory channel number and incorporates an S-meter that doubles as an RF output indicator. The display can be illuminated for night-time operation.

Power output is rated at one watt or 0.1 watts, selectable from a rear mounted slide switch. Also on the rear panel is the simplex, duplex selector switch. Unfortunately, the offset information cannot be entered into the memory. Top panel controls, in addition to the frequency selection switches, include an audio volume/power on-off knob, a squelch control, CHK button which allows listening on the repeater input frequency and a sub-audible tone switch.

Options available for the Micro 2A include a selection of battery packs to give either extended life or slightly higher power output. The IC-HM9 speaker/ microphone, which was usable with the original IC-2A, is compatible with the Micro 2 also. Two headset/microphone units are also available, one with a VOX facility, the other with manual T/R switching.



IC-μ2A CIRCUITRY

The receiver side of the circuit bears a strong resemblance to the old 2A. It uses a double conversion set-up with a 16.9 MHz first IF (10.7 on the original 2A) and a 455 kHz second IF A crystal filter is provided at 16.9 MHz and a ceramic filter at 455 kHz. The RF stage and first mixer are both 2SK302 FETs with a bipolar amplifier at 16.9 MHz. As with the 2A, an IC provides the functions of second converter, 455 kHz IF and limiter-discriminator.

Battery backup is provided for the memory operation and it is felt that it is worth quoting the following from the instruction manual: "The usual life of the backup battery is one to two years. Monitor the backup battery carefully and replace it if there are repeated cases of display malfunction. Note: Battery replacement should be done by your nearest authorised Icom Service Centre. If the internal backup battery is exhausted, the IC- μ2A transmit and receive functions will still operate but no frequencies can be memorised in the memory channels." I am slightly concerned that the battery life is quoted at only one to two years. Only time will tell.

One of the nice features of the μ2A is the special power saving circuit. If no signals are received or switches operated for more than 30 seconds, the receiver drops into a standby mode where the current drain drops to one quarter of normal. If you use the transceiver for monitoring purposes this will result in very greatly extended battery life.

The transmitter final stage uses a 2SC1947 with two driver amplifiers fed from the CPU controlled PLL circuits. Diode switching is used for all transmit receive change-over functions.

ON THE AIR

Whilst the measurements of the Micro presented earlier might not indicate that this transceiver is all that much smaller than its predecessor, it's not until you actually get it in your hand, that its small size becomes apparent. Dialling up the required frequency is very easy.

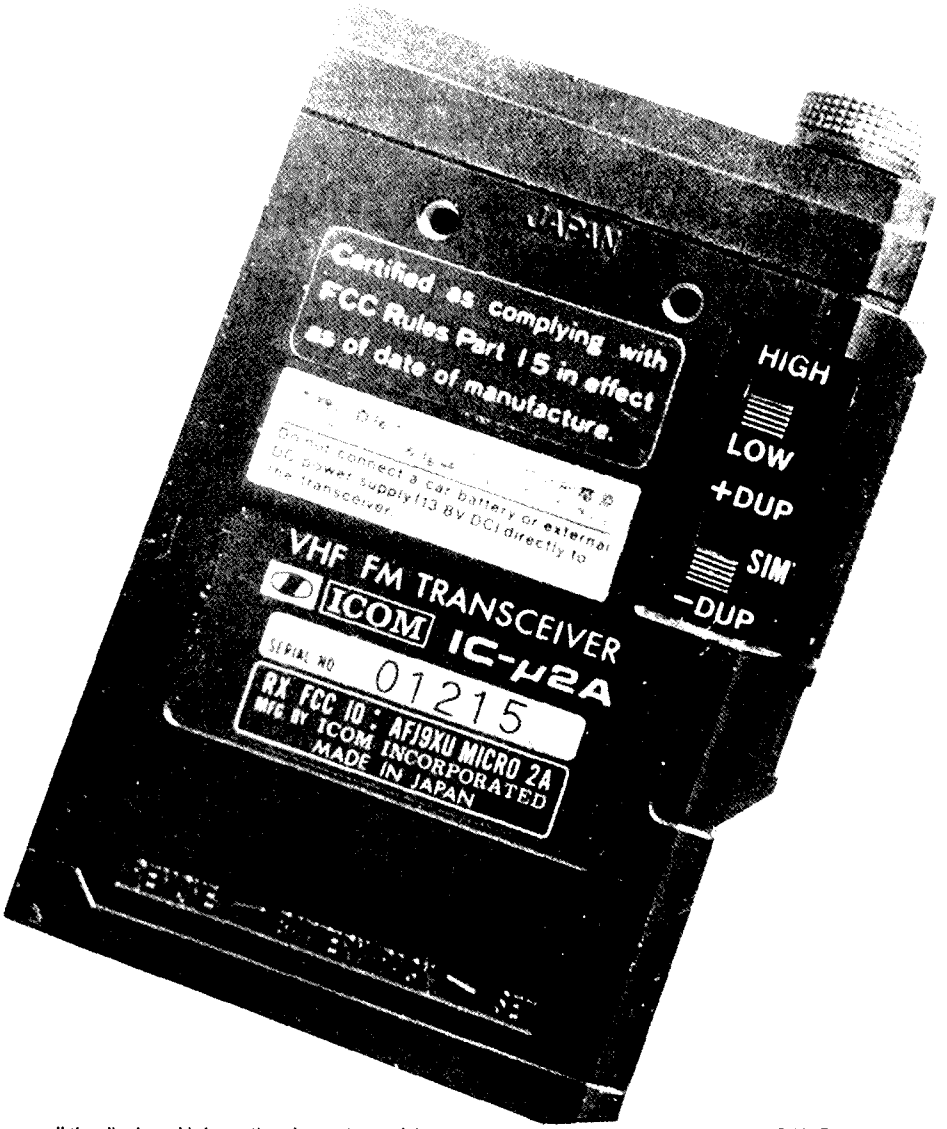
Holding the switch either up or down causes the frequency to scan up or down in one MHz, 100 kHz or five kHz steps. Just release the switch when you reach the required frequency. Once selected, the frequency is automatically entered into whichever memory channel is selected at the time. Perhaps the only criticism is that it might have been easier if the last five kHz position be optionally changed to 25 kHz. This would suit our band plan for FM somewhat better than the present system.

AUDIO OUTPUT

The audio quality from the very small speaker proved to be very good, although audio output was somewhat limited for mobile operation. An external speaker or the HM9 speaker/microphone would be a suitable way to overcome the problem. Reports on the transmitted audio quality were always complementary. The signal had a sharp crisp sound and the deviation seemed to be well set.

ILLUMINATION

One of the nice features was the excellent illumination of the LCD readout. A single push of the light switch located near the PTT bar kept the light on for about four seconds, enough to take in



all the displayed information. In use it was felt that the transmitter was not accessing repeaters as well as expected. As we shall later see in the test section, this proved to be true.

ON TEST

The usual line-up of test equipment was used to produce our test figures. This included a Marconi TF 955A/5 RF Signal Generator, AWA F-242 Noise and Distortion Meter, Daven Terminating Audio Power Output Meter and a Marconi TF-957/1 RF Power Meter.

First, the current drain was measured. On receive, with the squelch operating, but no audio output, the current drain was 25 mA. After 28 seconds of operation with either no signal input or control changed, the receiver drops into 'standby mode.' The current drain then cycles between about 4 mA and 10 mA over a one second period, giving an average standby current drain of about 7 mA. Receive audio power was next checked when the external speaker was terminated firstly into an eight ohms load, where the maximum power was 0.375 watts but with 35 percent distortion. At 0.2 watts output, the distortion was down to a more reasonable figure of five percent and at 0.1 watts output, it was an excellent one percent. Output and distortion were also checked with a 4 ohm load, but little notice was noted in the above figures. As can be seen, the total audio power available is rather limited, but not dissimilar to most other hand-held transceivers.

RECEIVER SENSITIVITY

The receiver sensitivity and S-meter calibration was checked. At 0.16 uV pd the SINAD measured 16 dB. The squelch, when set to the threshold, opened at about 0.1 uV. The S-meter is not actually calibrated in 'S' units which is just as well because the indicating segments bear no relationship to real S-points. For what it's worth, the calibration was as follows:

1st segment	Squelch open
2nd segment	2.0 uV
3rd segment	2.5 uV
4th segment	3.1 uV
5th segment	4.0 uV
6th segment	5.0 uV

Not the greatest S-meter, but no doubt better than nothing. Receiver sensitivity on the other hand is very good indeed.

POWER OUTPUT

Transmitter power output was next measured. In the high power mode, it measured 1.75 watts and when switched to low power the ligure was 0.1 watts. This is very similar to the older and larger IC-2A, but it soon became apparent that the transmit capability of the μ2A was well down on the old IC-2A. I therefore decided to check the performance of the helical stubby antenna supplied with the μ2A. The method used was as described in my article, *The Long and Short of Two Metre Antennae for Hand-Helds,* (AR December 1984). It was found that the short μ2A antenna was about 4 dB down on the longer IC-2A helical. While 4 dB might not seem much, in actual use there is a very noticeable difference. A better antenna is recommended.

CONCLUSIONS

The Icom IC-μ2A performs very well indeed. The compact size is certainly a big feature. Its a pity that the supplied helical antenna is not a bit more efficient, compared with other helical antennas of even the same size, it is well down in performance. Perhaps Icom should consider changing their antenna supplier. The instruction book is, in general, well presented and, in fact, very similar to the IC-2A handbook. A circuit diagram is supplied, but as usual no technical information is included. Surely it should not be asking too much to include a few basic adjustment details such as transmit deviation. Icom service manuals are hard to come by and are usually very late in production.

Our review unit was supplied with a 115 volt battery charger which might not have worked very well on 240 volts. Nevertheless, I found that my IC-2A charger worked fine. Icom assure me that this was due to the review unit being an early model and that all transceivers being distributed are supplied with normal 240 volt chargers.

Our thanks to Icom Australia for the loan of the μ2A transceiver for this review.

EVALUATION AND ON-AIR TEST AT A GLANCE

ICOM IC-μ2A FM TRANSCEIVER Serial No 01215

APPEARANCE

Packaging
***Strong carton with foam insert.

Size
****its amazing how they fit it all in.

Weight
***You will not know you are carrying it.

External finish
***Very pleasing finish.

Construction quality
***Appears to be Icom's usual high standard.

PANEL CONTROLS

Location of controls
***Logical layout.

Size of controls
***Relative to the size of the rig, very good.

Status indicators
**Transmit indicator only.

RECEIVER OPERATION

Memories
**Ten memories with no repeater offset included.

S-meter
*Only just better than nothing.

Frequency Display
***Small but clear. Very well illuminated for after dark use.

Sensitivity
***Very good. See test results.

Signal handling
***Very good for a hand-held.

Internal speaker
**Clear distinct quality, but rather limited output power capability.

Listen on input facility
***Push button listen on input for repeater operation. Does not allow reverse transmit.

TRANSMIT OPERATION

Power output
***Similar output to the old IC-2A in a much smaller package.

Battery drain
***Not excessive on transmit. Overall with low average drain on receive, very good indeed.

Metering
**Output indication only.

Audio quality
***Crisp clean audio.

Antenna efficiency
*Well down on input. See test section.

Battery life
***With the current saver in use. Very good.

MANUAL

Owners Handbook
***Lacks technical information but operating instructions very well covered.

OVERALL RATING

***The overall concept of this little hand-held is very good. If you require a compact two-metre FM transceiver, this one should be at the top of the list.

RATING CODE:

* Poor, ** Satisfactory, *** Very Good, **** Excellent.

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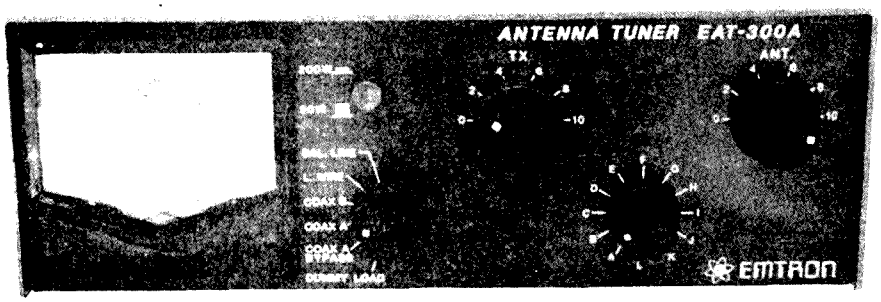
Equipment Review

Ron Fisher VK3OM
3 Fairview Avenue, Glen Waverley, Vic. 3150

EMTRON EAT-300A ANTENNA TUNER



For some years now, Emtronics, under the direction of Rudi Breznik, have produced a wide range of antenna couplers, SWR meters and other ancillary items for the Australian amateur radio market. Rudi is to be congratulated for being one of the few to get into the rather limited Australian market.

Emtronics state in their advertisements that over 800 famous EAT-300 ATUs have been sold which would have to rate as a very good achievement.

The new EAT-300A is an improved version of the original 300 and provides the following facilities:

Matches everything from 1.8 MHz to 30 MHz and includes a built-in balun to feed a balanced line feeder, which was incorporated in the earlier model. The EAT-300A has the additional attributes of a cross needle forward and reverse power meter and a six position antenna selector switch. This permits the selection of a balanced line antenna, a long wire, two coaxial fed antennas, a coaxial fed antenna which bypasses the tuner or a final position that switches in a 100 watt dummy load.

The standard of construction is excellent with high quality components and first-class wiring. The cross needle power meter is of the Diawa type with two power scales of 20 and 200 watts. The metal cabinet is solidly built with an excellent enamel finish.

ON TEST

The tuner was set up with various antennas to test its ability under typical operating conditions. However, before starting the tests a few questions arose. The EAT-300A is rated at 300 watts but the power meter only reads to 200 watts. A little strange to say the least. Also, advertisements for the EAT-300A rate the dummy load at 100 watts, but the operating manual supplied with the tuner gives no specification at all. It just states *Do not apply full power out of your transmitter for longer than 1 (one) minute.* Perhaps I could ask what the full power output of your transmitter is.

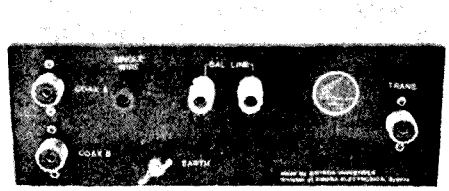
The initial test was with a 100 watt output transceiver feeding a balanced transmission line to a centre fed 80 metre dipole. I have, in fact, been using this type of antenna for the last 25 years with good results using a Johnson Matchbox AT-U.

The 300-A was able to tune up this antenna on all amateur bands from 80 to 10 metres, including the new WARC bands. It was noted though that the tuning on most of the bands was extremely critical. As the balun used to couple to the balanced line output was rather small, I expected that it might run hot after some extended operation with 125 watts output. However not so, it was stone cold after a couple of hours operation. Nevertheless, the air wound inductor used to tune the lower frequency bands became too hot to touch. I would suggest that if a full 300 watts had been used, the plastic supports used as the coil former would melt in a very short time. I should mention that this only occurred while testing on the 80 metre band. As a further test, I ran 100 watts through the tuner for one minute and then measured the temperature of the wire. It was 85 degrees Celsius. I hate to think what it might have been with 300 watts running through the tuner.

As the frequency was increased, the heating became less pronounced, with a slight warming being only noticeable on 20 metres.

It was also noted that tuning with 125 watts applied caused the capacitors to arc over although, with the unit correctly tuned, no trouble was noted. I would therefore recommend that initial tuning should be carried out with no more than about 50 watts applied from the transmitter. The 330A was tested with a coaxial input to a trap vertical antenna, which runs a high SWR, when used away from its resonant frequency. The tuner was easily able to cope with an initial SWR of up to 4:1.

I did not try a random length of wire, but there are no doubts that the tuner would be able to load a transmitter into the proverbial piece of 'wet string.' The power meter readings proved to be very accurate when checked against my Drake W4 which in turn is regularly checked against a professional Bird Thru-Line wattmeter.

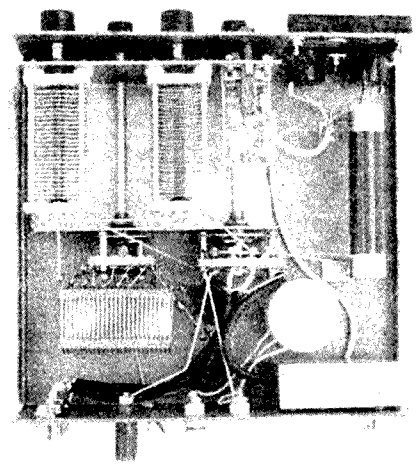


Rear View.

CONCLUSIONS

The Emtron EAT-300A is a very well constructed antenna tuner. It is felt that its advertised power rating of 300 watts is very optimistic. I would suggest that 100 watts is nearer the mark. This would certainly fit better with the 200 watt full scale reading power meter.

However, the greatest disappointment is the so



called operating manual. This consists of four pages (one being blank) of poorly presented information. There is no specifications included in the 'manual' and it is necessary to refer to Emtronics advertisements to work things out.

If you need an all band ATU, the EAT-300A is certainly very much better value than many of the imported units. It will cope with most feeder matching requirements encountered in the average amateur shack. My thanks to John Hill of Emtronics Melbourne outlet for the loan of our review unit.

ANTENNA RANGE

AUSTRALIA'S LONGEST MODERN ground reflection antenna test range has been set up by Telecom at Caldermeade, south-east of Melbourne.

With a range length of up to 2500 metres, it will be used by Telecom for antenna measurement and analysis work from VHF and UHF bands to the microwave and millimetre wavelengths.

Major features are a receiving and transmission site, linked by a computer- cased measurement and control system. At the receiving end is a 30 metre tower fitted with a crane, rotators and positioners needed to mount and control under test antennas.

The transmitting site consists of a trailer mounted tower on which the transmit antenna height, orientation and polarisation can be varied.

Mobile cranes can enter the site to mount antennas of up to 10 metres diameter weighing up to 6000 kilograms on the receiving tower.

The range in which Telecom has invested $1.3 million has attracted the interest of government departments, OTC, CSIRO, private industry and universities interested in having their antennas tested.

Education Notes

Brenda Edmonds VK3KT
FEDERAL EDUCATION OFFICER
PO Box 883, Frankston, Vic. 3199

Out of all the comment and debate about proposals for examination systems there came a number of criticisms of the current procedures. Some members argued strongly for a move away from the multiple- choice questions, a change in the pass-mark, a two-level paper, or a lower standard entry to the hobby.

Most of these proposals have been debated previously, and the debate continues. They are perhaps topics which the committee considering the "Future of Amateur Radio" should be including in their brief. But I would like to add a little more to the discussion about multi-choice questions.

Those of us who gained our licenses by passing an essay-type examination generally had it fairly easy.

Admittedly, there was no set syllabus, but copies of past question papers could be had for the asking, and it was only necessary to collect two or three years' papers to establish the range and type of question likely to appear.

By preparing and remembering answers to 10 or 15 questions success was virtually assured.

The questions were straight-forward and not liable to misinterpretation. But — this type of question requires a technically competent person to spend significant time on its marking, and the mark awarded may vary according to who marks it.

As the numbers of candidates began to rise, the time taken for marking these questions became so significant that in the late 70s results were taking months to arrive.

The moral of all this is that an essay type question is easy to set, but hard and time-consuming to assess.

The multi-choice question, however, is very easy to mark, and its mark is not affected by the bias or attitude of the marker. In fact, the marker need have no technical knowledge at all.

But *good* multi-choice questions are very hard and time consuming to set. (Bad ones are easy).

So on balance, it should be as economic in terms of manpower to set and mark a nine question essay paper as a 50 question multi-choice paper — and it probably would be if the questions had to be produced fresh for each exam.

Once a bank of multi-choice questions is established, however, questions can be re-used many times. They can be selected so that any sub-section of the syllabus can be examined, and the weight given to each section can be varied by altering the number of questions included from that section.

So a multi-choice examination can be much more searching than an essay- type, both in range of topics covered and in degree of depth. The strength of such a system lies in the number of questions on each topic in the bank. If the bank is large enough, the whole thing can be published as the candidate has no way of knowing which questions will appear on any one paper.

Complaints about questions generally relate to the wording of the question being unclear, or the possibility of two (or no) correct alternatives.

A good question should not require the candidate to spend time working out what is being asked, but it is often necessary to make the wording precise to ensure that the desired question is the one being asked. It is up to the candidate to read all of each question.

Two correct alternative is a problem that may arise if the candidate's knowledge and background are such that he can see possible situations beyond those required for the syllabus.

It is almost impossible to set a paper without any risk of misinterpretation.

Candidates should be exposed to as wide a range of questions as possible, and should read them not only to find the answers but also to become aware of the finer points of detail or wording.

If an unanswerable question does arise in an examination, it should be brought to the attention of the supervisor or DOC.

Candidates who have complaints are invited to let me know of the problems, and I will approach DOC on their behalf.

If faulty questions are found they can be corrected or removed from the bank.

I look forward to hearing all the new call signs that should be appearing about the time this is published.

—73, Brenda VK3KT
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Know your Second-hand Equipment

Ron Fisher VK3OM
3 Fairview Avenue, Glen Waverley, Vic. 3150

THE TRIO KENWOOD RANGE continued

This month we will look at some of the early VHF transceivers produced by Trio Kenwood.

As with their HF equipment, Kenwood took quite a while to get established in Australia and some of their early models were not sold in large quantities. It is also interesting to note that Kenwood Trio two metre FM transceivers were sold in the United States of America under the Drake brand name during the 1973 to 1976 period.

THE TRIO TR-7100

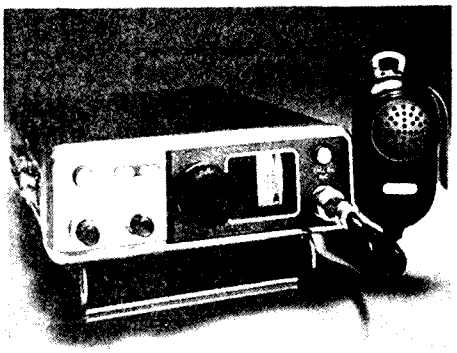
This two metre FM receiver was the first of the brand to be available in Australia. I was lucky enough to own one of these in the early 1970s. It was a fully solid-state transceiver with 10 watts output. There were 12 switched channels and, as with many of the early two metre transceivers, there were usually three sets of crystals for frequencies in the 144 MHz region. These became known as 'Japanese' channels and were frequently used for local simplex working.

The general performance was quite good, but like the original YAESU FT-2, there was no means of netting the receive crystals onto the exact frequency. With normal crystal tolerances, this was quite a problem.

I cannot find any reference to the original price of the TR-7100 but I would think that the second-hand value today would be about $100 to $120, depending on the number of usable channels fitted.

THE KENWOOD TR-7200

This was the first of the now Kenwood two metre transceivers to be widely distributed. I reviewed it in the September 1975 issue of *Amateur Radio*. Channel capacity was now up to 22, with an addition switch position for an external VFO input. Kenwood did produce a matching VFO, but so far as I know, none were imported into this country. The 7200 was one of the first two metre transceivers to incorporate a 'call' channel.



The frequency installed selector switch enabled one to select a channel by pushing the call button, regardless of the main channel switches position.

The TR-7200 was somewhat larger than most of its contemporaries but still very compact for the period. Actual measurements were 180, 60 and 240 mm (WHD). Weight was 2.5 kg. Performance was of a high order and test figures taken at the time surpassed most of the opposition. Price when new was $210 fitted with two or three channels. Secondhand value today would be about $120 to $130 again depending on the number of usable channels installed.

THE KENWOOD TR-2200A AND THE TR-2200G

These two metre FM transceivers were of the portable type. They had provision for internal batteries and had a telescopic whip antenna that could be extended from the front panel. They were known as 'hand bag' portables, supplied with a shoulder strap, they were an alternative to the then new hand-held transceivers. While it might seem odd, the 'G' model was the first to be released with the 'A' model coming along later with several improvements including higher power output. The 'G' was rated at one watt output whilst the 'A' had selectable 0.4 or 2 watts output.

The size of both was the same at 135, 58, and 191 mm (WHD). Weight with batteries was 1.8 kg. Like most of the Kenwood equipment of the time, they have an excellent record of reliability. Receiver sensitivity was in general slightly better than the other makes. If you are looking for one on the secondhand market, try to find one fitted with Ni-cad batteries. Both had provision for 12 channels and, of course, like all the transceivers described so far, required two crystals per channel. Price when new over the period from 1974 to 1977 for the 'G' model and 1978 for the 'A' model was $220 to $275. Secondhand value today would be about $100 to $130.

THE KENWOOD TR-7400A

This model was released in 1977 and was Kenwood's first fully synthesised two metre transceiver. It also was capable of putting out 25 watts which was really something at the time. It was quite large for a mobile transceiver, measuring 182, 270, and 74 mm (WDH). Weight was 2.8 kg. Frequency selection was via three controls, a lever switch for MHz and two rotary switches for 100 kHz and 10 kHz selection. The actual frequency was displayed on a red LED readout.

A separate three position lever switch selected the required repeater offset or simplex operation. The general performance of the 7400A was first class and although it was before the days of memories, frequency selection was simple and quick. Price when new was in the $400 range. Secondhand value today would be about $250.

Finally, thanks to one and all who have written to me with suggestions for equipment that might be covered in future editions of this column. Given time, it will be included.

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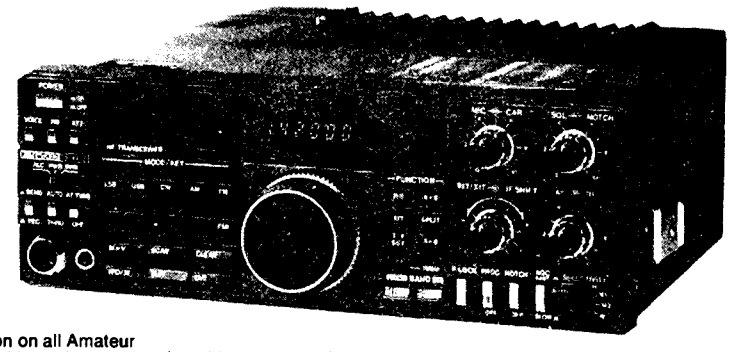
"It's freezing here OM — the linear's not working!" —VK2COP

TS-440S
HF TRANSCEIVER



The TS-440S is an HF transceiver designed for SSB, CW, AM, FM and AFSK modes of operation on all Amateur bands including the new WARC bands. It is the ultimate in compact size with the automatic antenna tuner built-in and featuring a highly efficient final amplifier cooling system. It incorporates a 100 KHz to 30 MHz general coverage receiver having superior dynamic range. Advanced digital technology controls the various functions, including dual digital VFOs, 100 memory channels, keyboard frequency selection, memory and programmable band scan, and RIT plus XIT. Additional operating features include full break-in CW (switchable to semi break-in), built-in automatic antenna tuner, IF shift, notch filter, IF filter selection, RF attenuator, speech processor, and other features for ease of operation and added versatility.

TS-940S
HF TRANSCEIVER

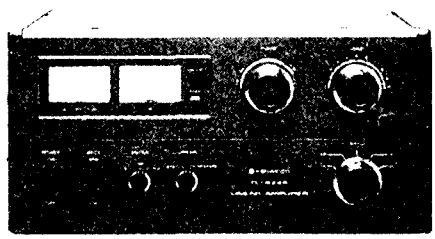
The TS-940S is a competition class HF transceiver having every conceivable feature, and is designed for SSB, CW, AM, FM and FSK modes of operation on all 160 through 10 meter Amateur bands, including the new WARC bands. It incorporates an outstanding 150 KHz to 30 MHz general coverage receiver having a superior dynamic range (102 dB typical on 20 meters, 50 kHz spacing, 500 Hz CW bandwidth).

Engineered with the serious DX'er/contest operator in mind, the TS-940S features a wide range of innovative interference rejection circuits, including SSB IF slope tuning, CW VBT (Variable bandwidth tuning), IF notch filter, AF tune circuit, Narrow/Wide filter selection, CW variable pitch control, dual-mode noise blanker, and RIT plus XIT.

TL-922
HF LINEAR AMPLIFIER

The TL-922 is a band linear amplifier designed to provide maximum legal performance, utilising two 3-500Z high performance transmitting tubes. Incorporates class AB_2 round-grid amplifier circuit. Excellent IMD (intermodulation distortion characteristics).

VALVES NOT INCLUDED



KENWOOD ELECTRONICS AUSTRALIA PTY. LTD.

4E WOODCOCK PLACE, LANE COVE, SYDNEY, N.S.W. 2066. Ph. (02) 428 1455.

YOUR DEALER BELOW WILL GUARANTEE SATISFACTION

Further beware of dealers not listed in this advertisement who are selling Kenwood communications equipment. All Kenwood products offered by them are not supplied by Kenwood Electronics Australia Pty Ltd and have no guarantee applicable

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VHF UHF — an expanding world

Eric Jamieson VK5LP
1 Quinns Road, Forreston, SA. 5233

All times are Universal Co-ordinated Time and indicated as UTC

AMATEUR BANDS BEACONS

FREQUENCY	CALL SIGN	LOCATION
50.010	JA2IGY	*Mie*
50.060	KH6EQI	*Honolulu*
50.075	VS6SIX	*Hong Kong*
50.109	JD1YAA	*Minami Tori-shima*
52.013	P29BPL	*Loloata Island*
52.020	FK8AB	*Noumea*
52.100	ZK2SIX	*Niue*
52.200	VK8VF	*Darwin*
52.250	ZL2VHM	*Manawatu*
52.310	ZL3MHF	*Hornby*
52.320	VK6RTT	*Wickham*
52.325	VK2RHV	*Newcastle*
52.345	VK4ABP	*Longreach*
52.350	VK6RTU	*Kalgoorlie*
52.370	VK7RST	*Hobart*
52.408	VK0MA	*Mawson*
52.420	VK2RSY	*Sydney*
52.425	VK2RGB	*Gunnedah*
52.435	VK3RMV	*Hamilton*
52.440	VK4RTL	*Townsville*
52.450	VK5VF	*Mount Lofty*
52.460	VK6RPH	*Perth*
52.465	VK6HTW	*Albany*
52.470	VK7RNT	*Launceston*
52.485	VK8RAS	*Alice Springs*
144.019	VK6RBS	*Busselton*
144.400	VK4RTT	*Mount Mowbullan*
144.410	VK1RCC	*Canberra*
144.420	VK2RSY	*Sydney*
144.430	VK3RTG	*Glen Waverley*
144.465	VK6RTW	*Albany*
144.470	VK7RMC	*Launceston*
144.480	VK8VF	*Darwin*
144.485	VK8RAS	*Alice Springs*
144.550	VK5RSE	*Mount Gambier*
144.565	VK6RPB	*Port Hedland*
144.600	VK6RTT	*Wickham*
144.800	VK5VF	*Mount Lofty*
144.950	VK2RCW	*Sydney*
145.000	VK6RPH	*Perth*
432.057	VK6RBS	*Busselton*
432.160	VK6RPR	*Nedlands*
432.410	VK6RTT	*Wickham*
432.420	VK2RSY	*Sydney*
432.440	VK4RBB	*Brisbane*
432.445	VK4RIK	*Cairns*
432.450	VK3RAI	*MacLeod*
432.535	VK3RMB	*Mount Buninyong*
432.540	VK4RAR	*Rockhampton*
1296.171	VK6RBS	*Busselton*
1296.420	VK2RSY	*Sydney*
1296.480	VK6RPR	*Nedlands*
10300.000	VK6RVF	*Roleystone*

EX-MACQUARIE ISLAND

Sojo VK7ZSJ (ex-VK0SJ), has written to put matters right in regard to possible future six metre operations from Macquarie Island. It appears Doug VK0DS, now at Macquarie, has no keyer on his six metre rig so VK0DS, as a beacon, has been removed from the list. In addition, Doug does not monitor the six metre receiver in his work area as Sojo did last year, hence he will only make the odd contact on six metres when he is in the shack. So it appears the degree of activity from that island will be spasmodic. The original keyer has been returned to its rightful VK3 owner through co-ordinator, Gil VK3AUI.

Although Gil has the full list, Sojo included a resume of his VHF activity from Macquarie last year. He worked separate call signs in the following call areas:

VK1 — 2; VK2 — 15; VK3 — 72; VK4 — 13; VK5 — 11; VK6 — 3; VK7 — 26; VK8 — 5; ZL2 — 7; ZL3 — 9; ZL4 — 2.

He said the number of OSOs is easily double these figures, plus the first 10 contacts to VK3 on 144 MHz.

Thank you for writing Sojo. I think the VHF fraternity owe you and David VK0CK a big thank you for the degree of dedication given to VHF operation during the past three years. There have been others previously who provided a small number of contacts to VK stations, but the efforts of you two people have provided hundreds of operators with a VK0 contact. We must also thank those operators in VK3 (such as Gil VK3AUI and Lionel VK3NM) who provided the backup facilities when needed. The VHF fraternity says well done and thanks!

ACROSS THE EQUATOR

Peter VK8ZLX, has kept me informed of good conditions prevailing during the equinoxial period with contacts between Alice Springs and Japan on 50 MHz. The first openings appear to have started on 19/3 with two JAs worked around 0854, then on 20/3 10 JAs around 0705. On 28/3, further JAs on 50.110 from 0530. On all occasions, in response to Peter's phone messages, I checked both 50 and 52 MHz, but no sign of any stations from Japan. We were too far south and needed some assistance from Es to make contacts possible.

A further message from Peter VK8ZLX, on 18/4 indicated a big opening to Japan on 50.110 or thereabouts, with a whole log page of contacts to districts 1, 2, 3, 4, 6, and 0. Contacts started in the late afternoon and continued into the evening local time. Peter also said KG6DX, at Guam, was working into Japan as he could hear the JAs calling him but found no sign of the Guam station in Alice Springs. The JAs were also calling HL9. In addition to Peter, others involved in Alice Springs were Jeff VK8GF and Mike VK8ZMA.

On 9/4, VK8 stations also had contacts to VK6KXW in Perth and to VK2 stations. So it looks as though sitting in the middle of Australia has some compensations!

DXPEDITIONS TO THE PACIFIC

My apologies to Nev VK4ZNC, for mislaying his letter sent in January 1987 — it came to light a week ago. The information it contains is still relevant and of interest.

"After my recent expeditions to Niue ZK2, West Samoa 5W1 and Fiji 3D2, on six metres, I thought readers may be interested in activity *from* these places.

"On the way to Niue Island, I had to stay overnight in Auckland, where I was met at the airport by Cliff ZL1MQ. He put me up for the night after taking me around to meet Bob ZL3NE. Cliff has some 40 odd countries up on six metres, his score being pushed up by lots of countries from the Caribbean area.

"On arrival in Niue, I found the hotel was the only place to stay at $70 a day plus meals. From here, with a 10 W TR-9300 transceiver running into a home-brew 70W power amplifier and a five element Yagi at 15 feet (4 metres), I was able to contact 32 stations in VK and ZL during my two weeks stay. Stations worked: ZLs — 21; VK4 — 4; VK2 — 5; VK3 — 1; ZK2 — 1. On Niue I met most of the active amateurs on HF these being Robert Douglas ZK2RD, who can operate on six metres from the radio station where he works or from his home. Father Philip Turner ZK2PK, from the Catholic Mission, who would be interested in coming on six metres if somebody supplied him with some equipment. Sione Tiakia ZK2ST, the local RI man, who handles radio licensing. He is not active at the present time.

"From Niue I flew on to American Samoa, where I spent only two days. The town of Pago-Pago is surrounded by very high mountains making it difficult to get a clear take-off in any direction. Also, the mains voltage is 110 volts, which rendered my power supply useless. I was informed by one chap at the communications office, that he knew of only one active amateur on the island and he was in the States at the time. I suspect this amateur would have been AH8A, a station contacted in peak years of the sunspot cycle by many VKs on six metres. On the strength of all this, I moved on to West Samoa, only 80 miles (128 km) away by air. By the way, in both the Samoa's they drive on the right-hand side of the road.

"On arrival in Apia, I found, as in Niue, that a licence was very easy to obtain over the counter by just showing your VK licence and paying the required fee. Here and in Niue a "Z" call or a novice will be given a full call and allowed to operate on all bands. The maximum power allowed in 5W1 is one kilowatt.

"As 5W1GA, I managed to contact 32 stations from Apia. These comprised: ZLs — 19; VK3 — 5; VK2 — 4; and VK4 — 4. Before I managed to get the beam up I did hear VK4ZJB, at 5x6 and VK2XJ, at 5x3 on a temporary indoor ground plane antenna, but did not have the power to get back to them. In Apia I met most of the active HF operators and these were: Bill, Mary and Stewart Francis. Bill 5W1FT, his wife, Mary 5W1FM and Stewart 5W1FZ, their son, are all active on HF. Percy Rivers 5W1AB and Richard Tenney 5W1FV are also active. Phil Williams 5W1AU, is also active on HF and has six metre equipment. Since he shifted house recently, he has not bothered to put his six metre beam up again. So, at the moment, no one is operational on six metres and no one is very interested in coming on in the near future. After two weeks in West Samoa, I moved on to my last port of call — Fiji.

"Upon arrival at Nadi airport my equipment was confiscated by Customs. Without a prearranged licence, radio transceivers are not allowed into Fiji. After a four and a half hour bus trip to Suva, the capital, I managed to get a clearance the next day from the radio inspector, Josua Turaganivalu 3D2JO, to release my equipment, but no licence. In Fiji you need to apply for a licence well in advance, by mail. So, with the permission of Jos and another amateur, Raj 3D2ER, a retired radio operator, I set up my equipment at Raj's place in Suva, after retrieving the equipment at Nadi — four and a half hours away by bus again!

"Using Raj's call sign I contacted 105 stations in VK and ZL in only three and a half days before leaving for Brisbane on 22/12/1986. With very limited time In Suva I did not meet many other amateurs, but I was told the following station should be active: 3D2CC, 3D2DW, 3D2ER, 3D2ES, 3D2MR, 3D2PD and 3D2RM. Also, Dick Northcott 3D2CM, is active on HF and has six metre equipment. Unfortunately, I did not get to meet Dick as he was in Melbourne at the time of my visit. Greg 3D2MR, came to visit Raj a couple of times while I was operating, and showed much interest in the band and used my equipment for a while to work some stations. My equipment and antenna were left with Raj.

"In all the places I visited, there are very few white people, and mainly from their ranks come the radio amateurs. Almost no dark local people were amateurs. Why? When the locals are earning a typical wage of less than our dole no wonder they cannot afford to buy radio equipment. . .Nev Cooper VK4ZNC (ex-VK9LC, ZK2AZ, 5W1GA, 3D2ER)."

That's a very interesting letter Nev, and sorry it had to be so late. At least one can now understand why there is a rather low level of activity from these places. It would be hard enough to find spare cash for HF equipment let alone six metre equipment.

REPORT FROM ALBANY

Wally VK6WG, sends along some information of a quite different nature and probably not covered before in such detail. In response to a suggestion from Reg VK5QR, Wally has tabulated the many times the VK5VF two metre beacon has been heard in Albany during the six months to March 1987, also information on openings on the UHF and SHF bands as well. Bearing in mind that the distance is around 1910 km to the beacon on

Mount Lofty, and 1885 km to Reg VK5QR, at Enfield, an Adelaide suburb.

"28/9/86: 0210 UTC VK5VF in and out of noise through to 1230. Made many calls but no answers. 2/11: 2215 heard VK3 repeater, VK5VF very strong, tried to raise VK5QR but no QSOs. 19/11: VK5VF heard at 2130 and still audible at 2200. 22/12: heard VK5VF 0955. 28/12: 0955 heard fairly well but faint at 0135.

"3/1/87: Heard VK5VF at 0630, again at 0200 weak and still audible 0815 then again 0900 to 1030. Worked several VK5 stations on 144. Tests made with VK5QR on 432 were good on peaks, signals faded out by 1400. 4/1: Beacon heard and worked VK5QR on 432 at 1135 and faded out by 1147. At 1200 worked VK5NY on 432, signals gone by 1330. 5/1: Beacon in 2245. Worked VK5NY 0032 on 144. At 0100 signals gone. 7/1: 0740 heard VK5VF at 0805 on 144 worked VK5NY, VK5VBT, and VK5NY on 432. Signals 5x5 and 3x2. 14/1: 0030 VK5VF faded out 0400. 18/1: VK6KJ reported hearing beacon at 2340. 4/2: VK5VF 0100 very weak, still weak at 0330 then strong to 1030 and very steady. Tried to raise VK5s but none heard. 8/2: VK5VF at 0320.

"11/2: VK5VF at 0648 and came stronger at 0830 and still in at 1300. At 1325 worked Reg VK5QR, on 432. 1296 was just discernible by Reg, at 1400 much stronger and good signals relayed back by Reg. Closed down at 1435. 15/2: VK5VF 0730 fair strength then weakened; in again at 0745 and out at 0900.

"2/3: VK5VF 0805 and still in at 0845; 11/3: VK5VF 2300 to 2330; 13/3: VK5VF 0245 and still there at 0355. On 22/3 VK5VF at 2320 was steady and strong. Made several calls on 144.100 as did VK6XY but no replies. Beacon again audible 0625, again at 0700 and still there 0800. Then worked VK5ZMK, VK5NY, VK5ZPS on 144 and VK5NY on 432. At 1150 caught up with VK5QR and 1296, 2304 and 3456 MHz were all found to be usable. This is the second time all bands usable up to 3456 MHz has been noted this year. The previous occasion was 8/2/87 when 3456 was usable for about four hours continuously with fast QSB. The last opening on 22/3 was only available for a short time."

Wally VK6WG, hopes that this report of the continuing availability of a path across the Great Australian Bight on many bands will generate an increased interest by operators, particularly in the Adelaide area where they are uniquely situated to make good use of the path to Albany, and so make use of the higher frequency bands which are available to them.

At present both VK5QR and VK6WG have working 5760 MHz receivers and very low transmitter power, and both have heard their own signals up to 15 km, and of course, are looking for the day when conditions are suitable to produce a contact on that band between them.

Wally also says, one day when he has time(!) he will compile a list of his findings as to when the UHF and SHF bands come good for use. This will require going back to about 1948 when his records start. In the meantime, both operators get much joy from investigating and making parts for the GHz bands. Good luck to you both and may you be joined by some others before too long.

THE ROSS HULL CONTEST

I had hoped by now to have been given enough ideas by the VHF fraternity to put something quite positive on paper regarding the future of the Ross Hull Contest. There has been very little response to my continuing requests for your thoughts. The latest letter to hand is from my good friend, Gordon McDonald VK2ZAB, who is an operator with a very keen VHF interest and been in the forefront of pioneering contacts using aircraft to enhance signals. His thoughts need to be given attention and I quote from his letter as follows:

"This letter is in response to your request for readers views on the Ross Hull Contest as spelled out in AR for March 1987.

"I have already spelled out my views in a letter to the Contest Manager some months ago, and, looking back on that, the lack of response from that gentleman indicates that perhaps I should have sent it to you. I recall sending you a copy for reference, perhaps it should have gone to you for direct action. However, it won't hurt for me to go over some of my views again, so here goes:

"Contest... as defined by the ***Macquarie Australian Dictionary*** is 'striving for victory or superiority.'

"Therefore, in order for any endeavour to qualify as a contest it must engender in the participants a feeling that success in that endeavour will put them in a position of superiority and/or that they will be victorious over the others.

"The Ross Hull does not do this for me and I assume it does not do it for others either. I do not feel the urge to strive for victory or superiority in the Ross Hull simply because the current rules emphasise the requirement to be there above all else. In other words, the mere act of being there can put you in the position to win. This is not enough.

"Anyone who has seen the Peter Sellers film 'Being There' will know than an endeavour which relies on the being there factor is a joke — ludicrous!

"Put in another way, the Ross Hull as it stands is a contest for the 'quiche eaters' not 'real men'.

"The reason why the Ross Hull is seen to rely too heavily on the being there factor is that it depends too much on points gained through contacts made due to anomalous propagation conditions. In other words, we give kudos through the allocation of points to that person who, for whatever reason, happens to 'be there'.

"To be successful, the Ross Hull must be changed so that it gives kudos through the allocation of points to the person who has skill — skill at the building and operation of an amateur radio station.

"The only way to do that as I see it is to cut out, as much as possible, the anomalous propagation factor. This means holding the competition at that time of the year when these conditions are least likely to be obtained; ie plus or minus six weeks from mid-winter.

"Of course, the Ross Hull is too long as it is now but that seems to follow from the emphasis on anomalous propagation; ie it is long to try and spread the chance at getting anomalous propagation over a wider area. If it is held at plus or minus six weeks of mid-winter there would be no need to do that and it could occupy one weekend only — a much more reasonable period all round and one which further reduces the being there factor.

"Incidentally, I am writing this during the John Moyle Field Day Weekend Contest and I must say that even that seems to be too long because, although these was a great deal of activity on two metres and 70 cm early in the contest — more activity than I have seen for many years in fact, as I have worked some 34 stations on two metres SSB including three VK4s and eight VK3s up to now (4 pm Sunday), but at this time there is virtually no activity here. It all seems to stop about lunchtime — roughly 24 hours after it started, so it seems like putting the extra bit on the end and allowing people to choose their own 24 hour bit wasn't worthwhile — in fact, why do it at all? Is this another attempt to cover anomalous propagation?

"Twenty four hours is enough — no more, no less. The Ross Hull (and John Moyle) should be 24 hour competition and that's that!"

Thank you Gordon for that contribution. Your thoughts are quite different from any others which have so far surfaced and should be capable of causing some comment and I will be the first to say something.

But first, let me refer to the results of the Ross Hull Contest as published in April AR. Congratulation to Les Jenkins VK3ZBJ, who once again has come out winner of the contest in the seven day section, and to David Tanner VK3AUU, for winning the two day section. Of the 19 logs submitted there was none from VK1, VK6 or VK7.

One can understand the disappointment and frustration of the FCM with such a small log entry, and I feel disappointed too that more did not enter in an effort to try and keep the contest alive while we further attempt to sort out something which will be approved by more people. I am aware of a virtual boycott from VK6 and VK7, but I do not think this really helps the cause. VK7 will have the Contest Manager in their State for the next three years. If the Contest is still going will they treat their Manager in the same way?

In line with the theories expounded by Gordon above, it could be said VK3ZBJ won because he "was there." Certainly Les put in a lot of time operating and, whilst some would say he was fortunate to have the time to do so, I am not sure this is a fair comment, as one still needs to be dedicated enough to spend so many hours at the operating desk. Another point which did please me about Les was the fact that, despite the removal from the contest of all bands above 70 cm, he still entered and proved under the existing conditions it was still possible to win with three bands instead of the six or so which he normally operated. I am only sorry some of the others with an equal number of bands did not see the contest in the same light and give it a go!

I have also been informed that, in many cases, those with capabilities to operate on 1296, 2304, 3456, etc have moved into these regions with the idea of having contacts in the Ross Hull Contest. If, as a result of their non- participation at the moment, the Ross Hull is removed from the Contest Calendar, what has been achieved? I have stated previously that somehow the UHF and SHF bands should be included in the Ross Hull but for this year we should try a three band contest whilst we look at the higher band position. I am not entirely convinced that bands up to 3456 MHz and perhaps higher, are solely attempted because of the Ross Hull, although this may be a contributing factor. Reg VK5QR, and Wally VK6WG, who have done so much to pioneer work on those SHF bands, I am sure, never had the Ross Hull in mind! I too would like to move into those areas before too long and because of my location, all such activity will have to be from portable locations, but I don't have operation in the Ross Hull on those bands in my mind at all. I believe any operating I do in that contest should be on bands where the majority of operators are located and so provide me with the maximum of competition.

On the subject of the timing of the Ross Hull as suggested by Gordon VK2ZAB, whilst the idea of a mid-winter contest has some merit, I don't believe it will be universally supported because it will be far too restrictive for the following reasons.

1. Generally it will favour those operators who live on elevated sites; eg VK2ZAB, VK5NY, VK5CK, and others.
2. In the event of no enhancement of propagation as Gordon would hope for, those living in the metropolitan areas of capital cities will have distinct advantages over those living elsewhere by reason of amateur station density alone.
3. Those living close to the southern seaboard areas; eg Adelaide to Albany path, etc, could have advantages in the event of some enhancement over those not so favourably placed.
4. A simple 24 hour contest will not give any incentive to operators to go out portable to try and match locations like those of Gordon's due to the logistics of putting everything together for say three bands for such a short period. I know what I am saying in this regard because I have gone out portable on many occasions, but I do like to be out for more than 24 hours when I make the effort!

In looking at No 2 above, how fairly would, say Peter VK8ZLX in Alice Springs, see the contest. Maybe in 24 hours he could work five stations on each band (52, 144 and 432), while Les VK3ZBJ, in the same time could work perhaps 200 or more stations if he really got into it! As a mid-winter effort, I see the contest becoming a metropolitan area only contest.

Although it would not fit Gordon's non-enhancement criteria, a contest held over a weekend, say after Christmas; eg this year it could be Saturday and Sunday, December 26 and 27, for a weekend or one of those days for a 24 hour contest, it would give those living in areas away from cities and not normally favourably placed some chance to achieve a reasonable ratio of contacts due to the generally more favourable propagation conditions existing at that time. I really don't believe we can expect a successful VHF contest on an Australia-wide basis to be successful unless it is held during the normal Es period.

If it will mean the continuation of the Ross Hull Contest for the time being, I have no real objections to a 48 hour contest (not 24 hours) over

a two day UTC period between Christmas Day and New Year on 52, 144 and 432 MHz for one part, and for bands 1296 MHz and above for a second part of the contest. An overall trophy for the best score on the first three bands, another for 1296 and above. Certificates could be issued for best performance Australia wide on 52, 144 and 432, and if thought to be giving further incentive, certificates for best performance on those bands on a State basis. If successful it may be possible to have a Ross Hull Contest based on a State by State scoring as for the Remembrance Day Contest, with the highest scoring State being the overall winner. There are lots of possibilities in a shortened contest and this Is something the new Contest Committee or FCM could look at during the next three years. The important thing is to keep the contest going and the help of everyone is needed to ensure that it is kept going, and no more boycotts please!

As the result of all the above, you may now feel compelled to put pen to paper and come up with some constructive suggestions which will be so much better than the considerable amount of destructive criticism heard on the bands this year!

OVERSEAS

From April 1987 *World Above 50 MHz* in *QST*, Bill Tynan W3XO gives a list of the Microwave Standings as seen from the USA. On the new 33 cm (902 MHz) band longest distance worked is 478 miles (miles are still used in the US) by W2PGC; on 23 cm N6CA and KH6HME with 2472 miles; on 13 cm KD5RO and W8YIO with 940 miles; 9 cm WB5LUA/5 and WB5AFY with 265 miles. These are terrestrial distances and not EME.

By now the Northern Hemisphere stations will be getting into their summer Es period and W3XO notes a number of European stations now have activity on six metres with the most stations in the UK but with restricted radiated power. Other European countries reportedly with some six metre activity include Norway with 25 permit holders; Ireland with at least two permit holders; Spain with some activity and also Portugal. Gibraltar still permits six metre operation and the ZB2VHF beacon has now been moved to "the top of the rock" and is generally refurbished. Bill does not have any information on how active ZB2BL or any other of Gibraltar's potential 50 MHz operators may be. On the Isle of Man there is GD0GBA who was originally EI9D and very active during the last sunspot peak from Ireland.

During the Northern Summer, following our 1985 Summer, with its outstanding two metre contacts, the northerners did not have a similar improvement on two metres. It will be interesting to see whether the 1987 Northern Summer will give a peak to two metres anywhere approaching the great coverage we had during our 1986 Summer. I expect Bill will keep me informed on this as time goes on. So far there seems little to indicate the two hemispheres follow one another closely when it comes to VHF propagation in general.

GENERAL NEWS

Not much to report from my QTH on six or two metres. One opening to VK2 on six metres recently and I am still off two metres while awaiting that rotator!

Angus VK2VC, has received confirmation of his contact with 3D2ER so confirmation is possible. Angus remarked he had heard Gary W6XJ was to be in VK during March/April and regretted not having worked him during the 1980s. I missed him too.

Doug VK3UM, has forwarded information on MS activity between Ross VK2DVZ and himself and this I will pass on to you in a later issue. There is also an Interesting resume of the EME activity of the now defunct VK2AMW effort (due to destruction and theft of their equipment) in *The Propagator* which I think should be given wider publicity and this too will be used at a later date.

Closing with the thoughts for the month: *Definition of a brat: Somebody on their pest behaviour.* and *Nothing will be attempted if all possible objections must first be overcome.*

OVERSEAS VISITOR from Gil VK3AUI

Gary W6XJ, provided many of the contacts across the Pacific on six metres during the Sunspot Maxima.

During a recent overnight stop in Melbourne, Gary went out to dinner with some Melbourne six metre operators. Many tales of contacts and near-contacts were told.

Gary and his wife Jan visited Australia on their Pacific area honeymoon trip. They visited Tahiti, the Cook Islands, New Zealand and Australia.

In Australia Gary met amateurs in Tasmania, Melbourne and Sydney.

From left: Rob VK3XQ, Lionel VK3NM, Gary W6XJ, Gil VK3AUI and Mike VK3BDL enjoying a meeting with Gary during his visit to VK.

Lionel VK3NM and Gary W6XJ.

—73 *The Voice in the Hills.*

ar

Contests

Ian Hunt VK5QX
FEDERAL CONTEST MANAGER
Box 1234, GPO, Adelaide, SA. 5001

CONTEST CALENDAR

JUNE

6 YLRL Novice/Tech Day
13 — 14 South America CW Contest
20 — 21 VK Novice Contest
20 — 21 SMIRK (6m) QSO Party
27 — 28 ARRL Field Day

JULY

1 Canada Day Contest
11 — 12 IARU World Championship
18 — 19 CQ WW WPX VHF Contest

AUGUST

15 — 16 Remembrance Day Contest
15 — 16 New Zealand Memorial Day Contest

SEPTEMBER

26 — 27 CQ WW RTTY Contest

By now you will, I hope, be gearing up for the VK Novice Contest. I would encourage as many as possible of you to support this contest. Also, what about the Full Call operators doing their best to help the Novice operators by providing them with contacts in this contest and also encouraging as many of the Novice operators to come up on CW. It might also be a good chance for some of the Full Call operators to brush up on their CW capability. In this contest you need not be embarrassed because there is a speed limit set for CW operation and you can pretend that you are only operating at slow speed so as to help the others. (No one else need even know the real truth). See rules for the VK Novice Contest in last month's issue.

The next major contest on the Australian Calendar is the annual Remembrance Day Contest. Once again, a big entry is expected and it will be interesting to see whether the trophy will change hands again. The rules will appear in the July issue and will be pretty well unchanged from the 1986 Contest.

At the same time as the Australian Remembrance Day Contest is being conducted I expect that the New Zealand Memorial Day Contest will be run. Having both these contests coincide is fitting, particularly as they both represent a tribute to those members of our fraternity who gave their lives in the service of both the countries concerned.

I would hope that the number of ZL stations participating in our Remembrance Day Contest might increase as a result of the approach taken. It has been agreed between myself and the ZL Contest Manager, Jock White ZL2GX, that contacts made in either contest will be accepted as being valid for both; ie VK stations may work ZL station and count the contacts towards the Remembrance Day Contest. You may then also use the contacts made with ZL station as an entry in the ZL Memorial Day Contest. I do not yet have a copy of the rules for the ZL contest, but, if my memory serves me correctly, that contest is run only on the 80 metre band is of limited duration.

So look carefully at the content of next month's issue for more details.

YLRL NOVICE/TECH DAY

I have included information on this one solely as an example of a contest which has been implemented for a Special Purpose and with a restricted entry. It may be of some interest for you to see something done this way. Details are as follows:

This is a new one organised by the YLRL to promote activity for the YL Novice and Technicians. Operation will be for YLs on CW only.

TIME: 1700 to 2100 UTC Saturday, June 6.

EXCHANGE: Station worked, RST, Name, QTH and class of licence.

SCORING: Three points for each YL Novice/Tech worked. Two points for YL General or Advanced Class and one point for YL Extra Class. The same station may be worked on each band for credit. Score each band separately. The sum of your score on each band is your final score.

FREQUENCIES: 3.730, 7.130, 21.130 and 28.130 MHz ± 10 kHz. Maximum power of 200 watts.

AWARDS: YLRL postcards to the top scoring Novice/Tech and General Class or higher YL. Submit original log only, which must be signed by the station operator. Include a summary sheet showing the scoring and other essential information, including your licence class and address. All entries must be received by July 3 and go to: Mary Lou Brown NM7N, 504 Channel View Drive, Anacortes, WA 98221, USA.

From time to time, details of a number of rather obscure contests come into my hands, however I generally do not include them in my notes as they would be of little interest. Suffice to say that it appears that contests can be run by any group of operators, no matter how small and for virtually any purpose, mode, time or any reason that can be dreamed up.

ADELAIDE HILLS AMATEUR RADIO SOCIETY "NATIONAL SPRINTS"

It would certainly seem that the first of these events was most successful. I have been advised that the AHARS intends to run the next of two of these short and sharp competitions on July 11 for CW and July 18 for phone.

The rules for the events will be almost the same as previously. Times of operations will be similar but the total operating period will be reduced. These "Sprints" will be restricted to the VK/ZL and P2 call areas. So, here is a chance to test out both your equipment and yourself in readiness for the Remembrance Day Contest to follow.

My personal opinion is that the sprints are a great idea. I hope that you will back my judgment on this by providing plenty of support for them. One particular advantage is that they do not require a commitment of a great deal of time for you to be a full participant. Rules for the coming round of sprints will be provided separately by the AHARS for publication.

JOHN MOYLE MEMORIAL FIELD DAY CONTEST

Logs have been steadily coming in for this contest and, as I write this, there would appear that this contest has again been a success. The section for stations operating from home with emergency power seems to be becoming popular. A certain amount of comment has been received regarding bias towards VHF operation. I can assure you that this has not been intended, however I accept that this is the case.

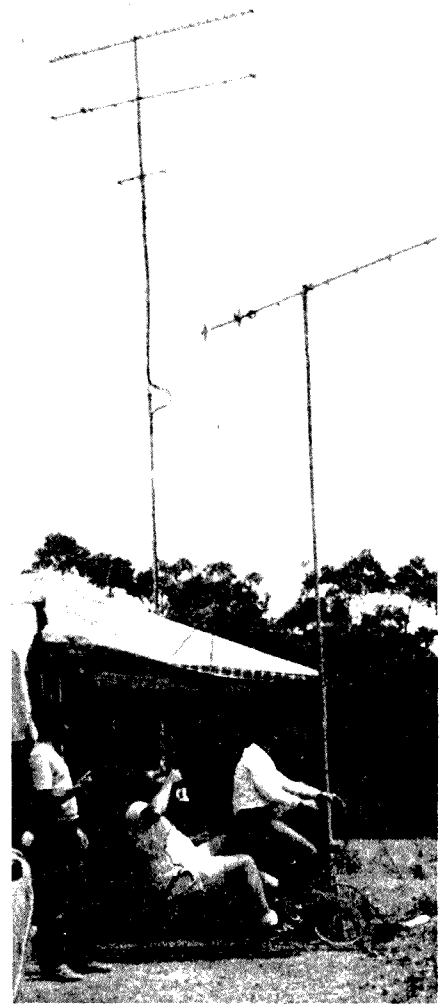
I do not intend to go into detail as to how this situation occurred, at least not at this stage, however I will merely comment that the basis for this effect has been mainly historic.

My report for the coming annual Federal Convention soon to be held in Melbourne has been submitted. (These notes are being written in mid-April). Should the Federal Council see fit to accept my report and adopt the recommendations contained therein, you will see some changes to rules for contests in the future. I would hope that these changes will again see an improvement in contest matters here, within VK.

Amongst the correspondence already received, in connection with the Field Day, was a letter and description provided by Judy VK5BYL, as to the various adventures encountered by the operators of VK5BAD in this contest. It makes most interesting reading and was accompanied by photographs as well. I thank Judy for her help in providing this material.

"OUR FIELD DAY WEEKEND

"Now, have we got everything ready for the weekend? Just check the list. Rigs, Antennas, Coax, Patch Cords, SWR Meter, Pen, Paper, Log Sheets, AR with the Rules, Food Drink, etc, etc."



The VK5BAD Operating Site.

"Looks like we're going for a fortnight, not just the weekend!"

"Dale and Trevor will be around at 8 in the morning and Graham and Joan will meet us there at 10."

"Glad we've got a new 'operating' table this year. The other one is just slightly the worse for wear, although it has done good service for the past three contests. The trailer's loaded up and the 'shack' is hooked on so we should have no problems getting off in the morning."

Saturday, March 14, and perfect weather for the John Moyle Field Day Weekend.

As planned we all arrived at the site eager to set up camp. Many hands help to get the van in place, erect the annex and install the radio shack with all its bits and pieces. "Oh, no! Where's the lead for the power supply! The only thing we've forgotten."

Within a few minutes Trevor saved the situation and, with a little ingenuity, made up a plug to fit.

Time now to sort out all that coaxial cable, dipoles, beams and guy ropes which were carefully packed in the box. At least they were

Operating VK5BAD. Judy VK5BYL and Trevor VK5ATR pedalling. Graham VK5AT using the whip. Joan VK5AVJ watches bemused whilst Dale VK5BGR concentrates on the operating.

carefully packed when we left home. Guess the rough road didn't help a lot!

We all helped pull the extendable pole out to its full length, which would be our tower, and attached the beams, dipoles and guys, then supported it all on the ladder we had brought. Now for all the coax and to remember which coax goes to what antenna.

"Looks like it's already to go up. Each grab a rope and we'll get this up in no time."

CRASH!!! Oh *no*! Who tripped, yanked the coax and made the whole array fall off the ladder and onto the ground. What a site/sight!

"We hardly dared look — bent beams, broken insulators and everything else very "skew-whiff."

Quick, out with the sticky tape, pliers, spanners and good amateur spirits to get it all together again.

"Okay, let's try again. Heave Ho! Up she goes. Just as well there's no strong wind today."

"Looks good."

With the tower not securely tied down (up) and the generator eagerly purring away it's time to check out the SWRs and power levels — all vital to a good amateur shack (even though it's out in the bush).

"Hey, look at this. The 70 cm beam just won't load up. Must have done something to it when it fell. Can't do anything about it now. It's the one right on top too!"

"Pens, paper, log sheets, rules and "instant paper" close at hand. We all agreed we were ready to start but not before a well earned cup of coffee.

"Okay, we're in it for 24 hours and here we go!"

"CQ, CQ, John Moyle Field Day Contest. This is VK5BAD-portable calling."

The rest of the day slipped by rather quickly and the "shack" worked really well.

We all took our turn on the radios and all enjoyed our rostered canteen work too! In between, we eagerly awaited our turn on the "natural power source" we had "invented."

An exercise bike connected to an alternator, connected to a battery via an amp meter.

Phew! It was uphill pedaling all the way but it worked!

We found that pedalling tandem was just a little easier and could sustain a more steady rate of charge for a longer time (with a little encouragement — whip, whip).

Full marks to Dale who sat up all the long, lonely night manning the station, adding greatly to the score. Just as well he had a kerosene lamp burning "just in case the generator ran out in the dark."

The silence was deafening, and, right in the middle of a contact, too!

Sunday morning dawned bright and beautiful. It was nice to wake to the sound of nature blending with (competing with?) the persistent sound of the generator still purring away.

Everything at the station worked well (for a field site) and it was nice to have a few interested visitors drop in and have a cuppa with us.

All to soon it was time to put out the last call from our field station for this year.

We all thoroughly enjoyed it again and you can be sure you will hear us next year calling "CQ, CQ, John Moyle Field Day Contest. This is . . ."

We look forward to meeting you on the air and exchanging signal reports and numbers. Til then, best 73 and take care.

Baylee VK5BAD
Judy VK5BYL
Joan VK5AVJ
Graham VK5AT
Dale VK5BGR
Trevor VK5ATR

Another keen operator, who also provides an interesting letter is Ken VK3AJU. This letter is worth quoting.

"Here it is . . . my first serious contest entry.

"I've given numbers to help the other bloke in several contests and I put in a log for the last Remembrance Day, but it represented only broken time in the shack, in between domestic chores and visitors.

"As you see, I did not eventually take the solar-wind route. The array of solar panels offered to me were about 300 km away and moving them, etc, was too big a job for a solo operator. I could not afford a wind generator and my workshop facilities — or lack of them — debarred me from trying to make one.

"Just as well — it was a breathless night, not a whisper of wind all through.

"That was a blessing, because my tent woomphs and flutters at a high audio level in a wind.

"Despite a lot of planning, a few things went wrong. Transport logistics for a start. I was still trimming wires for inverted Vees when the contest got under way. So my 24-hour entry represents a bit less, since transport logistics chopped off a bit of time at the other end too.

"However, the aim of the John Moyle Contest is to enable us to test our portable equipment and all things associated with it, and in doing so to improve it and our ability to use it.

"Long before Murphy enunciated his laws, Rabbie Burns noted that 'the best laid plans o' mice and men gang aft agley. . .' Ideas and plans which look great when you sketch them out in the shack fall apart when you try them in practice. Seemingly trivial matters can become crucial when the real test is on. Is the hammer heavy enough to drive the star pickets for the guy wires into rock-hard ground? Is the generator noise tolerable 50 feet from the tent, or must you put it 200 yards away — or sink the thing in a pit?

"Two pullovers and an overcoat kept me warm — except my feet, which froze. I stepped out of the tent about 4 am and was staggered by the scene. It resembled a snowfield, but it was merely wall-to-wall heavy frost. With a backdrop of pine trees, it looked, by moonlight, like a scene from Canada.

"Some difficulties were of my own making. I should have had a decent light powered from the lead-acids instead of a dry cell torch. A wrist watch is far from ideal for time-keeping under torchlight. Checking back through the log to avoid duplicate contacts within three hours was very difficult. Often I had to rely on the other fellow to do the checking. My only battery- operated 24-hour clock has a dial 12 inches in diameter, and you can't hang that on a tent wall.

"I was a miser with power, rarely operating at full throttle. (Surely conserving power is part of the art of portable operating?) However, I perhaps overdid it, particularly with regard to light on the table. I never called on my third battery and the one I put on recharge was not called into service again. So I could have gone into action without the generator — not that I ever would.

"Despite all these minor problems, all of which can be overcome, it was a great experience. In fact, I'm seriously thinking of using the same QTH when the VK/ZL/O Contest comes around. The main reason is that it would give me an opportunity to run antennas which I can't accommodate at home — inverted Vees for 80 and 160 metres, for example, and even — hold your breath — a three-element beam for 20 metres. The portable QTH, should it be available again, even rouses visions of a Beverage.

"As you'll see from the formal entry material, it was an abandoned airstrip in the middle of a pine plantation near Kinglake West. Lots of clear space.

"You are welcome to include any of the above in entrants' comments on the contest, and perhaps particularly the following.

"It was a friendly contest, with hardly a cross word heard. It was also a fascinating total immersion in amateur operations for more than 20 hours, something I've never been able to do before — no telephone calls, no dogs to feed, no interruptions.

"At one stage, I contemplated operating from one of the "high places" in Gippsland; eg Mount Baw Baw, and in anticipation of curious tourists, visitors, etc, I prepared the accompanying "What are we doing here?" handout. As it turned out, I didn't need it in my splendid isolation on Mount Robertson. However, experience working portable in National Parks — particularly with high visibility in parking areas — suggests something along these lines can be useful.

"VK3BSM and others in the Gippsland area were very helpful in advising about possible QTHs in their area, incidentally.

"Cheers, 73, see you in the Novice Contest.

"Ken VK3AJU."

In Ken's letter he mentions a "handout" which he prepared in anticipation of inquisitive visitors to his Field Day Site. I have also reproduced this here as I feel that it is an excellent approach which many of you may well wish to adopt. I appreciate the efforts which Ken has made and I trust that this contribution may be used as a suitable example which can be followed by those wishing to do so.

"WHAT ARE WE DOING HERE?

"We are taking part in an annual exercise to test amateur wireless equipment designed for use in emergency situations and to improve our skills in operating it.

"You may have seen the late Tony Hancock in his famous comedy sequence about wireless amateurs and know that we are called "hams".

"Many Australian amateurs are members of the Wireless Institute Civil Emergency Network (WICEN) which can be called upon by the

Victorian and Australian governments to help during bushfires, floods and other disasters which have disrupted normal means of communication.

"The first news of Darwin's destruction by a cyclone came from an amateur operator running his transmitter from a car battery. During the Ash Wednesday bushfires, amateur operators were called out to provide communications in areas where telephone and electricity services had been cut.

"Even in distant disasters, such as last year's Mexican earthquake and this year's hurricane in Vanuatu, Australian amateurs have been able to help. Through wireless contacts with fellow amateurs in the stricken areas they were able to receive messages about what types of aid were needed, and to pass messages from survivors to worried relatives in Australia.

"The station you see here is VK3AJU/P. "VK" means it is Australian, "3" indicates it is in Victoria, and the "P" at the end means it is working in portable style and not from its owner's home.

"It all arrived in a station wagon — including the 11 metre mast and several aerials and was assembled within an hour (rather more I'm afraid).

"This weekend, March 14-15, hundreds of similar stations are operating in Australia, New Zealand and the Pacific Islands. Like VK3AJU/P, thoy are testing their equipment in strange surroundings where there is no mains electricity or other amenities.

"We are testing our equipment in case it is ever needed in an emergency — and improving our skills in using it.

"To make things more interesting and keep us on our toes, the exercise is in the form of a competition. Stations receive points for the number of contacts made with other stations, the distances between them and other factors.

"We apologise for being unable to give you a more personal account of what we are doing here. If you are reading this on Sunday, we will have been at the microphone or Morse key for 24 hours continuously — and more like 30 hours if it happens to be Sunday afternoon. The exercise is a test of stamina and ability to concentrate, as well as of wireless equipment!

"When the contest ends at 6 pm Sunday, we'll be happy to show you more of our station and answer your questions.

After all, you wouldn't expect a marathon runner to pause in his race to talk to you about athletics, would you?

"KEN GOTT VK3AJU
"Wireless Institute Civil Emergency Network, Area 13."

There seems to be no lack of material from entrants this year regarding the Field Day and this I appreciate. I would like to quote now from another interesting contribution. This comes from Steve VK3YH.

Charge System used. 600 x 300 mm Solar Panel, 1 x 2 metre Foil Covered Plywood Solar Booster, 400 Amp-Hour Battery, 0-5 Amp Amp-Meter, and Multimeter to monitor voltage.

Blacksmith's Workshop. About 3 x 3 metres, circa 1920. Note the 30 metres-plus gum tree — ideal for antennas.

"My portable operation was carried out from a somewhat dilapidated blacksmith's workshop, circa 1920, located on my farm.

"My game plan was to use the borrowed FT7 powered by a small solar panel, and my FT101E powered by a 2.5 metre diameter wind generator, if the wind would blow. As calm conditions were forecast, I left the 101 at home.

The VK3YH Contest Shack.

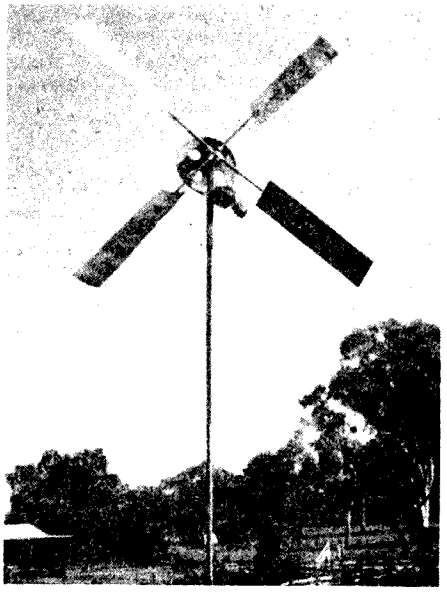
"The 400 amp-hour battery was discharged somewhat, by turning on the tractor lights for several hours before removing the battery. It was hooked up to the solar panel early on Saturday morning and the initial charge rate was two amps. But after adding the solar reflector, a one by two metre piece of plywood covered with tinfoil, the charge rate went up to four amps. After 10 hours of charging, at the commencement of my operation, the charge rate was down to two amps and I assumed the battery was fully charged.

"Taking an average three amps charge for 10 hours I figured the battery owed me 30 amp-hours of solar power.

"The FT7 has a current drain of 0.4 amp-hour on receive and three amp-hour key down CW. Taking two amp-hour (probably double the SSB TX/RX average) from sundown 0830 UTC until I went off air at 1730 UTC, I would have used 18-20 amp-hours.

"Therefore, I fell it is valid to claim the station was solar powered for the total length of my operation, and to claim the 10 bonus points for all contacts. I hope this meets with your approval.

"My antennas consisted of a halfwave dipole for 80 metres supported at one end by a 100 foot plus gum tree and 40 feet at the other. This gave a broadside orientation to the north and south and a sloper effect to the west. The 40 metre halfwave dipole was similarly sited but slightly lower.



Unused Wind Generator — No Wind! It is about 2.5 metre diameter, 40 amp car alternator. Blades are cut from a 200 litre drum. The blade angle is adjustable at the hub.

Feedpoints for both were directly above the shed. The 20 metre antenna was a quarterwave ground plane made of wire and supported by the tree.

"The good location and orientation of the 80 and 40 metre antennas brought many compliments of a good signal and disbelief at 'only QRP with FT7.'

"General operation in the contest was of a high standard with everyone enjoying themselves. Main topic of discussion between 2 am and 4 am was the cold an its cures. I quit at 4.30 am for one-and-half hours sleep and then milked my cows. I had to stop an hour early at 4 pm to milk again.

"Next Year? ? ? Sunday night I swore I would only do six hours, but it seems like a lot of work to go to for only six hours. . .

"One for the suggestion box. How about giving single operators the option of separate logs for each band starting at 001, to help avoid some of the confusion of who worked who, when and on which band?" (Perhaps those could be looked at when rules for next years are being formulated — FCM)

Well, to my mind it seems that Steve certainly went to some trouble to ensure that his solar powered operation met both the letter and spirit of the rules. I also find it somehow "different" to take breaks from the contest to milk cows. Gum trees up to 100 feet in height are a great thing to have around. Has anyone any favourite stories as to how they get their antenna wires up over tree branches. (Personally I use a roll of nylon venetian blind cord with a very heavy diamond-shaped lead fishing sinker on the end./ I also make sure not to have the nylon cord run through my fingers as it whistles upwards. I have learned a lesson from experience here! —FCM).

I also thank Steve very much for the photographs which he has supplied. Without being too ruse Steve, just how many redback spiders did you have to risk carrying you away from within the shed, or don't you suffer from such creatures in your area?

The solar panel reflector idea is great. I have done this using a sheet of aluminium as a reflector, however the aluminium foil looks to be much shinier and this is probably better.

So, there we can see just a little of what some of the operators in the Field Day are doing. I am sure that you all have many more stories out there, so why not send them in and let us all hear about your activities.

I would expect that I will have all the Field Day results collated and ready for publication for next

month's issue. I will include selections of comments from logs together with results as per the usual method.

HF CONTEST CHAMPIONSHIP — 1986 — Final Results

Following publication of the 1986 VK/ZL Contest Results, I am now able to bring you the results for the 1986 Contest Championship Phone and CW Competitions. Please note that * denotes Trophy Winner.

PHONE

CALL SIGN	FD	RD	NOV	VK/ZL	TOTAL
VK1LF	0	8	10	10	28
VK1RH	0	1	9	0	10
VK3DOM	0	9	9	0	18
VK3YH	0	7	8	0	15
VK3ZI	0	8	5	0	13
VK5QX*	10	10	9	9	38
VK5SJ	10	0	10	10	30
VK5ATU	0	5	8	0	13
VK6ED	0	8	8	0	16
VK7NCP	0	7	10	0	17
VK7NAI	0	4	9	0	13
					CW
VK2DQP	0	5	9	0	14
VK2AZR	0	1	8	0	9
VK3CGG*	10	10	10	10	40
VK3XB	0	9	7	8	24
VK3KS	0	6	8	5	19
VK3NK	0	8	9	0	17
VK4BRZ	0	6	8	0	14
VK4VAT	0	4	10	0	14
VK5AGX	0	9	10	8	27
VK6AFW	0	10	10	0	20

I would like to draw your attention to the magnificent result produced by Gil VK3CGG (now VK3CQ and our Pounding Brass Editor). He only commenced contesting in the last couple of years and has already obviously learned a lot. You will note that he has a clean sweep for the CW Trophy with the maximum number of points obtainable. Rather than repeat the method used to determine the points allocated, I would refer you to page 41 of the March 1987 issue where I provided an explanation as well as listing the points accumulated by entrants to that time.

I hope to hear soon from the Federal Office that progress has been made in production of the trophies and also that the smaller replica trophies have become available.

One thing has become most obvious regarding the Contest Champion Competition which is, that entrants who enter all the contests involved will always have a far better chance of scoring well. From the results it also becomes apparent that good points can be produced by going out into the field for the annual Field Day Contest. Personally I do not understand why so many more operators do not participate in this way as it is a simple thing to do as well as a way of having a lot of good fun. A really elaborate field station is not essential.

I would hope that interest in the Contest Champion Competition will increase and that there will be a much harder fight for places during this current year.

Well, that is all that I have for you this month. Next month I may publish some of the details of my report as submitted to the Federal Convention depending upon what sort of reception it had by the Federal Council.

—73, de Ian VK5QX

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RSGB LISTENER CONTEST 1987

The second RSGB Listener Contest held last year was given world-wide publicity. The response was very good and the RSGB is hoping for an even higher number of entrants for this year's event. It is open to all SWLs throughout the world with separate sections for British Isles and overseas entrants. Activity on the amateur bands could be increased as the IARU SSB/CW Contest is also held over the same weekend.

Object of the contest — to log as many stations in QSO as possible.

Date and times — 1400 UTC July 11, to 1400 UTC July 12, 1987.

Sections and bands —

a) SSB only

b) CW only

Only one section may be entered — mixed-mode entries will not be accepted. The 28, 21, 14, 7, 3.5 and 1.8 MHz bands may be used.

Scoring — For scoring purposes the station logged must be in QSO with another amateur station. It does not matter whether the station is taking part in a contest or not. CO, QRZ or similar calls cannot be counted for scoring. One point to be claimed for each station heard on each band. A multiplier may be claimed for each different country heard on each band. In the case of the USA, Canada, Australia, New Zealand and Japan, each call area prefix may be claimed as a separate multiplier, for example: W1, W2, VE2, VK5, VK6, and so on. All other countries will be determined by the ARRL Countries List.

The final score is made up by the addition of the points scored on all bands ***multiplied*** by the total number of multipliers claimed on all bands.

Logs — Logs should show in columns, time (UTC), call sign of station heard, call sign of station being worked, a RS/T report on ***station heard*** at SWL's QTH, multiplier (if any), points claimed. If both sides of a contact are heard, they may be claimed as separate stations, and the call signs are to appear in the ***station heard*** column. Each station heard can only appear ***once*** in the ***station heard*** column on each band. In the column for ***station worked*** a call sign must appear once in each three contacts unless it is a new multiplier for the receiving station.

Logs should be submitted with each band listed on separate sheets, 28 MHz on one sheet, 21 MHz on another and so on. A separate sheet listing all multipliers for each band should also be included.

Duplicate loggings for which points have been claimed will be penalised at 10 times the contact value.

Address for entries — R A Treacher BRS32525, 93 Elibank Road, Eltham, London SE9 1QJ, England. Entrants should ensure their entries arrive no later than August 10, 1987.

Awards — Certificates will be awarded to the leading station in each country in the overseas section provided that station scores at least 50 percent of that section winner's score.

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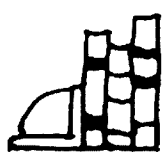
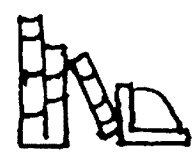


Book Review



Allan Foxcroft VK3AE
11 Virginia Court, Caulfield, Vic. 3162

RADIO FREQUENCY INTERFERENCE HANDBOOK
Department of Communications

This handbook was first prepared and distributed for DOC staff and has now been produced as an AGPS document.

Its original objective was to assist DOC investigators to identify and clear radio frequency interference problems and as such, the handbook is primarily directed to the Broadcasting and Television Services.

The coverage of RFI sources is comprehensive and the numerous colour photographs of television interference patterns are of great value in identifying these sources. Likewise, the techniques for suppression in each case are covered well, but are, of course, restricted to the BC and TV Service. Such an approach is understandable, since DOC Policy for many years has been to concentrate RFI investigation resources to the BC and TV Service often excluding other problems which warrant attention — certainly from an amateur point of view!

Only when we get to the last chapter do we find recognition that another piece of domestic equipment — the humble AF amplifier, can suffer from RF sources! ! ! This was obviously "tacked on" to the previous six chapters for convenience rather than completeness and is a reprint of already existing DOC publications. Nevertheless, the specialised subject of immunity is covered reasonably well and should be of interest and value to amateurs confronted with this problem.

Some comfort can be derived, in a whimsical manner, from the fact that in Chapter 4 — Interference from RF Sources, the Amateur Service does not warrant a mention. I suppose this is consistent with DOC statistics for the year 1983-84, which show that only 3.7 percent of complaints of interference to radio reception and 3.5 percent of television interference complaints are attributable to amateurs. Nevertheless, a section on Citizen Band Radio covers techniques and filters which may be applied to minimise the effects of nearby transmitters, including amateurs. Some of this material is a direct copy from amateur handbooks.

So, if you are looking for a broad coverage of common sources of RFI with accent on their impact on BC and TV, then this is a very worthwhile buy. For particularly amateur problems, you should adhere to the well-known ARRL or RSGB Handbooks.

Chapters and contents are as follows:

Chapter	General
1	
2	Domestic Appliances
3	Interference from Television Receivers
4	Interference from RF Sources
5	PLI
6	Propagation Characteristics
7	Interference to Audio Equipment

Available from the AGPS mail order services and AGPS bookshops for $9.95 (mailing cost included).

ar

How's DX?

Ken McLachlan VK3AH
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Many years ago it was said that the pastime of amateur radio was a hobby that could be enjoyed by all, regardless of colour, creed, religious or political beliefs and whether one was a miner, farmer, housewife, king or queen. At the time it was stated as an example, but it has proved to be true over the years.

Our hobby has become the hobby of kings, queens, princes, prime ministers, senators, miners, the owner of the corner store and others who are all on an equal and generally no one is the wiser until that valued QSL card turns up via the bureau or direct.

One of the more active amateurs of note apart from King Carlos of Spain, is King Hussein of Jordan, JY1. King Hussein, a brilliant scholar with his education being in Britain, as was his army training, had no option or any say in being declared the King of Jordan, an area torn by many fractions, at the age of 16, in 1953. This was due to his grandfather King Abdullah being horrifically assassinated and the rule being taken over by his son, King Tallah, Hussein's father. Unfortunately King Tallah, after a few months rule, was declared medically unfit to rule the nation and the responsibility fell to their present ruler, JY1.

Hussein, since that date, has had to make many decisions for his people, some popular and quite a lot not so popular and his life has been marked by tragedy. His wife Alia, an amateur operator, with other members of the royal household, some also being amateurs, were killed in a tragic helicopter accident that brought media headlines, worldwide.

In June 1978, Hussein married Lisa Halaby. Lisa, an American of Syrian and Swedish descent and an accomplished graduate in Architecture and Urban Planning (one of her assignments was a study of Sydney suburbia) from the prestigeous Princeton University, who was to become Queen Noor, and have the interest in our hobby of taking the call JY1NH. This call appears in the *International Call Book*, simply as JY1NH Noor Alhussein. Incidentally, the couple share the interests of other hobbies which include aviation and photography.

As previously stated, generally one does not know who is at the other end of the QSO and even when they receive the card, it is not always clear. Is this not what the hobby is about, no matter who or what, everyone is equal. In my opinion, this is why one can get so much enjoyment from meeting on air and talking to people from countries hailing from all continents over a weekend or even in one day. As amateurs our privilege of being able to converse, experiment and enjoy a hobby should not be allowed to be exploited and run as a business which a minority seem to want in the search of 'gold at the bottom of the rainbow' or 'get rich quick'. It is a relaxing hobby. Please let us keep it that way and encourage others to join the ranks of the hobby that has so much to offer. Remember, if every Australian amateur introduced the hobby to one other person, it would double the issued licences and if each WIA member joined a new member in one year, our membership would double. No one needs a calculator to work that one out.

Incidentally Mary Ann WA3HUP, a staunch WIA member, is the QSL Manager for JY1 and has visited and operated from Jordan as JY9AA. Another lady amateur who has operated from Amman under her Jordanian call of JY8CQ is Ruthanna WB3CQN, a lady who was very popular when she visited our shores a few years ago. Incidentally both ladies still hold their Jordanian calls.

MARION ISLAND

There appears, at the time of writing, that there is some confusion when George VE3FXT, is going to show up from the area and the extermination of the feral cats has been given as one excuse. A number of substantiated reports indicate the future of the island and if the rumblings are true, there will not be any problems with the cats or any other fauna for that matter. If you hear a ZS8, which is the new prefix for the island, get it in the log quick-smart.

The unintentional and unfortunate mistake of Lew ZS1SL, in operating ZS2MI on August 30-31, 1986 and his intention of QSLing with the card overprinted declaring it was not a valid operation and therefore not acceptable for DXCC was thwarted by the South African Radio League Council and all cards received are now being returned with an accompanying letter outlining the details.

PIRATES

Again a sub-heading unfortunately. If you hear a station signing 3B6, 3B7 or 3B9 they have no paperwork to substantiate the call, as at the present the hobby is not permitted from these areas. Reason and period unfortunately unknown.

Another very suspicious operator and call is Song P9LZ, which is assigned to the Democratic People's Republic of North Korea. In my opinion, it is not worth 'singing' about.

One cannot but mention two other calls such as XZ2A and the unlikely XY5OO. It is nearly as bad as putting F0OL in the log on the first day of April.

GUANTANAMO BAY

A reasonably difficult country to get in the log. There are one or two around the bands on SSB and CW. One is KG4SG, who frequents the very low end of 20 metres on of course, CW. He prefers cards via the bureau, which can create a problem if not enough VKs in one call area work him, as they may be held until it is practical to send a number of cards because of economics. My advice if it is a new country for you, send the card to the bureau, with an SAE and appropriate means to buy the return postage.

SOVEREIGN BASE QSLS

Due to the short tours of duty by some of the operators, getting the QSL is quite a problem. The *RSGB Newsletter* suggests to QSL via the Joint Signals Board, BFPO 53, London, England. (Please mark the operators call clearly on the envelope to avoid confusion in the office ... VK3AH).

QSLING GENERALLY

It is an age old problem, some operators QSL promptly, some not so promptly, some infrequently and some not at all. If I knew of an answer or a solution to the problem, I probably would not have time to be writing these notes because of running a mega billion dollar turnover per year Business Consultancy Practice.

As I am still typing them, I do not know the answer though I consider that at this QTH, we have been very lucky as we have no outstanding cards that are required for DXCC. This is attributed to the tenacity of my wife Bett and the diplomacy that she has used to get a 100 percent return. Small items such as an accurate card, a little note to a QSL Manager, correct number of IRCs for postage, some used stamps included as goodwill, correctly addressed envelope (both sides) which saves the recipient a considerable amount of time.

One amateur, Paulo I2UIY, worked a number of new countries for his DXCC in the *1986 CQ WW SSB Contest*. Paulo has sent two cards with IRCs to the following stations C50WCY, FO8NG, V47K and XE2PQ. No replies have been received, which has been a very frustrating and expensive exercise and it is believed to be quite a common occurrence and personal thinking is that it will further deteriorate due to the economics involved.

Paulo would appreciate if anyone who has contacted these stations has or has not received a card and he has come up with the following suggestion for those in similar situations from contest operators, in that if no cards are received within one year of the contest contact, that a petition be forwarded to the contest organisers to have offending stations disqualified. I have my own thoughts but I would like to know what you the readers of this column think. Ladies and gentlemen, your thoughts please?

At least two well-known overseas QSL Managers read these notes, namely Mary Ann Crider WA3HUP (a WIA member) and John Parrot W4FRU. Mary Ann and John here is an open invitation for you to say how you would like to receive cards and to divulge the secrets that you may have developed over the years to receive the cards for those amateurs that you look after.

FACT — NOT FICTION!

After my comments in the above paragraphs here is another one to consider. It appears that F0AT has said and it has been related by N7RO 'I will be leaving New Caledonia in a few months, and all that want a QSL for FK0AT, FK025AT, C21NI, YJ8MC, YJ0KMS, FK0AT/FW should send as soon as possible with their card US$1 for each contact. All QSLs sent via the bureaus or N7RO, will not be honoured. They must be sent direct with $.' All I can say is this — is our privileged hobby becoming commercialised and prostituted to this extent? Also does his society if he belongs to one condone his operations being handled in this manner?

YES, NO OR ???

Members of the well known Spanish LYNX DX Group are due to activate the call sign S0RASD, in August, from the Saharan Arab Democratic Republic (SADR) which is roughly in the area that was known as Rio de Ora and used the prefix of EA9.

The suffix stands for Republica Arabe Saharaui Democratica and SADR is recognised by the member nations of the Organisation of African Unity. The big question is, will the Newington DXCC desk share the same view. Again a case of work first and worry later.

ANOTHER OPERATORS SHACK

In the quest for the best looking shack and the handsome prize that has been kindly donated by GFS Electronics, pictured is the VK6NNG DXing shack. This photograph will be considered by GFS Electronics when they pick the winner. Have you submitted your shack for the competition yet.

SENSE OF HUMOUR

Iris and Lloyd (W6QL and W6KG) respectively still have their sense of humour after all that has happened.

In their usual letter writing style, this has been received:

"Dear Friends,

"...A dictionary gives the following information: MAL — means evil, harmful, hurt, bad; DIVE — means fall or plunge.

"The dictionary is absolutely correct because on February 4, whilst leaving the Maldive Communications Office, Iris slipped ..."

The rest has been previously published, but this duo have real internal fortitude, for want of a more descriptive word. To you both, every good wish and to Iris a very speedy recovery from a very nasty injury from all your friends from 'down under'.

All QSLs, or letters via YASME.

I have been told of the beauty of the Maldives from Soma 4S7YL/VS9YL/ 8Q7YL, the first YL to operate from both areas, (unfortunately now a silent key) and her two daughters Chitra and Luchmea, who spent a considerable part of their

childhood in the archipelago which is located in the Indian Ocean approximately 700 kilometres from Sri Lanka and 600 kilometres from India and consists of in excess of 2000 islands. Only about 200 of these are inhabited and under the local law only nationals are allowed to own land and its improvements, however a lot of tourist hotels and entertainment centres are leased to foreigners. The islands are surrounded by brilliant white sand and water so clear that one may, if skin diving, have a visibility of up to 50 metres in a climate that averages between 28 to 30 degrees Celsius in the shade all the year round.

Incidentally, Lloyd and Iris have finished this stint and ended up with figures like this:

Call	Country	QSOs	Countries Contacted
FR6/W6QL	Reunion	8 000	148
FH/W6KG	Mayotte	8 000	144
D68OL	Comoros	9 000	152
S79KG	Seychelles	9 000	130
8070L	Maldives	4 000	120
5Z4KG	Kenya	7000	135

The question is where will this happy duo turn up from on their next tour?

Frank OK1DFP, runs a FT101D and with his wife Ivana OK1DYL, is interested in the low bands. Frank is a watchmaker specialising in antique varieties.

ANOTHER PREFIX

VA3T has been recently heard and worked. It appears that it is another VE 'special', one of many in the last few years and they are getting more confusing as the years go by. Unfortunately it reminds me of the VAT tax. Who mentioned the unmentionable? ? ?

Whilst on the subject, here are a few more that may have been worked or will appear in the future. CN5SE, was used for the Semaine du Cheval (Horse Week). QSL via PO Box 299, Rabat, Morocco.

The call sign 6C40, has been issued to four stations to honor the national society's 40th birthday. It appears that special cards will be struck for the occasion by the Technical Institute of Radio for the event in December.

ST HELENA ISLAND

Have you worked Adrian ZD7AF? Adrian is St Helena's youngest amateur at the age of 15 and is the son of proud parents ZD7XY and ZD7BJ. Congratulations Adrian.

HEADACHE

If Joe W3HNK, suffers from headaches, it is no wonder.

He is the QSL Manager for CQ1NH, CR1NH, CS1NH, CT1NH, CQ2NH, CQ4NH, CQ5NH, CQ6NH, CQ7NH, CQ8NH, CR2NH, CR4NH, CR5NH, CR6NH, CR7NH, CR8NH, CS2NH, CS4NH, CS5NH, CS6NH, CS7NH, CS8NH, CT2NH, CT5NH, CT6NH, CT7NH, CS8NH, CT2NH, CT5NH, CT6NH, CT7NH CT8NH.

Wait for it, they all belong to the same guy, CT4NH, who is a prefix hunter enthusiast and is on the Honor Roll — no wonder! Good luck Joe, and not too many analgesics.

DESERTING

Really the heading is not fair as this is one thing that Percy VK3PA, would not do.

Percy is leaving the 'Garden State' and is heading towards the 'Sunshine State', to live there permanently. Percy will be greatly missed by the VK3 'gang' as this gentleman is approaching becoming of an octogenarian, who is still rated as a number one net controller. Percy every good wish to you and please get set up quickly in your new QTH, and rejoin the net operations that you have given so much of your time to over so many years.

INDONESIAN SILENCE

It appears that the amateurs in this country could have been asked to 'refrain' from transmitting from March 17, to May 1, because of the general election that was held on April 23.

ST PETER 1 ISLAND

The breakdown of the log from the expedition is as follows. Total QSOs were 15 841. 10 090 SSB, 5 703 CW and 48 on RTTY. Bands: 160m = 29, 80m = 587, 40m = 1 189, 20m = 9307, 15m = 4 570 and the balance on 10 metres. The breakdown of the areas is quite interesting as the USA/VE heads the list with 9 367 contacts followed by Europe with 2 736, then the JA and Asia area with 2 370 entries in the log, Central and South America accounted for 917 lines of the log with VK/ZL/Oceania accounting for a mere 278 plus the residue being classed as miscellaneous. After I have made you get your calculators out to find the missing figures one has to wonder how many of the 'lucky' ones deserved the country by working it a number of times, depriving the less fortunate DXers of a new country that could be quite rare due to its location and the difficulties and economics associated with making a landing on the island.

ANOTHER NEW CALL

TV7GLC has been allocated to the Normandie Radio Club in Rouen for use on all bands and modes until the end of this month. The occasion is the 900th anniversary of death of William the Conqueror. Special QSLs are reported to have been struck and are obtainable from F6DLM. Unfortunately there is no mention of cards being available via the bureaus.

THE ANTARCTIC SUMMER

Did you complain about our lack of summer this year while you are reading this at the start of winter? Spare a thought for the Antarctic inhabitants who, on Mawson Base, had a maximum temperature of 3.9 degrees Celsius whilst Macquarie Island suffered a 'heatwave' of 10.7 degrees in December. Casey Base endured 19 days of snow in December and 12 in January where the maximum temperature of 9.2 degrees created a record since the base was created and named after the late highly distinguished Lord Casey, who took an active personal interest in the research projects that were undertaken and created numerous messages of his enthusiasm to be forwarded to the duty crews.

Still feel cold and huddling closer to the fire in the southern States, think that the lowest temperature at Mawson reached -6.7 degrees in December and Macquarie Island recorded 109 mm of rain. I will not depress you anymore, spring will soon be here!

LIBYA

Whilst Hubert continues his activity as 5A0A, to the joys of many, his Manager has asked that the call sign or any relevance to the hobby should NOT be shown on the envelope.

Address all correspondence to Wieslaw Ziolkowski, PO Box 253, 50-950 Wroclaw 2, Poland. IRCs are preferable in this instance.

It is felt that it is good practice to refrain from putting call signs and any notes on envelopes that would imply that the recipient is an amateur radio enthusiast, as the unscrupulous will be tempted to remove the monetary contents. It purportedly happened to one call sign owner on an island in the Indian Ocean a few years ago, and this is the excuse that the operator gave for not QSLing. If it is fact or fiction one will never know.

SURVEY

John Parrot W4FRU, Chairman of the ARRL DX Advisory Committee, is conducting a survey on the future of the ARRL DXCC. Input is required from all DXers. You may have your say and a survey form is available from John with a SAE and funds to cover return postage.

The address is — ARRL DXAC Form, PO Box 5127, Suffolk, VA23435, United States of America.

If you are interested in DXing and the DXCC future, please put your input into John, so that he may deliberate on it with his committee. Comments from all DXers are required to give a cross section of the users thoughts. I feel the readers and John are aware of my thoughts already.

Congratulations to John and his committee on the democratic approach they are taking in the formulation of the criteria on DXing that will take us into the 21st century.

UNUSUAL CALL SIGNS

Recently some lengthy, unusual call signs such as CW66PAX/7BY, CW66PAX/5BW, CW66PAX/6CB, CW66PAX/1TE and many others were heard. These calls emanated from Uruguay to commemorate the first Papal Visit to South America.

Pope John Paul's visit to Victoria allowed the use of a special amateur call sign, however very few amateurs knew of the security and police enforcement that was involved, with the dignatory's visit.

The Victoria Police force proudly boasts that it has the most modern police communications system in the Southern Hemisphere (Refer AR August 1982 p6). This facility has been enhanced with the addition of an aeronautical Video Unit known as The Victoria Police Video Operations Unit which, during the papal visit, gave the D24 Control Complex, a 'birds eye' view of all the proceedings from the Dauphin helicopter that hovered overhead. The 'chopper' was equipped to allow video to be relayed from the flight deck to a remotely controlled tracking microwave dish on top of the building housing the Police Communications Complex.

Much planning went into this facility that has become an integral part of the updating of law enforcement within the force in Victoria, which owes its success to the Chief Commissioner Mr Mick Miller, a man noted for his precision, forward thinking and guidance who led his dedicated staff to obtain this status.

The officer in charge of the Operations Centre during the visit of the Pope was Deputy Commissioner (Operations) Mr Kel Glare, who stated 'My role as police commander of the operation was to, if possible, resolve any incident without loss of life, injury to any person or damage of property.

'The live-eye TV coverage gave me the ability to see some of the general scene which added reality to the written and oral communications I was receiving. I was able to develop a feel for the situation which assisted in the vital operational decision making'.

A quietly spoken and unassuming Mr Glare succinctly added: 'One picture is worth a thousand words.'

Video Operations Unit's Senior Constable Trevor Beattie demonstrates the required aerial technique. The operator relies on a full harness to prevent him from vacating the helicopter and actually joining the birds!
Photograph courtesy of Police Life

BITS AND PIECES

Khalid A61AB, is still quite active and valid for DXCC. QSLs to Mary Ann WA3HUR ** Luigi HB9KLI, has come to the conclusion it is never too late, as he recently received cards from VR1Z (QSO date February 1966) via Yasme and VK0WR (QSO date March 1960) from VK6RU. ** If you

worked **Mike KI6DF** as **FO0OK**, QSL to **W6TM**, not the FO Bureau. ** The call **4W1AA**, is still cropping up in overseas reports. No one seems to know if it is genuine and no one to my knowledge has a card or documentation. Work first and worry later! ** **4K1AH**, is quite active and his QTH is the **Soviet Union's Mirny Base in Antarctica.** ** Apparently **FR5ZU/E** has been active from Europa. The fortunate may QSL via **PO Box 4, F-97490, Sainte Clotilde, France.** ** **XF4DX** is now accredited for DXCC. ** **Tom VR6TC**, is home on **Pitcairn** again after a considerable absence due to ill health. Hope to hear you on the bands more frequently Tom. ** If you worked **KG4GX** from **Guantanamo Bay.** QSL to the home call **KG6GXO.** ** **V47KJI** was **W2BJI** operating from **St Kitts.** ** Special postal covers and souvenir cups are available to commemorate the establishment of **St Peter 1 Island** as a **DXCC-country.** Further details from **Elnar LA1EE.** ** Fifteen people are working on the **31EE/3Y2GV** cards, so please be patient.

CALL SIGN CHANGE

Ron ex-VK3BEE, a keen exponent of the 160 metre band has relinquished this call and taken Tony's VK3IO call. Tony ex-VK3IO, has moved interstate. Ron says that a two letter suffix is an advantage and 160 metres will benefit. Good luck Ron with the low band 'goodies' and also good luck to Tony and his wife at their new QTH in VK1.

LISTENING AND WORKING

Jim VK3YJ, did quite a lot of listening over Easter, obviously whilst waiting for the Easter Bunny. Jim heard many stations working Hubert 5A0A on 14.144 MHz at 1216 and 0630 UTC. Jim had a ball on 20 metres during an all night stint from after midnight until nearly sun-up. During the early hours he picked up some of the following jottings.

Peter ZK3PM, has stated there will be no QSLs until he returns home in September this year. SM2DWH/BT0 was operational from the slopes of Mount Everest. LA2GV, was quite QRV working stations in the USA, congratulations on the card for St Peter 1st Island, Jim. Another note from Jim's diary is that GB2NES, was a special event station commemorating the news broadcast service in the United Kingdom.

HEARD AND WORKED ON THE WEST COAST

1.8 MHZ

K1ST/6W1, DJ6QT/9L*, OH1RY/CT3, CT3CU*, DL6EN, G3OFW, LA8AW, ON5NT, SM4CAN, TU4A, UA9CBO, VEs and Ws.

3.5 MHZ CW

DJ6RX, EA4MY, EI8EI, G3NKS, HA5KF, LA5LT, OE7PGJ, OK3EQ, OY7ML, PA3CCF SP1DPA and UQ2GP.

3.7 MHZ SSB

4M0ARV*, DJ6QT/9L, EA9KQ, FT8WA, KN4BPL/KH3 and VK0DA.

7 MHZ CW

4M0ARV*, CW66PAX*, FM5BH, FT8ZA, HS0B, UH8EAH and UM8MFB.

7MHZ SSB

4C2A, 5L6D, 5Z4SS, 7Q7LW, 8R1RPN*, CN8EL, CT3CU, OH2KI/CT3, D44BC, EA8RCT, FT0ZA, HH7PV, HV3SJ*, NP4CC, PY0FG*, TE2Y, TZ6BG, VK0DA, VP2EC, WL7E and ZF2KT.

Note: * Denotes heard and not worked.

CW SWLING WITH ERIC L30042/VK5

7 MHZ

FK8EJ, G3SED, GI3OQR, LA5SAA, P29PL, UZ0LQX, VK8MQ, VU2REC, YV5ANT, ZK1DD and ZL7DE.

10 MHZ

DL8AN, EI5DR, G2BY, G3HEJ, G4UJI, JF1CCI, KF7E, KM2S, NH6BH, ON4KLG, SM6CYZ, W1CCN, WS4I and W6OV.

14 MHZ

CE2JHE, DL8OB, N7ET/DU7, EA1IY, F5IN, FK0AV, G3ZOA, G4TYF, HI8LC, I2CWF, IK2EGL, IK5DEY, I0BVP, OK3FON, OH5NM, ON7YO, RO4OZ, RE4AC, SM5CIK, UA3RLO, UA4YA, UB5JWA, UB5MIF, UA6ARE, UA0LU, UZ9CWO, UP2BW, VE3UDX, W4HAM, YB0TK, YU2BHI, ZK1DD and ZS1AAQ.

21 MHZ

HL1ZP/DU1, JF2UAQ, JA3YBF, JA8YBY, UM8MIY, UM9MWA, YC0BLO and YC0JYI.

28 MHZ

VK2RSY and VK5WI Beacons.

HEARD AND WORKED ON THE EAST COAST

3B8CA, 5H3RB, 5N9GMC, 5Z4JB, 7J1ACH, 8P6OB, 8R1RBF, 9J2BO, A61AB, A92EM, BV1IA, CE0ZIG, CP5LE (YL), CT1BCR, FM5CL, FO5JV, FT8WA, GW4WEQ, H44AF, HA3HA, J73LC, OA4ED, OX3KM, OZ7TM, TA1E, TI2LTA, V85RM, VK0DA, YV2NY, YZ7AA, ZL7AA, ZK1DB, ZK2EKY and ZK3PM.

SOME QSL INFO

K1ST/6W1:K1MM, DJ6QT/9L:DJ6QT, CW66PAX:CX2CO, FM5BH:W3HNK, KN4BPL/KH3:WB4MJH, SM2DWH/BT0:SK4NI, ZK2EKY:VK2EKY.

THANKS

Sincere thanks to the Editors of weekly, bi-weekly and monthly publications such as: *ARRL Newsletter; BARG; CQ-QSO; The DX Family Foundation Newsletter; Inside DX; KH6BZF Reports; Long Island DX Bulletin; NIAR News Letter; Papakura Radio Club Bulletin; QRZ DX; RSGB DX News; QRZ DX, RSGB DX News* and *The W6GQ/K6HHD QSL Manager List.*

Magazines including *Break In; cqDX; DX Post; JA CQ; JARL News; KARL News; Meteorological News; QST; Police Life; RadCom; Veron; Weather News* and *Worldradio,* to mention but a few.

Individual contributors this month include VKs, 3IO, 3YJ, 3YL, 6NE, L3- 0042/VK5, ON7WW, Senior Constable Susan Tattersall, and research by the staff of the Lillydale Municipal Library at the Lilydale and Mooroolbark Libraries.

Sincere thanks to one and all who again have made this column possible and good DXing.

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THE FIJI ISLANDS

Usually described as a Pacific paradise, the Fiji Islands that straddle the 180 degree meridian, 1600 kilometres south of the Equator, is the home of 32 amateurs according to the *International Call Book.*

Fiji is an archipelago of more than 300 islands, ranging from tiny coral atolls, limestone islets, to the two larger islands of Viti Levu and Vanua Levu which comprise 85 percent of the total area of 7022 square miles (18 000 square kilometres). It has been estimated that 30 percent of the islands are occupied with a population being *in the* vicinity of 750 000 people who enjoy a moderate climate where the temperature seldom varies from round the 24 degrees Celsius mark. The humidity increases around January through to March, due to the precipitation and at times cyclonic conditions do exist, which unfortunately, at times, have devastated the area.

The islands were discovered by European sailors over a period of some 300 years. The Dutch explorer Abel Tasman, sighted some of the area in 1643. Captain James Cook, charted other islands in 1774, but Captain William Bligh, charted the majority of the area, when sailing through the area after the Bounty Mutiny in 1789.

The Fijians are very proud people, and the legend is that the great chief Lutunasobasoba led his people across the seas from South-East Asia via Indonesia and Tonga, resulting in an admixture of Polynesian blood and attitudes. More European influence occurred during the 19th century, causing friction and a British Consul was appointed to the area in 1857. His presence assisted the missionaries and the traders. In 1874, Fiji was officially taken over by Great Britain.

This official annexation, changed the Fijian society dramatically in that the influx of sugar and cotton planters wanted labour. The Fijians were neither interested in work or the recompense that they would receive and Sir Arthur Gordon, Fiji's first governor, sought labour from India, importing people as 'coolies', who had the right to return if they wished. Between 1880 and 1916, 62 837 Indians were imported. Less than one-third wished to return to their homeland. It was estimated in 1920, there were 39 000 Indians in Fiji, but uncontrolled migration and a high birthrate, it was estimated that the Indians outnumbered the Fijian population by 1945. Present estimates are that the Indian and Fijian population is evenly balanced even though 60 percent of the population is under the age of 25 years of age.

The Indians dominate the lifestyle in this exotic area. Most shopkeepers, lawyers, doctors, importers are of Indian descent, and there is virtually no marriages between the two races who do not generally mix socially. Even the plantations of rice and sugar-cane are controlled by the Indians, who own less than two percent of the land and lease the rest from the Fijians. In October 1970, Fiji was granted full independence.

Fiji's first and only Prime Minister is Ratu Sir Kamisese Mara, a hereditary chief and graduate of Oxford University, has guided *Fiji* even though his party did not win a majority in the April 1977 elections, which are based on a very involved electoral system that ensures a racial balance and the rights of the Fijians. A later election in September, saw the previous two seat defeat of the National Federation Party reversed dramatically by them winning 36 of the 50 seat Parliament. They were also re-elected in mid-1982.

The islands rely on chiefly agriculture and tourism. Sugar cane is partly processed and exported in vast quantities such as nearly half a billion tonnes in 1985 bringing in a income of F$160 million. Other exports are copra, cocoa, ginger and in the future wood chips, wood pulp and timber from vast plantations are envisaged. Small quantities of gold are mined and exported whilst tourism attracted some 250 000 visitors, quite a few dollars per person would be anticipated to be spent in the shops, markets, motels and hotels.

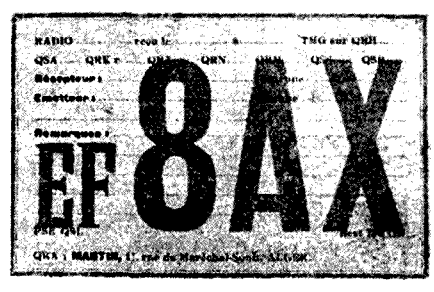
Any vast industry is at present hindered by inadequate power which is obtained from imported fuel, but a large hydro-electric complex in Viti Levu is being gradually brought on line, to ease the demand.

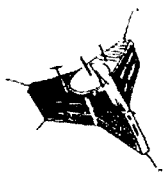
It is coincidence that two races so far apart in their historys, one indigenous and the other that has migrated over the years, should indulge in 'fire-walking', each for different reasons. The Fijian's Sawau people, who live on Beqa Island, can walk on white hot stones, heated by a huge log fire and this phenomenon has been handed down through the ages and is legendary. Indian fire-walking is done for religious purposes and is practiced by the Madrasis sect of the Hindu religion. Those that walk on the hot stones generally adorn their bodies with vivid coloured dyes and their bodies are pierced with needles and it is said to be a cleansing of the soul.

No story would be complete without mentioning the drinking and manufacture of Yaqona, or Kava which is made from the root of the pepper plant. In early days long past, the roots were masticated in the mouths of the young maidens of the village, until it was a pulp, then it was placed in a receptacle and mixed with water. In this day and age, more hygenic methods are used such as a pestle and mortar and it is strained before being placed in a half coconut shell and passed around like a chalice, by groups of men from the village.

Many amateurs are active from the 3D2 prefix and are also in demand from country hunters. If you have the chance and can engage an operator in a lengthy QSO, ask him or her to explain a little of their history and some details about the superb museum which is located next to the home of the Governor. I am sure you will enjoy the contact and it will give you the incentive to visit the islands and meet these friendly people. Good hunting for a 3D2 prefix.

ANTIQUE QSL CARD
Courtesy Peter Wolfenden VK3KAU





AMSAT Australia

Colin Hurst VK5HI
8 Arndell Road, Salisbury Park, SA. 5109

NATIONAL CO-ORDINATOR
Graham Ratcliff VK5AGR
INFORMATION NETS
AMSAT AUSTRALIA
Control: Graham Ratcliff VK5AGR
Amateur Check-In: 0945 UTC Sunday
Bulletins Commence: 1000 UTC
Primary Frequency: 3.685 MHz
Secondary Frequency: 7.064 MHz
AMSAT SOUTH WEST PACIFIC
Control: John Browning W6SP
Bulletins Commence: 2200 UTC Saturday
Frequency: 14.282 MHz

Participating stations and listeners are able to obtain basic orbital data, including Keplerian Elements from the AMSAT Australia Net. *This information is also included in some WIA Divisional Broadcasts.*

ACKNOWLEDGMENTS
Contributions this month are from Bob VK3ZBB, and Harold Price NK6K and Jeff Ward G0/K8KA.

AMSAT-AUSTRALIA'S NEW ADDRESS GPO Box 2141, Adelaide, SA. 5001

Most readers of this column are probably aware that Graham VK5AGR, for the last four years, has been the Treasurer for the SA Division of the WIA. Therefore, with the permission of the Divisional Council, AMSAT- Australia has been using GPO Box 1234, Adelaide as its mailing address and all moneys have been processed through the Division. However, due to his ever increasing commitment to AMSAT-Australia, he has decided to resign as Divisional Treasurer as of the AGM on April 28, 1987.

At the Divisional Council meeting on March 20, 1987, Council decided that, due to 'Standing Orders' Graham could no longer have direct access to 'Box 1234' after the AGM as he would no longer be Treasurer, or a member of Council. It was therefore suggested that he arrange a separate box for AMSAT-Australia as soon as possible. As indicated above, the new box number is 2141 — not as easy to remember as 1234 but hopefully, given time, most will associate AMSAT-Australia with Box 2141.

Similarly, as Graham will no longer be Divisional Treasurer, AMSAT- Australia moneys will no longer be handled through the Division, therefore, can all future money orders and cheques be made payable to 'AMSAT- Australia' rather than the WIA.

AMSAT-UK FUJI TECHNICAL HANDBOOK

The AMSAT-UK 'FO-12 Technical Handbook' is now available from AMSAT-Australia for $15 including air mail postage.

It is a 76 page A5 (half A4 size) loose-leafed booklet containing all the information that is currently available concerning FUJI OSCAR-12 or JAS-1. AMSAT-UK also offers an 'Update Service' for the Handbook for the cost of a 'Small Donation' (to cover return postage) and returning a completed 'FO-12 Update Information' card.

UOSAT-2 (OSCAR-11) DIGITAL COMMUNICATIONS EXPERIMENT (DCE) — VK Gateway

On March 19, 1987, Graham VK5AGR, received a DCE Encoder from Jeff Ward G0/K8KA of the Department of Electrical Engineering, University of Surrey, Guildford, Surrey, GU2 5XH, England. The DCE Encoder will allow Graham to act as a Gateway to the DCE 'Store-and-Forward' package on UOSAT-2 (OSCAR-11).

At the time of writing this column (April 18), Graham had successfully uploaded and downloaded messages from the DCE but had not completed his HF modem to enable VK stations to forward messages to the DCE via the VK5AGR BBS as a HF Gateway. Hopefully, Graham will have his BBS operational on HF by the time you read this column. Graham is particularly interested in hearing from educational institutions who would like to communicate with educational institutions with similar interests in the UK and USA via a HF Gateway using the DCE on UO-11.

Unfortunately, when Graham activates the DCE on UO-11 this will result in the interruption of the normal Telemetry, Bulletin or Whole Orbit Dumps (WOD) on the 145.826 MHz beacon. After Graham has successfully commanded the DCE ON, DCE Title Frames will appear on either the two metre or 70 cm beacon. On occasions, the two metre beacon may be switched off entirely as the two metre beacon tends to desense the two metre Command Receiver on UO- 11. After one or two cycles of the DCE Title Frames, Graham will commence DCE operations; ie upload a message using the 'PUT' command, download a message using the 'GET' command or kill a message using the 'KILL' command. Graham has supplied the following information on the date format of DCE to enable stations having a mutual window with UO-11 to decode the 1200 Baud date exchange between Graham and the DCE with the same 1200 Baud Demodulators used to decode normal UOSAT 1200 Baud telemetry. NB: DCE uses eight-bit ASCII, not seven-bit as is used for the normal telemetry.

MSG2 PROTOCOL

The MSG2 protocol was designed primarily to be easy to implement. Its only other goal was to provide the minimal message handling capability to PUT a message on the DCE, to GET one back, and to KILL a message no longer required.

As "easy to implement" dictated a single user approach, a LOGON and LOGOFF capability was added to keep two or more ground stations from starting message transfer operations simultaneously.

Experimentation with minimal ground stations is planned; the MSG2 protocol was designed to accommodate this activity. Messages are broken into small (64 Byte) blocks with CRC error detection. Once a message transfer is begun, message blocks can be acknowledged at any time, and in any quantity. This allows a battery powered station to reduce its transmissions by requiring only one acknowledgment for a message of any arbitrary number of blocks. Unacknowledged blocks are retransmitted in a "round robin" fashion.

DCE blocks are acknowledged by sending a bit map frame. The bit map contains one bit for each block in a message. Bits set to 1 represent unacknowledged blocks, and 0s represent acknowledged blocks (Figure 1). The transmitting station continues to send the blocks indicated by 1 bits, until a bit map is received with all bits set to 0.

Figure 1: Example of a MSG2 Bit Map.

7 6 5 4 3 2 1 0 (1)
0 0 1 0 1 0 0 0 (2)
0 1 2 3 4 5 6 7 (3)

(1) numbering of bits in bit map (MSB Is 7)
(2) bit map ack'ing all but blocks 2 and 4
(3) blocks represented by bit map bits

MSG2 FRAME FORMAT

This section is not meant to provide a formal MSG2 protocol specification, but to outline the structure of the protocol and the frames used by it. Frame types may be added or removed as the protocol matures.

Although there are several types of frames, they all share the following format:

<10h><03h><cmd><cmd not><data length><data><crc>

Each byte is sent as an asynchronous character with eight data bits and no parity bit. Frames are preceded by several SYN Bytes <16h> for modem and timing synchronisation.

Frame Breakdown:

<cmd> — A single ASCII character specifying a DCE command.

<cmd not> — The inverse of <cmd>. This Byte can be calculated by <CMD> XOR FFh or by 255 minus <cmd>.

<data length> — A single Byte giving the length of the <data> portion, in Bytes. Data length is between 0 and 128 Bytes.

<data> — <data length> Bytes of data. This data can be either ASCII characters or binary bytes.

<crc> — Two Bytes of cyclic redundancy check. The CRC is a type of checksum, and it covers everything from <cmd> to the end of <data>, inclusive.

In order to assure that <10h><03h>, the beginning of frame marker, does not get transmitted in the frame, all <10h> Bytes other than the one at the beginning of a frame are doubled. That is, during transmission, <10h> is converted to <10h><10h>. When receiving a frame, after the first <10h><03h> has been detected, all <10h><10h> sequences should be converted to a single <10h>. If a non-doubled <10h> is encountered in a frame, it is an error.

MSG2 CRC

Every frame transmitted by the MSG2 ends with a two-Byte Cyclic Redundancy Check (CRC). The CRC is an error detection code, and if you use the CRC equation on a received frame, your two-Byte answer should match the two Bytes transmitted at the end of the frame. The CRC used by MSG2 is calculated using a modified CCITT CRC algorithm. A Z80 machine-language program showing how this is done is provided in the appendix.

The CRC calculation includes all Bytes from <cmd> to the end of <data>. The CRC calculation is done prior to doubling <10h> Bytes and, by the receiver, after removing the extra <10h>.

TITLE FRAMES

The DCE was required to "do something interesting" when it was idle; ie not performing a function at the specific request of a ground station. To this end, MSG2 sends the first line of each active message on the downlink when it is idle. This line is the message "title" and usually contains at least the source, destination and subject of the message. Ground stations can see if they have any waiting traffic without interacting with the DCE by simply copying these title blocks. The OBC DIARY program currently switches the DCE onto the downlink for 30 seconds at roughly five minute intervals.

Title frames provide a way for stations not directly involved in DCE operations to monitor DCE activity. The <cmd> Byte in a title frame is "T". The contents of the <data> portion of a title frame are as follows:

Message number, 1 byte. If the first bit of this byte is set, the message is not complete, and the message title may be invalid. Message numbers for complete messages run from 0 to 127.

Message length, 1 byte. This is the length of the message that is stored on the DCE, it is not the length of this title frame. Multiply this by 64 to get the message length in bytes.

Call sign of station using DCE, 9 bytes of ASCII. If no one is using the DCE then this will be nine blanks.

Title of message, the remaining <length> minus 11 bytes of the <data> field. This is taken from the first line of the message. The length referred to above is the FRAME LENGTH (which follows the inverted command). The 11 accounts for the message number, message length and call sign data.

The title for message number 0 contains MSG2 administrative and status information. It currently contains MSG2 version number, a counter from the error detection and correction (EDAC) memory, the number of free memory blocks available, the number that will be assigned to the next message, a counter that is incremented every time

MSG2 receives a valid frame, an error indicator and an indication of which bank of RAM is active. Message 0 itself is used to download portions of the program variables, including a table of memory address where the EDAC circuits have corrected an error.

OTHER FRAMES

The above information and a short computer program will allow casual ground observations to monitor DCE activity. During actual DCE operations, however, several other frame types are used. The following command frames are used by DCE ground stations, and the list provides insight into the operation of the MSG2 mailbox.

LOGIN tells the DCE the call sign of the ground station.

LOGOUT frees the DCE for use by another ground station. Logout is automatic if the DCE does not hear the ground station for two minutes.

PUT is used by the ground station to store a message to the DCE.

CONTINUE allows the ground station to continue (on another orbit) a PUT operation that was interrupted by LOS.

GET is used to retrieve a message from the DCE.

KILL deletes a message.

END resets DCE software to the title-display mode, without logging out the ground station.

Thus, the DCE has all of the commands needed in a computer bulletin-board system.

MESSAGE FORMATS

MSG2 is a data-transparent system; ie messages are stored as a single string of eighth bit bytes. Message content does not effect and is not effected by communication through MSG2. Most messages, however, will follow a fixed format for their first line. The first line is defined as the text up to the first <cr>, or 116 characters. This is the part of the message that is sent on the downlink in title blocks.

Person-to-Person Messages

The following format is used for standard messages:

To:<call> De:<call> Re:<title>

The call can be up to nine characters. There are no spaces after the colon in any field.

For example:

To:G0/K8KA De:NK6K Re:Software updates

The To: and De: fields are the call signs of DCE ground stations.

A future command in MSG2 will permit messages in this format to be searched by To: field and downlinked in a group. The format is flexible, and fields may be added to it if the DCE is used for other than direct ground station to ground station data transfer.

DCE CRC ALGORITHM

The routine below can be used to compute the checksum for reception of DCE frames. The HL register is cleared before the first byte is received. Each byte is acted on in turn. When all bytes have been check- summed, the result is compared against the received checksum. The L register contains the first byte received, the H register the second.

```
;
;       COMPUTE CRC ON A, INTO HL
;
CKSUM:
        LD B,8
        LD C,A
CRC2:
        LD A,C
        RLCA
        LD C,A
        LD A,L
        RLA
        LD L,A
        LD A,H
        RLA
        LD H,A
        JR NC,CRC4
        LD A,H
        XOR 10H
        LD H,A
        LD A,L
        XOR 21H
        LD L,A
CRC4:
        DEC B
        JR NZ, CRC2
        RET
```

In using this program on DCE frames, remember that the CRC covers all bytes from the <cmd> to the end of the <data> segment, inclusive. It does not include the CRC itself, or the leading <10h><03h> bytes. Also, CRC calculation is done prior to doubling <10h> bytes and, by the receiver, after removing the extra <10h>. To check your CRC program, CRC check the characters "TEST MESSAGE". The result should be CRC bytes L=253 and H=223. 253 would be the byte transmitted or received first.

ar

SATELLITE ACTIVITY FOR THE MONTH OF FEBRUARY 1987

1. LAUNCHES

The following launching announcements have been received:

INTL NO — 1987	SATELLITE	DATE	NATION	PERIOD min	APG km	PRG km	INCL deg
011A	Cosmos 1818	Feb 01	USSR	100.7	810	790	65.0
012A	Astro C	Feb 05	Japan	95.9	593	528	31.2
013A	Soyuz TM-2	Feb 05	USSR	—	—	see	note
014A	Cosmos 1819	Feb 07	USSR	88.7	254	197	72.8
015A	USA 21	Feb 12	USA*				
016A	Cosmos 1820	Feb 14	USSR	88.8	273	186	64.8
017A	Cosmos 1821	Feb 18	USSR	105.0	1029	983	82.9
018A	MOS 1	Feb 19	Japan	103.0	917	903	99.1
019A	Cosmos 1822	Feb 19	USSR	89.5	331	205	73.0
020A	Cosmos 1823	Feb 20	USSR	116.0	1538	1497	73.6
021A	Cosmos 1824	Feb 26	USSR	89.7	370	177	67.2
022A	GOES-H	Feb 26	USA				

* Department of Defence

2. RETURNS

During the period 29 objects decayed including the following satellites:

1986-060A	Cosmos 1770	Feb 02
1987-002A	Cosmos 1811	Feb 13
1986-005A	Progress 27	Feb 25
1986-014A	Cosmos 1819	Feb 18

3. NOTES

1987-012A — Astro C has now been renamed 'Ginga' ('galaxy' in Japanese). It is dedicated to high energy astrophysics and has telemetry frequencies of 400.000 MHz and 2280.000 MHz.

1987-018A — MOS 1 is a Marine Observation Satellite and has transmissions on 2220.000 MHz, 8150/8350 MHz and 1702.4848 MHz. Its nickname is Momo 1.

1987-013A — Soyuz TM-2 had on board cosmonauts Yuriy Romanenko and Aleksandr Laveykin. The spaceship has docked with the MIR-Progress 27 orbital complex and will carry out scientific and technological research. Progress 27 has now returned to earth.

1987-022A — GOES-H is a meteorological spacecraft intended to provide world-wide weather coverage. It has been renamed GOES-7.

—Contributed by Bob Arnold VK3ZBB

ar

MORSEWORD 3

Compiled by Audrey Ryan

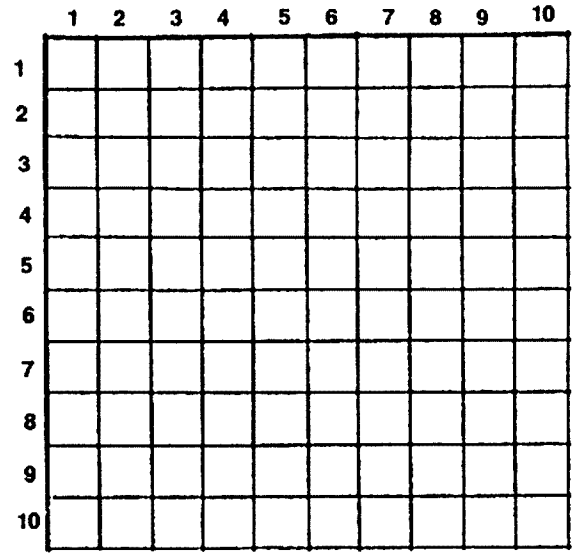
Wife of Joe Ryan VK3ABA

ACROSS

1. Painful
2. Barter
3. Part of a church
4. Stud
5. State (abb)
6. Poke
7. Indian garment
8. Bite
9. Blows
10. Interior

DOWN

1. Barren
2. Food
3. Corrode
4. Famous
5. Scottish garment
6. Scoff
7. Record
8. Currents
9. Turn inside out
10. Sped



Solution page 55. . .

TECHNICAL MAILBOX

MICROPHONIC SOLID-STATE EQUIPMENT

The amateurs of the valve era will well recall the problems in audio equipment where microphonics could be the plague of an Audio Amplifier. Rubber suspended valve sockets, and premium manufactured valves were all the go to overcome the "patter of little feet" causing the whole amplifier to oscillate in an ear-splitting howl! ! !

However, microphonics in solid-state devices! ! ! Yes, it can occur. It is not the chip rumbling around inside its plastic package, but the most likely cause is the socket into which it is fitted.

Eric VK5LP, having spent a lifetime in domestic appliance servicing, relates this relatively common problem in certain televisions.

The remedy is to remove the IC and carefully clean the pins with a non- conducting abrasive cloth (Scotchbright® or similar), spread the pins slightly and reinsert into the socket. If that fails to cure the problem, then replace the socket.

I came across this problem and initially thought I was hearing things! The above procedure cured the problem and one's sanity was restored.

ALUMINIUM CORROSION PREVENTION

This tip comes from Gordon VK2ZAB, and concerns the problem with corrosion of joints, connections, etc that can occur in antenna systems.

Utilux® sell an aluminium jointing compound H2397 (with zinc additive) and H2398 (without) which, when sparingly applied to joints or connections during the assembly of beams, etc, will preserve conductivity and guard against corrosion. Works like a "beauty" and saves the frustration of the yearly maintenance of your antenna system. Moreover, if you wish to make modifications, those joints will come apart with little effort and the aluminium will be found to be still bright and shiny.

COMMON FAULTS IN THE FT101B

John VK3RV, of Ormond, Victoria, has spent considerable time with this equipment and the following is a guide to rectifying some of the likely problems. In previous *Technical Mailbox* columns we have addressed similar faults, but here John provides the fine detail on the FT101B. Thanks John.

After having seen quite a number of FT101B transceivers with burnt-out power transformers and ruined 6JS6C final tubes, and studied the reasons for these tragic events, I figured that maybe I should share these reasons, along with preventative measures, with other members of our fraternity in view of the great expense involved in purchasing new tubes, (if you can get them) and/or a new or rewound power transformer. The bits and pieces used to prevent the above events only cost a few dollars, and may pay handsome dividends in the long term. . .

CAUSE No 1

The leakage, and subsequent insulation breakdown of the 80 pF coupling capacitor C13 reduces, and finally eliminates the negative bias on the control grids of the 6JS6Cs. Complete capacitor Insulation breakdown applies a positive bias to the grids, with subsequent enormous plate current flow, thus ruining the tubes. This can happen with the transceiver on the RECEIVE mode as well. The tubes will crumple up with the heat, the power supply is now effectively short-circuited, and if the set is not switched off immediately, the power diodes and the power transformer may be destroyed amid clouds of evil smelling smoke. C13 should therefore be replaced with a 100 pF, 3000 or 5000 volt heavy duty ceramic disc capacitor. The correct value of 80 pF can be obtained by connecting a SIMPLEX 1000 volt SM (stacked mica) 470 pF in series. This gives extra protection for the future. The joint capacity of 80 pF may be 10 percent higher or lower. The foregoing operation is carried out by firstly removing the bottom cover of the transceiver, then the shield covering the bases of the values and alignment screws. Next, carefully remove the screws holding the PB1092 circuit board. Gently swing the board to one side to expose C13. Cut this capacitor out and replace with the new ones. Replace PC1092 and shield. The 101B should now be realigned on all bands in accordance with the operator's manual.

CAUSE No 2

The same type of capacitor with the same shortcomings is used in series with the 6JS6C neutralising the variable condenser. If it shorts-out, the high voltage 600 VDC appears directly across this close spaced midget variable, sometimes causing a flash-over with similar tragic results as outlined in Cause No 1. This is very easily replaced by removing the top of the final cage, being very careful not to have the set switched on. The capacitor, C125 on your circuit will then be easily seen. I replaced mine with two SIMPLEX SM (stacked mica) 1000 volt 330 pF in series. The joint capacity is not critical as long as it is at least 80 pF and not more than 180 pF The final stage **must** then be neutralised in accordance with the instructions outlined in the Owners Manual. Neutralising the 101B, by the way, is a "piece of cake" providing NEC or Toshiba brand 6JS6Cs are used in the set and, you follow the instructions in the manual to the letter.

CAUSE No 3

If one of the 6JS6s develops an internal short circuit between the control grid and another element, this produces the same sort of situation as described above. Both tubes will be destroyed because of lack of bias or because of positive bias. Protection of the tubes and the power supply is effected by the installation of a fast-blow 400 mA fuse in the 600 volt line between the reservoir capacitor C77 and the RF feed choke to the final anodes. To do this, install a chassis mounting, open-type fuse carrier on the lower part of the side of the final box beneath the chassis adjacent to the two reservoir capacitor terminals. On most 101Bs there are two holes already drilled and tapped, so all you have to do is find a metal thread screw of the correct size and type, a washer, then screw it on. Break the red cambric covered wire between C77 and the feed choke, connecting the ends to the mounting base being careful to watch for pieces of floating solder and sharp chassis edges cutting into the insulation of this lead. Load this fuse carrier with a 400 mA fast-blow capsule. Next, remove the mains fuse capsule at the rear of the set, check its value, which should be about three amps working. However, I have found that a 1.5 amp working fuse is the correct value because the AC line current of the 101B from the 240 volt mains does not exceed 1.42 amps when the set is fully loaded. I strongly recommend the use of a fast-blow 1.5 amp working fuse here. You can, if you are a patient-type, make your own 1.5 amp fuses by drilling one-sixteenth inch diameter holes in the ends of blown glass capsules and soldering in a piece of .004 inch diameter (38 B&S) copper wire. The blowing current for this fuse has been tested at 2.7 amps.

The foregoing modifications involving fuses should be carried out for Cause 1 and Cause 2. In fact, I would strongly recommend it for all FT101s. As the power factor of the normal amateur class equipment is pretty close to unity on our 50 Hz, 240 volts AC supply, the working current of the AC line fuse should be the makers full load rating in watts or volt amps divided by the declared line voltage which is normally 240 in this country. I would therefore recommend checking this on any mains operated equipment, and despite what the makers recommend, use the obvious calculations that I have suggested. Fuse capsules in a great range of ratings may be purchased at your friendly electronics store.

CAUSE No 4

In most cases, it appears that 400 PIV diodes are used in the FT101B high voltage power rectifier boards. Each diode has a 470 kohm, half watt carbon resistor in parallel, presumably acting as a surge suppressor and voltage equaliser. However, I have found in several sets that one or two of these 470 kohm resistors have open-circuited, thus causing a rise in potential during part of each cycle across the diode, because two diodes with their respective shunt resistors are connected in series in each leg of the bridge. The PIV can go above the rated 400 PIV under these conditions, and it is my opinion that this causes many diode failures, sometimes resulting in raw AC being applied to the reservoir capacitor. The result is an enormous inrush of power from the transformer secondary. If protection is inadequate, not only all the power diodes, but the reservoir capacitors and power transformer may be destroyed. My remedy to prevent this from happening is to replace all eight diodes with 1000 volt PIV units, each diode shunted with a new 330 kohm half-watt resistor. A 1.5 amp (working) mains fuse as suggested for the previous cases would protect the transformer and reservoir capacitor. This job is a little painstaking, but not beyond the average person who uses hand tools and a small circuit board soldering iron. When removing the board (PB1076B) be careful that the wires are labelled as you unsolder them. Take care when installing new diodes and the new shunt resistors that you do not short-out tracks or sections. Clean up and check with a magnifying glass before reinstalling the board.

A NOTE ON MOULDED CAPACITORS

A noted magazine, in a recent article, suggests that moulded capacitors in which silver has been used in their construction should not be used in circuitry where DC voltage appears across them. The article stated that there was evidence of silver migration across the dielectric medium, which caused leakage, and eventually, complete breakdown of the capacitor. The foregoing technical description sounds ominously like the practical condition encountered in the failure of the 80 pF C13 and C125 in the 101B transceiver. Perhaps we should not use silvered mica capacitors in any DC-volts situation! ! !

TESTING EQUIPMENT AFTER SERVICE

The most careful person can, on occasions, make a wrong connection, leave a loose piece of solder, a nut, bolt or washer, floating around inside the equipment. Tragic results can, and do, occur because of short circuits when the 240 volts mains supply is connected for the test after service work has been done. A simple check can be made before applying the full-force of the 240 volt supply by connecting an ordinary 240 volt lamp in series with the supply cord. With a set like the 101B, a 100 watt lamp will glow bright yellow, then drop gradually to a duller colour as the heaters warm up and the filter capacitors charge. This would indicate that it is pretty safe to apply the full power to the set. With lower power equipment, use a 60 watt, or even a 40 watt lamp for this test.

TESTING POWER TRANSFORMERS FOR SHORTED TURNS

First, remove all load from the secondaries and from the tappings on the primary. A medium sized transformer, say 50 to 100 watt capacity, connected to 240 volts with a 15 watt, 240 volt, pilot lamp in series, should make the lamp glow from red to a medium yellow. Transformers rated at 100 to say 300 watts would require a 40 to 60 watt lamp for the test. The foregoing is a rough check for shorted turns. If there are shorted turns, the lamp in each case will glow almost to full brilliance.

Radio Amateur Old Timers Club

Kevin Duff VK3CV
PUBLICITY OFFICER
Radio Amateurs Old Timers Club

RAOTC DINNER AND AGM — March 5, 1987

The Radio Amateurs Old Timers' Club had its Annual General Meeting and dinner at the City and Overseas Club, in Melbourne on March 5, 1987. This was well attended with 46 members present. Our retiring President, Max Hull VK3ZS, was Master of Ceremonies. There were apologies from 19 members who came from VK2, VK3, VK4, VK7 and also from John W6GTI, one of our American members. VK7LR and Bob VK3XZ, were welcomed as first timers at our dinner and members were very pleased to see Mr and Mrs Eric Trebilcock also. Eric looked after the Victorian QSL Bureau for many years.

Members enjoyed a four course dinner and, when coffee was served, Secretary/Treasurer, Harold Hepburn spoke briefly about the finances of the Club and thanked all people who had made a donation to make sure that the OTN Journal can continue to be published. He reported that our financial position was fair to good and looked forward to our next year. The motion was put that the Treasurer's Report be accepted. Moved by Mac McConnell, seconded by Lay Cranch, motion carried.

APPOINTMENT OF OFFICERS FOR THE COMING YEAR

Max Hull VK3ZS, intimated that he could no longer stand for President of the RAOTC, but was willing, if required, to stay on the Committee. There was only one nomination for President and this was from Max Hull, who nominated Bill Gronow VK3WG, for this position. Seconded by Kevin Duff VK3CV, and the motion carried unanimously.

Lay Cranch VK3CF who for many years has been a tower of strength for the RAOTC, particularly in regard to negotiations with DOC to get our own call sign and as Net Co-ordinator, has now retired from the Committee. A new member was needed and Harvey Utber VK3AHU was nominated. As there were no other nominations he was duly elected. All other Committee members were elected unopposed.

Max Hull spoke about some of the earlier days of our Club and the fact that he has had two-three year periods as President, as well as running his business, however he would be very happy to continue with Kevin VK3CV, to produce the OTN Journal. His message was that we should attempt to attract more younger members to our Club and not give the impression that we are all octogenarians. Max thanked members for having him for so long and said that he had thoroughly enjoyed this participation.

Bob Cunningham VK3ML, spoke about our late President, and the great work he had done from the inception of the Club, right through to the production of the OTN Journals. A vote of thanks was given to Max VK3ZS.

GENERAL BUSINESS

Snow Campbell VK3MR, spoke about what he considered a great anomaly in the beginnings of the RAOTC. He felt the word "founder" should not be used and the word "organiser" should be substituted. The Committee agreed to look at our Constitution about this matter.

Lay Cranch VK3CF welcomed Harvey Utber VK3AHU, to the Committee and reminded all members that more of the 15 minute tapes, recorded by them and on any interesting subject, are required for our monthly net. Tapes (no longer than 15 minutes, please), can be forwarded to Mac McConnell VK3RV, 23 Stewart Street, Ormond, Vic. 3204.

A discussion about ways to recruit new, younger members to our Club followed and several ideas were put forward. These will be investigated by the Committee.

A very interesting video tape about the world of amateur radio was played which was very well received by all present. Thanks to Max VK3ZS and Harvey VK3AHU.

New President, Bill Gronow VK3WG, then spoke to members. He believed that the discussion earlier about new members should provide the Committee with several ideas to think about.

As Max VK3ZS, has offered to be Master of Ceremonies for future events, this offer should be taken up by the Committee.

Bill told an amusing story about obtaining his first receiving licence in 1922. In those days, you had to have a Morse test to own a receiver and for this Bill went, on his bicycle, to the South Melbourne Post Office and asked the Postmaster to give him a test. The problem was that the Postmaster only had a sounder, which Bill had never used. He went home and brought his own buzzer to the Post Office. All went well and Bill passed the 12 words-per- minute test, listening to his own buzzer! Bill said that he was grateful for the compliment of being President and would do his best for the Club. He then declared the 1987 AGM of the Radio Amateurs Old Timers Club closed.

Wireless, or radio for people now, has been around since the turn of the century. It is hard to conceive what those days were like. The following snippets have extracted from English *Wireless World* magazines of 1914 and 1915, and I hope these small pieces demonstrate the feeling of development, progress and humour taking place 73 years ago.

"SPARKS" FROM THE TROOPS

That the London electrical engineers are far from being depressed is evident from the cheery tone of their publication, *The Eclipse*, which contains some very amusing matter. The following conundrums, perhaps of a highly technical nature, are culled from the back page of the journal in question —

Where did the Ammeter? In the Magnetic Field.

Why do the British Forces offer such good resistance? Because they are OHMS.

Why did the Voltage? Because it was told it would Die-in-a-mo.

"You know we are leading a shocking life," remarked the medical coil to his partner, the dry cell.

"Yes, I think we shall have to rest soon," replied the dry cell. "I'm beginning to feel a bit run down."

WIRELESS OPERATORS MUST NOT SWEAR

A wireless operator in Massachusetts was recently admonished by the United States Department of Commerce for swearing by wireless, and warned that his licence would be revoked if he were not more careful with his language.

A PRIMITIVE WIRELESS TELEPHONE

People who spend their time in belittling great inventions, attributing great inventions to any but the proper source, have now the chance of their life with regard to the wireless telephone. The researches of Mr Marconi and other scientists in this direction will in future go for naught. The *African Mail* of recent date gives a short account of the interesting experiences of Mr James Chaplin, of the American Museum of Natural History, in his recent six years' expedition along the banks of the Congo. Among the many wonderful stories of native and animal life that Mr Chaplin has brought back with him, not the least curious is his account of the "wireless telephone; used by the natives in the forest country of the Congo. It is a wonderfully efficient system, and is quite unlike the Morse or any other that we use. The natives make noises on drums which will carry quite 10 miles, these noises resembling the sounds of words in their own language.

ARCHAEOLOGICAL RESEARCH

THE GREEK: "They have found iron wires at Athens in excavation among ancient ruins, proving that the ancient Greeks understood telegraphy."

THE EGYPTIAN: "But at Cairo it is more remarkable. They have made excavations and found nothing!"

THE GREEK: "Found nothing! What does that prove?"

THE EGYPTIAN: "Why, that the ancient Egyptians understood wireless telegraphy!"

—From *Le Rire*

SOME WIRELESS APPARATUS

A spark gap which gives good results for small power is shown in Figure 1. It consists of a piece of aluminium rod $\frac{3}{16}$ inch diameter riveted on to a piece of brass strip $\frac{1}{32}$ inch thick.

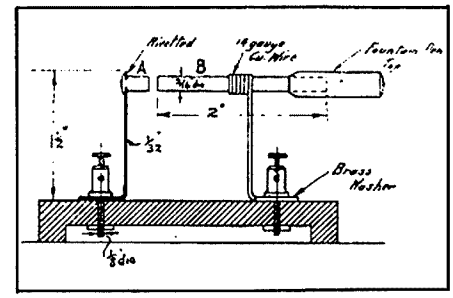


Figure 1.

The other portion has five turns of about 14 gauge copper wire wound round it. The effect of this is to allow B to be advanced to, or retarded from, A by a screwing action. The end of the wire is brought down and soldered on to a brass washer. Terminals are used to fasten A and B on to the ebonite base. An old fountain-pen top is filled with molten sealing wax and stuck on the end of B.

GIBSOR

TELEGRAPHISTS REQUIRED AS WIRELESS TELEGRAPHISTS ON BOARD SHIP

AGE 18-25

Applicants should be able to send and receive not less than 18 to 20 words per minute. Selected applicants will be paid 17/6 per week during short periods of training. Apply giving particulars of past experience, quoting this advertisement to Traffic Manager, The Marconi International Marine Communication Company, Ltd. Marconi House, Strand, London, WC.

A MARCONIGRAM

A TOUCH on the keys, a crackle,
A glow in the aerial wire,
Then, cleaving the night
With the speed of light,
Issued a message — in fire!

Next, as a buff "Marconi,"
It reached Miss Eleanor Shadd;
'Twas very concise,
But extremely nice,
And Eleanor's heart was glad.

Quickly, Eleanor, quickly!
Time and the hour slip by;
The poor little page
Has waited an age
For the expected reply!

What was this urgent business?
"Sparks" is inclined to guess;
The 'phone at his ear,
He is ready to swear,
In dashes and dots spelt — "YES!"

DOUGLAS R P COATS

WIRELESS MUSIC AT SEA

The *Adelaide Advertiser* recently contained an account of the novel experience of the wireless operators on board the American steamer *Port Kembla*, which arrived at Fremantle, WA, from New York early in April. Shortly after the steamer left New York, one of her operators, who had the receivers to his ears, was surprised to hear a human voice come from his instrument. Listening intently he was able to hear the voice call "Hullo Philadelphia," to which the answer came "Hullo Boston," followed by a further call from the first station, "Stand by for a little music."

After a slight interval the grating sound of a gramaphone came to his ears, followed by the rendering of the song "Sister Susie Sewing Socks for Sailors." The operator could hear each note as plainly as if the gramaphone were in the wireless room.

On the arrival of the *Port Kembla* at Bermuda, it was learned that other operators had experienced the same musical treat, and it was eventually ascertained that the reason for it was that some experiments were being carried out by a wireless telephone at Boston.

EXPEDITION

An unique feature of the expedition undertaken by Sir Ernest Shackleton to cross the Antarctic Continent is the arrangement made for a service of news messages to be despatched by the Port Stanley (Falkland Islands) station. This is made possible by the loan by the Marconi Company to the expedition of a complete installation for the reception and transmission of messages, and by the action of the Falkland Islands Government in arranging the service clear of all charges.

It can easily be imagined the source of pleasure this will be to the expedition, who are now wintering somewhere in the vicinity of the Weddell Sea. The installation is in charge of Mr R Jones, physicist attached to the party, who is to transfer the set to a shore station in the South. A directional aerial is to be erected towards Port Stanley.

AMATEURS IN THE ANTIPODES

About four years ago a number of wireless enthusiasts in New South Wales gathered together for the purpose of interchanging ideas concerning wireless telegraphy. The outcome of this was the formation, in 1910, of the "Wireless Institute of New South Wales," which claims to be the first amateur wireless body to be established in the British Empire. As far as we are aware, this claim is justified, for we have not heard of the existence of a wireless society in any part of the Empire prior to 1910. We are informed by the hon secretary, Mr Malcolm Perry, that there are about 400 experimenters in New South Wales and that wireless is going ahead wonderfully there. New South Wales amateurs claim to cover longer distances than amateurs in England. Mr Perry states in his letter to us that "Our amateurs here seem to do very long distances as compared with what we read about the amateurs of England. It is a common occurrence for them to do 30 miles overland with a half-inch motor coil. We tune our stations with a Marconi wave-meter, which we find very efficient." The New South Wales Institute would like to enter into correspondence with wireless societies of Great Britain. The address of the hon secretary is Box 2, King Street, Sydney. NSW.

SIGNOR MARCONI A SENATOR

In the Senate on March 17th Signor Guglielmo Marconi was introduced to the House as a new Senator with the customary formalities. He was received with long and enthusiastic applause, in which the public in the gallery joined.

ar

SUMMER QSO PARTY — 1987

The 1987 Summer QSO Party on 20 metres was held in rather poor conditions, nevertheless enticed a total of 50 members of the VK and ZL clubs on to the band, 18 of them from Victoria.

As usual, skip had a serious effect on adjacent state contacts, but many QSO totals in the 20s were recorded. Despite the difficulties, all those who sent in logs considered the three hour interlude as time well spent.

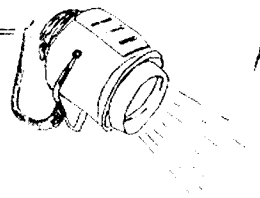
SCORES

CALL SIGN	MODE	QSOs	AREA	TOTAL
VK5SJ	SSB	29	10	1450
VK3SM	SSB	23	10	1150
VK3JA	CW/SSB	24	9	1080
VK2RJ	SSB	25	8	1000
VK3VF	SSB	19	9	855
VK3LC	SSB	21	8	840
VK3XF	CW/SSB	20	8	800
VK3GI	SSB	17	9	765
VK3KF	CW/SSB	21	7	735
VK2ABC	SSB	16	8	640
VK3KS	CW/SSB	20	6	600
VK3XB	CW/SSB	20	6	600
VK6CF	SSB	24	5	600
W6GTI	CW/SSB	19	6	570
VK2OH	SSB	14	7	490
VK7BJ	SSB	14	7	490
VK3ZC	CW	11	5	275
VK7RY	CW/SSB	9	6	270
VK3YW	CW/SSB	6	6	180
VK5KV	SSB	7	5	175
VK5RK	SSB	5	3	75
ZL3BJ				780
ZL2AB				630
ZL2AT				450
ZL1OV				320
ZL3AY				320
ZL2AKY				225

Note the dates of the Winter Parties — August 3 on 40 metres; August 10 on 80 metres. Both Parties are from 0800 to 1100 UTC. Details in OTN Magazine.

John Tutton VK3ZC

ar



Spotlight on SWLing

Robin Harwood VK7RH
52 Connaught Crescent, West Launceston, Tas. 7250

Today, I have had several interruptions whilst writing this column, and I have wondered to myself whether the June column would ever meet the deadline. We have had some renovations done at our house, so it was impossible to get peace and quiet, in which to concentrate. Easter came around, which meant distant relatives arrive at your doorstep, wanting to check on how the newlyweds are coping. Then you think that you would have a clear go, forgetting that the National Brass Band Championships are in town and that one has to go down and watch the street-marching in the city. But the last straw was when "Tiddles," our six-month tabby cat had to be taken to the vet, after being severely beaten up by the neighbour's ginger tom.

So, now let us concentrate on this month's news. As predicted in this column, the "Christian Science Monitor" has purchased KYOI in Saipan, and will be linking up, via satellite, with their parent station in Maine, WCSN. They are reportedly also going to acquire a second transmitter for their Saipan site. Programming on KYOI should be radically altered in a few months, and will be news and information, with religious programming on Sundays, just as WCSN.

The World Service of the "Christian Science Monitor" commenced on April 1, from a site close to Bangor, Maine. Studios are in Boston, Massachusetts and the station is wholly owned by the influential and respected Boston newspaper. The program-makers are utilising their correspondents throughout the world to contribute to their news output and are not relying on network newscasts as are the other private Stateside stations. I have not space to print the complete schedule, but I have found that it is best heard on 7.365 MHz, from 0600 to 0800 UTC. Programs are in English.

Another station and country also came on-air in mid-March. It is Radio WSZO in the Marshall Islands and has been logged clearly on 4.940 MHz in our evening hours. Programming is primarily in Majuro, a local language, but English newscasts have reportedly been heard, plus the sender signs off at 1005 in English. From 1900 to 0530, WCZO is on 6.170 MHz and on 4.940 MHz from 0530 to 1005 s/off. This station is in the Federated States of Micronesia, a former US Trust Territory. Another ex-territory near the Philippines is now known as Palau, and some are wondering whether they too will make it onto shortwave, in view of the tremendous interest amongst DXers to the appearance of WSZO. Incidentally, WSZO is utilising a 10 kW NEC sender.

Well, the ILG arrived for the M87 quarter in mid-April and it is not surprising as the publishers are rather annoyed because of the unofficial six broadcasting periods, the two extra periods which accommodate daylight saving in Europe. This plays havoc with frequency planners, not only at stations, but also to ILG monitors.

Consequently, not unexpectedly, the editors have wisely decided to put back publication just a few weeks to when scheduling settles. The "ILG" will still be issued four times a year — in April, May, October and November. I still find it indispensable and much easier to use than the WRTH.

Earlier this year, there was another WARC in Geneva, this time to get some agreement in High Frequency Broadcasting Scheduling. The big question was jamming and the conference bogged down on this point and deferred coming to a decision on resolution of this thorny question until 1992. So the present chaotic situation will continue. However, there were two interesting decisions at WARC 87. One was that the introduction of single sideband by broadcasters would be gradually phased in with 2015 being the target date for full SSB broadcasts. Presently many broadcasters have been experimenting with SSB reduced carrier, which is compatible on many, if not the majority of shortwave receivers throughout the world. DW and Radio Sweden have both experimented with USB for many years and results were encouraging. The Soviets have employed SSB HF Feeders for over 20 years, so have, until recently, the Voice of America, Radio Australia and Radio Beijing. One SSB HF feeder is still the only reliable way to hear Radio Liberty/Free Europe, which is under constant jamming on all of its allocated channels.

The other interesting resolution that was unanimously carried is of particular interest to Intruder Watch monitors as well as to long-suffering 40 metre operators. It is that broadcasters will, in future, adhere to 7.1 to 7.0 MHz amateur allocation and that it should remain exclusively amateur. The only known non-ITU member who broadcasts still within our exclusive allocation is Albania, whose station, Radio Tirana, is on 7.065, 7.080 and 7.090 MHz. All other broadcasters are now supposed to be out of 7.0 to 7.1 MHz. This will probably mean other utility services will gradually creep within our allocation, as is already happening.

Well, I have finally cracked the North American MW Wall. On April 2, I heard several DX stations coming through on MW from Asia and thought that I would try and see if I could hear US stations. 1540 was free from the heterodyne of the New Zealand commercial on 1539 and at 1205 I did hear an American with ABC news, thinking it was a known Hawaiian, but the call sign given was KNBS. This turns out to be a Californian five kilowatt station in Capitola. This station was confirmed to me by a logging from a Queensland listener in the *DX Post* — the monthly journal of the Southern Cross DX Club of the same sender.

There was another American station on 1.480 MHz at 1213, but there was much splatter from nearby Australian stations. I think the call was KYOR, but I am not even 50 percent sure if that is correct. Now that I've broken the barrier I am hoping to hear more North American MW stations. Incidentally, my receiving equipment is an R70 to a G5RV. The antenna should be connected to the high impedance input for maximum effect on MW. I do not have a loop antenna, but I'm hopeful of borrowing a commercial MW loop to really have a go at getting Stateside on MW!

HF conditions dramatically improved mid-April, which is a sure sign that we have turned the corner. I was pleasantly surprised to hear stations coming through well on 13 metres the other night. The latest count in mid-April was 46, yet this is expected to vary quite a bit, so don't be surprised if there are low spots again.

While we are on the South Pacific, it has recently been reported that Radio Rhema, a New Zealand Christian radio network, plans to open a MW and FM station in Tonga, with the future possibility of HF broadcasts from the same site. If this is so, it will mean another South Pacific nation for DXers and SWLs.

Well, that is all for June. Don't forget to tune over the 49 metre band around 0200 UTC for the Europeans coming from across the Antarctic.

—73 de Robin VK7RH

CORRECTIONS

Please amend the following corrections to "An Introduction to AX.25 Link-Layer Protocol" which appeared in March AR.

1. Page 8 column 1, last paragraph of *Digipeating* should read:

— until such time that a Network Layer protocol for level 3 is implemented. Once a true level 3 Networking protocol is in use, digipeating links will gradually be phased out.

2. page 8, figure 3 should read:

A stream IO Link State is: CONNECTED to
— VK6AAA
B stream
— Link State is: CONNECTED to VK6DDD P
C stream
— Link State is: DISCONNECTED
D stream
— Link State is: CONNECTED to VK6CCC via VK6BBB

...

I stream
— Link State is: CONNECTED to VK6EEE
J stream
— Link State is: CONNECT in progress

3. Page 8, column 1 and 2. *Multi-Connect Operation* should read:

STREAMSWitch $7C (:)

4. Page 8, column 2, third sentence of paragraph commencing:
The STREAMCAll On option enables the TNC-2 user . . . should read:

Notice that the STREAMSWitch character and stream identifier ":B" without the ":" displayed immediately following. . . (All occurrences of "IB" and "BI" should be ":B".

5. Page 9, Glossary should read:
HDLC instead of HGLC.

Please amend your copy.

IONOSPHERICS FROM VK2QL

Some readers may not be aware that the values of all indices are provisional. Final values are not available for several months. The A index given on the weekly VK2WI Broadcasts is for three days prior to the broadcast date. If you regularly listen to WWV you will referring back to the index of WWV for the same date as IPS there will often be a slight difference. In addition WWV gives a K index. From a chart in the possession of VK2QL, an A index of 46 will equal within the region of a K index of five which is very disturbed conditions. Those who have kept a record of the A index given on the broadcasts will not necessarily agree with that of the summary.

The monthly averages for February were 10 cm flux 71.5. Sunspot number 4; A index 9.1; I index 13.9/ No flares were observed. Solar activity was low. (See Solar Geophysical Summary, this issue for more details).

The regions visible during the month appear to have been new cycle regions. This strengthens the views we have passed solar minimum.

The table of A index value to propagation levels of magnetic disturbances are:

A INDEX VALUE	DESCRIPTION
0 to 7	Quiet
8 to 15	Unsettled
16 to 24	Active
25 to 35	Minor Storm
36 and above	Major Storm

The I index is a measure of the average level of the ionospheric critical frequencies available on a particular day. The higher the value of the I index, the higher the ionospheric critical, and MUF of HF circuits for that day. The I Index is based on data from Australian ionospheric stations and so Is most applicable to HF circuits with reflection points In the Australian region.

Awards

Ken Hall VK5AKH
FEDERAL AWARDS MANAGER
St George's Rectory, Alberton, SA. 5014

DXCC UPDATES — 1986

This does not include those with scores of 270 and above, which were published last month.

Date	Name & Call	Phone	CW	Open	RTTY
Jan	S E Molen VK2SG	256/18	138/10		159/1
	John Kelleher VK3DP			104	
	John Heine VK3JF		226/14		
	Keith Schleicher VK4KS		128/11		
Feb	Jim Swan VK2BQS	160		165	
Mar	Ken Jewell VK3AKK		205/1		
	Bob Searle VK3CSR	253/1			
	Les Cattord VK5LC	264/11			
Apr	Gerry Butler VK3GB	268/18			
	Kim Wilson VK3CYL	268/3		268/3	
May	Gray Taylor VK4OH	212			
Jun	F H Macklin VK1ZL		217		
	John Heine VK3JF		227/14		
	Tom Dowling VK4OD			163/1	
	Poppy Bradshaw VK6YF	203			
Jul	Gwen Tilson VK3DYL	240			
Sep	Bert Williams VK5BO	206/1		258/34	
Oct	Ian Thomas VK3DNC			152	
Nov	Tom Aubrey VK5EE	265			
Dec	John Kelleher VK3DP			153	

DXCC UPDATES — 1987

In future, updates will be published monthly, for all DXCC holders. The complete list of those with scores of 270 and above will continue to be published annually.

Date	Name & Call	Phone	CW	Open	RTTY
Jan	Bill Hempel VK4LC	306/35			
	Brian Lavender VK4LV		184/6		
Mar	F H Macklin VK1ZL	228			
	John Kelleher VK3DP			175	
	John Heine VK3JF		227/15	311/24	
	Bert Williams VK5BO	212/1		261/34	
	Neil Penfold VK6NE	307/10			

AWARDS ISSUED RECENTLY

Worked All VK Call Areas (VHF)
28 S J Hutcheon VK4ZSH (6 metres)

WORKED BERLIN WEST AWARD (WBW)

To encourage the activity of amateur radio stations in the area of Berlin-West the Ortsverband Schoeneberg DOK DO5 of the DARC is issuing the WBW (Worked Berlin West) Diploma.

The WBW is available to all licensed radio amateur stations (SWLs on a 'heard' basis) fulfilling the following conditions.

For the WBW, count confirmed QSOs with licensed radio amateur stations working from the different 'Postal Delivery Districts' (PDD) of Berlin-West. The PDD is a two-digit number following the name of the city of Berlin as apart of the address, printed on the QSL card. For example: D-1000 Berlin 37 denotes the PDD 37.

The WBW is issued in two categories:

Category GENERAL — QSOs in all allowed classes of emission.
Category 2 x CW — All QSOs in two-way CW.

The WBW is issued in three classes:

CLASS C (Champion) — 30 PDDs confirmed.
CLASS S (Senior) — 20 PDDs confirmed.
CLASS J (Junior) — 10 PDDs confirmed.

All QSOs after January 1, 1970, are valid for the WBW. No charge will be claimed for the WBW Class Champion in either category, otherwise the fee for the WBW in either category is DM5 or five IRCs. Stickers are available for all classes in the same category. For the first application there will be no charge for the sticker, for later applications the fee is DM1 or one IRC. For Class Champion the sticker will be free of charge.

QSL cards are not required but a GCR list should be submitted, certified by two other licensed amateurs, and signed by the applicant. Include data of call sign, date, QTR, class of emission and PDD. The GCR list and fee should be sent to the WBW Award Manager, Detlef G Liebe DH7ACG, Zinnowweg 4, D-1000 Berlin 37, West Germany, FRG.

WIA 75 AWARD RECIPIENT UPDATES

Cert No 706: Peter Nilon VK3CPN
Cert No 707: Buntoro Njoto Hartanto YC3PXF
Cert No 708: Paulus Hermawan YB3HM
Cert No 709: Achmad Soini YB3GX
Cert No 710: Mhd Ishak Delasan YC7BBI
Cert No 711: Iman Sujudi YB2IA

TEN TEN INTERNATIONAL NET IN "Twenty Eight" Chapter

In keeping with the "Twenty Eight" theme, the Chapter has devised their award program to keep within the framework of "28", "10", "10 x 10" or multiples/combinations thereof.

BASIC AWARD: (Western Third) requires 28 points including 1C or 1L (VK6 station) or IQ.
Stickers to Basic:
"North" . . . 56 points
"East" . . . 84 points
"South" . . . 112 points
"West" . . . 140 points

Each worth one point.

1st u/g "Wildflower-State" requires . . . 280 points
(including 2C/L or 3HC or IQ)
2nd u/g "Perth-on-the-Swan" requires . . . 420 points
3rd u/g "Kings Park" requires . . . 560 points
4th u/g "Rottnest Island" requires . . . 784 points
5th u/g "Twenty Eight Parrot"
Maintain a QSO of at least 28.560 minutes (Net Frequency) with another "Parrot" (holder of this award), the other station ('Parrot') to confirm QSO with CM.

(IQ Basic)

Stickers to "Twenty Eight Parrot"
'10x10' — worked 10 stations with 10 or more points
'28x10' — worked 28 stations with 10 or more points
'10x28' — worked 10 stations with 28 or more points
'28x28' — worked 28 stations with 28 or more points

Each worth one point
(IQ Basic + 1st u/g)

6th u/g "VIP" will be issued with 1st sticker (900 points)
Stickers for each 100 points to 2800
(each sticker worth one point)
For the "Basic" Award
CHARTER MEMBERS . . . (C) are worth an extra five points
'FIRST STATE' COUNTRY, PROVINCE, OBLAST . . . (FS etc) are worth four points
HONORARY CHARTER MEMBERS . . . (HC) are worth three points
OVERSEAS STATIONS . . . (DX) are worth two points
AUSTRALIA (except VK6) . . . (A) are worth one point
LOCAL (VK6) . . . (L) are worth zero points
(However, they may be needed for 'Basic' or 1st u/g)
"FIRST STATE" etc will also be used for u/gs but not for stickers
C/HC cannot be FS etc. HC given at discretion of CM/CH
NOTE:
1. Station can be worked ONCE ONLY for Basic and stickers to Basic.
2. Stations can be worked once again for 1st and 2nd u/g. (If the station has not been worked before, can be worked a second time provided there was at least 24 hours between QSOs).
3. Stations may qualify for the "Twenty Eight Parrot" at any time. However, it will not be issued until after the 4th u/g, and will be sent with it.
4. "First Country", "First State" etc, apply to Basic and all u/g.

COST: $2 each Award plus $1 for postage (one IRC exchanges for $A.50). Except "Twenty Eight Parrot" which will be free. Stickers to basic: 25 cents each plus SASE or sent DX with next u/g. Stickers to "Twenty Eight Parrot and "VIP" to be advised later.

When applying for these awards, always Include:
Call sign of stations worked, 10x: No, Date and points claimed.

Proof of current membership also required.

CM/CH "Twenty Eight" Chapter, Dave Handscomb, PO Box 1073, Subiaco, WA. 6008.

Magazine Review

Roy Hartkopf VK3AOH
34 Toolangi Road, Alphington, Vic. 3087

G General **C** Constructional **P** Practical without detailed constructional information **T** Theoretical **N** Of particular interest to the Novice **X** Computer program

BREAK IN, January 1987. QRP issue (G C N)
QST, February 1987. Radio Frequency Chokes (C N). Product Review Index (G). Monolithic Wideband Amplifiers (P).
RADIO COMMUNICATION, March 1987. Commercial Equipment — readers' survey (G). Annual General Meeting (G). 1200 MHz Oscillator (C)
RADIO COMMUNICATION, April 1987. Long Yagis (G). FET Dip Oscillator (P).
CQ, January 1987. Low Cost Dip Meter (N). Antennas and Guy Wires (P). Old Radio Gear (G).
OSCAR NEWS, March 1987. Official Journal of AMSAT-UK with news of satellites, equipment, etc. (G).
WORLDRADIO, February 1987. General information on amateurs, equipment, International news, maritime mobile, etc (G).

Australian Ladies Amateur Radio Association

Joy Collis VK2EBX
PUBLICITY OFFICER, ALARA
Box 22, Yeoval, NSW. 2868

JAPANESE VISITORS FOR JOAN VK3BJB

I have received another letter from Joan VK3BJB, adding a further chapter to the story of her Japanese language lessons (May AR).

Five of the six-man crew of the yacht, *Okira 7*, in Melbourne for the Melbourne-Osaka Yacht Race, found they had time to spare before the commencement of the race, and decided to pay Joan a surprise visit to personally thank her for relaying messages to their families in Japan during the two month voyage to Australia.

They had no idea of Joan's address, but did have a telephone number, given to them by the Okera Net Controller. What they did not know was that the telephone number was incorrect, and was actually a disconnected Wentworth number.

Meanwhile, the net controller, JE6AAQ, realising his mistake kept regular scheds with Joan every hour to see if the "surprise" visitors had arrived safely, becoming increasingly concerned as the hours went by with no sign of them. Finally Joan decided to check the hotels and motels in Mildura, reasoning that they would need somewhere to stay overnight. At the sixth motel contacted she located the missing visitors, who could not work out how Joan knew they were in Mildura, or how she managed to find them.

Joan and her family subsequently travelled to Melbourne on March 20, to meet the Japanese yacht crews and attend the farewell party, given by the Sandringham Yacht Club, as guests of the Japanese entrants.

Joan has assisted other Japanese visitors to Australia with travel plans. She says; "Many Japanese people have no idea how big Australia is and how long it takes to travel from one place to another."

Not only Japanese call on Joan for assistance. She was recently instrumental in making a contact with Sweden for a Swedish girl in Mildura for the grape picking season.

As Joan says; "Never a dull moment in this place."

ANOTHER ALARA?

Following an article about ALARA written for *73* magazine by Jim Joyce VK3YJ, the following letter was receive by him:

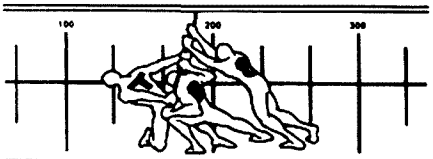
"A friend of mine gave me an article from *Amateur Radio* (February 1987, page 94) about the Australian Ladies Amateur Radio Association (ALARA). I am involved in a different ALARA organisation.

"In my case, ALARA stands for As Low As is Reasonably Achievable and is a world-wide group that exists in Nuclear Power Plants. Our aim is to maintain plant workers exposure to radiation ALARA. We do not have our own song but, we do have stickers that all at Pilgrim Station wear on our hard hats — enclosed is one of them. As the sticker states "Time, Distance and Shielding" are important ALARA principles since they all play a big role in exposure reduction.

"You may no longer have the America's Cup but, any country with a great ALARA group is fine by me.

"Sincerely,
"Patty Robinson."

PILGRIM STATION **alara**



TIME • DISTANCE • SHIELDING

The Other ARRL Logo.

THE LADY WITH THE MORSE CODE LAMP

Judy VK5BYL, came across the following article while looking through some old magazines.

"She waved her way to happiness
"Ill in bed, a girl from a Tasmanian sheep station waved to passing ships and became known to seamen all over the world. . .by Vernon Black.

"It took a Dutch sailor to bring to my notice the unique hobby of Kathleen Cashion, of East Arm, on the River Tamar, Tasmania. He was Commander Klass Tiel, of the *Admiral Crinjssen*, and at first I wondered what on earth he was so excited about. I couldn't see anything unusual in a wave to a passing ship.

"The Commander, however, was delighted to receive a message from a young woman as his famous little destroyer steamed up the Tamar soon after the war ended.

"Soon I became as interested as the Commander, and investigations unfolded an unusual and romantic story. I discovered that Kathleen Cashion never missed sending signals to passing ships, and had made friends in many parts of the world by this means.

"All this started about 15 years ago when the Cashion family first moved to East Arm. Kathleen was ill at the time, and used to wave to the ships as they went by, up and down the river. The officers and men on board used to wave back to her, and soon began to send her messages with flags and lights in Morse code.

"It was an opportunity for her to learn flag signalling and Morse code while she was sick, and she was soon able to wave a "good morning" or "good afternoon" to a ship.

"After a short while she wouldn't let a ship go by without sending some form of greeting, and the men in the ships always replied to her.

"When a ship ran aground near the Cashion property some years ago, the authorities installed a light on the point, and knowing of Kathleen's interest in ships, they asked her to be caretaker of the light. Of course she said yes and since then has had charge of Sheeptail Light, commonly known to seamen familiar with the river as "Kathleen's Light."

"During the war when signals to and from ships were banned, Kathleen's messages got through, because the Navy granted her special permission to continue her self-made job.

"Imagine the astonishment of the crew of a Norwegian freighter when they entered the river during the war and found Kathleen using a Morse lamp! Many other ships, including visiting British submarines, Dutch destroyers, and overseas cargo ships were welcomed — and surprised — by her messages.

"There's quite a social aspect to Kathleen's waving — whenever she visits Launceston she is entertained on board various ships and she receives letters and presents from seamen in all parts of the world. She's *even had* proposals of marriage in Morse code but prefers to remain sweetheart to all sailors and wife to none."

—From *Woman* September 19, 1949

Judy wonders ". . .if Kathleen eventually married a sailor or not, and whether she became interested in amateur radio." Judy suggests that perhaps some VK7s might be able to find out a little more about Kathleen.

So, how about it, VK7s? Is there anyone in Tasmania who knows what became of Kathleen Cashion?

Judy does the Slow Morse sessions once a week, a task she enjoys. At the time of writing she was planning to be active in the John Moyle Contest using "pedal power."

We would be interested to know how many contacts you made, Judy, not to mention how much slimmer you will have become with all that exercise!

WARO CONTEST

A number of ALARA members participated in the special Silver Jubilee Thelma Souper Memorial Contest held on April 4 and 5. Conditions on 80 metres were very good, and the contest proved most enjoyable with some high scoring being achieved.

Many ALARA members have qualified for the attractive Silver Jubilee Award, issued for WARO contacts during the month of March.

WARO had its beginning in March 1962 with a membership of seven. By January 1987, the number had grown to 218.

Silver Jubilee congratulation to our sister YLs across the Tasman.

GET-TOGETHER

Plans for the September ALARA Get-Together are well under way. Further to the details already given in March AR.

Registration Fee — $20 per head to cover meals.
Children —
Up to five years — $5 per head.
Five to 10 years — $10 per head.
10 to 15 years — $15 per head.
Over 15 years — $20 per head.

Registrations and inquiries to Maria VK5BMT.

NEW MEMBERS

It is very pleasing to see a steady flow of DX. YLs joining or being sponsored into ALARA, and the continuing growth of the VK membership.

A warm welcome to Vicki VK5FK, Dawn ZL2AGX, Tuti YD0TTK, and Mimi ZS5YO.

That's all for this month.

—73/33, Joy VK2EBX

Club Corner

OXLEY REGION AMATEUR RADIO CLUB FIELD DAY PORT MACQUARIE

June 6 and 7
Details: PO Box 712, Port Macquarie, NSW. 2444
or phone Lester O'Connell
(065) 83 1100 (BH)

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THE TWENTY EIGHT CHAPTER

We are a group of amateur radio operators.

As many are aware, radio propagation varies, among other factors, within a 10-11 year cycle, according to the activity of Sunspots, hence known as the "Sunspot Cycle." At the moment we are at the 'low' of Cycle 21 and about to enter Cycle 22. As a result, propagation will soon begin to improve again, especially on the 28 MHz (10 metre) band, which is most affected by the Sunspot Cycle.

In 1962, a group of amateurs in America formed an organisation to promote activity on this band, the organisation has come to be known as *Ten-Ten International.*

All the members of our group belong to 'Ten-Ten' and the WIA, and with the increasing activity anticipated, we see this as an excellent opportunity to publicise the State of Western Australia, and, in particular, the City of Perth and surrounding districts.

To that end we are planning to form the first Chapter of 'Ten-Ten' in WA (there have been a number of chapters started in the Eastern States as well as about 250 throughout the world, but never before has there been a 'Ten- Ten' Chapter in WA).

We plan to call our Chapter *The Twenty Eight Chapter* — the name being inspired by reading that:

Twenty eight parrots, so named because of the resemblance of their call to the words 'twenty eight' are the most common parrots in the neighbourhood of Perth (WA). Unlike most Australian parrots, they are bold, inquisitive birds, and is alarmed will sit overhead and call loudly instead of flying away. This will often bring in large numbers from nearby and all join in the commotion.

—if you have ever listened to a "Ten-Ten" net you will understand exactly why we think this is an ideal name for our Chapter.

See the Awards Column of this issue of AR for Certificates offered by the Chapter.

The Chapter Net is held each Sunday on 28.560 MHz at 0230 UTC.

For further information join in on the net or contact Dave Handscomb VK6ATE (ex-VK6NHD), PO Box 1073, Subiaco, WA. 6008.

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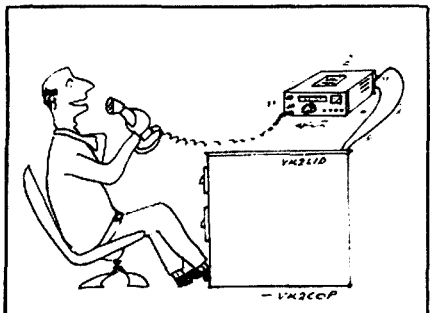

"Rig is 'drifting' a bit here, OM!"
—VK2COP

BEACONS AND REPEATERS

Tim Mills VK2ZTM
FTAC BEACON CO-ORDINATOR

In the last issue, an indication was given into the establishment, by a club or group, of a beacon or repeater facility.

This time I would like to list some of the subjects that need to be addressed.

CAN IT BE JUSTIFIED?

Many think it would be nice to have the facility but may give little thought to the long term involvement. Besides the initial financial outlay on the system, there is the ongoing cost of license, power, insurance, maintenance and cost involved with the site. There is also the personal required to maintain the system.

Is you region already served by a suitable system? Will it continue to receive the use after the first round of button pushing a new system?

RUNNING COSTS

A well engineered system should not require a site visit more than every few months. (Usually to check the batteries). If it is operated within its commercial specifications there should be little wear and tear. If you do not receive free power from the site host, then extra funding is required from your group funds.

FREQUENCY DETERMINATION

The central data bank maintained by FTAC now greatly assists the State technical committee and the applicant group work out the most suitable channel available. All the major bands have now been planned for both beacons and repeaters, so the general framework exists.

THE SITE

This is often hard to find as most RF hills are already occupied. (Or if you intend a two metre system there is already a pager there or nearby). It is most important that (written) permission is obtained prior to installation. It can be embarrassing to be caught. For security purposes to both yourselves and your host, do not publicise its exact whereabouts. There are some anti-social types about.

THE EQUIPMENT

Work around reliable equipment that does not need a visit every other day to readjust. Elevated sites are hard on antennas and coaxial installations, so either construct them well or obtain good commercial ones. Make them blend with the other site antennas so they are hard to pick out. This improves your systems security. Make sure it is RF clean, equipment wise, as it often has to live with other systems.

STAND ALONE OR LINKED?

Many country regions do not have the amateur population to justify the time, effort and expense. In these cases and with other established systems in a similar geographical region there may be benefit in being linked to provide increased coverage and additional users.

WHICH BAND?

While most think of two metres for repeaters, the 70 cm band should not be overlooked. In much of the eastern part of Australia, the two metre band has become saturated. The 10, six and 23 (cm) bands also offer facilities but with less possible users. These should be considered, more as supplementary systems after some area coverage has been achieved with two and 70.

HOW DOES ONE ESTABLISH A SYSTEM?

In the first instant after the group decides that they would like to establish a facility they should contact their State Repeater Committee for advice on what channels are available and if other systems are being planned.

In these notes over the next few issues I will expand on some of the above points.

In closing, may I remind the various groups to keep FTAC advised and updated about your system so that the data bank can be maintained for the benefit of all. This will also ensure accuracy in the Call Book listings.

Intruder Watch

Bill Martin VK2COP
FEDERAL INTRUDER WATCH CO-ORDINATOR
33 Somerville Road, Hornsby Heights, NSW, 2077

Well, here we are in winter, and the year seems to be flying by. Listening on HF reveals a mixed bag, and I think it is a question of being at the right spot at the right time. It is disappointing to hear scheds being conducted on or around 14.100 MHz, the International Beacon Frequency, and makes it difficult to check propagation through SSB signals.

Those readers who have AMTOR facilities might like to have a look around 14.104 MHz and up, and let me know if they learn anything of the origins of the signals. Some of them are thought to be coming from Auckland, New Zealand, and the IW in ZL are looking into that from their end. Some confirmatory bearings from VK would be helpful.

Good reports were received for February from VK1s HF, WX; VK2s CS, SG, Arthur Bradford; VK3s AMD, XB; VK4s AKX, BG, BHJ, BTW, DA, KHZ, OD; VK5s AF, GZ, TL; VK6s JQ, RO, XZ; VK7RH, VK8s HA, JF and VK9NI.

Some spill-over observed into the 40 metre amateur band from USA operators on the "MARS" network. Bit disappointing. . .

Congratulations to the DARC Monitoring System, in West Germany, for their 15th Anniversary. Their Intruder Watch (Bandwacht) was started in 1972 by Rudolf Klein DL2DZ, and is still very active.

Some encouraging news, again from West Germany, concerns the WARC for the planning of the HF bands allocated to the broadcasting services in Geneva, 1987. Resolution No 641 resolves that "the broadcasting service shall be prohibited from the band 7.0 to 7.1 MHz, and that broadcasting stations operating on frequencies in this band shall cease such operation" and urges that "the Administrations responsible for the broadcasting stations operating on frequencies in this segment to take action so that such operation ceases immediately"! The ITU Secretary General is requested to bring the resolution to the attention of the Administrations. Of course, this has been tried before, but there is a lot to be gained from the exercise, and certainly nothing to be lost!

So that's about all I have for this month. . . see you next month, and keep the IW in mind when you hear that next intruder (and you will!).

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MARINE RADIO

The Icom M-700, a 48 channel HF SSB/AM marine transceiver, can transmit and receive on any authorised marine channel from 2 to 23 MHz with up to 150 watts output (selectable outputs — 20, 60 or 150 watts).

Ideally suited for small craft, the M-700 can also be programmed to receive-only on any frequency from 1.6 to 24 MHz, providing access to facilities such as weather FAX (weather chart facsimile transmissions on 5.100 MHz), local standard time (4.500, 7.500 and 12.000 MHz), news broadcasts or international (UTC) time and Pacific areas weather (10 and 15 MHz).

Allocation of frequencies to the 48 simplex and semi-duplex memory channels can be made according to individual requirements or Icom can supply the M- 700 fitted with all popular marine frequencies.

Frequency selection is controlled by two rotary channel switches — the first controls channel group selection with three channel groups in logical order according to purpose and a fourth position providing instant emergency access to the 2.182 MHz International Safety and Calling Frequency. The second controls selection of 16 frequencies within each logical channel group.

Because the output of some marine transceivers does not always exactly match the specified marine channels, the M-700 is fitted with a received signal 'clarifier' to adjust the pitch of SSB signals, making off-frequency signals easier to understand.

Exacting specifications ensure that the unit is locked on its operating frequencies and electronic frequency programming of the M-700 by any authorised technician means it will always keep abreast with changing frequency allocations.

A voice-activated squelch allows listening on favourite marine channels without the pop and crackle of less sophisticated HF transceivers, whilst a built-in noise blanker eliminates annoying static and electrical impulse noise from received signals. The noise-cancelling microphone allows clear, noise-free transmissions even in rough weather. An optional telephone-style handset allows privacy of conversations when needed.

The M-700 comes with its own heavy-duty mounting bracket and is compatible with most marine and general purpose antenna tuners. Used with the Icom AT- 120 automatic antenna tuner and a wire antenna or backstay, the unit can usually change from band to band in less than three seconds.

For more information contact your nearest authorised Icom dealer or Icom Australia, 7 Duke Street, Windsor, Vic. 3181. Telephone (03) 529 7582.

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IPS USER TRAINING COURSES

To increase the value of their services, IPS Radio and Space Services are offering users a one-day training course. The course consists of three lectures, each of which is followed by a question/answer session. Topics included in each lecture are:

Lecture 1 — Scientific Background to IPS Predictions

- The ionosphere and its formation
- Reflection and absorption of radio waves
- Ionospheric variations
- Mapping and predicting the ionosphere

Lecture 2 — HF Radio Propagation and Prediction Formats

- Oblique propagation
- IPS predictions and formats

Short-Term Disturbances Caused by the Sun

- The sun-earth environment
- The main types of solar activity
- The terrestrial effects of solar activity
- Warning services provided by IPS

The presentation of the course is based on overhead transparencies. Each participant receives a copy of the IPS User Training Manual which includes copes of the transparencies used, along with relevant descriptive text and a copy of a Handbook describing IPS services.

Generally the course is aimed at the HF communicator, but the presentation can be tailored to suit the audience by emphasising topics of special interest.

The UTC course is presented in Sydney during September of each year. For other regions, the course is presented regularly, usually on a two year cycle, at locations throughout Australia. The following table provides details of locations and dates for proposed courses for financial years 87/88.

Perth	July 1987
Adelaide	October 1987
Darwin/Alice Springs	April 1988

Venues for the courses have not yet been organised. Usually during the registration period prior to a particular course, participating organisations are invited to offer a suitable venue. The cost per person attending a scheduled course if $55 for the day.

The training course will normally occupy the period 0900 to 1500.

IPS can provide user training courses outside of the above schedule. In this case, a flat fee of $500 per day is charged and there is no limit to the number of people attending the course. Each participant will be presented with a training manual (additional charge $10) which covers the course content. The inviting organisation is asked to provide travel, accommodation and meals.

For further information contact D G Cole, Assistant Secretary, IPS Radio and Space Services, 162-166 Goulburn Street, Darlinghurst, NSW. 2010. Phone (02) 269 8555.

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HEAD OFFICE MOVES

Vicom Australia Pty Ltd has recently moved its Head Office to cope with an aggressive expansion program commenced at the start of 1987.

Vicom has moved to new premises at South Melbourne, which offer expanded areas for its research and development, consulting and manufacturing activities. The new building covers 14 000 square feet and also houses Vicom's National Service and Support Centre.

This is Vicom's third relocation since commencing business in 1974.

The company has recently diversified into the computer business with the distribution of *GRiD* laptop personal computers. The GRiD is considered the *Rolls Royce* of personal computers.

Vicom's new address is 4 Meaden Street, South Melbourne, telephone (03) 690 9399.

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ESD INTERFERENCE SIMULATOR

The new high-performance Electro Static Discharge (ESD) simulator NSG 432 has been designed by Schaffner Elektronik AG to simulate electrostatic discharges in a range from 2 to 25 kV. The high 25 kV test voltage complies with recent test specifications and makes it ideal for testing devices requiring high security against ESD interference and sabotage.

The NSG 432 design concept provides the ability to add the following options for special test operations:

- Power supply with precounter to preselect a required number of discharges
- Negative HV cascade for negative discharge from two to 25 kV
- E field adapter simulating body capacitance
- H field adapter generating induced electromagnetic interference
- Adjustable spark gap for calibrating the discharge distance onto the test object

The NSG 432 being a universal ESD test instrument is conceived to meet all relevant national and international standards, the simulator is designed such that it can be expanded to meet future legislation.

For further details please contact Westinghouse Systems, 80-86 Douglas Parade, Williamstown, Vic. 3016. Telephone (03) 397 1033.

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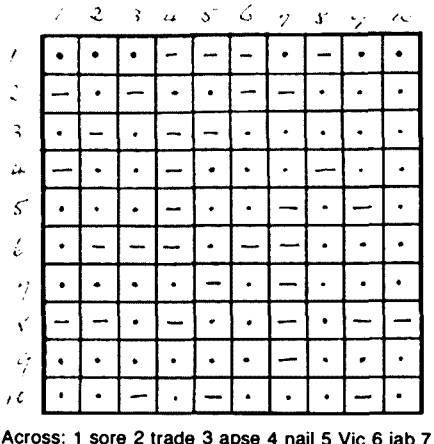
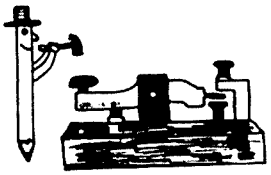
MORSEWORD 3 SOLUTION



Across: 1 sore 2 trade 3 apse 4 nail 5 Vic 6 jab 7 sari 8 gnaw 9 hits 10 inner

Down: 1 arid 2 fare 3 rust 4 noted 5 kilt 6 gibe 7 log 8 tides 9 evert 10 hied



Pounding Brass

Gilbert Griffith VK3CQ
7 Church Street, Bright, Vic. 3741

Funnily enough, I am writing this on March 10, only a few days before the John Moyle Field Day. Last weekend I visited my chosen site for a test and found thick ice on the telephone pole that I was to climb to string up the dipoles. If it is not so cold next Saturday I may get the other one tuned up in time. Thanks Peter VK2PA, for the test transmission.

Contesting is a bit like sitting for your Morse exams all over again, isn't it? A lot of hard work and preparation and then waiting for the results. Thank goodness it is a lot of fun, especially if you try new things in the field day. Three telephone calls is all it took to obtain permission to use the Mount Hotham fire lookout tower, so I'll let you know how it goes. . .

This month I have more letters from amateurs asking for help or advice with on-air practice. I mentioned this on the Friday net (3.510 MHz 1030 UTC) and both Les VK3BPW and John VK3PIZ have very kindly offered their services. So if you are after a Morse OSO, as slow as you like, you don't have to join a net, just drop Les or John a line, QTHR. Why not drop in on the net, too?

Another regular net member, David VK3DVW, has sent in the following article written by Maurie VK3AVO. It should straighten out some of the errors we have been making in our terminology. I know I often use the term CW when I should use Morse.

"The terms CW and Morse code are not, never have been, and never will be equivalent or synonymous. CW is simply one of several methods by which this code is sent over the airways. The definitions to be used in this article are based on English specifications as spelt out in reference[1]. I have been told, but cannot verify by reference, that some American texts differ in these specifications but my original statement still stands. CW and Morse code are not one and the same thing.

"Let us examine each method of transmission in turn and look at its characteristics:

(1) CW or continuous wave

This is by far the most common mode of telegraphy by which the code is sent. One central frequency now, but not always, called the carrier is used. It is broken into the familiar dits and dahs by a process that turns the transmission on and off according to the message being sent. This mode of transmission has the disadvantage of not being readable on a receiver that lacks a BFO, as the speaker only emits a series of hisses.

Back to the statement regarding the word "carrier." Originally this word was applied only to telephony as it was said to 'carry' the information after modulation of its amplitude or frequency.

(2) ICW or Interrupted Carrier Wave

This method transmitted the carrier in a series of very short bursts each time the key is depressed. If the carrier is interrupted at an audio frequency rate, say 1000 times per second, this signal will produce an audio tone of 1000 Hz after it has passed through the demodulator stage of a 'conventional' AM receiver and hence a BFO is not necessary for reception.

The most common method used to produce this interrupted carrier was to use an interrupter or tone wheel driven by an electric motor. The rate of interruption and hence the frequency of the audio tone was determined by the number of segments on the wheel and the rate which it was rotated.

(3) MCW or Modulated Continuous Wave

With this method the carrier was transmitted for the entire over. Code transmission is achieved by keying, hence turning on and off, an audio oscillator which amplitude modulates the carrier during key down periods thus producing the usual upper and lower sidebands. This mode too can be received without the use of a BFO but occupies more of the spectrum because of the sidebands.

". . .I was prompted to write this article after reading the Editorial of an amateur radio magazine (not AR). The subject under discussion was who should conduct the CW examinations. Perhaps the day will come when we will be examined by listening to Morse code sent over the airways by the CW mode. I am joking of course but my point is this — confusion regarding CW and Morse code has been going on for far too long and it is a shame to see it being perpetuated in professional publications.

References 1/1939 Radio Engineering, Odhams Press Ltd, London."

Thanks David, the above article will make it sink in, I'm sure.

I guess it is a lot easier to say we like CW than Morse code, or perhaps more correctly International code. The original Morse code was really nothing like what we now use.

Now a quicky from Jack VK5AF, which I will squeeze in because if I don't it will be sure to get lost in the files.

Jack says, "I cut my teeth on the sounder and they say that if you can read the sounder, you can read anything. I well remember my first fair-dinkum exposure to visual telegraphy when I was a Radio Officer in a merchant ship during the war. Merchant vessels do not usually carry signalers, this duty devolving to the deck officers. Because signals is only a small part of their curriculum and they do not get a great deal of practice in peacetime, some were not over proficient at high speeds, whereas Navy signallers were good, knew it, and delighted in taking a rise out of us Merchant Service yobbos. It was therefore common practice for radio operators to double as signallers.

"It was our first day in convoy, and, just on daybreak, I received a call on the bridge blower telling me 'get yourself up here Sparks and see what this joker is on about'.

"Climbing out of my comfortable chair in the nice warm radio room and throwing on some wet weather gear, I made my way to the bridge. Through the rain squalls I could just make out a destroyer over on the horizon, blinking at us at about 15 words per minute. (Fast for V/S). The message contained our zig-zag courses for the next 24 hours (zig-zagging, random course changes, was a ruse to make it a bit more difficult for enemy submarines to aim their torpedoes) and there was no room for error, as, with some 30 ships steaming in close formation, if everyone did not do the right thing at the right time, the resulting kerfuffle can be imagined. I didn't have to change my underwear when I went below but it was close.'

Before I close down for this month, there is some advice that I really need. Since starting what I thought would be a mammoth task in writing, I have found that what is needed is something more. It seems that there are an awful lot of amateurs out there who need a lot more information than Pounding Brass can supply. Not only do I fail to reach half or less of the amateur population, of VK land, but there is a lot of information pouring in from sources that just will not fit. Marshall was hinting about a book devoted entirely to Morse, and I agree that is what is needed. So, to start off, I will be collecting all the information that I can on the subject, including items on operating practices, codes, abbreviations, equipment etc, with the hope of finding a publisher who, together with appropriate advertisers, can finance a publication in the cheapest format. Please don't expect miracles, but do send me your ideas.

—73, Gil.

Sydney Amateur Digital Communications Group AX25- X3 Protocol for use in Amateur Packet Radio

Steven Blanche VK2KFJ
Secretary, SADCG
PO Box 231, French's Forest, NSW. 2086

Part 3: TNC PARAMETER VALUE SUMMARY

* = default value
\# = not supported
% = additional to X.3 standard
Values in square brackets are the defaults for Transparent Mode.

NO	DESCRIPTION	VALUE	FUNCTION
1	Command Escape Character	0	not possible
	[0]	*27	ESC character
		1-26, 28-255	optional values
2	Echo	0	no echo
	[0]	*1	echo
3	Data Forwarding	0	full packet only
	[0]	1	alphanumerics
		2	carriage return
		4	ESC, BEL, ENQ, ACK
		6	carriage return, ESC, BEL, ENQ, ACK
		8	DEL, CAN, DC2
		16	ETX, EOT
		18	carriage return, EOT, ETX
		32	HT, LF, VT, FF
		126	all control characters
		%128	line feed
		*%130	line feed, carriage return
4	Idle Timer	0	no timer
	[4]	*32	approximately 7.5 seconds
		1-31, 33-255	other delay values
5	Flow Control to TNC	0	no flow control
	[4]	1	X-ON/X-OFF (data transfer)
		2	X-ON/X-OFF (data transfer and command)
		*4	CTS/RTS flow control
6	Control of TNC Service signals	0	no service signals
		1	transmit service signals
	[0]	*5	transmit service and prompt signals
7	Operation on Break	0	no action
	[8]	*8	escape from data transfer state
8	Discard Output	*0	normal data delivery
	[0]	1	discard output to terminal
9	Carriage Return Padding	*0	no padding
	[0]	1-255	number of nulls inserted after CR
10	Line Folding	*0	no line folding
	[0]	1-255	number of characters per line
11	Binary Speed (set up by AUTOBAUD)	0	110 bit/s
		134.5 bit/s	
		1	
		2	300 bit/s
		3	1200 bit/s
		4	600 bit/s
		5	75 bit/s
		6	150 bit/s
		7	1800 bit/s
		8	200 bit/s
		9	100 bit/s
		10	50 bit/s
		# 11	75/1200 bit/s
		12	2400 bit/s
		13	4800 bit/s
		14	9600 bit/s
		15	19200 bit/s
		# 16	48000 bit/s
		# 17	56000 bit/s
		# 18	64000 bit/s

NOTE: It is not possible to change parameter 11 using SEt command.

12	Flow Control to Terminal	*0	no flow control
	[2]	1	X-ON/X-OFF flow control
		%2	CTS/RTS flow control
13	Line Feed Insertion	0	none
	[0]	1	after carriage return to terminal
		2	after carriage return from terminal
		4	after echoed carriage return
		*5	values 1 + 4
		6	values 2 + 4
		7	values 1 + 2 + 4
14	Line Feed Padding	*0	none
	[0]	1-255	number of nulls after line feed
15	Editing	0	off
	[0]	*1	on
16	Character Delete	*8	BS (backspace) character (® H)
	[8]	0-7, 9-127	other characters
17	Line Delete	*21	NAK character (® U)
	[21]	0-20, 22-127	other characters
18	Line Display	*18	DC2 character (® R)
	[18]	0-17, 19-127	other characters
19	Editing Service Signals	0	no editing service signals
	[0]	1	editing for printing terminals
		*2	editing for display terminals
		# 8	editing using characters from range 32-126
20	Echo Mask	*0	all characters echoed
	[0]	1	no echo of carriage return
		2	no echo of LF
		4	no echo of VT, HT, FF
		8	no echo of BEL, BS
		16	no echo of ESC, ENQ
		32	no echo of ACK, NAK, STX, SOH, EOT, ETB, ETX
		64	no echo of editing characters
		128	no echo of all control characters or DEL
# 21	Parity Treatment	# 0	no parity detection or generation
	[3]	# 1	parity checking
		# 2	parity generation
		* # 3	value 1 + 2
22	Page Wait	*0	no page wait
	[0]	1-255	number of line feed characters before waiting
%23	Buffer Cushion	*80	number of characters in cushion
	[80]	2-79, 81-254	other values
%24	Linked Timeouts	*16	maximum consecutive timeouts linked
	[16]	1-15, 17-255	other values
%25	Unlinked Timeouts	*5	maximum consecutive timeouts when not linked
	[5]		not linked
		1-4, 6-255	other values
%26	Line Timeout	*10	approximately 10 seconds
	[10]	1-9, 11-255	other values
%27	Duplex Line Control	*0	no duplex line control
	[0]	1	always assume that channel is clear
%28	Clear to Send Delay	*32	approximately one second
	[32]	1-31, 33-255	other values
%29	Link Control	*0	normal
	[0]	1	links to other nodes not permitted
%30	Unused Link Control Parameter		
	[0]		
%31	Information Frame Call Sign display while unlinked	*0	0 = do not display call signs
	[0]		1 = display call signs while unlinked
%32	Received Packet Forwarding	0	only pass packets when linked
	[1]	*1	pass unlinked packets
%33	Maximum Packet Length	*200	maximum output packet data bytes
	[200]	3-199, 201-250	other values
%34	Unused Network Control Parameter		
	[0]		
%35	Digipeat Control	*1	0 = digipeating disabled
	[1]		1 = digipeating disabled
%36	Unused Network Control Parameter		
	[0]		
%37	Unused Network Control Parameter		
	[0]		
%38	Unused Network Control Parameter		
	[0]		
%39	RLSD (CD) Line Control	*0	always on
	[0]	1	indicates if link is established
%40	Data Mask	*127	mask off high order bit
	[255]	255	pass all eight bits in each byte

In the manual, there is references to the Master Control Subsystem. This is a part of the software package supplied bv the SADCG for the VADCG TNC, and will be covered in more detail in Part 4.

Electro-Magnetic Compatibility Report

Hans Ruckert VK2AOU
EMC REPORTER
25 Berrille Road, Beverly Hills, NSW. 2209

TV & FM-BC PRE-AMPLIFIERS AND THEIR PROBLEMS

Preamplifiers are installed because the received signal is not sufficiently strong to permit, for example, "snow-free" television reception or noise-free stereo FM signals. The RF gain of the television set or FM radio front end may be too low or the RF amplifier may generate too much noise. This means, also, that the receiver is working with maximum gain, and under these conditions, the dynamic range and intercept point may be very low too. Therefore, legal transmitter operation in the vicinity of these installations may affect the television and FM reception, unless these receivers have sufficient selectivity to make them compatible with other services, which do not operate on television or FM radio channels. The users of these receivers will usually blame the innocent legal transmitter operators, claiming that they cause *interference*. They may not understand that legal transmissions do not cause *interference;* they may *affect* substandard (perhaps illegal) receivers in an undesired way. It is up to the users, and manufacturers to make these receivers or preamplifiers compatible with legal transmissions, which do not use television or FM channel frequencies. Did the dealer who sold the preamplifier, and perhaps installed it at the masthead or under the roof, inform the customer that he may have to expect unwanted RFI? Do we have standards, which define the selectivity and dynamic range requirements these preamplifiers have?

This situation became so bad in West Germany, overloading the local radio inspectors with complaints, that the FTZ (equivalent to VK's DOC), had to introduce the necessary regulations and exercise strict controls, because most people lived in home units using preamplifiers. The electronics magazine *Funkschau* (West Germany) issued several special editions to educate all concerned on the EMC requirements (*Funkschau,* No 12, 1977). The installation of the preamplifiers has also to be checked by the RI to avoid situations as reported by K9POX (*QST,* November 1986) (see later). The regulations go back to July 11, 1974; the installation and use of preamplifiers has to be reported to and permitted by DOC (local RI), and an inspection and test is to be carried out by the RI. The technical standards cover selectivity and dynamic range and other safeguards. Preamplifiers having a flat response from 40-400 MHz (sold in some countries) are illegal in West Germany. Using these amplifiers is asking for trouble, and so often the innocent party is being blamed. These amplifiers also amplify the unwanted signals from all the other services which operate within this frequency band legally. The six and two metre amateur bands are only one example, and police, taxis, mobile radiophones of many organisations (like the Europa-Signal, in Europe) use transmitters legally in this range. Where UHF-television is used, the preamplifiers will also cover that range, which is also used by radio amateurs (70 cm band) and other legal services.

TRANSLATED FROM THE *FUNKSCHAU* EMC REPORT

If RFI is reported by a preamplifier user, and the installation does not conform with the FTZ technical standards, the permit to use this installation and preamplifier will be revoked, and the equipment must not be used any longer. The installation has to be brought up to the necessary standard by adding filter circuits between the antenna and the preamplifier, which will sufficiently reduce signals out of television and FM radio bands. Medium wave frequency circuits covering 0.15 . . . 1.6 MHz are usually included also. The modified installation has to be reported again to the RI, to be inspected and tested, before the permit is re-issued. These regulations, and their strict enforcement, have an added benefit, because they teach the television and radio listener/viewer that his equipment can be at fault, and that RFI is not automatically the fault of the nearby radio amateur. Are our neighbours likely to believe us or the Radio Inspector, or the television serviceman and salesman? Additional filter circuits will have to be installed between the various antennas (long wave, medium wave, short wave, television, FM radio antennas) and the preamplifier, if, in spite of correctly installed amplifiers, RFI is experienced from other legally operated services working on different frequency channels. The television manufacturers and special antenna manufacturers supply these filter units.

Figure 1 shows the circuit of the Wik 501 filter. Table 1 shows the frequency bands the filter passes with about 2 dB (or less) insertion loss and also the attenuation of about 18 dB for the unwanted frequency bands for each of the five antenna connections. Only a very short coaxial cable should be used between the filter and the preamplifier, both of which must be fully shielded and in a weatherproof housing if installed at the masthead. Figure 2 shows another filter (works photograph: Hirschmann) model 60 S 9, which has three independent filter sections for long wave, medium wave and short wave for the television bands IV/V and III. Table 2 again shows the filter characteristics, which are especially selected to attenuate unwanted (but legal) signals from amateur radio operators, as we can see from the frequency bands mentioned. The insertion losses are lower and the attenuation is higher (over 30 dB in most cases). L6, L7, L9, C10 form a trap for the 70 cm amateur band. Preamplifiers can also add problems of their own, by over-amplifying long wave (in Europe) medium wave and shortwave signals, thereby causing cross-modulation if the equipment works in the vicinity of strong radio transmitters. These amplifiers could also radiate harmonics of the line frequency oscillator at 15.625 kHz. Switch- mode power supplies are another source of unwanted signals. Therefore, one does not use preamplifiers for these low, medium, or high frequency bands. Special filters are available to suppress excessively strong local radio transmitters (100 kW and more ERP). The Auth Co supplies special filters to suppress strong CB transmitter signals (Figure 4). Figure 5 shows the filter to suppress the Post Office radio telephone signal *Europa.* We see that filter design and availability is a precondition for using preamplifiers without running into difficulties, such that the nearest radio amateur or CB operator was usually blamed. Filters like those shown here, or similar design have become a $multi-million business, keeping several special firms busy. Without the filters it would, in may cases, not be possible to obtain compatibility of transmitter services and receiver users. More will be said on filters in a later EMC Report.

MORE MAST-MOUNT AMPLIFIER QRM

"I'd like to bring to your attention a situation that appears to be bringing bad publicity to the amateur radio community through no fault of our own. I was recently appointed an OO (Official Observer) and have been involved with broadcasting in the Chicago area for 26 years. Within the last couple of years, our television station (Channel 5) has been *deluged* with complaints of severe interference to our off-the-air signal in many diverse locations. The station management asked Engineering to look into the problem (in the interest of viewer relations), and I was given the assignment (being a radio amateur and involved in "fox hunting" in the past). We have had very good luck in finding the TVI sources; and most (95 percent) have turned out to be oscillating television antenna amplifiers that have been

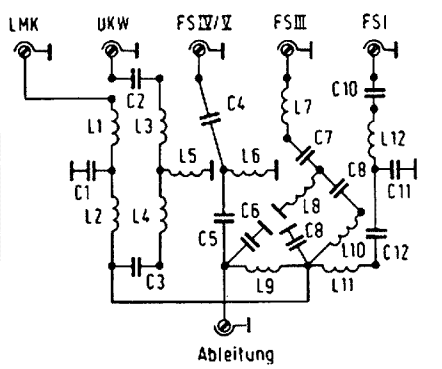


Bild 1. Schaltung der Antennenweiche Wik 501

Figure 1: Circuit of the Antenna Filter, Wik 501.

Tabelle 1. Betriebsdämpfung bei den einzelnen Frequenzbereichen der Antennenweiche Wik 1 von Hirschmann

Eingang 1 Bereich I (47...68 MHz). Eingang 4 Bereich III (162...230 MHz)
Eingang 2 LMK-Bereich (0.15...26.1 MHz) Eingang 5 Bereich IV/V (470...860 MHz)
Eingang 3 UKW-Bereich (87.5...104 MHz)

Dämpfung	47...68 MHz	0.15...26.1	87.5...104	162...230	470...860MHz
Eing. 1/Abltg.	≦ 2 dB	≧ 18 dB	≧ 18 dB	≧ 18 dB	≧ 18 dB
Eing. 2/Abltg.	≧ 18 dB	≦ 2 dB	≧ 18 dB	≧ 18 dB	≧ 18 dB
Eing. 3/Abltg.	≧ 18 dB	≧ 18 dB	≦ 2 dB	≧ 18 dB	≧ 18 dB
Eing. 4/Abltg.	≧ 18 dB	≧ 18 dB	≧ 18 dB	≦ 2 dB	≧ 18 dB
Eing. 5/Abtlg.	≧ 18 dB	≧ 18 dB	≧ 18 dB	≧ 18 dB	≦ 2 dB

Table 1: Radio and Television Passbands and Attenuation Frequencies of the Hirschmann Filter Circuit.

Dampfung = attenuation
Eingang = antenna connection terminal
Bereich = frequency band

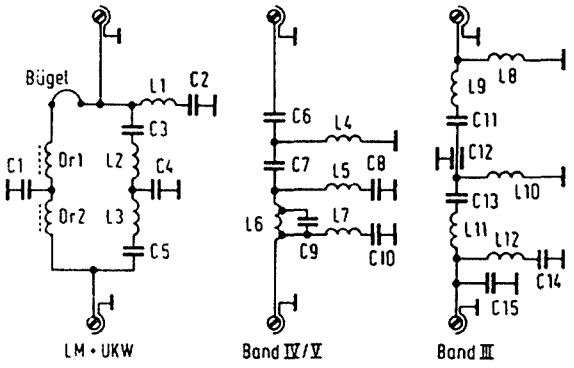
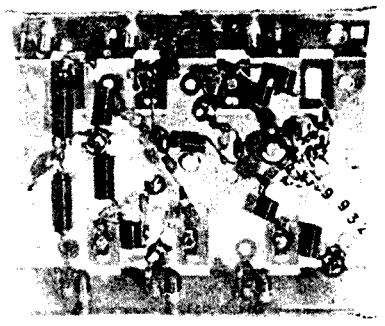


Bild 3. Schaltung der einzelnen Filter der Bandpaßkombination Sperr 60 S 9

Figure 3: Circuit of the Individual Filters of the Bandpass Combination 60 S 9.



—Photograph: Hirschmann (West Germany)

Figure 2: Inside View of the Filter Combination 60 S 9.

Tabelle 2. Betriebsdämpfung bei den einzelnen Frequenzbereichen der Bandpaßkombination Sperr 60 S9 von Hirschmann

Betriebsfrequenzbereich:
Filter 1 LM: 0,15...1,6 MHz
UKW: 87,5...104 MHz
Filter 2 B III: 174...230 MHz
Filter 3 B IV/V: 470...790 MHz

Frequenz [MHz]	0,15...1,6	3,5	7	14	21	28	87,5...104	144...146	174...190
Filter 1 LM + UKW	≦ 1	≧ 15	≧ 26	≧ 32	≧ 30	≧ 30	1,5 ±0,5	≧ 40	≧ 30 dB
Frequenz [MHz]	0,15...1,6	3,5...28		87,5...104	144...146		174...230	430...440	470...790
Filter 2 B III	≧ 40	≧ 40		≧ 30	≧ 30		1 ±0,5	≧ 40	≧ 40 dB
Frequenz [MHz]	0,16...1,6	3,5...104		144...146	174...230		430...440	470...790	
Filter 3 B IV/V	≧ 40	≧ 40		≧ 35	≧ 20		≧ 20	1,5 ± 0,5 dB	

Table 2: Attenuation and Passband Frequency Ranges of the Filter Combination 6O S9.

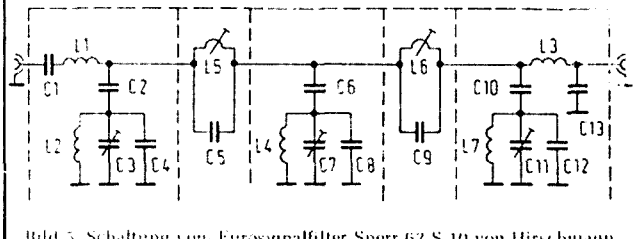


Bild 5. Schaltung vom Fernsignalfilter Sperr 62 S 10 von Hirschmann

Bild 4. ▶
Dämpfungskurve vom Sperrfilter BSF 27 für das 11-m-Jedermannband von Auth

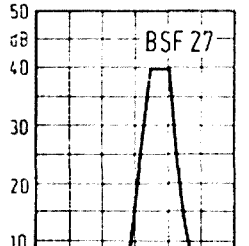


Figure 5. **Figure 4.**

incorrectly installed or operated by nontechnical viewers.

"We've discovered than an oscillating antenna amplifier can radiate an interfering signal for three-quarters of a mile or more from the source and cause a *complete* blackout of picture and sound within the same block. In most cases, the affected viewer tends to point immediately to amateur antennas in the area when trying to help us locate the offending signal. We've tried to inform them that amateur interference does not generally behave like that, nor is it on 24 hours a day, but often people believe only what they wish to believe. The problem is quite serious and promises to get worse as more and more gadgets permeate the market only to be hooked up improperly by the general public. It's unfortunate that amateurs are being blamed in many cases for this situation, but that is our apparent image in the mind of the average person.

"*Radio Shack* markets a 25 dB gain, 300 ohm antenna amplifier that turns into quite a devastating transmitter when the input and output leads are taped together as one viewer decided to do. That one took out a whole town! I'm not trying to indict *Radio Shack* in particular; any brand of amplifier can become unstable when not properly installed or terminated."

—David F Miller K9POX, 7462 West Lawler, Niles, IL 60648, in *QST*, November 1986

The case of RFI reported by K9POX, was the result of wrong installation. Other cases have been reported too. One masthead preamplifier had been forgotten, but was still connected to the television antenna, although the supply power had been removed. The front end transistor acted as a diode (a non-linear device) which distorted clean signals from other legal services. The distorted signals contained a harmonic which was tuned to the input circuit of the preamplifier and reradiated RFI on a television channel via the television antenna. This source of RFI, for which, as usual, a radio amateur had been blamed, was eventually discovered with the help of very experienced radio inspectors, who did not give up even after many attempts to locate the problem source.

ar

FUNKSCHAU 1977, Heft 12

PET TRACER

ELECTRONICS CAN NOW tell you where, oh where your little dog or cat or Holstein has gone with a microchip injected under its skin with a syringe.

The tiny microchip carries information about the animal and its owner. It is encapsulated in glass — the whole package about the size of a grain of rice — and inserted by a veterinarian in the skin on the animal's back. All you need to read the information from the chip is a wave of the wand on a specially designed reader. The cost of tagging an animal is about US$40 to US$60. The reader is about US$1800.

The first place to use the reader is an animal shelter in Colorado Springs. They will be waving the wand on all the strays they pick up in hopes of identifying the animals and their owners. And that should have them singing, "I've Got You Under My Skin."

—Adapted from *Gernsback's Outlook*, February 1987

Over to You!

Any opinion expressed under this heading is the individual opinion of the writer and does not necessarily coincide with that of the publisher.

NEVER BEEN DISAPPOINTED

Let me take this opportunity to thank you for the excellence of the publication. I look forward to its receipt each month and have never, in the three years of my membership, been disappointed by its contents.

Thank you.

Best 73,

Mario Dolfen VK3NI,
Box 119,
Montrose, Vic. 3765.
ar

CONCERNING CW

It is quite obvious many amateurs wish for the elimination of a test for Morse code.

The recent statement in a widely read publication — ". . .if a candidate can read five or 10 words-per-minute they should not have to pass a sending examination. . ."

This is utter "balderdash" and shows the ignorance of those responsible for thinking along such lines.

Learning Morse code is a tedious and disheartening process. There are no patent methods which accelerate it in the smallest degree, and the student who worries about it in the least usually gets on the best. To read Morse at 20 WPM only means the operator has heard the letters so often that a particular Dit/Dah combination recalls the letter with no appreciable time- lag. A rough calculation shows the average student has to hear every letter about 40 000 times before he recognises it without conscious effort. Of course, much less for five to 10 WPM.

There is nothing clever in reading Morse and nothing difficult in learning to do so. It is merely a matter of having daily (repeat *daily*) practice at gradually increasing speeds and making reasonable efforts to read it — frantic efforts are worse than useless — Morse should always be taken calmly.

As regards the sending of Morse, every operator should take a pride in the rhythm and accuracy of his sending.

When a mistake occurs in a message, it is nearly always the fault of the sending operator (90 percent).

Sending perfectly formed and spaced Morse is not easy, although many operators think it is.

The art of sending Morse is not to be regarded lightly — hence this letter.

Use the facilities of the WIA Slow Morse Sessions and enjoy real amateur radio. Although a retired steam locomotive driver from the Victorian Government Railways, my experience of sending Morse extends over a period of 62 years.

I am not knocking SSB, however I find many operators do not know the correct Phonetic Alphabet, speak too quickly, mumble, use incorrect procedure, show intolerance, do not use dummy loads, but worst of all — *do not listen out before transmitting.*

Give yourself a treat — QSY to the CW-bands such as the HMAS *Castlemaine* Net under the hand-pump of Margaret VK3QU.

Hundreds of operators can be found happily "pounding brass" — just to mention two; Peter VK2PA and Rex VK2YA — sending and receiving 50 WPM-plus in their heads, far more accurately and quickly than SSB. It is interesting to note that the Iron Curtain Block place great importance on Morse code — Why?

No further correspondence entered intol

73/88

H O Alderson VK2EP,
(ex-RAAF, Pacific Zone WWII, TPI 20 years)
32 Beacon Crescent,
Emerald Beach, NSW. 2456.
ar

NATIONAL SPRINTS

The Adelaide Hills Amateur Radio Society advises that the second running of the National Sprint Contests is tentatively scheduled for July 11, 1987 (CW) and July 18, 1987 (Phone). Rules will be similar to the first Sprints and will be published in advance of events.

Results of the first Sprints as published in the February issue of *Amateur Radio,* contained some typographical errors.

Under the heading 1986 National Sprint Results, the score for VK5ZN should read 32 vice 37.

Under the heading 1986 National Phone Sprint Results, VK3JA should have been shown as having earned a certificate for equal first place in VK3.

The Society regrets any inconvenience or embarrassment these errors may have caused.

—For the Adelaide Hills Amateur Radio Society, M G Emm VK5FN (President)

ENJOYABLE

Just a note regarding the article by Bert Thrupp VK5BVN, regarding Antarctic Communications.

I listened to the earliest of these broadcasts and I enjoyed Bert's article immensely and I thank him for it.

John Atkinson VK4RZ,
8 Maxwellbrown Drive,
Southport, Qld. 4215.
ar

MORSEWORD

Having derived pleasure from Morseword 1 in April AR, I write to thank Audrey Ryan for the novel idea.

What surprised me was that, when most characters had been found, still some words were elusive. Of interest also was, that with identical characters my words were different; eg SEAL instead of HARE and LIST instead of ASSET. KEPI eluded me entirely and needed the solution, which prompts me to suggest that the solution be held in future for the following edition.

Congratulations to Audrey and I hope future puzzles will become a part of AR.

Yours sincerely.

Don Ockley VK3BKU,
12 Norris Road,
Rowville, Vic. 3178.
ar

CONGRATULATIONS

My congratulations to Tony Tregale for his timely letter in April 87 AR.

Contrast this with the opinions of Rick Rickard in the same issue advocating even lower standards for the RAE — Heaven Help Us! It is a fact to be regretted that there are so many in our society hell-bent on lowering standards and expecting everything to be handed to them on a plate.

Furthermore, Mr Rickard would do well to appreciate that the equipment he now enjoys was made possible by many of those, now 55 and over, whom he effects to despise.

Yours fraternally,

Bill Dukes VK2WD,
44 Avian Crescent,
Lane Cove, NSW. 2066.
ar

NOT NEUROTIC

Unlike Mr Tregale VK3QO, I do not engage in virulent personal attacks on fellow amateurs.

My valid criticisms of the ATN have been directed against its operational procedure in amateur radio emergency methods and procedures, not its members.

If, according to him, 'neurotic' means advocating logical, common sense and standardised operational networks then he must have misread his directory or is unable to see the difference between constructive and destructive criticism.

His snide remarks concerning the 'destruction' of the ATN are completely refuted in my letter AR, August 1984, page 52, which states: and I quote: ". . .the logical solution would be for the ATN to use the SES/WICEN system within this country and the ARRL system overseas.

They would then be compatible and the SES and WICEN would welcome their co- operation."

So much for Mr Tregale's spurious allegations! The other remarks are puerile. Since he mentions 'democracy and freedom of the press being everyones right' — (except of course for defamation) — then I would remind him of the basic tenet of the democratic freedom of speech, expression and constructive criticism which is contained in this quotation:

"I may disapprove of what you say, but I will defend to the death your right to say it."

(Voltaire)

Yours sincerely,

Ted Gabriel VK4YG,
PO Box 245,
Ravenshoe, Qld. 4872.
ar

SAVE AMATEUR RADIO WITH NUMBERS

Tony Tregale has done it again; expressed an opinion with which I agree (AR April).

The supporters of 'save amateur radio with numbers' overlook some important points.

The quality of the participants in the service is more important than the quantity arid adequate technical knowledge is an essential component quality.

Without a basic understanding of the technology, progress with self- education, technical investigations and communication in the language of the art of radio communication is impossible.

International communication in the language of the art is the main means for exchanging knowledge about radio communication and a major justification for the retention of the service. Our image in the international forum will not be very good if all we can provide are mere smatterers.

It is probably easier and in the long term, more beneficial for the WIA to encourage quality improvement In its members and to lobby for higher qualifying standards rather that the alternative of more numbers and lower qualifying standards.

Referring to the April editorial. Devolution is not a new buzz word, I have heard it many times during my professional career.

Organisations devolve tasks which they don't want because they are incapable or just plain lazy.

Executive administrators promoted beyond their level of competence devolve tasks and responsibilities to incompetents of lower rank.

Engineers devolve onerous duties to technicians and technicians do the same to mechanics and so on.

My 'heirloom' dictionary circa 1930 defines devolution and that definition is confirmed by my 1984 edition of the *Oxford Concise* but the Oxford suggests degradation as an alternative. My experience indicates that degradation of services and the execution of tasks is a likely outcome of devolution.

I suggest that WIA members oppose devolution of public service duties and responsibilities to the WIA; it is not qualified and its resources are not equal to the task. Most importantly, as Tony suggests, the WIA privately aligned interests must be a disqualification.

Has the Executive considered the possibility of a challenge to the legality of any devolution? I might for example, be sufficiently concerned about the matter to mount a legal challenge with or without the support from fellow amateurs.

In the meantime it might be worthwhile informing my representative MHR about the possibility and my good reasons for opposing it.

Yours faithfully,

Lindsay Lawless VK3ANJ,
Box 112,
Lakes Entrance, Vic. 3909.

(While quality is vital, increased numbers provide economies of scale, since many costs are fixed irrespective of the numbers receiving the service. "Devolvement", not "devolution" was the word described as "new". The WIA is as qualified as its best available members. Its interests are "privately aligned" only to seeking the improved wellbeing of ALL its members. How is this a disqualification? —Ed)

ar

Five-Eighth Wave

Jennifer Warrington VK5ANW
59 Albert Street, Clarence Gardens, SA. 5039

THE 10TH ANNIVERSARY THAT NEARLY WASN'T!

A chance remark during a conversation with John Ingham VK5KG, our Federal Video Tape Co-ordinator, made me realise that it was 10 years since the opening of the Burley Griffin Building, at which point, John raced off to check and came back to inform me that I had less than a week to organise something as the official opening date was April 3! As there was no way that it was going to be possible to organise something at such short notice, it was decided, in consultation with other members of Council, to celebrate this special event on the night of the AGM, April 28. It was also decided to invite those who were on Council in April 1977 and the others who were instrumental in acquiring and renovating the building. The list read like a *Who's Who* of the VK5 Division and it was with some trepidation that I realised that, as President, I should be chairing my first AGM, reading my first Annual Report, etc, in front of a possible seven past-presidents and five Honorary Life Members! ! ! The list reads as follows:

President — Garry Herden VK5ZK
Vice-President and Treasurer — Colin Hurst VK5HI
Vice-President and WICEN Representative — Gerry Preston VK5PI
Secretary, Publicity Officer and Country Representative — Gordon Bowen VK5CXU (Silent Key)
Minute Secretary and Federal Councillor — Ian Hunt VK5QX
Program Organiser — John Mitchell VK5ZJB (now VK5JM)
Associates Representative — Les Wood (later VK5NVU, now VK5ALW)
Building Supervisor — Mike Hart VK5ZMH
E5C Chairman — Bob Murphy VK5MM
and Clive Pearson VK5PE

also involved were . . .

Les Diener VK5NJ and Geoff Taylor VK5TY (both were Divisional Presidents during the period in which the building was obtained and had a great deal to do with refurbishing of it).
Rob Wilson VK5WA, who was the driving force in helping to obtain the building.
Ross Dow VK5KF, Secretary at the time the lease was signed.
Lindsay Collins VK5GZ, Keith DeKock, Curl Blythe VK5CL, Jack Dew VK5JX, Leith Cotton VK5LG. . .and many many more, who helped in the three years that it took to acquire the place and then turn it into the place that you see today.

In fact, the more stories that I hear about it, the more impressed I become.

I hope that April 28 (complete with a shortened version of the video of the opening and the special supper) will be a happy and memorable night for those who made our Headquarters building possible. and also for the rest of us.

PRESIDENT'S REPORT

Elsewhere in this column you will find the President's Report which will be given at the AGM on April 28. I decided that, by printing it here, there will be more space in the Journal for the 'important things' like ESC and Publications Lists!

DIARY DATES

SERG Convention — June 6 and 7.
General Meeting — June 23. (Topic unknown at time of going to press). 7.45 pm.
Buy and Sell — June 30. Starts 7.30 pm — no ESC, QSL Bureau, Publications, etc.

PRESIDENT'S REPORT TO THE ANNUAL GENERAL MEETING OF THE VK5 DIVISION — April 28, 1987

This year has been a busy and memorable one in many areas, not least for those who were involved with the many and varied aspects of our Jubilee celebrations for our 150th Birthday. Our special event call sign was heard all around the State and even mobile in Texas, and from such varied locations as the Cape Wiloughby Lighthouse, the Trade Train, the Paddle Steamer *Industry*, the Grain Clipper *Failee* and the Horse- drawn Train at Victor Harbour. We also helped to promote the Centenary of the City of Marion, and the opening of the Observatory at Stockport, which coincided with the best viewing period of Halley's Comet. So many people have been involved with these activities that it would be impossible to attempt to name them all. But three names have stood out from the crowd and I would like to thank Graham VK5AQZ, who was our Jubilee 150 Co-ordinator, Rowland VK5OU, our Jubilee Awards Manager, and John VK5SJ, who was responsible for organising the Jubilee Nets and also the Centenary Celebrations at Marion. To these and all the others we say thanks.

WICEN had a quiet year as far as emergencies were concerned, but was still very active providing communications for the Chinese Dragon boat races, the Walk Against Want, the Forest Rally and their most taxing activity — providing communications for the State Bank Discovery Trail.

Nearer to home, we sponsored the two-part National Sprint Contest organised by the Adelaide Hills Amateur Radio Society and had the interior and some of the exterior of the Burley Griffin Building painted. Our Journal format was changed to contain the escalating costs and was presented as an insert in AR. This has caused a few headaches in the "what to leave in or what to take out" line and I would like to thank Trevor Lowe VK5ZTJ and his wife Brenda for the excellent job they have done as joint editors.

It is always a sad occasion to announce that someone has become a Silent Key, but perhaps the one that came as the greatest shock this year was the death of Peter Barlow VK5NPC, our Broadcast Producer, only a few hours after he had recorded segments for the next broadcast. Chris VK5PN, stepped in at very short notice and continued for several weeks until his place was ably taken by Arthur VK5AAR, who continued until future commitments forced him to retire in January. Our current Broadcast Producer is Kevin VK5IV, who, like his predecessors, is keeping up the high standard we have come to expect.

Other changes this year have seen Chris VK5PN replace Sam VK5TZ as Broadcast Roster Co-ordinator, Hans VK5KHZ, take on the job of Program Organiser, and Paul VK5BWZ, has joined the Morse Practice Panel. Our two new members on Council, Peter VK5PRM and Bob VK5BJA, have proved themselves popular and hardworking members of the team. Bob has taken on a new position, that of Co-ordinator of SATAC, the South Australian Technical Advisory Committee, which in turn reports back to FTAC, its Federal counterpart.

During the year three new clubs have affiliated with the VK5 Division, the Barossa ARC, the Mid-North ARC and the Port Augusta ARC, which is very encouraging. Our major events for members were the Picnic at Bridgewater Oval, the Christmas Social — which included items by the Glenlea Singers and the presentation by John Hampel VK5SJ, entitled "Looking Back on Radio in South Australia — an audio history" an our recent Clubs' Convention.

During the year we had some excellent speakers and interesting displays on meeting nights, these included Barry Bryant VK5KAU on the "Central North ATV Repeater" In May; Ray Bennett VK5RM, discussing the duties of a Historian, in June; Steve Mahoney VK5AIM, on Antenna Rotators, in July; Steve Stephenson VK5ZB, on Power Supplies, in August; September was our usual Display of Members' Equipment night and October was a display of members' Historically Interesting pieces of equipment. November say Hans Van Der Zalm VK5KHZ, speaking on Communications in Aviation, Ray Bennett was again our speaker in February, on "New Developments in Ionospheric and Radio Wave Propagation Research" (surely the longest title of the year!) and last month Den Smith VK5LS, gave an interesting insight into his tour of duty in the Antarctic.

I would like to thank all these people who entertained or informed us, also those who conduct and support our Buy and Sell nights, those who make our Broadcasts possible or keep our Morse Practice Sessions on air. In fact, to anyone who has done anything to improve or keep the Division In its present healthy form, we say thanks.

On this our 10th Anniversary of the opening of our Headquarters Building, we can look back in pride, but also look forward in anticipation to the next 10 years.

(I move the adoption of this report. . .)
Signed: Jennifer M Warrington VK5ANW
Divisional President

ar

J150 AWARDS

1317	OK1QV	1318	9M265434 (1st 9M SWL)
1319	YC7JUL	1320	K9RHY
1321	YC0JXH	1322	G4XTA
1323	4S7NMR	1324	C21FS
1325	YB06CA	1326	YB2IA
1327	DF5NW	1328	DJ2MN
1329	G4TKE	1330	ZC4IT
1331	PA3EKK	1332	YB2CR
1333	VU2ONL	1334	W8AH
1335	JA1ATB	1336	YC8VFB
1337	Y81ZN	1338	PA3DUP
1339	SP8AJK (1st SP)	1340	JF1CKL
1341	VU2DPD	1342	G0DNQ
1343	JA3CAV	1344	C53BU (1st C53)
1345	YB0AF	1346	JK3ACO
1347	JE7O	1348	JF6XGG
1349	VU2KYX	1350	YC5BEH
1351	YC5BEE	1352	YU2WM
1353	V85AK	1354	HA5XW
1355	RB5DX (1st Ukraine)	1356	VK5AAS
1357	5Z4BP (1st 5Z4)	1358	OE1TKW
1359	YO2BZV	1360	VK5BJF
1361	VK5PBL	1362	9V1WR (1st 9V1)
1363	KA1OJE	1364	KA5VTQ
1365	G4WXO	1366	N4HGZ
1367	N0CKT	1368	AA4NJ
1369	N0HFS	1370	Nike Aoki (JA?)
1371	G0BZG	1372	GM3EXS
1373	G3TMN	1374	OZ4BO
1375	I8QLI	1376	G0DKM/M
1377	YC0JWY	1378	YD0PXP (as an SWL)
1379	JS1LFB	1380	VK3KCL
1381	I2IAU	1382	ZL1BNT
1383	HL2ADV (1st Korea)		

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VK3 WIA Notes

NEW MEMBERS

The following applications were received for the month of March 1987, and accepted by Council on March 26, 1987. A warm welcome is extended to them.

Phillip Katz VK3KPK, Colin Pink, Gerald Shnier, Roger Stafford, Jeremy Stokoe, and Peter Marmet HB9DCZ.

ar

VK2 Mini-Bulletin

Tim Mills VK2ZTM
VK2 MINI BULLETIN EDITOR
Box 1066, Parramatta, NSW. 2150

DIVISIONAL COUNCIL

This year, at the time of the AGM, there were only five nominations for Council. This is a disappointing start to the new year as it places an even *greater work* load *on those who* stood. It is *hoped* that by the time these notes are published that the vacancies have been filled.

Council is not the only place that the membership can assist. There are various committees and other functions which would benefit by membership involvement. If you can help in any area would you contact the Divisional Office with your offer.

As these notes were complied, the major council positions had been filled as follows:

President	Roger Henley VK2ZIG/NWH
Vice-Presidents	Mike Burns VK2AUE
	Tim Mills VK2ZTM
Secretary	Peter Jeremy VK2PJ
Treasurer	Dave Horsfall VK2KFU

The other office bearers and committees will be listed next month.

1988 CELEBRATIONS

It is now just under six months until the new year and the various celebrations that 1988 will generate. Now is also the time for all clubs and groups to formalise any activities they are planning and let the Divisional Office know the details so that a central recording point can be maintained. The Division will also be involved in various activities during the year. This will require assistance from the membership to provide the manpower to conduct these activities, it is not something tat can be left to the Council to undertake.

Council would welcome ideas as to possible functions which would benefit by the presence of amateur radio.

VK2RWI REPEATER 7000

The continued anti-social behaviour occurring on this repeater has been a constant worry to some members and Council.

In late January, a warning was given that, if there was not an improvement in behaviour, the system would be turned off. The problems continued and the system was turned off. This caused one section of users to request it be restored and the matter brought before the AGM. The meeting debated the problem and concluded that the final solution rested with the Department to enforce the appropriate regulations and take action on offenders.

One of the suggestions as a possible way to control the problem while the Department took action was to shorten the time-out and extend the tail so that the system operated more as a calling repeater, allowing contacts to be established and the users to move elsewhere. Apparently few users attended the AGM as the actions did not meet with the general approval of the various users. After some days of what could only be described as mayhem, a forum of all interested users was called for April 8.

Considerable discussion occurred at the forum. The conclusion reached was that the behaviour on this repeater by some users was neither in accordance with the regulations nor in the spirit of the Amateur Radio Service. It was further felt that, if a reasonable standard of decorum could not be maintained by the users themselves, the Department would have to increase surveillance and take whatever action was necessary.

It is hoped however, that the public airing of various points of view at the forum will assist. Repeater 7000 has excellent coverage and appears to attract the exhibitionists, besides being a problem of radio behaviour in a large population region. The repeater has now been returned to its normal time-out and tail length.

NEW MEMBERS

A warm welcome is extended to these new members who were in the April intake:

S L Carr Assoc	Campbelltown
J P Carroll VK2XFO	Campbelltown
R J Coleman	
VK2MBW	Bathurst
J M Lanser VK2XFP	Killara
A J Randell Assoc	Dundas
S P Reneman	
VK2MBS	Avalon
R Soulie VK2YQN	Fairfield
P Wheeler Assoc	Dee Why

ar

Silent Keys

It is with deep regret we record the passing of —

MR A N (NOEL) LANSLEY	VK2MA
MR D J (JOE) WILSON	VK2DW

Obituaries

IVAN GRAHAM VK4QO

It Is with deep regret that we record the passing of Ivan on March 13, 1987, aged 53 years.

Ivan was born at Biggenden on January 2, 1934, being seventh in a farming family of nine children.

The family moved to the Callide Valley in 1937, settling at Goovigen and then moved to Thangool In 1942. Ivan spent some years as projectionist for the Regent Theatre, Thangool, prior to the introduction of television.

In 1964, he secured a position with Amagraze Meatworks at Biloela, and left the farm to make his home in Biloela about this time.

Ivan became interested in obtaining an amateur license in 1966, and joined the WIA that year. He passed the LAOCP examination in 1969 obtaining the call sign VK4ZIS, upgrading to the full call in 1973. He was active on two and six metres and the HF bands, qualifying for the DXCC on 20 metres.

The Biloela Scouts and Guides looked to Ivan to organise the technical requirements for JOTA each year. He was also an active worker for the establishment of two metre repeater VK4RGA, in the Biloela, Monto and Gladstone area.

At the time of his death he was President of the Biloela and District Amateur Radio Club, a member of the WIA, WICEN Officer for the district and a member of the State Emergency Service.

Despite his failing health, he remained interested in his hobby obtaining a two metre QSO with an enthusiast on the Asbestos Range *in Tasmania earlier this year.*

Ivan was always ready to assist any newcomers to amateur radio to the extent of running classes. People were always welcome at Ivan's home at any time and he always appreciated any assistance he was given.

Ivan was respected and loved. He will be sadly missed by his brothers and sisters, people of the Callide Valley and friends in amateur radio.

Mark Haseman VK4CMH (ex-VK4VDH)
ar

QSP

DOC MODIFICATION WARNING

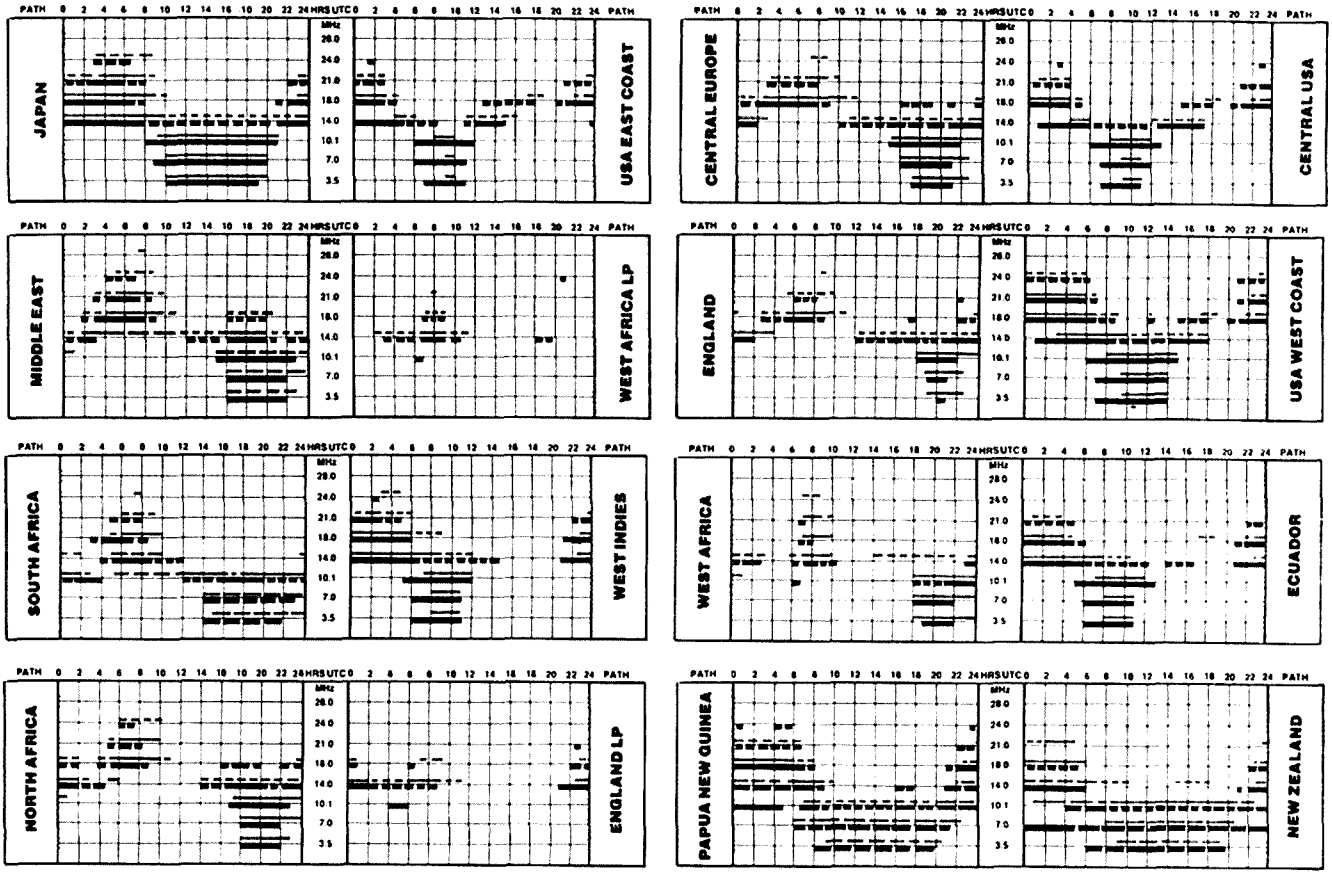
THE MODIFICATION OF Amateur Radio Service transceivers so they can transmit outside the amateur bands is illegal.

The Department of Communications has issued a reminder that the fitting of Citizen Band Radio Service channels or any other out-of-band frequencies will not be condoned.

DOC says it will take "positive action" if it finds anyone using amateur equipment in such a manner.

Ionospheric Predictions

Len Poynter VK3BYE
14 Esther Court, Fawkner, Vic. 3060



LEGEND
From Western Australia (Perth)
From Eastern Australia (Canberra)
Mixed mode dependent on angle of radiation (long broken lines).

Better than 50% of the month, but not every day (continuous lines)
All paths unless otherwise indicated; (ie LP = Long Path) are Short Path.

Less than 50% of the month (short broken lines).
Predictions are presented courtesy of the Department of Science, IPS Radio and Space Services, Sydney.

Solar Geophysical Summary

FEBRUARY

Solar activity was low during the month with no energetic flares being observed. The sun was without spots during the period 01-09, 13, 16-19 and 23, 24. At other times, there were a number of small sunspot regions visible on the solar disc.

The 10 cm flux values ranged from a low of 69 on the fifth up to a high of 75 from the 25-28th. The monthly average of 71.5 was the lowest since September 1986.

The regions visible during the month appear to have been 'new cycle' regions, supporting the view that we have passed the solar minimum.

Geomagnetic Activity suggests that February was more disturbed than January which was an exceptionally quite month. The most disturbed day being the 20th when the A index recorded a value of 24.

February monthly values were:

Sunspot No	4.0
A Index	9.1

Sunspot yearly average for 8/86 was 13.3 following:

7/86	13.8
6/86	13.8
5/86	14.5
4/86	13.8
3/86	13.1
2/86	13.2

Certainly still in the doldrums and waiting for a considerable rise in solar activity to move these figures upwards to effect any real improvement in conditions.

It was back in 1984 that the solar flux figures dropped down to the 70s and the previously good DX producing conditions deserted us. Those who persevere are rewarded with the odd good day — even 10 metres comes alive albeit briefly. Interest is centred on the following nine months to see if the long awaited upsurge in solar activity will appear. When it does commence this upsurge in conditions will produce some good DX — the upward part of a new solar cycle brings some pleasant surprises.

—From data supplied by the Department of Science IPS Radio and Space Services February 1987

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ANTARCTIC STATIONS

Mark VK9ML, Macquarie Island, has now got his iambic keyer working so will be sending a lot more CW than SSB. He will attempt to be on one of the following frequencies, CW, from 0908 UTC each Thursday depending on conditions (and inclination):

3.510, 7.010, 10.110, 14.010, 18.110, 21.010 MHz.

Mark note that there are a number of amateurs at the bases this year:

Macquarie Island
Graham Currie (Chompers) VK0GC
Doug Speedy VK0DS
Mark Loveridge VK0ML

Mawson
Mark Spooner VK0AQ
Alan Jeffrey VK0AJ
Andy Crammon VK0ZA

Davis
Frank O'Rourke VK0DA
David Rasch
T Lloyd VK0TW
Ray Clark VK0RC

Casey
P Marshall? VK0PM

It is not known how active these amateurs will be, but Mark says his great little island has "plenty to keep me busy!"

Ray Dobson VK5DI is Mark's QSL Manager.

—Contributed by Ray Dobson VK5DI

DEADLINE

All copy for inclusion in the **August 1987** issue of *Amateur Radio*, including regular columns and Hamads, must arrive at **PO Box 300, Caulfield South, Vic. 3162**, at the latest, by **9 am, June 19, 1987.**

Hamads

PLEASE NOTE: If you are advertising items FOR SALE and WANTED please write ***each*** on a separate sheet of paper, and include all details; eg Name, Address, Telephone Number, on both sheets. Please write copy for your Hamad as clearly as possible. ***Please do not use scraps of paper.***

- Please remember your STD code with telephone numbers
- Eight lines free to all WIA members. $9.00 per 10 words minimum for non-members
- Copy in typescript, or block letters — double-spaced to ***Box 300, Caulfield South, Vic. 3162***
- Repeals may be charged at full rates
- QTHR means address is correct as set out in the WIA current Call Book

Ordinary Hamads submitted from members who are deemed to be in the general electronics retail and wholesale distributive trades should be certified as referring only to private articles not being re-sold for merchandising purposes.

Conditions for commercial advertising are as follows: $22.50 for four lines, plus $2.00 per line (or part thereof)

Minimum charge — $22.50 pre-payable

Copy is required by the Deadline as indicated on page 1 of each issue.

TRADE ADS

AMIDON FERROMAGNETIC CORES: Large range for all receiver and Transmitting Applications. For data and price list send 105 x 220 mm SASE to: RJ & US IMPORTS, Box 157, Mortdale, NSW. 2223. CLOSED DURING JUNE (No inquiries at office . . . 11 Macken Street, Oakley). Agencies at: Geoff Wood Electronics, Lane Cove, NSW. Webb Electronics, Albury, NSW. Truscott Electronics, Croydon, Vic. Willis Trading Co, Perth, WA. Electronic Components, Fishwick, Plaza. ACT.

WANTED — NEW CALEDONIA

RCA RECEIVING TUBE MANUAL: Please state year, condition and price. Write to Phill Hardstaff, C/o South Pacific Commission, BP D5, Noumea Cedex, New Caledonia.

WANTED — NSW

TRS 820(S), TS 830(S), TS 130(S), FT 101ZD: or similar. Must have digital display & manual. Reg VK2ELG, QTHR. Ph:(060) 43 1044.

YAESU FC-102 ANTENNA TUNER: FV-102 DM ext VFO to suit FT- 102 transceiver. Any area. Must be in good condition. Brett VK2PUC. Ph:(02) 570 7609.

WANTED — VIC

ATLAS HF TRANSCEIVER: 12 or 24 VOC, with mains P/S unit & cradle. Would consider alternative similar equipment. Barlow-Wadley PLL HF receiver. Price & details to: VK3ZA, C/o PO Box 423, Belmont, Vic. 3216. Ph:(052) 44 1277.

MOBILE 2 METRE TRANSCEIVER: Icom favoured. Robin VK3YRC. Ph:(03) 435 9104 (AH); (03) 690 8666 (BH).

OWNER'S MANUAL: or photocopy for receiver Sony ICF 7600D. Jim Linton VK3PC, QTHR.

WANTED — QLD

Any WIRE & WIRELESS TELEGRAPHY EQUIPMENT: Hand keys, paddles, keyers, buzzers, sounders, etc. Genuine collector. Contact Fred VK4NMA, QTHR. Ph:(07) 396 3521.

FILAMENT TERMINAL CONNECTORS: also plate & grid connectors for 833A tube for display purposes. Appreciate any help. VK4EF, QTHR. Ph:(07) 38 1803.

FT-101Z/ZD TCVR: with ATU if possible. Will consider complete rig. Must be in very good condition. Write Jim McPherson VK4CBU, 14 Tristania Street, Everlon Hills, Qld. 4053. Sorry no phone.

FV-707DM EXTERNAL VFO: for Yaesu FT-707 transceiver. Please send details to VK4KHQ, PO Box 2154, Mount Isa, Qld. 4825 or Ph:(077) 43 4508.

WANTED — WA

DOCTOR DX: Contest simulator module. John VK6JF, QTHR. Ph:(090) 21 2599.

FOR SALE — ACT

KENWOOD TS-820 TRANSCEIVER: £600 ONO. Icom IC-501 6 metre transceiver, 50-54 MHz, 10 watts, USB, LSB, CW, AM. £225 ONO. Ralph VK1RK, QTHR. Ph:(062) 81 0203.

PORTABLE COMPUTER: Tandy Model 100. Built in database, text editing, scheduler, BASIC & terminal software in ROM. Full size keyboard. Connectors for RS232, Centronics printer, cassette, built-in modem & bar code reader provided. Fitted with full 32k RAM, NiCAD batteries & perspex keyboard cover. Supplied with all manuals in original carton. One careful owner. VGC. Under half price at $445. Portable disc drive for Tandy 100/102/200 series computers. Battery powered. Uses 3.5" discs. Supplied with DOS. Under half current price at $145. Software on tapes & discs for Model 100. Includes commercial word processing, database, project management, spread-sheet, amateurs radio & utility programs. All with manuals plus some home-brew software. $95. Package deal of $670 for the lot. Contact Ray VK1ZJR, QTHR, or call Ph:(062) 65 2193 (BH) or (062) 88 0027 (AH).

FOR SALE — NSW

ICOM IC-471 H: High Power 80 watt 70 cm transceiver complete with internal power supply & AG-35 masthead preamp plus dual transceiver desk mic SM-8. $1810. Kenpro KR-5400A Azimuth & elevation rotators with common dual control box plus 12 core cable with plugs & sockets. $2 per metre. $520. Kenwood SM-220 station monitor with cables & book lor use with TS-520 & TS-820. $480. Yaesu FT-2700 RH dual band 2 metre & 70 cm transceiver complete with voice synthesiser still under warranty sacrifice at $650. VK2ABO. Ph:(02) 86 4897.

KDK-FM2025 Mkll MOBILE TRANSCEIVER: with ⅝ vertical & magnetic base. $350. Also Azden PCS-300 hand-held 3 watt transceiver inc ext speaker/mic, ⅝ wave telescopic $350. Tokyo Hy-Power HL-35V linear amp. $100. Bob VK2ZRG. Ph:(02) 625 4490.

KENWOOD TS120S, MC50, MM120. $475. TET Triband beam $225. HiGain TH6DXX Triband beam $300. 2 Icom IC2N hand-helds C/W BP8 battery packs & BC35 charger stand. $350. C Band 3.7-4.2 GHz satellite receiver for TVRO with down converter, LNA (95°k) & feed horn with pole rotor $850. LNA 3.7-4.2 GHz 90°k $150. New 4CX250B $50. VK2DDG. Ph:(066) 77 7405.

MODEM NETCOMM 1234A SMARTMODEM: with handset plus crosstalk communications software. Features autodial, autoranging, autoanswer & autodisconnect. Baud rates 2400 FDX, 1200 FDX, 1200/75 FDX, 300 FDX (V22Bis, V22, V23, V21, Bell 212A, Bell 103). Used once. Worth $2000 sell $1300 ONO. Barlow-Wadley XCR-30 communications receiver. 0.5-30 MHz. $75 ONO. Ph:(02) 451 1752.

SHACK CLEAR-OUT! Finding it hard to move so I'm *selling excess goodies.* IN4148s, WO2 bridges, resistors, various relays, ETI, EA, ARA, AR, W World, PE, PW, digital meters, cassette LEDS, BC548s, 4000 series ICs, IC sockets & loads more. Help me move again! Russell VK2DWF or wife Louise VK2DZV. Ph:(02) 639 0615.

YAESU FT-107 DMS: with scanning microphone. All solid-state & all WARC bands. Also instruction manual & full service manual in first class condition with original carton. Ph:(02) 477 6275 or 477 4947.

YAESU FT708R 70 cm TCVR: Complete with FNB2 NiCAD & case. $375. Plus spare FNB2 NiCAD. $30. PA3 car PWR/Charger adaptor. $45. YM24A speaker/mic for FT708R. $40. Oskerblock SWR-435 UHF PWR/SWR meter. $80. DSE Centaur 25W 70 cm linear amp. $60. DSE 70 cm 13 el Yagi (never used). $40. All in as new condition, manuals & original cartons. Will accept $550 tor the lot. Reply Ph:(02) 649 9981.

YAESU FT-726R: 2m, 6m, 70 cm tribander complete with all modules, satellite board & CW filter. $2250 ONO. FT101E & ext VFO with CW filter. All manuals $500 ONO. HyGain quad, 2 elements, 3 band. Never used $300 ONO. VK2KLS, QTHR. Ph:(02) 747 4675.

2 METRE ALL MODE TCVR: Yaesu FT-225R, 240/12V, rptr xtals. $450. VS33 triband beam $230. KB105 10-80 trapped vert ant $130. Jim VK2PU, QTHR. Ph:(065) 69 5381.

2M HAND-HELDS: Kenwood TH21A. Near new cond with two spare batteries & case. $295. Icom IC2A VG cond with handbooks, case, spare battery, DC converter $195. 30 watt amplifier to suit either set $50. John VK2KOK, QTHR. Ph:(02) 918 2911.

FOR SALE — VIC

DECEASED ESTATE: Yaesu FL-2100, FL-101Z transceiver, FT-230R 2m transceiver, YD-148 Dynamic microphone, FV-101Z ext VFO, FT-7 transceiver, Hansen FS 500H power meter. Also many more items — all equipment in very good condition with manuals. Majority still have original packing. Complete list available from Ron Jardine, 26 Oerimai Street, Horsham, Vic. 3400.

JRC HF TRANSCEIVER: As new comprising JST-100XCVR, NBD 500 PS, NFG-97 ant tuner & NVA-88 spkr. This is latest from JRC with ultimate in reliability & performance. Ph:(03) 842 8822 BH or (03) 715 1164 AH. Inspect at 27 Rosella Street, Doncaster East, Peter VK3IZ.

PRINTER: Hard copy, Tono HC-800, IBM compatible, incl full box paper, extra ink ribbon $450 ONO. PC. 'Bathtub' Morse key, WWII Model, best offer. PC. Dick Smith DC power supply 240/12V, 50 Hz, AC/3A DC. New $20. Bird wattmeter, PC. $140. Ph:(055) 62 6016.

SHACK CLEARANCE: Yaesu FT102, 17 mths old, fitted with FM unit & narrow SSB & CW filters. Mint condition — $1050. 4 element 20m (14 MHz) Mono Delta Loop Quad by W Wulf, constructed to convert to 3 element. Built on 6 mm thick aluminium scaffolding tube $350. Weltz 600 watt dummy load 1 to 30 MHz. $100. Avo meter model 7 $75. Contact Mario VK3NI (QTHR as VK3CWD). Ph:(03) 566 0625 (BH).

TTY MODEL 15: manuals, 110V supply. VK3AWM, QTHR. Ph:(03) 791 2528.

VIDEO CAMERA: Canon VME-1 super 8 mm. C/W acces pack. New, unused with warranty. New price $2600. Will sell $2000. Tower 35 ft crank- up/down suitable for TH3 or SIM & VHF/UHF arrays. $160. VK3WL. Ph:(03) 741 7654 (AH).

YAESU FRG-965 RECEIVER: VHF-UHF 60-900 MHz. As new. Unwanted gift. Price $650. Ph:(054) 28 3527 or 380 6244.

YAESU FT-230R: 2 metre FM 25 watts. 1 owner, excellent condition. Only been used as mobile rig. No mods, complete with original carton & instruction book. $400. Alf VK3DFW QTHR. Ph:(03) 873 3777 (BH); (03) 877 2983 (AH).

FOR SALE — QLD

KENWOOD TS-520S: Serial No 740669 with DC power supply, MC, plugs, handbook, original carton. Unmarked in full working order. $450. VK4WR, QTHR. Ph: (071) 41 1315 (AH).

MARCONI TF995B/5: AM/FM VHF RF signal generator. 2/220 MHz excellent condition & pedigree with handbook $1250. Vintern MM-2 deviation monitor 70-500 MHz $120. Hewlett Packard electronic frequency counter Model 5246L 0-500 MHz with manuals. $800. VK4OY. Ph:(07) 396 0886 anytime.

FOR SALE — SA

TET MODEL HB34D: 3 band beam antenna. Very good condition. $200. Saville VK5AHK, 2 Wood Street, Lobsthal, SA. 5241. Ph:(08) 389 6221.

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Australian Electronics Monthly is edited by Roger Harrison VK2ZTB and published by Kedhorn Holdings, Fox Valley Centre, Cnr Fox Valley Rd & Kiogle St, Wahroonga 2076 NSW.

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Subscribe, and you could win this superb Weller WTCPN Soldering Station courtesy of Cooper Tools. Each month, we'll award this prize — worth over $140! — to the new subscriber who best answers the questions here.

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Amateur Radio

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JULY 1987

JOURNAL OF THE WIRELESS INSTITUTE OF AUSTRALIA

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Amateur Radio

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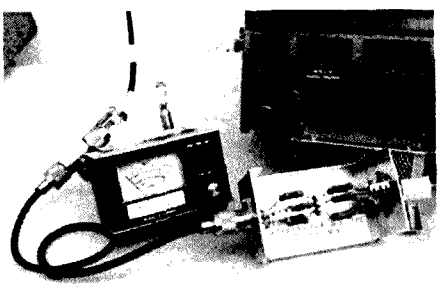
FRONT COVER: Storm Brewing — These photographs were taken over a short period of time as a storm approached the beam at the QTH of Earl VK3BER, Frankston.
—Photographs courtesy Earl Russell VK3BER



Regular Features

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All copy for inclusion in the September 1987 issue of Amateur Radio, including regular columns and Hamads, must arrive at PO Box 300, Caulfield South, Vic. 3162, at the latest, by 9 am, July 20, 1987.

Amateur Radio

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HAMADS should be sent direct to the same address, by the same date.

Acknowledgment may not be made unless specifically requested. All important items should be sent by Certified Mail. The Editor reserves the right to edit all material, including Letters to the Editor and Hamads, and reserves the right to refuse acceptance of any material, without specifying a reason.

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Editor's Comment

HELP!

As mentioned in the account last month of the Federal Convention, there was discussion by a financial sub-committee of the current fortunes of this magazine. What it boils down to is that our present expenses exceed our present income and that things are getting worse!

We have two sources of income. The largest is the amount which you, the members, pay us from your subscriptions, in effect to buy your monthly copy of AR. In 1986 this was close to the budgeted figure of $100 000. For 1987 it has been increased to $130 000, and hopefully kept at that level in 1988. If in round figures you divide 130 000 by 8000 members and 12 issues a year the answer is $1.35 per copy. That is what you are paying for your magazine. Two years ago, in the July 1985 editorial, we went through a similar exercise. The cost then was about 95 cents per copy. We can go back into other past financial statements and come up with figures such as 97 cents in 1982, 84 cents in 83, 88 cents in 84, and $1.14 in 1986.

We are all too painfully aware that the price of everything keeps going up. Particularly over the last few years, prices have risen considerably faster than wages. Figures published in the Melbourne "Sun" on the day I write this, show rises over the period March '83 to December '86 ranging from about 25% for milk, meat and bread, through 50% for beer and tea, to 90% for fresh vegetables. Petrol has risen by about 30%. AR magazine in the same time has gone up (at most) by 36%. Unfortunately, few peoples' incomes have risen commensurately so our average standard of living is slowly falling. This is apparent from the responses already received to the May editorial, in which I discussed membership non-renewals. It's not so much that subscriptions are rising, as that peoples' ability to pay is falling. Incidentally the membership situation is not really quite as bad as it appeared in that editorial. Certainly *many* have dropped out, but others have joined or rejoined. The net overall loss of members seems to be around 200.

Our second source of income is advertising. In a good year, such as 1984, it brought in nearly $49 000. But for various reasons, among which once again must be the customers' ability to pay, it has slowly fallen since, to about $37 000 last year, and we expect only $34 000 this year. Is there a business in your area for whom the amateur market is still untapped? Tell them about AR. It may be just the advertising vehicle they've been looking for, with influential technically-qualified readers throughout Australia, and some overseas as well.

Now to expenses. Our biggest single outlay is for printing, followed by postage. Budget expectations for 1987 were $65 000 and $33 000, but both are set to increase more than expected. Cost of paper has jumped by 23% and postage will rise soon because Australia Post is now required to pay sales tax. Typesetting and production total about $40 000, wrapping and addressing $10 000, but no significant changes are expected here. Office salaries and expenses, and costs of drafting work make up the rest.

Do you see the problem? We must reduce expenses, or increase income, or preferably both. In doing so, we can't afford to reduce our standard of quality, as even more members are then likely to become ex-members! The suggestion made at the Convention was to revert to the single colour covers we used to have up to 1981. This would slightly overcompensate the rise in paper cost, but only if the cover paper grade was the same as the text. We could reduce paper quality even further. Neither measure is attractive.

There is another possibility. We could publish six issues a year, of 128 pages, instead of 12 issues of 64 pages. The only loss here would be in topicality. After all, the "Womens' Weekly" is now a monthly, undoubtedly for similar reasons. What reasons? In our case, half as many expensive colour covers. Half as much for postage (although this may need slightly cheaper, lighter paper). Probably the various columnists and I wouldn't "rave on" for twice as long, so more room for technical articles, always your favourite reading.

All of these possibilities and more are on the agenda at the Executive meeting of May 26. I will leave space for a last-minute postscript to announce the decision.

Bill Rice VK3ABP
Editor

(PS. The Executive was unwilling to cut back on the number of issues per year. For the time being, while all other possible avenues of cost-reduction are being investigated, it was agreed that we should change to 2 colour covers on the present glossy paper, but reduce the main paper quality. Hopefully, this should just balance the budget. 73, VK3ABP)

A REMEMBRANCE DAY LOG PROGRAM WRITTEN IN PASCAL

Without question, the most valuable aid an entrant in the RD Contest can have is a computerised log keeper.

John Drew VK5DJ
34 Aitken Street, Millicent, SA. 5280

Although it is certainly helpful to have your contacts printed out for you, the most essential part of the process is to check for duplicates. Many of our better operators do this very well with dupe sheets and get to be very fast at it, or have a big family of helpers, however, there is no doubt that computerised is fastest and most accurate.

For several years now I have successfully used versions written in Basic and these programs worked very satisfactorily. Speed was always a problem or, if speed up techniques had been used, then memory usage became inefficient when call signs were broken up into groups. Towards the end of a long contest with, say, 400 plus contacts in the log, it could take up to two or three seconds to check. So early in 1987, I wrote a machine code routine to place the calls in memory and do the searching for dupes, at the same time, a complete rewrite of the Basic program was begun. (Those who have been programming for a while will know how messy a re-written Basic program can get).

The whole thing was lightning fast and I could see real potential. Around about then I discovered that there were some real languages out there that could do things only dreamed about by Basic or Assembler programmers. Turbo Pascal was the only way to go, said the write-ups and advertisements.

(Using the Eratosthenes sieve benchmark Pascal completed 10 iterations in 23.5 seconds, interpreted Basic takes about 2000 to 4000 seconds depending on which Basic — a speed factor of 100 in dealing with arrays and simple arithmetic). Still speed was only part of it. The power of Pascal resulting from its structure has to be played with to be fully appreciated. So I forgot about the composite Basic/Machine code log program and set out to do it in Pascal. As can be seen from the accompanying printout, I managed to have a version up and running in time for this year's RD.

In essence, a Pascal program has a main program (usually located right at the end of the program) with a number of procedures (or subroutines, if you like) defined beforehand. Each procedure is called by its name.

It is necessary to define variables before you use them so these appear at the beginning of the program, if they are global, (and apply throughout the program) or at the beginning of a procedure if they are local (apply only in that procedure). This turns out to be a programming advantage, especially when your documentation is as sloppy as mine! In retrospect, I should have made more efficient use of variables and used more local types.

It is not expected that everyone, or anyone, will want to copy the program as is, but maybe some of the ideas could help others. Anyway, it was my first "biggish" Pascal program and it certainly works well. I am quite prepared to accept that it might be improved in a number of areas; eg next time I would use the RECORD structure for storing information about contacts rather than storing it in a string array — although it may not work better.

This is what the program can do when compiled in a 64k Microbee:

* It can store 1500 contacts with five or six kilobytes to spare.
* With 500 entries you are just becoming aware of the delay between hitting return and gaining approval to continue.
* It checks to see if the call and the particular band already exist in memory. If they do, it checks to see if the mode was in the same category. If not it allows the contact to proceed. If it does find a dupe it beeps and puts up:

Band	Call Sign	No Sent	No Rcvd	Time	Mode
eg:					
80	VK3UM	105	172	11.52	SSB

If the calling station is unconvinced, providing him/her with the time and the number sent usually sorts out the dupe.

* The operator can change the time or the date. Normally, the computer looks after the time by means of the interrupt driven in-line machine code procedure RUNCLOK. A one second pulse is externally derived from a crystal and out onto the clock pin of the reprogrammed RS232 port.
  This reprogramming and setting of interrupt mode is performed in procedure SETCLOK.
* The time automatically updates at the bottom of the screen every second.
* Contacts can be altered later in case a mistake was made.
* Band and mode may be changed, immediate print or delayed print selected, contacts may be saved to disc (RD.DAT) and automatic creation of a back up file (RD.BAK), loading previous contacts at the start of a new session are other important facilities.
* Auto checking of entries is carried out; eg call signs may only have letters, numerals or a / within them. Numbers must be pure integers (foreign bits are not permitted). All letters are converted to upper case irrespective of keyboard entry.
* Call signs beginning with a number are assumed to be VK calls and have VK automatically placed as a prefix.
  Eg, if VK3UM calls me, I type in 3UM. The computer checks for VK3UM on the mode and band in use.
  However, the full call sign can also be keyed in and all the funny commemorative calls are also accepted.
* The machine displays my next number to send.
* Call signs are checked for sloppy operators. Eg, VK3SLOP identifies as VK3SLOP/P4 (portable 4) and calls you later without the portable suffix, the program needs to be able to spot this or a dupe could be missed.
* Faulty contacts can be deleted and become invisible, although it is possible to undelete them if necessary. It works by changing the band to '0' and subsequently checking for band '0' before other functions.
* Printing of each contact, keeps track of page numbers, score, scrolling of pages, last contact printed (if print is being held to save a second, or stop the noise), prints from certain contact numbers if required.
* By typing FINISHED it finishes off the log. A separate word processor file looks after the front page details.
* The program occupies 18k of program space when compiled and, in my case, runs under CPM in a Microbee(CIB).
  Just type RD to run it.
* All facilities are menu driven.

GENERAL INFORMATION

The contact information is stored like this:

BYTE NUMBER

1	2 3 4 5 6 7 8 9 10	11	12 13 14	15 16	17 18
band	call sign	mode	no rcvd	Hrs	Mins

The number sent is not stored, that is inherent in the array counter. Because this version of Pascal packs arrays automatically, not all contacts occupy 18 bytes. The longest call I could think of was VK5ABC/P4 — nine bytes long. Most will occupy only five or six bytes. This meant a bit of fancy footwork when checking for sloppy operators (see above) and in the general dismantling procedure and costs a bit of time but not too much.

The band is stored as a single character. 160 metres is stored as char(160), two metres is stored as char(2), etc. Saves a little space!

There are other space savers that occurred to me, such as storing the time and no received in BCD. This could save a couple of bytes or so, but as it is not in the high speed section of checking, and I am never going to work more than 1500 contacts in the RD Contest, it was a bit academic. I might do it one day just for fun though.

A typical contact goes like this:

	VK3UM replies to my CQ RD
* TYPE	3UM <return>
	machine checks call, band and mode
	finds no dupe so puts up my number for him (105), his call in full and awaits my input of his number.
	I give VK3UM my number (105), he gives me his (172).
* TYPE	172 <return>

Machine then reads the time and prints out the entry in columns under headings:

Time	Band	Mode	Call Worked	No Sent	No Rcvd	Points
11:52	80	SSB	VK3UM	105	172	1

and returns Main Menu ready for next entry. The program permits the operator to opt out of a contact at the point when it awaits the number from the other station. A <return> at this point abandons the contact, resets counters and returns to Main Menu.

Note, a typical contact requires typing a total of six or seven characters and hitting <return> twice. A scoring rate of three contacts a minute is a piece of cake (if the stations are there).

To convert this program to another machine, eg an IBM, all that should be required is to delete Procedures SETCLOK, RUNCLOK, GETCLOKRUN, GETCLOK, TIMECHANGE and GETTIME. The last three will need to be rewritten to gain access to the inbuilt clock in the computer.

The machine code in-line statements of SETCLOK and RUNCLOK are written to suit the Z80 and the ports of the Bee.

You will have to supply the one second pulse to pin 24 of the RS232 socket to make the clock work and connect a parallel connected printer to the parallel port.

```
{COMPILE FROM 28E9H to Allow for Storage of time - Written by J.F.Draw}
PROGRAM RD86T;
type
    Contacts=array[1..1500] of string[18];
    CALLcase=STRING[10];
Var
    bandr,strlen,band,print,checkcall,eokey,flag,code,count,asearch: integer;
    LenConSrch,dupLeng,count8,linecount,band1,codea,I,X,printline,page:integer;
    slash,callLength:integer;
    date: string[8];mode: string[5];Modein,Modetype,ModeStored,Modetest:char;
    call: string[9];Callsign:string[9];Ba:string[4];
    value:string[1];calldup:string[11];
    callr:string[9];recvd:string[4];baginning:string[3];
    time: string[4];zerom:string[3];page$:string[10];
    count$t:string[4];CountStr:string[3];finalCall:string[10];
    dupTimeH:string[2];dupTimeM:string[2];dupRcvd:string[3];
    timeh:string[2];timem:string[2];call:string[9];noSent:string[3];
    noRecvd:string[3];countSave:string[10];LinCount$:string[10];
    contact:contacts;
    filename:file of string[10];
    filenm:file of string[10];
Const
    Bell=^G;
    Tab=^I;
    Clock=$4;9;
PROCEDURE GETCLOK;
{SET UP MACHINE CODE CLOCK PORTS,INITIATE PIO, SET INTERRUPTS}
Begin
    Inline ($E5/$C5/$D5/$F5/
           $3E/$CF/
           $D3/$83/
           $3E/$9D/
           $D3/$83/
           $3E/$46/
           $D3/$83/
           $3E/$B7/
           $D3/$83/
           $3E/$FB/
           $D3/$83/
           $3E/$DF/
           $ED/$47/
           $00/       {REMOVED A F1 POP AF FROM HERE}
           $C5/
           $E5/
           $21/$E3/$28/ {HOURS DIGIT STORED AT 28E3H}
           $06/$06/
           $3d/$38/
           $23/
           $18/$FB/
           $E1/
           $C1/
           $DB/$82/
           $FB/
           $ED/$3E/
           $F1/
           $D1/
           $C1/
           $E1/$C9);
END;

PROCEDURE  RUNCLOK;
{Inserts code for interrupt driven machine code clock running off serial port
clock pin - relies on 1 sec pulses at this point}

Begin
    inline ($F5/$C5/$D5/$E5/
           $DB/$82/
           $06/$38/
           $21/$E8/$28/ {LAST SECONDS DIGIT STORED AT 28E8H}
           $34/
           $7E/
           $FE/$3A/
           $38/$2F/
           $78/
           $28/
           $34/
           $7E/
           $FE/$36/
           $30/$27/
           $78/
           $28/
           $34/
           $7E/
           $FE/$3A/
           $30/$1F/
           $78/
           $28/
           $34/
           $7E/
           $FE/$36/
           $30/$17/
           $78/
           $28/
           $34/
           $7E/
           $FE/$34/
           $30/$0F/
           $20/
           $7E/
           $FE/$32/
           $28/$09/
           $23/
           $7E/
           $FE/$3A/
           $38/$03/
           $78/
           $28/
           $34/
           $21/$E3/$28/  {HOURS DIGIT STORED HERE AT 28E3H}
           $11/$53/$F7/
           $01/$02/$00/
           $ED/$B8/
           $3E/$3A/
           $12/
           $13/
           $01/$02/$00/
           $ED/$B8/
           $3E/$3A/
           $12/
           $13/
           $01/$02/$00/
           $ED/$B8/
           $ED/$5B/
           $E1/
           $D1/
           $C1/
           $F1/
           $FB/
           $ED/$4D);
END;

PROCEDURE GetClokRun;
        Begin
            Mem[-$378]:= Lo(Addr(RunClok));
            Mem[-$377]:= Hi(Addr(RunClok));
        End;
PROCEDURE Start;
BEGIN
    bend:=$0;print:=0;count:=1;mode:='SSB';modein:='S';linecount:=1;x:=0;
    page:=1;modetest:='P';
    assign(filename,'RD.DAT');assign(filnm,'RD.BAK');
END;
PROCEDURE Bandchange;
    BEGIN
        ClrScr;gotoxy(30,5);LowVideo;Write(' B A N D  C H A N G E ');
        Normvideo;gotoxy(14,7);
        WriteLn('SELECT : required band from 160,80,40,20,15,10,6or2');
          Repeat
            Gotoxy(39,9);ClrEol;Read(Ba);
          Until (BA='160')or(BA='80')or(BA='40')or(BA='20')or(BA='15')
          or(BA='10')or(BA='6')or(BA='2');
          val(Ba,band,codea);
    END;
FUNCTION StUpCase(St:callcase):callcase;{converts lower case to upper case}
    VAR I:integer;
    BEGIN
        for I:=1 to length(St) do
        St[I]:=UpCase(St[I]);
        StUpCase:=St
    END;
PROCEDURE Save;
    BEGIN
       {$i-}
       Reset (filnm);     {check if RD.BAK exists}
       {$i+}
       if (IOresult=0)then Erase(filnm);
       {$i-}
       reset (filename);  {check if RD.DAT exists}
       {$i+}
       If (IOresult=0) then Begin
                               Rename (filename,'RD.BAK');
                               Assign (filename,'RD.DAT');
                            End;
         str(count,countsave);  {Now save the file}
         str(linecount,LinCount$);
         str(page,page$);
         rewrite(filename);
         write(filename,CountSave,LinCount$,page$);
         for I:=1 to count-1 do
             Begin
                 write(filename,contact[I]);
             End;
         close(filename);
    END;
PROCEDURE Load;
   Var
    continu:char;
    BEGIN
        ClrScr;gotoxy(20,5);write('L O A D  R O U T I N E');
        gotoxy(10,8);
        Write('Danger .... This will overwrite your current contacts');
        gotoxy(22,9);Write('ensure that you also have a file RD.DAT');
        gotoxy(10,12);write('Shall I continue ? (Y/N) ');read(continu);
        continu:=StUpCase(continu);
        if continu<>'Y' then exit;
        reset (filename);
        read(filename,CountSave,LinCount$,page$);
        val(countSave,count,codea);
        val(LinCount$,linecount,codea);
        val(page$,page,codea);
        for I:=1 to count-1 do
            Begin
                read(filename,contact[I]);
            End;
        close(filename);
    END;
PROCEDURE Timechange;
Var  Continu:char;
    BEGIN
        REPEAT
        ClrScr;gotoxy(30,5);lowvideo;write(' S E T   T I M E ');normvideo;
        gotoxy(25,8);write('Input hours 12 digital  ');read(timeh);
        gotoxy(25,10);write('Input minutes (2 dig)  ');read(timem);
        UNTIL (length(timeh)=2) and (length(timem)=2);
        mem[clock]:=ord(copy(timeh,1,1));
        mem[clock+1]:=ord(copy(timeh,2,1));
        mem[clock+2]:=ord(copy(timem,1,1));
        mem[clock+3]:=ord(copy(timem,2,1));
        mem[clock+4]:=48;
        mem[clock+5]:=48;
        gotoxy(10,12);write('Do you wish to change the date ? (Y/N) ');
        read(continu);continu:=upcase(continu);
        if continu='Y' then Begin
                                gotoxy(25,14);Write('Enter new date ');
                                read(data);
                            End;
    END;
```

. . .continued page 5

. . .continued from page 4

```
PROCEDURE ModeChange;
 Label InMode;
        BEGIN
             ClrscrlGotoxy(25,6)llowvideolwrite(' M O D E     C H A N G E ');
             normvideo;
             gotoxy(30,8)lwrite('Present mode is ',mode);
             gotoxy(30,10)llowvideolwrite(' A ')lnormvideolwrite(' AM');
             gotoxy(30,11)llowvideolwrite(' S ')lnormvideolwrite(' SSB');
             gotoxy(30,12)llowvideolwrite(' F ')lnormvideolwrite(' FM');
             gotoxy(30,13)llowvideolwrite(' C ')lnormvideolwrite(' CW');
             gotoxy(30,14)llowvideolwrite(' R ')lnormvideolwrite(' RITY');
             gotoxy(30,15)llowvideolwrite(' O ')lnormvideolwrite(' OTHER');
      Inmode:  gotoxy(30,17)lread(ModeIn)lmodein:=StUpCase(modein);
                  Case ModeIn of
                  'S':Begin
                           mode:='SSB';
                           modetest:='P';
                      End;
                  'F':Begin
                           mode:='FM';
                           modetest:='P';
                      End;
                  'A':Begin
                           mode:='AM';
                           modetest:='P';
                      End;
                  'C':Begin
                           mode:='CW';
                           modetest:='D';
                      End;
                  'R':Begin
                           mode:='RITY';
                           modetest:='D';
                      End;
                  'O':Begin
                           mode:='OTHER';
                           modetest:='O';
                      End
                  else Begin
                       gotoxy(30,19)lwrite('Type A,S,F,C,R or O <CR>');
                       gotoxy(30,17)lClrEollgoto Inmode;
                  end; (else)
                  End; (case)
        END;
PROCEDURE GetTime;
        BEGIN
             time:=chr(mem[clock])+chr(mem[clock+1])+chr(mem[clock+2])+
             chr(mem[clock+3]);



        END;
PROCEDURE PrintHeading;
        BEGIN
             If linecount>1then
                Begin
                   WriteLn(lst)lWriteLn(lst);
                   WriteLn(lst,'Contacts this page : 54    ');
                   WriteLn(lst,'Contacts to this point total :',linecount-1);
                   WriteLn(lst)lWriteLn(lst)lWriteLn(lst);
                   WriteLn(lst)lWriteLn(lst);
                End;
             Write(lst,'RD Log for ',callsign,'                Date : ');
             WriteLn(lst,date,'                Page : ',page)lpage:=page+1;
             Write(lst,'Time      Band      Mode      Call Worked    ');
             WriteLn(lst,'No. Sent  No. Rcvd  Points');
             WriteLn(lst);
        END;
PROCEDURE Dismantle;
        VAR  band:string[3];
             Sentst:string[4];
             Mainstring:string[18];
             LengthMain,num:integer;
    BEGIN
             MainString:=contact[linecount];
             LengthMain:=length(Mainstring);
             band:=copy(mainstring,1,1);
             call:=copy(mainstring,2,LengthMain-9);
             num:=linecount*3+1000,sentst);
             modein:=copy(mainstring,lengthmain-7,1);
             case modein of
                'A':mode:='AM';
                'S':mode:='SSB';
                'F':mode:='FM';
                'C':mode:='CW';
                'R':mode:='RITY';
                'O':mode:='OTHER';
             end;(case)
             NoSent:=copy(sentst,2,3);
             NoRecvd:=copy(mainstring,lengthmain-6,3);
             TimeM:=copy(mainstring,lengthmain-1,2);
             TimeM:=copy(mainstring,lengthmain-1,2);
    END;
PROCEDURE Printhold;
  Label JumPrint;
        BEGIN
          printline:=linecount;x:=0;
          While linecount<count DO
           Begin
             Dismantle;
             If band1=0 then
                          Begin
                             x:=x+1;
                             goto jumprint;
                          End;
             Write(lst,TimeH,':',TimeM,tab,band1,tab,mode,tab,call);
             WriteLn(lst,tab,NoSent,tab,NoRecvd,tab,'1');
             If (printline mod 54=0)and(printline>2)then printheading;
             printline:=printline+1;
    Jumprint: linecount:=linecount+1
           End;
        END;

PROCEDURE Printfrom;
    BEGIN
        If print=1 than begin
                          print:=0;
                          printhold;
                       end;
             begin
                clrscrllowvideolgotoxy(30,5)lwrite(' P R I N T   F R O M ');
                normvideolgotoxy(30,7)lwrite('Contact No: ')lread(linecount);
                gotoxy(30,9)lwrite('Page no. for next heading: ')lread(page);
                printhold;
             end;
       END;

PROCEDURE Callchange;
        VAR contactNo,holdcount:integer;
            HoldModeIn,change,delete:char;
            modehold:string[5];
      BEGIN
         modehold:=mode;holdmodein:=modein;
         clrscrlgotoxy(30,5)llowvideolwrite(' ALTER CONTACT DETAILS  ')lNormvideo;

         gotoxy(6,7)lwrite('Enter the contact number  ')lread(contactNo);
         holdcount:=linecount;linecount:=contactNo;
         DISMANTLE;
         linecount:=holdcount;
         gotoxy(40,7)lwriteLn('The record reads : ',contact[contactNo]);
         gotoxy(30,9)llowvideolwrite(' A ')lnormvideo;
         write('  Call     : ',call);
         gotoxy(30,10)llowvideolwrite(' B ')lnormvideo;
         write('  Band     : ');If band1=0 then write('Entry deleted')
                               Else write(band1);
         gotoxy(30,11)llowvideolwrite(' C ')lnormvideo;
         write('  No Rcvd : ',norecvd);
         gotoxy(30,12)llowvideolwrite(' D ')lnormvideo;
         write('  No Sent : ',nosent);
         gotoxy(30,13)llowvideolwrite(' E ')lnormvideo;
         write('  Time     : ',timeh,':',timem);
         gotoxy(30,14)llowvideolwrite(' F ')lnormvideo;
         write('  Mode     : ',mode);
         gotoxy(30,15)llowvideolwrite(' G ')lnormvideo;
         write('  Delete contact - careful');
         gotoxy(30,16)llowvideolwrite(' H ')lnormvideo;
         write('  EXIT unchanged data');
         gotoxy(30,18)lread(change)lchange:=StUpCase(change)lgotoxy(30,20);
         CASE change of
         'A':begin
                write('Type in new call in CAPS : ')lread(call1d);
                call:=StUpCase(call1d);
             end;


         'B':begin
                write('Type in new band : ')lread(band1);
             end;
         'C':begin
                write('Type in No. Recvd (3 figures) : ')lread(norecvd);
             end;
         'D':begin
                write('Unable to change contact number')ldelay(2500);
             end;
         'E':begin
                write('Type in hours    ( <24 ) : ')lread(timeh);
                gotoxy(30,22)lwrite('Type in minutes ( <60 ) : ');
                read(timem);
             end;
         'F':begin
                modechange;
             end;
         'G':begin
                gotoxy(15,20);
                write('Are you sure you want to delete the contact? Y/N ');
                read(delete)lif delete='Y'then band1:=0;
             end;
         'H':begin
                mode:=modehold;modein:=holdmodein;
                exit;
             end;
         end;(case)
         finalcall:=chr(band1)+call+modein+norecvd+timeh+timem;
         contact[contactno]:=finalcall;
         mode:=modehold;modein:=holdmodein; (restore value of mode)
      END;

PROCEDURE NoRcvd;
LABEL InNo;
      BEGIN
           (NUMBER RECEIVED FROM STATION)
           clrscrlgotoxy(30,5)lwrite('Input  Received  Number');
           gotoxy(20,7)lwrite('No to send          Callsign          No Received');
           gotoxy(24,8)lwrite(count)lgotoxy(39,8)lwrite(call);
      InNo: flag:=0lgotoxy(61,8)lread(recvd)lstrlen:=length(recvd);
           IF strlen=0 then exit
           Else
           IF strlen<3 than BEGIN
                                ClrEol;write(bell,'  Bad number');
                                goto InNo;
                           END
           ELSE for checkcall:=1 to strlen DO
                           BEGIN
                                value:=copy(recvd,checkcall,1);
                                askey:=ord(value);
                                CASE askey OF
                                0..47,58..128:flag:=1
                                END;(case)
                                If flag=1 then BEGIN
                                                  ClrEol;
                                               write(bell,'  Bad number');
                                               goto InNo;
                                          END;
                                .  -    END;
           CASE strlen OF
           3:zeros:='';
           2:zeros:='0';
           1:zeros:='00';
           END;(case)
           CountS:=count+1000;
           Str(CountS,CountSt);
           CountStr:=copy(CountSt,2,3);(used for printout only)
           GetTime;
           FinalCall:=calldup+zeros+recvd+time;(assemble string to save)
           Contact[count]:=FinalCall;
           count:=count+1; (update contact no.)
      END;
```

. . .continued page 6

. . .continued from page 5

```
PROCEDURE PrintOut;
    VAR
       TimeH:string[2];TimeM:string[2];
       ZeroCount:integer;
       ZCstring:string[3];
    BEGIN
        ZeroCount:=count+999;str(zerocount,ZCstring);
        ZCstring:=copy(ZCstring,2,3);
        TimeH:=copy(time,1,2);TimeM:=copy(time,3,2);
        Write(lst,TimeH,':',TimeM,tab,band,tab,mode,tab,call);
        WriteLn(lst,tab,ZCstring,tab,zero&recvd,tab,'1');
        if (linecount mod 54 =0)and(linecount<>0)then PrintHeading;
        LineCount:=linecount+1;
    END;



PROCEDURE DupFound;
          Var
             carryon,modeD:char;modedup:string[5];

    BEGIN
        Write(bell);clrecr;gotoxy(25,7);LowVideo;
        WRITE(' D U P L I C A T E   E N T R Y ');NormVideo;
        gotoxy(1,9);
        write('Band');gotoxy(21,9);write('Time');
        gotoxy(33,9);write('Mode');
        gotoxy(48,9);write('No. Sent');gotoxy(52,9);write('No. Rcvd');
        gotoxy(65,9);write('Callsign');
        LenConSrch:=length(contact&search);
        dupTimeH:=copy(contact[search],LenConSrch-3,2);
        dupTimeM:=copy(contact[search],LenConSrch-1,2);
        modeD:=copy(contact[search],LenConSrch-7,1);
            case modeD of
            'A':modedup:='AM';
            'S':modedup:='SSB';
            'C':modedup:='CW';
            'R':modedup:='RTTY';
            'F':modedup:='FM';
            'O':modedup:='OTHER';
            end;(case)
        dupRcvd:=copy(contact[search],LenConSrch-6,3);
        call:=copy(contact[search],2,LenConSrch-9);
        gotoxy(1,10);write(band);
        gotoxy(21,10);write(dupTimeH,':',dupTimeM);
        gotoxy(33,10);write(modeDup);
        gotoxy(42,10);write(search);
        gotoxy(54,10);write(dupRcvd);
        gotoxy(65,10);write(call);
        gotoxy(27,12);write('Press return to continue');
        read(carryon);
END;

PROCEDURE InitScreen;
BEGIN
    CLRSCR;
    GOTOXY(21,7);LowVideo;WRITELN(' Welcome to the Remembrance Day Contest ');
    NormVideo;
    gotoxy(24,21);WriteLn('Written by J.F.Drew : Version 86');
    gotoxy(27,11);WriteLn('Enter the date e.g. 28/8/86');
    gotoxy(36,13);read(date);
    gotoxy(27,15);WriteLn('Enter callsign of station');
    gotoxy(36,17);read(callsign);callsign:=StUpCase(callsign);
    {Set tab stops on the printer}
    write(lst,chr(27),chr(68),chr(11),chr(21),chr(31),chr(45));
    write(lst,chr(56),chr(65),chr(0));
    clrscr;gotoxy(21,7);write('Is this the beginning of a contest (Y/N) ? ');
    readln(beginning);
END;


PROCEDURE MainScreen;
BEGIN
    CLRSCR;LowVideo;WriteLn(' Change                                    Disc
                Print    ');
    NormVideo;
    Write('M : mode ');LowVideo;Write(' ',mode,' ');NormVideo;
    gotoxy(36,2);write('SA : save');
    gotoxy(69,2);writeln('PF : from');
    Write('T : time');gotoxy(36,3);write('LO : load');
    if Print=0 then LowVideo;
    gotoxy(69,3);WriteLn('PN : now ');
    if print=0 then NormVideo;
    Write('E : antry');gotoxy(36,4);
    if print<>0 then LowVideo;
    gotoxy(69,4);WriteLn('PH : hold');
    if print<>0 then NormVideo;
    Write('B : band ');lowvideo;write(' ',band,' ');normvideo;
    gotoxy(33,7);write('Next number '.count);
    gotoxy(22,9);write('E N T E R   C A L L / C O M M A N D');
END;

PROCEDURE NewCall;
Var Duplen:integer;
label CALL1;
label TryAgain;

BEGIN
CALL1: FLAG:=0;gotoxy(34,11);ClrEol;read(call);
       call:=StUpCase(call);
       IF CALL='FINISHED' THEN exit;
       IF CALL='SA'THEN BEGIN
                          save;
                          Mainscreen;
                        END;
       IF CALL='LO' THEN BEGIN
                          load;
                          Mainscreen;
                        END;
       IF CALL='PF' THEN BEGIN
                          Printfrom;
                          Mainscreen;
                        END;
       IF CALL='T'  THEN BEGIN
                          timechange;
                          Mainscreen;
                        END;
       IF CALL='PN' THEN BEGIN
                          print:=0;
                          printhold;
                          MainScreen;
                        END;
       IF CALL='PH' THEN BEGIN
                          print:=1;
                          MainScreen;
                        END;
       IF CALL='E'  THEN BEGIN
                          callchange;
                          Mainscreen;
                        END;
       IF CALL='B' THEN BEGIN
                          Bandchange;
                          MainScreen;
                       END;
       IF CALL='M'THEN BEGIN
                          ModeChange;
                          MainScreen;
                        END;
  {CHECK CALL SIGN FOR LEGITIMACY}
        BEGIN
            STRLEN:=LENGTH(CALL);
            IF (STRLEN<3) OR (STRLEN>9) THEN GOTO CALL1;
            ELSE FOR CHECKCALL:=1 TO STRLEN DO
                              BEGIN
                                 value:=copy(call,checkcall,1);
                                 askey:=Ord(value);
                                 CASE askey OF
                                 #..46,
                                 58..64,
                                 91..127:FLAG:=1;
                                 END;(case)
                              END;

        END;
        IF FLAG=1 THEN BEGIN
                          WRITE(BELL);
                          GOTOXY(28,12);WRITE('Bad call : re-enter');
                          GOTO CALL1;
                       END;
        BEGIN (allocation to a string and array)
            value:=copy(call,1,1);
            if (ord(value)>47) and (ord(value)<58) then call:='VK'+call;
            Slash:=Pos('/',call); (strip slash for batter dupe test)
                if Slash=0 then CallDup:=chr(band)+call
                else  CallDup:=chr(band)+copy(call,1,slash-1);(remove aa##ix)
            dupLeng:=length(calldup);
            contact[count]:=calldup;
            search:=0;
 TryAgain:  REPEAT
                search:=search+1;
            UNTIL copy(contact[search],1,dupLeng)=calldup;
            IF search=count then BEGIN
                                    (now put string together)
                                    NoRcvd;
                                    if (print=0)and(recvd<>'')then Printout;
                                 END
            ELSE Begin
 {Check that the call stripped of slash has really been found}
                        DupLen:=length(contact[search])-CallLength:=-DupLen-8;
                        Slash:=Pos('/',contact[search]);
                        if (DupLeng<>CallLength) and (DupLeng<>slash-1) then
                                                goto TryAgain;
 {Has a contact been made for the log category e.g. phone, cw or other}
                        ModeStored:=copy(contact[search],DupLen-7,1);
                         Case ModeStored of
                              'S','F','A': modetype:='P';
                              'C','R'    : modetype:='D';
                              'O'        : modetype:='O';
                         End; (case)
                         if modetype=modeteat then DupFound
                         Else goto TryAgain;
                    End;
        END;
END;(NEWCALL)
{This next section is the main program }
BEGIN
     GetClokRun;
     SetClok;
     Start;
     InitScreen;
     TimeChange;
     if (beginning='Y') or (beginning='y') then PrintHeading;
  Repeat
     MainScreen;
     NewCall;
  Until call='FINISHED';
     gotoxy(22,13);Write('Do you want to save the file (Y/N) ? ');
     read(modein);




     modein:=upcase(modein);
     if modein='Y' then save;
     WriteLn(lst);
     if linecount mod 54<>0
      then WriteLn(lst,'Number of points this page : ',(linecount mod 54)-1-X);
     WriteLn(lst,'Total number of points      : ',linecount-1-X);
     WriteLn(lst);
END.
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THE PAST DIRECTION OF AMATEUR RADIO

OR

AN EXPOSE OF THE TRUTH OF THE PAST AGAINST WHICH TO BALANCE THE FUTURE

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It was in the great days of the Beginning and at a time of the prominence of the Apple and in the place called the Garden State. The elders of the Illawarragoanavanapple Tribe, the name having been derived from a favourite saying and activity in those days, which they usually did and they multiplied, were gathered and they watched.

And it came to pass on a day that was dark with great clouds, they observed the great spark transmitter in the heavens. But they knew not what it was. And they wondered at it and were impressed. And all who watched and observed were amateurs ... for they did not have a professional income in those days. And they marvelled and wondered what could be done with it. But they could not touch it. And the great spark was accompanied by great noise audible even above their chatter so they could not hear one another speak. Even so it was intrusive upon them and they wondered at its *power*. And they called their times of observation of the phenomenon *Intruder Watch*.

And generations passed as they marvelled at the great spark and wondered what could be done with it, for they could not touch it. But it came to pass, in the observation of the spark and the noise that accompanied it, there was a realisation that the spark was very fast and the noise was delayed and very slow; and they marvelled and saw that the eye was quicker than the ear and that speed conversion was in the heavens so they could both see and hear. And they wondered at it and studied it

And they saw that sometimes the spark went up and sometimes it went down. And they studied it. And it came into evidence that about 50 percent of the spark transmitter discharge was in a downward direction, that being from the great cloud to the earth, and about half went from the earth to the cloud. And so was demonstrated the basic principle of alternating current. And the first scientific observations came into being in the minds of the amateurs. And it was recorded and they passed it to their children.

And it was observed that some of the 50 percent of downward discharges produced fire in certain places and under certain conditions. And they observed that it was good for it produced heat and smoke and they could smell it and touch it. And to cope with the knowledge that was being amassed some if the amateurs came together and formed a Club to study the phenomena. And they wondered what could be done with it. And it was a small club and they all contributed and it was a success. And it was seen to be good. And they that did not contribute were sent into the wilderness where they languished 40 Friday nights. And the club of amateurs studied the phenomenon as a Club project.

And it was about that time a traveller came from the far corners of the earth ... for the earth was flat in those days. And he brought gifts and he gave them a blanket. And the amateurs thought and studied the the blanket and the great spark transmitter and the fire and the smoke. And they co- operated. Even so their ideas were integrated in a new process called adding up. And they said to one another "Yes, that adds up." And others said; "Oh goannavanapple" and they argued and agreed and disagreed; and they were friends.

And it came to pass one night, at a more social meeting where the amateurs were getting tanked on spring water and apple juice ... for the brewery was out on strike because the month was December ... and they were going around in circles in a sort of social oscillation (note origins here of the water cooled tank circuit), one of the amateurs spilled water on the blanket. In the process of trying to dry the blanket by the fire they discovered two things. First the blanket did not burn where it was wet and secondly, they could gather the smoke under the blanket. And so was born the theory of the *Wet Blanket Inert Behaviour Syndrome*, which theory was later to e developed further by the Romans and named "Status Quo." And they found by using the blanket they could control the size of the fire which produced the smoke ... and by using a wet blanket they could control the emission of the smoke. And the fire was the Base, the blanket was the Collector and he who controlled the blanket was called the Emitter in those days.

And they made special fires called Signal Fires. And it was seen to be good. And the time came when it was seen that there were so many signal fires that nobody could see for smoke and the interference was so bad that it was necessary to allocate certain places and times when signal fires could be lit. And they appointed from among their number he that would be known as the Comptroller of Signal Fires. And he issued an Edict. And so was born the concept and practice of condition control and regulation.

And they made a common code so they could all understand, even when they wafted smoke. And the code was known by all those who were wafters and it was known as the Common Wafters Code. And those who learned the code and became proficient in its practice came together and were admitted to the Amateur Smoke Wafters Society ... colloquially known as the Interrupted Continuous Wafters or ICW mob ... and later called Indians by a traveller called Christopher Columbus. And the Comptroller of Signal Fires recognised the Society and they researched. And all was good. And they recalled what had been taught by their fathers about the great spark transmitter and in honour of the traveller who called them this new name, they came together and agreed that the great clouds that were in the transmitter should be called Columbus Clouds ... and at a much later time a typographical error was made.

And it came to pass that new and varied codes came into being and were used by some, but not by others. And great was the number of the codes. And there was great argument and they could not understand one another, for they talked in different codes. And there were many voices in argument and controversy. And the voices grew as a tower. And the tower grew and its call sign was BA3EL, which has also been subject to misprint in more recent times.

And there came a traveller and he was a wise man for he had three heads ... to accommodate the three hats he was wearing. And the traveller came out of a country called Victoria where there were more hats than heads and he was contributing to the balance of supply and demand. And the traveller addressed the elders of the Society and they spoke of the State-of-the-Art and the Ultimate Smoke Transmitter and of the Regulations and the conditions for the proper gating of the smoke.

And the wise man with three heads spoke of a new blanket called "envelope" and he showed them how to use it to vary the strength of the wind under the blanket which contained the smoke. And it was able to make big wafts or little wafts. So they gave it a name and called it Amplitude Draught.

And he came unto them again and said they should use the valleys and the gullies and the troughs and the peaks that were around them. But they understood him not. And he told them to goannavanapple, which they did because their fathers had told them about it. And they multiplied. But it came to pass that he forgave them that did not understand. And he took them and showed the how to use the smoke in the valleys and the high peaks and the gullies. And how to use the V-shape and the U-shape ... and the inverted V ... to control the entry of the wind under the blanket with the smoke. And they saw it and they did it and they observed and saw the smoke and how it could be made wide or narrow. And they called it Double Side Draught and Single Side Draught.

And the Society grew and with it the knowledge was spread. And some left the Society for they were avaricious and they went and they made money by broadcasting. But those that were left came together and they formed many clubs. And the clubs were spread across the nation. And the clubs came together and had counsel, one with another, and formed rules of conduct with the Comptroller of Signals. And they were happy.

And there came a prophet with a vision who was called Fourier. And the vision was a strange new code. And it was taken and used by the Amateur Smoke Transmitters Society to develop Harmonic Smoke. And it was good. And the Comptroller of Signal Fires arranged the allocation of the frequency of fires based on the new code which was named Harmonic Relationship. And for many years all was well, as it was a well kept secret from those in the community who might conclude that, where there is smoke there is fire.

But it came to pass that a group called the Digitalogists assembled all of the bits of smoke that escaped and they learned the secret. And they called it *Squarewave*. The Digitalogists studied the nature of this new smoke and found they could always produce harmonic smoke if they could make it come and go very quickly. And the Digitalogists boasted their superiority in that they could divide any number into any portion ... and the Council of the Clubs knew of the saying "Divide and Conquer" and they were concerned. And they became alarmed at the possible dangers that would assail the traditional smoke signallers and the difficulties that would arise.

In the course of time many other Societies had grown in many distant lands and they had come together and formed a Smoke Signallers Union. And all of the Comptrollers of the different lands spoke together and with the Union. But the Council of the Clubs in the land of the Illawarragoanavanapple was weakened by a strange disease called letho-apathy. And it came to pass that the Council was infiltrated by the Digitalogists on the pretext of having the potential to provide more members interested in Amateur Smoke Transmitting. And the Comptroller sought the advice of the Great Council in that land, and it formed a Committee to study the matter which would affect the future of the Smoke Transmitters. But that is another story ... as it lies in the future.

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BUILDING BLOCKS REVISITED
— Part 3

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This, the third part of the series, covers the IF amplifiers and generation of the various control voltages.

MODULE 3 — THE IF AMPLIFIER

Figure 12 is the circuit of the module, while Figure 13 shows the placement of parts on the 6 inch x 1.5 inch (150 mm x 38 mm) PCB.

In addition to two stages of 8 MHz amplification (only one of which may be required, see later text) the module includes circuitry for setting the gain of the stage/s when used as a transmit amplifier. A miniature relay is used to select the appropriate control voltage source.

It should be noted at this point that, if the board is used in conjunction with the (yet to be described) filter unit, only the second of the two amplifier stages is necessary. In this case, the input is to the point marked 'X' in Figure 12 and all components to the left of the dotted line in Figure 13 are omitted. If the unit is to be used for some other purpose, then the facility to provide additional gain is available.

The 8 MHz amplifier/s use BF981 dual gate FETs. They were chosen for their very low noise capabilities and their ready availability, is an added bonus.

The sources of the FETs are held at a fixed positive voltage by means of 3.3 volt zener diodes and their gate returns are also made to this fixed voltage point.

Control voltage is applied to gate two and is negative going. Under 'no signal' conditions the control line is set at seven volts (see description of the AGC generator later in this article) for reception and four to five volts for transmitting. The four to five volts 'no signal' level is set by means of RV1 on this module.

Any incoming signal (TX or RX) will cause the voltage on gate two to fall, so reducing the gain of the stage/s. At some point the incoming signal will cause the the control voltage to be less than the fixed 3.3 volts on gate one and the stage will be cut off. When in the receive mode, the AGC action begins at very low signal levels, as low as possible in fact, but when transmitting, the ALC action is delayed by the zener associated with the inverting input of the LF356 operational-amplifier. The level at which the ALC starts acting is set by RV2.

The tuned circuits of both stages are damped down by the resistors across them and are therefore fairly broad in their tuning. They are included only to provide some degree of filtering of the out of band noise generated by any amplifier. The alternate method of limiting this out of band noise is a second crystal filter at the amplifier output. There is no doubt that this second filter is the ideal way to go, but it can be expensive. However, after the section on crystal filters has been covered, some readers may be tempted to add a post-amplifier unit.

Output is taken from the junction of the 150 pF and 1n5 capacitors. The impedance at this point approximates to the 50 ohms required by the product detector and the (yet to be described, but see Figure 1 in Part 1) transmit mixer.

CONSTRUCTION AND TESTING

Only a couple of points need highlighting, otherwise building the module is simply a matter of putting the components in the right place and observing any component orientation.

The leads of the BF981/s need bending at right angles to fit the holes in the PCB. The longer drain lead is bent 4 mm out of the case, whilst the other three leads are bent 1.5 mm out from the case.

On one side of the device case is the identification marking (which includes the device number BF981). The leads are bent, so that when the device is put into the board, this identification is face down to the PCB, whilst the blank side of the case faces upwards.

Coil L4 (and L3 if used) is wound off the board. The coil former is cemented onto the base-plate with Superglue® or another similar good glue.

Scrape and tin half-an-inch (13 mm) or so of one end of the wire specified. Put this tinned end in the (hollow) base-plate 'leg' indicated by the letter 'B' on the parts placement diagram Figure 13. Starting at the base-plate end, close wind on the specified number of turns and lock them in place with a small quarter-inch x eighth-inch (6 mm x 3 mm) piece of clear adhesive tape. Cut off any excess wire, leaving just enough to go through the 'leg' marked 'T' on Figure 13. Scrape and tin this end, push it through the 'leg' and solder in place. Put the coil assembly into the board, filing off any excess solder left on the legs. *Check* that the bottom and top of the windings are in the correct places. Thread the tuning slug about halfway into the former. Slip the screening can over the assembly and rock it a little to make sure the top of the coil form is sitting in the raised lip around the hole in the top of the can. The bottom edge of the can should now be resting on the surface of the PCB.

Solder the can earthing spills to the board, checking that the assembly is still as it should be and finally solder the six coil legs in place.

To test the board and make an initial setting of the ALC operational- amplifier inverter, proceed as follows.

- Temporarily solder two equal sized resistors to the board. One between the AGC pin and earth, the other between the AGC pin and the +12 volts pin. The values of these temporary resistors is unimportant, only that they be equal. Two 15k, two 22k or two 10k will suffice as the idea is to put six volts on the AGC line.
- Temporarily solder a 51 ohm resistor across the two output pins and monitor this load resistor with the probe and meter described in Part 2.
- Apply power and inject some 8.000 MHz signal into the input pins. This can come from a signal generator or can be 'pinched' from the BFO described in Part 2.
- Adjust the signal input level until the probe meter just starts to indicate.
- Then adjust the tuning slug for a peak reading on the meter. The IF strip is now more or less lined up, although final 'tweaking' will have to wait until the receiver is complete.

To set the initial ALC voltage, first temporarily earth the ALC (not AGC) input pin and then adjust RV1 until the reading at pin six of the operational-amplifier is 4.00 volts. This sets the initial gain of the device/s in the transmit mode. RV2 cannot be set until the transmitter is finished.

MODULE 5 — THE CONTROL BOARD

This module contains the receiving AGC generator, the S/output- meter with its associated switching, and a 800 Hz audio oscillator to provide a CW transmit signal and sidetone.

Figure 9 is the circuit diagram of the AGC generator and meter switching arrangements. Figure 10 is the circuit of the audio oscillator and Figure 11 gives the parts placement on the six inch x 1.5 inch (150 mm x 38 mm) PCB.

The AGC is audio derived and the input to the generator is taken from the top of the audio volume control, see Figure 2 Part 2.

Consider first the situation that exists under 'no signal' conditions.

There is no rectified signal applied to the gates of either the MPF102A or the MPF102B. The residual DC voltage across the 10k resistor in the source of MPF102A is 'nulled out' by adjusting RV3 until the voltage at the operational-amplifier output (the AGC voltage) is 7.0 volts. MPF102B is conducting and thus the 100k resistor, in its drain circuit, is providing a low resistance path to earth, for the gate of MPF102A.

As soon as a signal arrives at the input, it is amplified by the BC548/BC558 bipolar pair. This amplified audio then splits two ways. The 'lower' path is further amplified in a BC548 and rectified by the 1N914 so as to apply a negative voltage to the gate of MPF102B, thereby pinching it off. This pinch-off, effectively leaves the gate of MPF102A with a very high (20 megohms) resistance path to earth.

Simultaneously, the audio in the 'upper' path is rectified by the germanium diode and the generated DC charges up the 1.0 μF capacitor. This DC is amplified by MPF102A and the voltage across its source resistor goes more positive.

This positive going voltage is inverted by the LF356 operational-amplifier causing its output (and the AGC line) to drop from the preset value of 7.0 volts, thereby reducing the gain of the controlled stages.

Consider now what happens when the input audio signal disappears (end of over, pause in speech, etc).

The charge on the 1.0 μF capacitor can only leak away slowly through the 20 megohm resistor and it would be many seconds before the full gain of the controlled stages was restored.

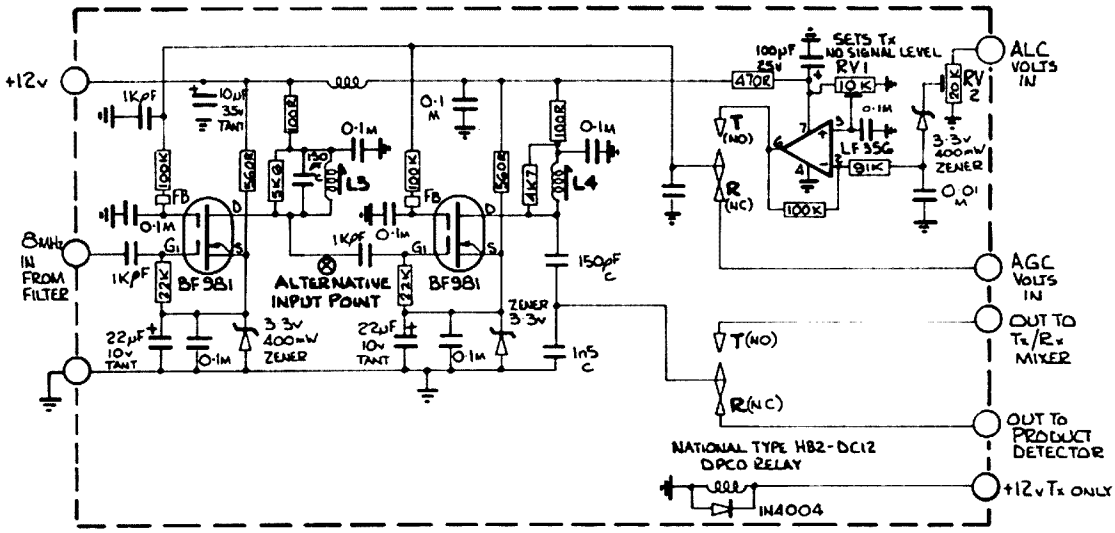
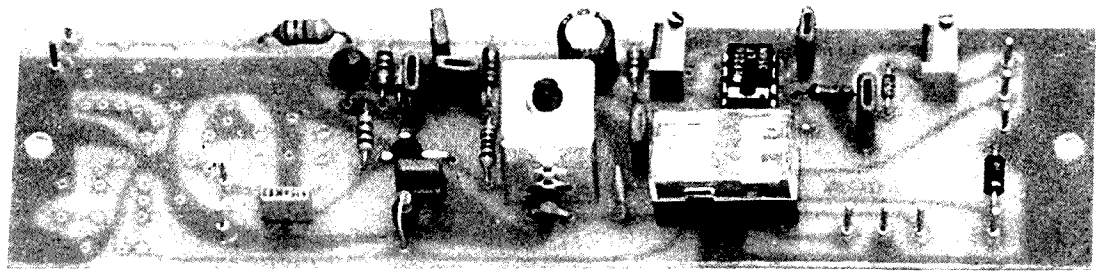


Figure 12: Module 3 — IF Stages

Notes:

1. All resistors ¼ watt 5 percent
2. M = Monolithic Ceramic Capacitor
   C = Ceramic Disc or Plate Capacitor
3. L3 = 25 turns, L4 = 27 turns No 32 (0.25 mm) enamelled wire close wound on Neosid Type A (5 mm dia) Former with Base-Plate. F29 tuning slug
4. RV1, RV2 25 turn Spectrol Trimpots Type 64Y



Module Three — IF Amplifier.

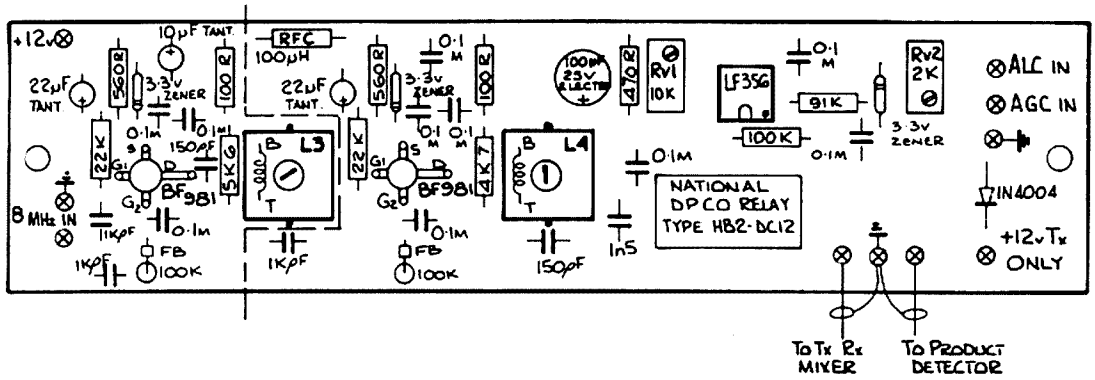


Figure 13: Module 3 — Component Layout.

Notes:

1. All components to left of dotted line omitted if used in conjunction with filter stage — see text.
2. Legs of BF981 bent down so that writing on device will be against the PCB.

⊘ = PCB Pin
B = Bottom of Winding; is nearest circuit.
T = Top of Winding.

Happily however, things are happening a bit faster at the gate of MPF102B. The negative charge on the 0.1 μF capacitor in its gate circuit is much more rapidly discharged through the 4.7 megohm resistor in parallel with it and, as a consequence, the MPF102B conducts and rapidly discharges the 1.0 μF capacitor, thus restoring the AGC line to its full gain value.

The attack time of the system is set mainly by the time taken to charge the 1.0 μF capacitor in the 'upper' path and is effectively fixed. The discharge time is set by the combination of the parallelled 0.1 μF capacitor and the 4.7 megohm resistor in the 'lower' path. The constants given are about optimum for SSB, but a bit slow for CW. Accordingly, provision is made to put a 1.0 megohm in parallel with the 4.7 megohm resistor to decrease the discharge time.

RV2 controls the level at which the AGC action starts. Under normal conditions it is set with the slider at the top of its travel and AGC action starts as soon as the germanium diode starts to conduct. If there is no need to control the AGC start level, then RV2 can be replaced with a 1k fixed resistor.

RV1 controls the level at which the MPF102B starts to pinch off. It is normally set about two-thirds of its full travel.

If 12 volts is applied to the inverting input of the operational-amplifier, the AGC line drops to near zero and mutes the IF stages. This facility is not normally used, but provision is made for occasions where it could be useful.

The S-meter circuit is a simple one and provides a fairly linear indication of incoming signal strength. It is not designed as a refined measuring instrument. In this respect it is no different from the S-meters of most commercial amateur equipment, all of which not only tell 'fibs', but tell them in different languages! How to make a truly linear and accurate S-meter may form the subject of a separate article, sometime in the future.

With the AGC line adjusted to its specified value of 7.0 volts, RV5 is adjusted to give a zero meter reading. Then with what is considered to be a S9 signal (50 microvolts into the input of the finished receiver or what is adjudged to be an S9 signal by ear) RV4 is adjusted to give a suitable reading, say half scale.

In the transmit mode, RV6 is adjusted to give a suitable scale deflection for the output power in use.

Note that all the trimpots on this and other PCBs are 25 turn, vertical mounting, top adjust types. They may be a little more expensive than the normal 'single turn' variety, but all adjustments are smooth and easily made. Once set, the adjustments are less likely to drift away from the required settings.

The 800 Hz audio oscillator of Figure 10 serves a dual purpose if the builder wishes to provide for CW transmission. It gives a signal which is offset 800 Hz from the carrier and is also a sidetone source which can be fed to the receive audio stage for monitoring purposes. If CW transmission is not an operating requirement, the oscillator may be omitted.

In providing for CW it would have been electrically possible to unbalance the balanced modulator of Figure 6 Part 2. This was initially tried but the mechanical arrangements were a bit difficult and the carrier suppression obtained was not good. Furthermore, it was not easily possible to provide the conventional 800 Hz offset for CW.

Since an 800 Hz tone introduced into the microphone circuit will produce in the transmitter output a single frequency 800 Hz removed from the carrier frequency, this method of producing CW was adopted. The method brought the above noted advantage that some of this audio could be fed into the receive audio system to give a monitoring sidetone. Furthermore by varying the amount of 800 Hz fed into the microphone circuit, the power output level of the final amplifiers in the transmitter could be varied, ie we have a 'Drive' control.

Reverting to Figure 10, RV7, an on board trimpot, sets the sidetone level. RV8 is a panel mounted standard potentiometer controlling the amount of audio fed to the microphone stage and thus the output level. The resistors in series with RV7 and RV8 are nominally 100k, but may need altering to suit the individual constructor.

CONSTRUCTION AND TESTING

Putting the components on the board calls for little comment. It is necessary only to put them in the right place and observe any orientation required.

It will be beneficial if all the trimpots (RV1 to RV9) are preset to half- travel before soldering them in. Use an ohm-meter to set them so that approximately the same resistance can be measured between the slider and each end. This is more accurate than trying to count turns.

At this stage do not connect the meter and leave off the 'Fast/Slow' switch. If the board is to be used only for reception, leave off the relay and the 1N4004.

With the input temporarily shorted to earth, apply 12 volts and then adjust RV3 until there is 7.0 volts between the AGC output pin and earth. Also adjust RV5 so that 7.0 volts appears between the 'Meter +' pin and earth.

The audio oscillator may now be commissioned. Put a temporary short across the 'Key' pins. Connect the 'Sidetone out' pins to the audio board (slider of audio level potentiometer on Module 4). Apply 12 volts to the oscillator. An 800 Hz tone should now be heard from the speaker. Now adjust RV7 to give a comfortable level from the speaker. If necessary, change the value of the 100k resistor in series with RV7 to attain the required level with the trimpot at about half travel.

Disable the oscillator, remove the connections to Module 4, remove the temporary short to the input of the AGC system and connect the output of the audio oscillator to the input of the AGC generator. Put a voltmeter between the AGC output pin and earth. Apply 12 volts to the board but **NOT** the audio oscillator. The meter should register the previously set 7.0 volts. Now apply 12 volts to the oscillator. The meter reading should drop to some lower reading, indicating that the AGC system is working. Final adjustment of the system will not be possible until the whole receiver is working. As a last check, temporarily apply 12 volts to the 'Mute' pin. The AGC output voltage should drop to near zero.

Part 4, next month, will describe Module 2, the IF crystal filter and Module 9, the VFO.

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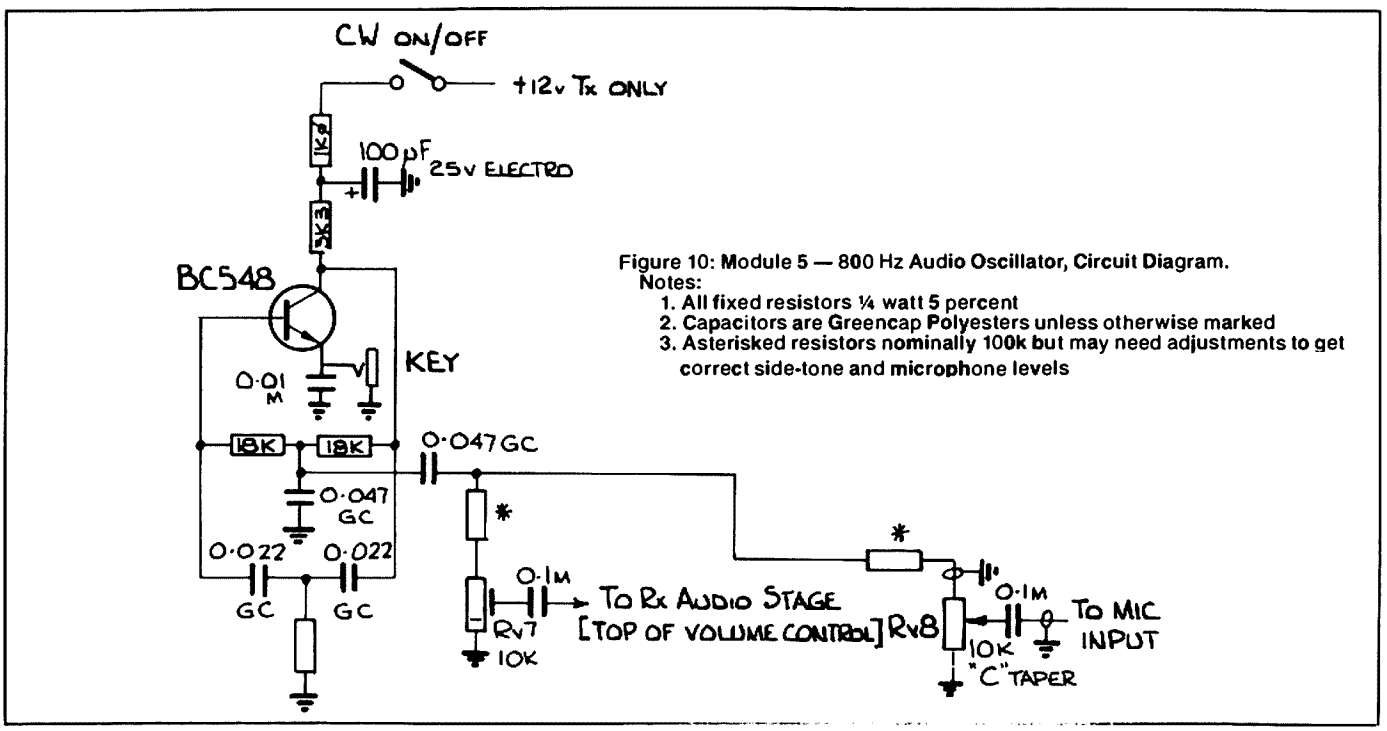


Figure 10: Module 5 — 800 Hz Audio Oscillator, Circuit Diagram.
Notes:
1. **All fixed resistors ¼ watt 5 percent**
2. **Capacitors are Greencap Polyesters unless otherwise marked**
3. **Asterisked resistors nominally 100k but may need adjustments to get correct side-tone and microphone levels**

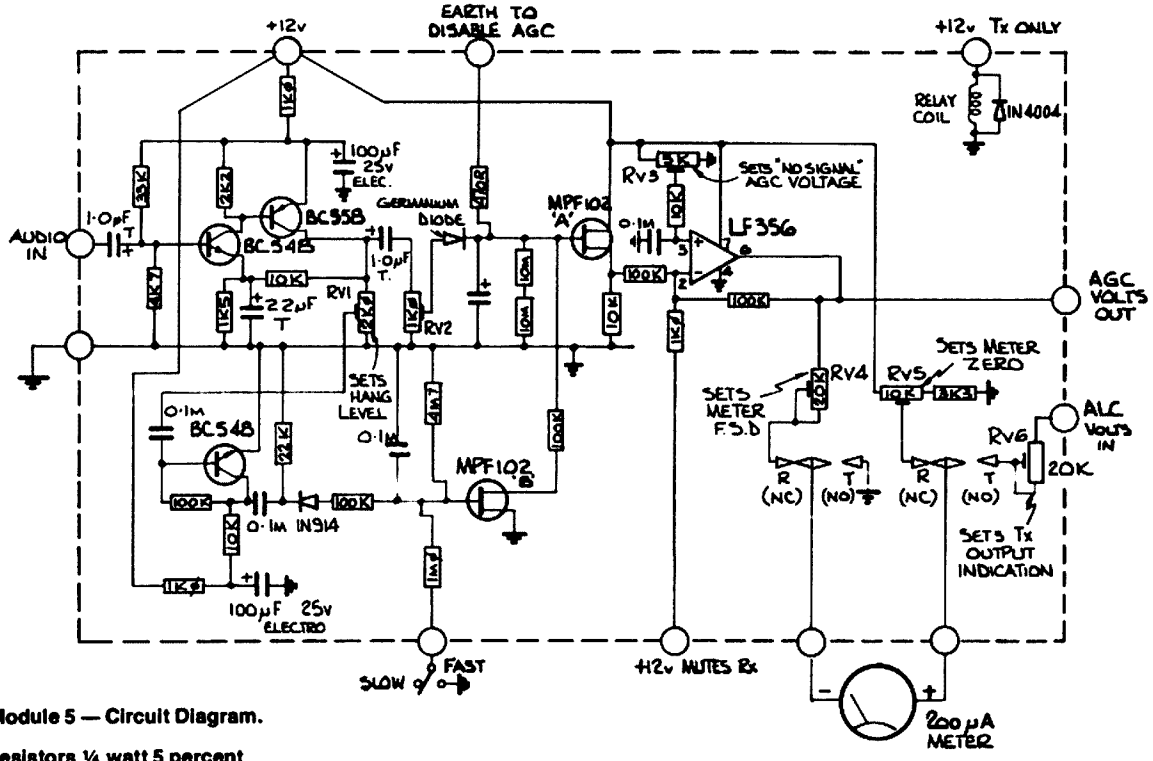
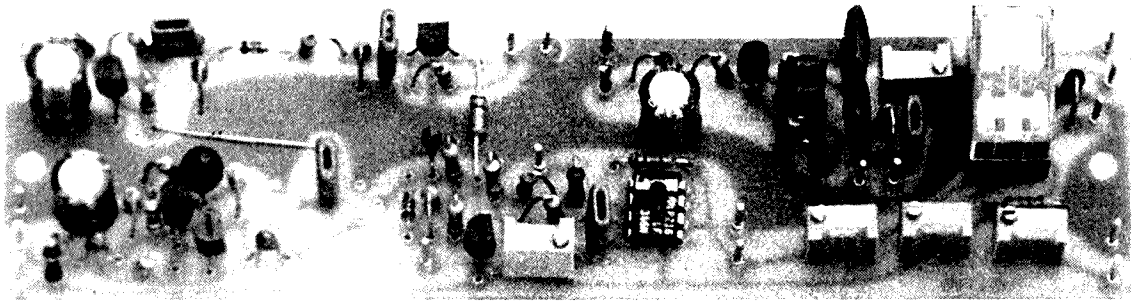


Figure 9: Module 5 — Circuit Diagram.
Notes:
1. **All resistors ¼ watt 5 percent**
2. **All trimpots 25 turn — top adjust triangular pin out, Spectrol Type 64Y**



Module 5 — AJC.

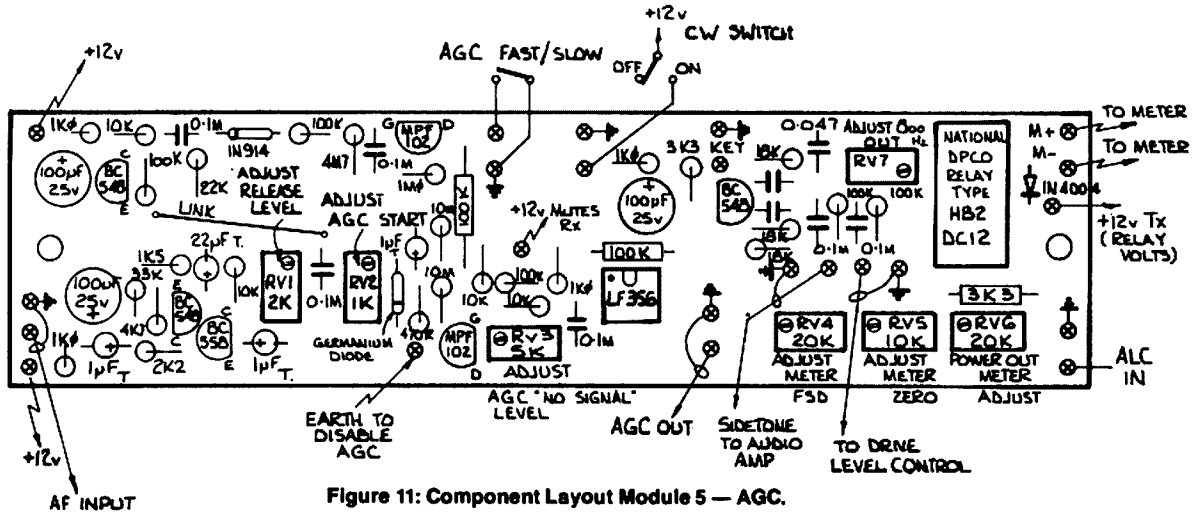


Figure 11: Component Layout Module 5 — AGC.

RD LOG FOR COMMODORE 64, DISC DRIVE & PRINTER

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A timely log-keeping computer program for the RD Contest in response to comment by VK6YA in the Contest Column, February AR.

The program was written prior to the 1986 RD Contest when the writer was looking for a computer log program which would satisfy the requirements of making the contest enjoyable by doing all the duplicate call checking and also print out a log in the format as required by the contest manager.

Never having been an avid contest contender, the RD Contest somehow does have limited appeal. I have even neglected entering that in recent years as I lost the desire after entering a couple of them but found the log-keeping rather tedious — or to be more precise, the checking for duplicate calls became a grind after the first few hours. That was about seven or eight years ago and I have not bothered entering since then. In the last five or six years I have become interested in computers and there has always been an idea percolating in the gray matter that perhaps I could write a program which would "do everything" for me in the RD Contest and if I could write that program I would give the contest a try again!

So, what exactly did I want the computer to do? I wanted it such that all I had to do was enter a call sign and the computer would do all the required checking to ensure that the contact was valid under the rules and, if so, all that was required by me was to enter the QSO number. The computer would then send all the information off to the printer and a running log would be kept throughout the contest that just had to be placed in an envelope and sent off to the contest manager. This of course included the computer generated front sheet recording all the details regarding pages and scores, etc.

If reference is made to the sample log, it can be seen that everything required is included and all that is required of the operator is to enter the call sign, the received QSO number and place his signature on the front sheet. What could be easier! ! !

To write such a program that could only be used once a year would appear to almost touch on the absurd, to which I have no answer except I have done it simply as a personal project to give me a reason to sit at the computer other than to play games or have the occasional RTTY contact. I was a little worried about possible rule changes that would render the program obsolete after one year, but I see in a recent Contest Column that there is a push toward standardising the rules and leaving them the same as this year's contest. Another small problem is that the log has been limited to 500 contacts per category, but following recent RD Contest results, not too many have exceeded that amount.

For those competent in BASIC programming, it is obvious there are techniques used in this program that could only have come from a self-taught programmer. So, content yourself with the fact that, if you feel you could have written better you would most certainly be correct. In some parts, the program is probably a little involved and could be classed as "going over the top" but it has slowly evolved over a few months and, as I think of another feature which I think may be fun to add, I have done so.

One very important fact to point out at this time is that I do not run the program in BASIC "as is" but run it through a compiler, such as *Petspeed* to speed the whole thing up. It has been found, with the log filled to almost its capacity of 500 calls, it only takes about 12 seconds to verify a call. Compare that to checking through a handwritten log and it seems insignificant.

LET'S LOOK AT THE PROGRAM

LINES 10-150 set the screen colour, display a title page and set arrays.
LINES 170-330 give the option of starting a new log from scratch or, if you have been working in the contest for a few hours and take a break, you can then load the unfinished log and continue in the contest without losing the previous entries.
LINES 380-460 sets or zeros variables as required.
LINES 510-610 are for entering the operators own call sign. There is some checks done on the call sign to try and ensure that it is entered correctly as far as the right alpha/numeric content is concerned. There is no facility to allow for "out of state" call signs, eg VK5AIB/6.
LINES 660-680 allow setting of the page length of the log. This is usually set by the distance between perforations in the paper and should not allow for gaps at the top or bottom of the page as this is taken care of in the program. There are 17 lines used in headers and spacing so if a number less than 17 is entered it defaults to 17. If no number is entered it defaults to 66 lines per page.
LINES 730-800 allow the contest category to be selected as per the contest rules. VHF and HF logs are not allowed to be mixed under the current contest rules so, once selected, the category cannot be changed.
LINES 850-940. If VHF has been selected the time between contacts is entered as this is the only restriction on VHF
LINES 990-1060 allow the contest section to be selected. Phone and CW/RTTY logs cannot be mixed under the current contest rules so once selected, the section cannot be changed. However, within the Phone Section it is possible to select SSB, FM, AM or TV.
LINES 1110-1220 allow entering of the date and then displays it back to you to ensure you are happy with what you have entered.
LINES 1270-1370 allow the input of UTC and checks for valid numbers and then displays it back.
LINES 1390-1470 looks at the time and the operators call sign to determine if it is the first or second day of the contest in local time. This information is used for the date entry on the log sheet.
LINES 1530-1550 converts the contact number to a number with leading zeros as this seems to be the accepted method for log numbering. The numbers are used in the range 001 to 500.
LINES 1560-1680 set the screen display that is used for each contact and displays the current contact number and the options available for changing mode within a section, changing frequency or saving or ending the log.
LINES 1700-1800 allow entering the contact call sign. Checks are carried out to ensure the call sign has the correct alpha/numeric content and that it is a VK, P2 or ZL call sign as these are the only areas worked in the contest.
LINES 1820-2050 allows a new frequency and/or mode to be entered is desired but the frequencies and modes selected are limited to those allowed within the limitations of the category and section originally selected.
LINES 2100-2270 check for duplicate entries. These checks are per the contest rules and can be easily seen in the program for HF For VHF the call area check is deleted but a time check is included and this is the purpose of the contact time and current time being converted to minutes to allow for easy comparison. If the current time has just passed 0000 hours and the previous contact time was prior to 0000 hours, 24 hours (1440 minutes) is added to the current time simply for the ease of time comparison. Where both times are on the same side of 0000 hours, this does not apply.
LINES 2320-2380 allows you to either accept the contact or reject it. At this point, the contact is a legal contact but you may still not want to enter it in the log for a variety of reasons, eg sudden QRM or QRN causes contact to be lost so numbers cannot be exchanged or the other station cannot hear you as well as you hear them, etc. In this case you simply reject it and the program reverts to entering another call.
LINES 2430-2510. If the contact is accepted you will then be asked to enter the contact number the other station gives and this must be in the range 000-999. Anything outside this range will not be accepted. The string variable is cleared prior to getting the next number so that, should an operator inadvertently hit the RETURN key instead of entering a number, it will be detected as an invalid number. If this is not done it will print the number from the previous contact. The total score is then incremented by one.
LINES 2560-2770 prints the page header if it is a new page. A check is made to determine if the date has changed since the last page.
LINES 2790-2910 sends data to the printer for each contact made. Line 2880 has to be included prior to closing a print file when the printer is in the CMD mode (line 2580). This results in an unwanted line-feed so lines 2870 and 2900 are included to temporarily disable the auto line-feed facility.
LINE 2950 will detect if the log has reached its maximum capacity and will automatically end the log and print out a front page.
LINES 3000-3180 prints a page footing if at the end of a page. If the log is "end"ed and only a part page is used it will form-feed the balance of the page and add the page footing on the correct line.
LINES 3260-3310 force a "garbage collection" every 20th contact to free-up memory of all the unused strings. Without this feature the computer will do it at some stage by itself but during that process the computer seems to go to sleep for a while until the process is complete. By doing it every 20th contact it takes less time, hence causing less inconvenience during the contest.
LINES 3360-3820 prints out a front page for the

log and allows you to enter your name and address. All relevant information is included on the front sheet and it only needs to be removed from the printer and the declaration signed.
LINES 3870-3940 is a subroutine for flashing error messages when an incorrect entry is made.
LINES 3990-4380 is the log saving routine so that if you wish to have a break from the contest you can save all the log and details including category and section, etc, to disc. This routine is accessed by entering "END" in place of a call sign and the option is then given of ending the log so that all entries are lost and a front page is printed or the option of saving the log to disc is offered so the log can be recommenced at a later time. It also includes a disc error trap so that, if you have a faulty save or forget to remove your write protect tab, etc, you will not lose your log. The routine will provide its own name for the log saved.
LINES 4430-4810 is the log loading routine used when re-commencing an unfinished log. When re-commencing a log it will continue on as though the log had never been stopped as far as line spacing on the printer is concerned so that the printer should be set to continue immediately under the previous contact.

As mentioned earlier, I run the program after compiling it with *Petspeed* to speed it up. Before running it through *Petspeed* it is necessary to do a few minor modifications to the routine to allow for the effect that the increased speed has on a few timing loops and also to remove a few lines of code which are not needed in the compiled format.

(1) Change line 90 to,
90 FOR A=1TO3000:NEXTA:REM DISPLAY DELAY

(2) Change lines 3900 and 3920 to,
3900 FOR DL=1TO2000:NEXT DL
3920 FOR DL=1TO2000:NEXT DL

(3) Change to GOTO values in the following lines to the new GOTO values as shown,
2950—GOTO3040
3020—GOTO3310
3060—GOTO3130
4120—GOTO3040

(4) The following lines are to be deleted,
150, 2560, 2870, 2900, 2910, 3030, 3120, 3150, 3160, 3230, to 3300.

Remember these modifications should not be done if the program is going to be run "as is" in BASIC.

REMEMBRANCE DAY CONTEST 1987

CATEGORY:-----HF
SECTION:------TRANSMITTING PHONE
CALLSIGN:-----VK5AIB
NAME:---------IAN BARTON
ADDRESS:------30 HALIFAX AVE., PARAFIELD GARDENS, 5107.
TOTAL SCORE:-- 56

PAGE TALLY: 2 SHEETS 56 POINTS

PAGE	SCORE
1	50
2	6
PAGES 2	TOTAL 56

DECLARATION

I HEREBY CERTIFY THAT I HAVE OPERATED IN ACCORDANCE WITH THE RULES AND SPIRIT OF THE CONTEST.

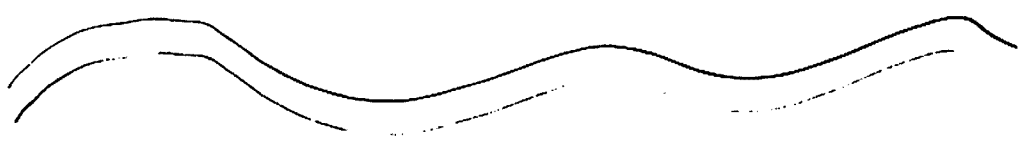
SIGNED

10/02/1987

REMEMBRANCE DAY CONTEST 1987

CALLSIGN: VK5AIB
CATEGORY: HF
SECTION: TRANSMITTING PHONE
DATE: 10/02/1987

TIME(UTC)	BAND(MHZ)	MODE	CALL	NO.SENT	NO.RECVD	SCORE	TOTAL
1611	3.5	SSB	VK1YT	051	047	1	51
1611	3.5	SSB	VK2UJ	052	278	1	52
1611	3.5	SSB	VK9RW	053	278	1	53
1612	3.5	SSB	VK3WU	054	378	1	54
1612	3.5	SSB	VK1WQ	055	078	1	55
1612	3.5	SSB	VK7GH	056	028	1	56



PAGE NO. 2 PAGE SCORE= 6 CONTEST SCORE= 56

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10 POKE53280,5:POKE53281,5:REM SCREEN AND BORDER COLOR
20 PRINT"{CLR}{BLK}":REM TEXT COLOR
30 PRINTTAB(13)"{DOWN}{DOWN}{DOWN}{DOWN}{DOWN}RD'CONTEST LOG"
40 PRINTTAB(19)"{DOWN}BY"
50 PRINTTAB(15)"{DOWN}IAN BARTON"
60 PRINTTAB(17)"{DOWN}VK5AIB"
70 PRINTTAB(10)"{DOWN}{DOWN}{DOWN}FOR USE WITH PRINTER"
80 PRINTTAB(13)"{DOWN}AND DISC DRIVE"
90 FORA=1TO500:NEXTA:REM DISPLAY DELAY
100 DIM C$(300):REN CALLSIGN ARRAY
110 DIM F$(500):REM FREQUENCY ARRAY
120 DIM T$(500):REM TIME WORKED ARRAY
130 DIM M$(500):REM MODE WORKED ARRAY
140 DIM P(20,2):REN PAGE NO. AND PAGE TOTAL DETAILS FOR FRONT SHEET
150 FM=0:REM STRING DELETE COUNT
160 REM----------------------------------------------------------------------
170 PRINT"{CLR}"
180 PRINT"{DOWN}{DOWN}{DOWN}**********ENSURE THAT PRINTER IS**********"
190 PRINT"**********ON AND READY TO GO**********"
200 PRINTTAB(8)"{DOWN}{DOWN}{DOWN}{DOWN}{DOWN}{DOWN}YOU CAN START A {RVON}N{RVOF}EW LO
G"
210 PRINTTAB(19)"OR"
220 PRINTTAB(3)"CONTINUE A {RVON}P{RVOF}REVIOUS LOG FROM DISK"
230 PRINTTAB(9)"{DOWN}{DOWN}{RVON}N{RVOF}EW LOG"
240 PRINTTAB(9)"{RVON}P{RVOF}REVIOUS LOG FROM DISK"
250 PRINTTAB(3)"{DOWN}ENTER N OR P"
260 GET A$:IF A$="N"THEN PRINT"{CLR}":GOTO300
270 IF A$<>"P"THEN GOTO260
280 PRINTTAB(5)"{DOWN}{DOWN}INSERT DISK WITH PREVIOUS LOG."
290 PRINTTAB(7)"{DOWN}{DOWN}PUSH SPACE BAR WHEN READY"
300 GET A$:IF A$=" "THEN GOTO320
310 GOTO300
320 PRINT"{CLR}":PRINTTAB(15)"{DOWN}{DOWN}{DOWN}{DOWN}LOADING LOG"
330 PRINTTAB(13)"BE VERY PATIENT":GOTO4430
340 REM----------------------------------------------------------------------
350 REM **********************
360 REM **PRESET VARIABLES**
370 REM **********************
380 FR$="144":REM ARBITARY START FREQUENCY
390 PS=66:REM NO. OF LINES PER PAGE ON PRINTER
400 PN=1:REN PAGE NUMBER COUNT
410 N=1:REN LOG START NUMBER
420 LC=1:REM PRINTER LINE COUNT
430 X=2:REM DEFAULT VALUE-NININUN TIME BETWEEN VHF CONTACTS
440 C=0:REM ARRAY POINTER
450 PT=0:REM PAGE TOTAL COUNT
460 TS=0:REM RUNNING TOTAL COUNT
470 REM----------------------------------------------------------------------
480 REM **********************************
490 REM **ENTER AND CHECK OWN CALLSIGN**
500 REM **********************************
510 PRINT"{CLR}"
520 INPUT"{DOWN}{DOWN}{DOWN}ENTER YOUR CALLSIGN";MC$
530 IF LEN(MC$)<5 OR LEN(MC$)>6 THEN GOTO610
540 IF LEFT$(MC$,2)<>"VK" THEN GOTO610
550 IF MID$(MC$,3,1)<"0"OR MID$(MC$,3,1)>"9"THEN GOTO610
560 IF RIGHT$(MC$,1)>"0" AND RIGHT$(MC$,1)<"9"THEN GOTO610
570 IF RIGHT$(MC$,2)>"0" AND RIGHT$(MC$,2)<"9"THEN GOTO610
580 IF LEN(MC$)<6THEN GOTO660
590 IF RIGHT$(MC$,3)>"0" AND RIGHT$(MC$,3)<"9"THEN GOTO610
600 GOTO660
610 PRINT"{RVON} CALLSIGN ENTERED INCORRECTLY {RVOF}":GOTO520
620 REM----------------------------------------------------------------------
630 REM **********************
640 REM **ENTER PAGE LENGTH**
650 REM **********************
660 INPUT"{DOWN}{DOWN}{DOWN}NO. OF LINES PER PAGE ON PRINTER";PS
670 IF PS<17 THEN PS=17
680 PS=PS-15:REM DEDUCT HEADINGS FROM LINE COUNT
690 REM----------------------------------------------------------------------
700 REM **********************************
710 REM **SELECT CONTEST CATEGORY**
720 REM **********************************
730 PRINT"{CLR}"
740 PRINTTAB(10)"{DOWN}{DOWN}{DOWN}{DOWN}{DOWN}SELECT YOUR CATEGORY"
750 PRINTTAB(12)"{DOWN}{1}VHF"
760 PRINTTAB(12)"{2} HF"
770 INPUT"{DOWN}{DOWN}              SELECT 1 OR 2";CG
780 IF CG<1 OR CG>2 THEN GOTO770
790 IF CG=2 THEN CG$="HF":FR$="14":GOTO990
800 CG$="VHF":FR$="144"
810 REM----------------------------------------------------------------------
820 REM ***************************************************
830 REM **IF VHF ENTER TIME ALLOWANCE BETWEEN CONTACTS**
840 REM ***************************************************
850 PRINT"{CLR}":PRINTTAB(6)"{DOWN}{DOWN}{DOWN}ENTER TIME ALLOWED, IN {RVON}HOUR
S{RVOF},"
860 PRINTTAB(10)"BETWEEN VHF CONTACTS"
870 INPUT"{DOWN}                    ";X
880 X=X*60:REM CONVERT IT TO MINUTES
890 PRINTTAB(7)"{DOWN}{DOWN}TIME BETWEEN VHF CONTACTS"
900 PRINTTAB(14)"IS "X/60" HOURS"
910 PRINTTAB(12)"{DOWN}OK-Y/N"
920 GET A$:IF A$="N" THEN GOTO850
930 IF A$="Y" THEN GOTO990
940 GOTO920
950 REM----------------------------------------------------------------------
960 REM ******************************
970 REM **SELECT CONTEST SECTION**
980 REM ******************************
990 PRINTTAB(10)"{DOWN}{DOWN}SELECT YOUR SECTION"
1000 PRINTTAB(17)"{DOWN}{1}SSB,FM,AM,TV
1010 PRINTTAB(17)"{2}CW,RTTY
1020 INPUT"{DOWN}{DOWN}              SELECT 1 OR 2";SN
1030 IF SN<1 OR SN>2 THEN GOTO1020
1040 IF SN=1 AND CG=1 THEN SN$="TRANSMITTING PHONE":MS$="FM":REM FM FOR VHF
1050 IF SN=1 AND CG=2 THEN SN$="TRANSMITTING PHONE":MS$="SSB":REN SSB FOR HF
1060 IF SN=2 THEN SN$="TRANSMITTING CW/RTTY":MS$="CW"
1070 REM----------------------------------------------------------------------
1080 REM **********************
1090 REM **INPUT TODAYS DATE**
1100 REM **********************
1110 PRINT"{CLR}"
1120 PRINTTAB(7)"{DOWN}{DOWN}{DOWN}ENTER TODAYS DATE DDMMYYYY"
1130 PRINTTAB(19)"E.G.  16081986"
1140 PRINTTAB(22)" ";INPUTA$
1150 DD$=LEFT$(A$,2):MM$=MID$(A$,3,2):YY$=RIGHT$(A$,4)
1160 PRINTTAB(8)"YOU HAVE SET THE DATE AT"
1170 PRINTTAB(15)"{DOWN}"DD$"/"MM$"/"YY$
1180 PRINTTAB(13)"{DOWN}IS THIS OK-Y/N"
1190 GET A$:IF A$="N" THEN GOTO1120
1200 IF A$="Y" THEN GOTO1220
1210 GOTO1190
1220 DY$=DD$:DY=VAL(DD$):REM SAVE DATE FOR LATER USE FOR PRINTER AND FRONT PAGE
1230 REM----------------------------------------------------------------------
1240 REM ***************************************************
1250 REM **INPUT G.M.T. AND CHECK FOR INCORRECT ENTRIES**
1260 REM ***************************************************
1270 PRINT"{CLR}"
1280 INPUT"{DOWN}{DOWN}{DOWN}{DOWN}           ENTER G.M.T. HHMM8{DOWN}{LEFT}{LEF
T}{LEFT}{LEFT}{LEFT}{LEFT}{LEFT}{LEFT}{LEFT}";A$
1290 IF LEN(A$)<>6 THEN PRINT "{CLR}{DOWN}{DOWN}       {RVON}TIME ENTERED INCORR
ECTLY{RVOF}":GOTO1280
1300 IF LEFT$(A$,2)>"23"THEN PRINTTAB(9)"{DOWN}{DOWN}{RVON}HOURS ENTRY TOO LARGE
{RVOF}":GOTO1280
1310 IF MID$(A$,3,2)>"59"THEN PRINTTAB(8)"{DOWN}{DOWN}{RVON}MINUTES ENTRY TOO LA
RGE{RVOF}":GOTO1280
1320 IF RIGHT$(A$,2)>"59"THEN PRINTTAB(8)"{DOWN}{DOWN}{RVON}SECONDS ENTRY TOO LA
RGE{RVOF}":GOTO1280
1330 TI$=A$:PRINTTAB(7)"{DOWN}{DOWN}G.M.T IS SET TO "LEFT$(TI$,4)" HRS."
1340 PRINTTAB(23)"{DOWN}OK-Y/N"
1350 GET A$:IF A$="N" THEN GOTO1270
1360 IF A$="Y" THEN GOTO1390
1370 GOTO1350
1380 REM CHECK GMT TIME TO SEE IF LOCAL TIME IS 1ST OR 2ND DAY OF CONTEST
1390 IF LEFT$(MC$,3)="VK6"THEN GOTO1420:REN CHECK FOR MIDNIGHT IN W.A.
1400 IF LEFT$(MC$,3)="VK5"OR LEFT$(MC$,3)="VK8" THEN GOTO1440:REM S.A.& N.T.
1410 GOTO1460:REM CHECK FOR MIDNIGHT E.S.T.
1420 IF VAL(TI$)>80000 AND VAL(TI$)<160000THEN DI=1:GOTO1530
1430 GOTO1470
1440 IF VAL(TI$)>80000 AND VAL(TI$)<143000THEN DI=1:GOTO1530
1450 GOTO1470
1460 IF VAL(TI$)>80000 AND VAL(TI$)<140000THEN DI=1:GOTO1530
1470 DI=2:REM 2ND DAY OF CONTEST
1480 REM----------------------------------------------------------------------
1490 REM **************************************
1500 REM **START TO BUILD UP SCREEN DISPLAY**
1510 REM **************************************
1520 REM NUMBERS TO STRINGS FOR PRINTER
1530 N=N+1000:NS$=STR$(N):REM ADD 1000 FOR DISPLAY OF LEADING ZEROES
1540 NS$=RIGHT$(NS$,3):REM ADD 1000 FOR DISPLAY OF LEADING ZEROES
1550 N=N-1000:REM SUBTRACT THE 1000
1560 PRINT"{CLR}"
1570 PRINTTAB(11)"{DOWN}CONTACT NO. "NS$:REM CONTACT NUMBER
1580 PRINTTAB(13)"{DOWN}{DOWN}FREQUENCY-"FR$
1590 PRINTTAB(11)"      MODE---"MS$
1600 PRINT"{DOWN}ENTER †(RET) TO CHANGE FREQUENCY"
1610 PRINT"      ←(RET) TO CHANGE MODE"
1620 PRINT"    END(RET) TO END OR SAVE LOG"
1630 INPUT"{DOWN}{DOWN}ENTER HIS CALLSIGN";CS$
1640 IF CS$=MC$ THEN A$="{RVON} THATS YOUR OWN CALLSIGN DUMMY {RVOF}{UP}":GOTO22
50
1650 IF LEFT$(CS$,1)="†" THEN GOTO1820:REM CHANGE FREQUENCY
1660 IF LEFT$(CS$,1)="←" AND SN=1 THEN GOTO1880:REM CHANGE PHONE MODE
1670 IF LEFT$(CS$,1)="←" AND SN=2 THEN GOTO1990:REM CHANGE CW MODE
1680 IF CS$="END" THEN GOTO3990:REM FINISH OFF LOG
1690 REM CHECK THAT CALLSIGN ENTERED CORRECTLY
1700 IF LEN(CS$)<5 OR LEN(CS$)>6 THEN GOTO1790
1710 IF LEFT$(CS$,2)="VK"ORLEFT$(CS$,2)="P2"ORLEFT$(CS$,2)="ZL"THEN GOTO1730
1720 GOTO1790
1730 IF MID$(CS$,3,1)<"0"OR MID$(CS$,3,1)>"9"THEN GOTO1790
1740 IF RIGHT$(CS$,1)>"0" AND RIGHT$(CS$,1)<"9"THEN GOTO1790
1750 IF RIGHT$(CS$,2)>"0" AND RIGHT$(CS$,2)<"9"THEN GOTO1790
1760 IF LEN(CS$)<>6THEN GOTO1780
1770 IF RIGHT$(CS$,3)>"0" AND RIGHT$(CS$,3)<"9"THEN GOTO1790
1780 GOTO2180
1790 PRINT"{RVON} CALLSIGN ENTERED INCORRECTLY {RVOF}":GOTO1630
1800 GOTO2180
1810 REM SELECT A NEW FREQUENCY
1820 INPUT"{DOWN}ENTER NEW FREQUENCY";FR$
1830 IF CG$="VHF"AND(VAL(FR$)<130 OR VAL(FR$))380)THEN GOTO1860
1840 IF CG$="HF"AND(VAL(FR$)<1.8 OR VAL(FR$)>29)THEN GOTO1860
1850 GOTO1530
1860 A$=" {RVON} INVALID FREQUENCY {RVOF}{UP}":GOSUB3870:GOTO1820
1870 REM SELECT A NEW MODE
1880 PRINT" SELECT NEW NODE (1)SSB"
1890 PRINT"                  (2) FM"
1900 PRINT"                  (3) AM"
1910 PRINT"                  (4) TV"
1920 INPUT"{DOWN}ENTER 1,2,3 OR 4";MS
1930 IF NS=1 THEN MS$="SSB"
1940 IF MS=2 THEN MS$="FM"
1950 IF MS=3 THEN MS$="AN"
1960 IF MS=4 THEN MS$="TV"
1970 IF MS(1 OR MS)4 THEN GOTO1920
1980 GOTO1530
1990 PRINT" SELECT NEW MODE (1)CW"
2000 PRINT"                 (2)RTTY"
2010 INPUT"{DOWN}ENTER 1 OR 2";MS
2020 IF MS=1 THEN MS$="CW"
2030 IF MS=2 THEN MS$="RTTY"
2040 IF MS<1 OR MS>2 THEN GOTO2010
2050 GOTO1530
2060 REM----------------------------------------------------------------------
2070 REM *********************************
2080 REM **COMPARE CURRENT CONTACT TO PREVIOUS CONTACTS**
2090 REM *********************************
2100 FOR S=0TOC
2110 IF CG$="VHF" THEN GOTO2150
2120 IF LEFT$(CS$,2)<>"VK"THEN GOTO2150:REM NO CALL AREA LIMIT ON P2 AND ZL
2130 IF LEFT$(CS$,3)<>LEFT$(MC$,3)THEN GOTO2150:REN SANE VK CALL AREA CHECK
2140 A$="{RVON} INVALID CALL AREA {RVOF}{UP}":GOTO2250
2150 IF CS$<>C$(S)THEN GOTO2270:REM CALLSIGN CHECK
2160 IF FR$<>F$(S)THEN GOTO2270:REM FREQUENCY CHECK
2170 IF MS$<>M$(S)THEN GOTO2270:REM MODE CHECK
2180 IF CG$="HF" THEN GOTO2240:REM NO TIME CHECK NEEDED ON HF
2190 REM *******CONVERT TIMES TO MINUTES FOR VHF TIME LAPSE CHECK********
2200 T1=VAL(LEFT$(T$(S),2))*60+VAL(RIGHT$(T$(S),2)):REM CONTACT TIME IN MINS.
2210 T2=VAL(LEFT$(TI$,2))*60+VAL(MID$(TI$,3,2)):REM CUPRENT TIME IN MINS.
2220 IF T2<T1  THEN T2=T2+1440:REM ADD 24HRS IF AFTER 0000HRS
2230 IF T2>T1+X THEN GOTO2270:REM TIME CHECK FOR VHF
2240 A$="{RVON} WORKED BEFORE AT "+T$(S)+" HOURS {RVOF}{UP}"
2250 OOBUB3c70
2260 GOTO1530
2270 NEXT S
2280 REM----------------------------------------------------------------------
2290 REM ****************************************
2300 REN **ADD NEW CALL, FREQ, TIME & MODE TO LOG**
2310 REM ****************************************
2320 PRINTTAB(13)"{DOWN}{DOWN}NOT YET WORKED"
2330 PRINTTAB(8)"{DOWN}ENTER CALL INTO LOG? Y/N"
2340 GET A$:IF A$="Y" THEN GOTO2370
2350 IF A$="N" THEN GOTO1530
2360 GOTO2340
2370 C$(C)=CS$:F$(C)=FR$:T$(C)=LEFT$(TI$,4):M$(C)=MS$
2380 PRINT"{DOWN}CONTACT TIME-----"T$(C)" G.M.T."
2390 REM----------------------------------------------------------------------
2400 REM ***********************************************
2410 REM **ENTER RECEIVED NUMBER AND CHECK IF VALID**
2420 REN ***********************************************
2430 NG$="";INPUT"{DOWN}{DOWN}ENTER NO.RECEIVED ";NG$
2440 IF LEN(NG$)<1 OR LEN(NG$)>3 THEN GOTO2500
2450 NG$=(LEFT$("000",3-LEN(NG$)))+NG$
2460 IF LEFT$(NG$,1)<"0" OR LEFT$(NG$,1)>"9" THEN GOTO2500
2470 IF MID$(NG$,2,1)<"0" OR MID$(NG$,2,1)>"9" THEN GOTO2500
2480 IF RIGHT$(NG$,1)<"0" OR RIGHT$(NG$,1)>"9" THEN GOTO2500
2490 GOTO2510
2500 PRINT" {RVON} INVALID NUMBER {RVOF}":GOTO2430
2510 TS=TS+1:REN INCREMENT RUNNING TOTAL SCORE
2520 REM----------------------------------------------------------------------
2530 REM ***************************************
2540 REM **ASSEMBLE AND SEND ENTRY TO PRINTER**
2550 REM ***************************************
2560 OPEN1,4,15
2570 OPEN4,4
2580 CMD4
2590 IF LC<>1 THEN GOTO2780:REM CHECK FOR NEW PAGE
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2600 PRINT:PRINT:PRINT:PRINT
2610 PRINTTAB(26)"REMEMBRANCE DAY CONTEST "YY$
2620 PRINT"CALLSIGN:   "MC$
2630 PRINT"CATEGORY:   "CG$
2640 PRINT"SECTION:    "SN$
2650 REM CHECK FOR CHANGE OF DATE IF AFTER MIDNIGHT LOCAL TIME
2660 IF LEFT$(MC$,3)="VK6"THEN GOTO2698:REM CHECK FOR MIDNIGHT IN W.A.
2670 IF LEFT$(MC$,3)="VK5"OR LEFT$(MC$,3)="VK8" THEN GOTO2710:REM S.A.& N.T.
2680 GOTO2730:REM CHECK FOR MIDNIGHT E.S.T.
2690 IF DI=1AND(VAL(TI$)>160000 OR VAL(TI$)<80000)THEN DY=VAL(DD$)+1
2700 GOTO2740
2710 IF DI=1AND(VAL(TI$)>143000 OR VAL(TI$)<80000)THEN DY=VAL(DD$)+1
2720 GOTO2740
2730 IF DI=1AND(VAL(TI$)>140000 OR VAL(TI$)<80000)THEN DY=VAL(DD$)+1
2740 DY=DY+100:DY$=STR$(DY):DY$=RIGHT$(DY$,2):DY=DY-100:REM ADD LEADING ZERO
2750 PRINT"DATE:       "DY$"/"MM$"/"YY$
2760 PRINT"    TIME(UTC)    BAND(MHZ)  MODE     CALL    NO.SENT    NO.RECVD    "I
2770 PRINT"SCORE    TOTAL"
2780 SC$=STR$(SC):TS$=STR$(TS)
2790 PRINTTAB(10-(LEN(T$(C))))T$(C);:REM PRINT TIME OF CONTACT
2800 PRINTTAB(12-(LEN(F$(C))))F$(C);:REM PRINT FREQUENCY OF CONTACT
2810 PRINTTAB(9-(LEN(M$(C))))M$(C);:REM PRINT MODE OF CONTACT
2820 PRINTTAB(3)C$(C);:REM PRINT CALLSIGN
2830 PRINTTAB(13-(LEN(C$(C)))-(LEN(NS$(I))))NS$(I);:REM PRINT NO. SENT
2840 PRINTTAB(11-(LEN(NG$(I))))NG$(I):REM PRINT NUMBER RECEIVED
2850 PRINTTAB(7)"1";:REM PRINT INDIVIDUAL CONTACT SCORE
2860 PRINTTAB(9-(LEN(TS$)))TS$,:REM PRINT RUNNING TOTAL
2870 PRINT#1,"LN";:REM SUPPRESS LINE FEED
2880 PRINT#4
2890 CLOSE4
2900 PRINT#1,"LY";:REM RESTORE LINE FEED
2910 CLOSE1
2920 REM------------------------------------------------------------------------
2930 C=C+1:REM INCREMENT ARRAY POINTER
2940 N=N+1:REM LOG NUMBER INCREMENT
2950 PT=PT+1:REM INCREMENT PAGE SCORE
2960 IF N=300THEN CS$="END":A$=" [RVON]END OF LOG [RVOF][UP]":GOSUB3070:GOTO3030
2970 REM------------------------------------------------------------------------


2980 REM ##########################################################
2990 REM ##CHECK FOR END OF PAGE TO ADD PAGE SCORE AND TOTAL SCORE##
3000 REM ##########################################################


3010 LC=LC+1:REM LINE COUNTER FOR PRINTER
3020 IF LC<>PS THEN GOTO3240:REM CHECK FOR END OF PAGE
3030 OPEN1,4,15
3040 OPEN4,4
3050 CMD4
3060 IF LC=1 THEN PN=PN-1:GOTO3120:REM NO ENTRIES YET, IGNORE PAGE FOOTING
3070 FOR A=0 TO (PS-LC):REM)  FORCES AN END OF PAGE FOR END OF LOG
3080 PRINT:              REM)
3090 NEXT A:             REM)
3100 PRINT:PRINTTAB(10)"PAGE NO. "PN
3110 PRINTTAB(20)"PAGE SCORE= "PT" CONTEST SCORE= "TS:PRINT:PRINT:
3120 PRINT#1,"LN";:REM SUPPRESS LINE FEED
3130 PRINT#4
3140 CLOSE4
3150 PRINT#1,"LY";:REM RESTORE LINE FEED
3160 CLOSE1
3170 P(PN,1)=PN:P(PN,2)=PT:REM SAVE PAGE NO. AND PAGE TOTAL FOR FRONT SHEET
3180 IF CS$="END" THEN GOTO3360
3190 LC=1:REM RESET LINE COUNT
3200 PT=0:REM RESET PAGE TOTAL
3210 PN=PN+1:REM PAGE NUMBER
3220 REM------------------------------------------------------------------------


3230 REM ##################################################
3240 REM ##FREE UP STRING STORAGE SPACE EVERY 20TH ENTRY##
3250 REM ##################################################


3260 FM=FM+1
3270 IF FM<>20 THEN GOTO1530
3280 PRINT"[DOWN][DOWN]   PLEASE WAIT WHILE I TIDY UP A BIT."
3290 FM=0
3300 XX=FRE(0):REM FREES UP STRING STORAGE SPACE. THIS LINE CAN BE DELETED
3310 GOTO1530
3320 REM------------------------------------------------------------------------

3330 REM ##########################
3340 REM ##PRINT LOG TITLE PAGE##
3350 REM ##########################


3360 INPUT"[CLR][DOWN][DOWN][DOWN][DOWN]WHAT IS YOUR NAME";NM$
3370 PRINT"[DOWN]ENTER YOUR ADDRESS"
3380 INPUT"[DOWN]WHAT IS YOUR HOUSE NUMBER";HN$
3390 INPUT"[DOWN]YOUR STREET NAME";HS$
3400 INPUT"[DOWN]YOUR SUBURB";HD$
3410 INPUT"[DOWN]YOUR POSTCODE";HP$
3420 PRINT"[CLR]":PRINTTAB(5)"[DOWN][DOWN][DOWN][DOWN][DOWN][DOWN]YOU HAVE ENTERED YOU
R NAME AND"
3430 PRINTTAB(12)"ADDRESS AS SUCH."
3440 PRINTTAB(18)"[DOWN][DOWN][DOWN]"NM$
3450 PRINTTAB(10)HN$" "HS$:PRINTTAB(10)HD$:PRINTTAB(10)HP$
3460 PRINT"[DOWN]ARE YOU HAPPY WITH THIS?":PRINTTAB(10)"[DOWN][DOWN]ENTER Y/N"
3470 GET A$:IF A$="N"THEN GOTO3360
3480 IF A$="Y"THEN GOTO3500
3490 GOTO3470
3500 OPEN1,4
3510 FOR A=1TO6:PRINT#1:NEXTA:REM INSERT SPACE AT TOP OF PAGE
3520 PRINT#1,CHR$(27);"W";CHR$(1);:REM SET ENLARGED PRINT MODE
3530 PRINT#1,CHR$(27);"-";CHR$(1);:REM SET UNDERLINE MODE
3540 PRINT#1,"      REMEMBRANCE DAY CONTEST "YY$"      "
3550 PRINT#1,CHR$(27);"W";CHR$(0);:REM CANCEL ENLARGED PRINT MODE
3560 PRINT#1,CHR$(27);"-";CHR$(0);:REM CANCEL UNDERLINE MODE
3570 CMD1
3580 PRINTTAB(3)"CATEGORY:-----"CG$
3590 PRINTTAB(3)"SECTION:------"SN$
3600 PRINTTAB(3)"CALLSIGN:-----"MC$
3610 PRINTTAB(3)"NAME:---------"NM$
3620 PRINTTAB(3)"ADDRESS:------"HN$" "HS$", "HD$", "HP$"."
3630 PRINTTAB(3)"TOTAL SCORE:--"TS
3640 PRINT:PRINTTAB(3)"PAGE TALLY:"
3650 PRINTTAB(13-LEN(STR$(PN)))PN" SHEETS"
3660 PRINTTAB(24-LEN(STR$(TS)))TS" POINTS"
3670 PRINT:PRINTTAB(24)"PAGE                              SCORE"
3680 FOR S=1TO PN
3690 PRINTTAB(27-LEN(STR$(P(S,1))))P(S,1);:
3700 PRINTTAB(31-LEN(STR$(P(S,2))))P(S,2)
3710 NEXTS
3720 PRINTTAB(21-LEN(STR$(PN)))"PAGES "PN:PRINTTAB(25-LEN(STR$(TS)))"TOTAL "TS
3730 PRINT#1,CHR$(27);"-";CHR$(1);:REM SET UNDERLINE MODE
3740 PRINT#1,"DECLARATION"
3750 PRINT#1,CHR$(27);"-";CHR$(0);:REM CANCEL UNDERLINE MODE
3760 CMD1
3770 PRINTTAB(8)"I HEREBY CERTIFY THAT I HAVE OPERATED IN ACCORDANCE WITH "
3780 PRINTTAB(8)"THE RULES AND SPIRIT OF THE CONTEST."
3790 PRINT:PRINTTAB(30)"SIGNED"

3800 PRINT:PRINT:PRINTTAB(43)"----------------------"
3810 PRINTTAB(48)DY$"/"MM$"/"YY$
3820 PRINT#1:CLOSE1:END
3830 REM------------------------------------------------------------------------

3840 REM ##################################
3850 REM ##SUBROUTINE FOR FLASHING MESSAGES##
3860 REM ##################################


3870 PRINT"[DOWN][DOWN]"
3880 FOR DT=1TO3
3890 PRINTTAB((40-LEN(A$))/2)A$
3900 FOR DL=1TO150:NEXT DL
3910 PRINT"                                        [UP]"
3920 FOR DL=1TO150:NEXT DL
3930 NEXT DT
3940 RETURN
3950 REM------------------------------------------------------------------------

3960 REM ####################
3970 REM ##SAVE LOG TO DISK##
3980 REM ####################


3990 PRINT"[CLR]"
4000 PRINTTAB(7)"[DOWN][DOWN][DOWN][DOWN][RVON]E[RVOF]ND LOG & PRINT FRONT PAGE
4010 PRINTTAB(7)"[RVON]S[RVOF]AVE UNFINISHED LOG TO DISC
4020 PRINTTAB(10)"[DOWN]ENTER E OR S"
4030 GET A$:IF A$="S" THEN GOTO4140
4040 IF A$="E" THEN GOTO4060
4050 GOTO4030
4060 PRINTTAB(6)"[DOWN][DOWN]THIS WILL FINISH OFF THE LOG"
4070 PRINTTAB(3)"AND THE PREVIOUS CONTACTS WILL NOT"
4080 PRINTTAB(13)"BE RECOVERABLE"
4090 PRINTTAB(10)"[DOWN]IS THIS WHAT YOU WANT?"
4100 PRINTTAB(15)"[DOWN]ENTER Y/N"
4110 GET A$:IF A$="N" THEN GOTO3990
4120 IF A$="Y" THEN GOTO3030
4130 GOTO4110
4140 PRINTTAB(9)"[DOWN][DOWN]INSERT FORMATTED DISK."
4150 PRINTTAB(7)"[DOWN][DOWN]PUSH SPACE BAR WHEN READY"
4160 GET A$:IF A$=" "THEN GOTO4180
4170 GOTO4160
4180 OPEN2,8,2,"@0: RD LOG,S,W"
4190 REM   FIRST CHECK FOR DISK ERRORS.
4200 OPEN15,8,15
4210 INPUT#15,U,U$,V,W
4220 IF U<20THEN GOTO4280:REM NO ERROR
4230 PRINTTAB(14)"[DOWN][RVON] DISK ERROR [RVOF] ":PRINTTAB((40-LEN(U$))/2)"[DOW
N]"U$
4240 PRINTTAB(7)"[DOWN][DOWN]PUSH SPACE BAR TO CONTINUE."
4250 GET A$:IF A$<>" "THEN GOTO4250
4260 CLOSE2:CLOSE15:GOTO4180
4270 REM   SAVE LOG
4280 PRINT#2,C:PRINT#2,N:PRINT#2,TS:PRINT#2,LC:PRINT#2,PT:PRINT#2,PS:PRINT#2,PN
4290 PRINT#2,SN:PRINT#2,X
4300 PRINT#2,CG$:PRINT#2,FR$:PRINT#2,SN$:PRINT#2,MS$:PRINT#2,MC$
4310 FOR S=1 TO PN
4320 PRINT#2,P(S,1):PRINT#2,P(S,2)
4330 NEXTS
4340 FOR S=8TO(C-1)
4350 PRINT#2,T$(S):PRINT#2,F$(S):PRINT#2,M$(S):PRINT#2,C$(S)
4360 NEXT S
4370 PRINT#2,"$"
4380 CLOSE2:END
4390 REM------------------------------------------------------------------------


4400 REM ########################
4410 REM ##LOAD LOG FROM DISK##
4420 REM ########################


4430 OPEN2,8,2," RD LOG,S,R"
4440 REM   FIRST CHECK FOR DISK ERRORS.
4450 OPEN15,8,15
4460 INPUT#15,U,U$,V,W
4470 IF U<20THEN GOTO4530:REM NO ERROR
4480 PRINTTAB(14)"[DOWN][RVON] DISK ERROR [RVOF] ":PRINTTAB(INT((40-LEN(U$))/2))
"[DOWN]"U$
4490 PRINTTAB(7)"[DOWN][DOWN]PUSH SPACE BAR TO CONTINUE."
4500 GET A$:IF A$<>" "THEN GOTO4500
4510 CLOSE2:CLOSE15:GOTO4430
4520 REM   GET LOG
4530 INPUT#2,C:REM ARRAY POINTER
4540 INPUT#2,N:REM NO. SENT COUNT
4550 INPUT#2,TS:REM TOTAL SCORE
4560 INPUT#2,LC:REM LINE COUNT
4570 INPUT#2,PT:REM PAGE TOTAL
4580 INPUT#2,PS:REM PAGE SIZE
4590 INPUT#2,PN:REM PAGE NO.
4600 INPUT#2,SN:REM SECTION SELECT FLAG
4610 INPUT#2,X :REM VHF TIME LIMIT
4620 INPUT#2,CG$:REM CATEGORY
4630 INPUT#2,FR$:REM FREQUENCY
4640 INPUT#2,SN$:REM SECTION
4650 INPUT#2,MS$:REM MODE
4660 INPUT#2,MC$:REM BASE CALLSIGN
4670 FOR S=1 TO PN
4680 INPUT#2,P(S,1):REM PAGE NO. FOR FRONT PAGE
4690 INPUT#2,P(S,2):REM PAGE TOTAL FOR FRONT PAGE
4700 NEXTS
4710 S=0
4720 INPUT#2,T$(S):REM TIME WORKED
4730 IF T$(S)="$"THEN PRINT"[CLR]":PRINTTAB(15)"[DOWN][DOWN][DOWN]LOG ENTERED":G
OTO4790
4740 INPUT#2,F$(S):REM FREQUENCY
4750 INPUT#2,M$(S):REM MODE WORKED
4760 INPUT#2,C$(S):REM CALL WORKED
4770 S=S+1
4780 GOTO4720
4790 CLOSE2
4800 CLOSE15
4810 GOTO1120
4820 REM------------------------------------------------------------------------

4830 REM ##################################################
4840 REM ##ROUTINE FOR SEEING WHAT HAS GONE ONTO DISK##
4850 REM ##################################################


4860 OPEN2,8,2," RD LOG,S,R"
4870 REM:OPEN1,4
4880 INPUT#2,X$
4890 PRINTX$;
4900 REM:PRINT#1,X$;
4910 IF X$="$"THEN GOTO4930
4920 GOTO4880
4930 REM:PRINT#1
4940 REM:CLOSE1
4950 CLOSE2:END

READY.
```

CONTEST COMPUTER LOG

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A computer program for the Commodore C-64, C-128, CBM 4032 and CBM 8032, particularly useful for the RD Contest, but indeed useful for any contest with minor modifications.

The program was initially written six years ago, as a checking program for the RD Contest, so that duplication of call signs on the same band or mode of operation could be avoided.

When originally written, the author only had a Commodore 3016 and cassette recorder. Since then the program has undergone many modifications, and the author has acquired more computer equipment!

As well as checking to see if the same station has been worked before, the program also checks to see if that station has been worked on other bands or using different modes, although it takes twice the time to check, as well as printing each contact in the format as required by the Contest Manager, etc.

It also creates and appends (adds to) a sequential file on disc, which is very handy if there is a program crash (operator error), power failure, etc. You can reload all contacts to date from disc and continue, as well as have a disk record of the contest.

Those unfortunate enough not to possess a printer or have a disc drive, can still use the program for checking and write down their contacts after the contest is over by simply recalling them from the memory onto the screen. Is is also possible to do a complete dump to a printer of all contacts during the contest or thus far.

There are prompts at the beginning of the program to ask what colour writing (C-64 only), screen and border (C-64 and C-128 only), then how many lines to be printed per page, if you have a printer, if you have a disc drive, if you want a previous band check on a call sign or not. It then asks you to enter two of the criteria, the band and **mode**. If a printer is available it then prints the heading onto the first sheet, then goes to the input stage and awaits entry of a call sign. When the call sign is entered, and if that station has already been worked, it tells you and will not accept it. If it has not been worked previously it then asks you to **enter number received**. As soon as this is complete it will pass it to memory, print it and append it to the disc file (if those facilities are available and have been chosen).

A word of warning to those who use the disc file — once a contest is finished you must either **rename** the file or use another disc, otherwise the next contest you enter will append (add) to the last one, and if there is a need to recall them from disc you will not only have this contest's contacts, but the last one as well.

This program is written in very simple BASIC so anyone with a different computer and a little programming experience can adapt it to their computer with very few changes.

Note that lines 1300 and 1940 are different for the C-64, C-128 and 4032 (8032). The lines in the printout are for the C-64. For the C-128 they should be altered thus:

1300 DIMA$(2100)
1940 PRINT2001-NN" CONTACTS LEFT MEMORY="FRE(1)

For the 4032 (8032) they should be altered to:

1300 DIMA$(760)
1940 PRINT751-NN" CONTACTS LEFT MEMORY="FRE(0)

Line 2560 should be used for the C-64 only.

The REMed statements can be omitted from the program when being typed in as they take up valuable memory space, which may be needed for other things.

The C-64 allows for about 1000 contacts, the 4032 (8032) about 750 and the C-128 over 2100.

Although the C-64 will "hang-up" at times (first noticed about 600 contacts), it does resume after a moment, it is just necessary to be patient:

Checking of memory in the C-64 can be time-consuming, especially after quite a few contacts. It is therefore advisable that, if it is to be checked, it should be left to quiet times during the contest.

For those with a printer, testing how many lines per page has to be done over two or three pages as the separating space to avoid perforations has to be taken into account. It also prints **page 1 of . . .** incrementing each page. The heading is printed at the top of the page.

eg: DATE TIME BAND MODE CALLSIGN NUM SNT NUM RCD PTS

On the change of date, press the appropriate key and change the date. The new date will print when the next contact is printed instead of **DITO** (//) marks in the left column.

The criteria of each contact is CALLSIGN, BAND and MODE. If BAND or MODE is changed, do not forget to change it on the computer by pressing the appropriate key (indicated at the top of the screen).

If there is an error in the first key stroke, say 'V' is typed instead of 'B', it must be corrected by pressing the **return** key and beginning again. The remainder of the call sign can be corrected with the 'INST/DEL' key.

If the call sign is input incorrectly you can type a minus '-' at the 'number given' input and start again.

Should the program crash, type CONT 'return' and the program should continue. If it will not, the checking system is unserviceable unless you have a disc drive to reload the files from.

Instructions are all displayed at the top of the screen when the computer is ready for call sign input.

Anyone requiring further information may contact the writer, QTHR.

ar

```
10 REMARK *** DION P THOMAS   VK2PD   P.O. BOX 77  PENSHURST  N.S.W.  2222
20 REM *** WHEN TYPING OUT THIS, YOU MAY OMIT THE REMARK & REM STATEMENTS
50 REM *** TO SAVE MEMORY, WHICH WILL BE NEEDED FOR THE CONTEST.
100 REM *** THEY ARE SIMPLY THERE SO YOU CAN TRY TO FOLLOW THE PROGRAM WORKING
120 X=8:Y=8:Z=7
140 GOTO600
160 REM *** DISK FILE HANDLING
180 REM *** THIS OPENS SEQUENTIAL FILE ON DISK AND APPENDS ALL CONTACTS INPUT
200 IFA1=1GOTO240
220 OPEN5,8,5,"RD CONT FILE,S,W":GOTO250
240 OPEN5,8,5,"RD CONT FILE,S,A
250 IFDS=63THENA1=1:GOTO240
260 PRINT#5,DG$:PRINT#5,DF$:CLOSE5,8,5:A1=1:RETURN
280 REM *** THIS READS SEQUENTIAL FILE ON DISK, APPENDS AND RESTORES TO MEMORY
300 M=1:PRINT"J":OPEN5,8,5,"RD CONT FILE,S,R"
320 INPUT#5,DG$:LETDG=VAL(DG$)
340 IFDG>999THENW$=""
360 IFDG<1000THENW$=" "
380 IFDG<100THENW$="  "
400 IFDG<10THENW$="   "
420 INPUT#5,DF$:PRINTW$;DG$;" ";DF$:A$(M)=DF$:IFBB$="S"GOTO540
440 IFST=64GOTO540
460 PRINT"PRESS 'RETURN' TO CONTINUE  OR  RETURN
480 GETZ$:IFZ$=""GOTO480
500 IFZ$="R"THENCLOSE5,8,5:GOTO1880
520 PRINT"                                        "
540 IFST=64THENCLOSE5,8,5:GOTO5160
560 M=M+1:GOTO320
580 REMARK *** THIS IS FOR C64 SCREEN COLOUR (LINE 900)
600 POKE53280,(X):POKE53281,(Y):POKE646,(Z)
620 L=56:P=0
640 PRINT"              CONTEST  LOG  "
660 PRINT"       BY:- DION (DANNY) PETER THOMAS
680 PRINT"             VK/AX2VCV/KDT/DBT/PD"
700 PRINT"(MODS AT 12/82-5/83-7/84-8/85-8&12/86)
720 PRINT"(TO CHANGE LINES PER PAGE TYPE L) "L" "
740 PRINT"TO COLOUR BORDER 1  SCREEN 2  CURSOR 3
760 PRINT""TAB(32)"HHMMSS
780 PRINT"SET THE TIME RIGHT  Y  N : TIME IS  ";
800 PRINTTI$
820 GETTE$:IFTE$="L"THENINPUT"HOW MANY LINES PER PAGE";L:GOTO640
840 IFTE$="1"THENX=X+1:GOTO600
860 IFTE$="2"THENY=Y+1:GOTO600
880 IFTE$="3"THENZ=Z+1:GOTO600
900 IFTE$<>"Y"ANDTE$<>"N"GOTO780
920 PRINT" "TAB(13)" "TE$" ":IFTE$="Y"THENGOSUB5600
940 PRINT"DO YOU HAVE A PRINTER"
960 GETP$:IFP$=""GOTO960
980 IFP$="Y"THENPRINT" "TAB(31)" YES ":GOTO1060
1000 PRINT" "TAB(32)" NO ":GOTO1080
1020 IFP$<>"Y"ANDP$<>"N"GOTO940
1040 PRINT:PRINT" YES ":GOTO1060
1060 GOSUB4800:GOSUB4920:GOSUB5040
1080 PRINT"DO YOU HAVE A DISK DRIVE
1100 GETG$:IFG$=""GOTO1100
1120 IFG$="Y"THENPRINT" "TAB(31)" YES ":GOTO1180
1140 PRINT" "TAB(32)" NO "
1160 REMARK *** CAN CHECK IF A CALLSIGN HAS BEEN WORKED ON OTHER BANDS OR MODES
1180 PRINT"DO YOU WISH A PREVIOUS BAND CHECK ?
1200 GETCB$:IFCB$=""GOTO1200
1220 IFCB$<>"Y"ANDCB$<>"N"GOTO1200
1240 PRINT" "TAB(36)" "CB$" ":FORQ=1TO1000:NEXT
1260 K$=" ":V$="    ":D$="    ":T$="    ":U$="/"
1280 REM ** COMMODORE NEEDS TO DIMENSION A STRING IF MORE THAN 10
1300 DIMA$(1150)
1320 IFP$="Y"THENGOSUB1360:GOSUB1480:GOTO1880
1340 IFP$="N"THENGOSUB1480:GOTO1880
1360 GOSUB6000
1380 PRINT"  DATE       TIME    BAND   MODE    CALLSIGN     NUM.SNT.---NUM.RCD."
:
1400 PRINT"       PTS.
1420 PRINT:PRINTDA$;U$;UM$;U$;DY$
1440 GOSUB6020
1460 RETURN
1480 GOSUB1560:GOSUB1740:RETURN
1500 REMARK *** ENTERS BAND & MODE - TWO OF THE CRITERIA OF LOG CHECKING
1520 REMARK *** CHANGE OF EITHER WILL ALLOW THE SAME CALLSIGN TO BE ACCEPTED
1540 REMARK *** AGAIN. BOTH ARE LIMITED TO FOUR (4) CHARS EACH.
1560 PRINT"160,80,40,30,20,18,15,12,10,6,2MTRS,70CM
1580 PRINT"1.8,3.5,7,10,14,17,21,24,28,52,144,430MZ
1600 PRINTTAB(8)"(IN METERS   TOP LINE)
1620 PRINTTAB(7)"(MAXIMUM 4 CHARACTERS)
1640 PRINT"          -ENTER BAND
1660 INPUT"    ";Q$
1680 IFLEFT$(Q$,1)=""GOTO1560
1700 Q$=LEFT$(Q$+"    ",4):O=VAL(Q$):IFO=0GOTO1560
1720 RETURN
1740 PRINT" SSB, FM, CW, RTTY, ATV, ETC. "
1760 PRINTTAB(7)"(MAXIMUM 4 CHARACTERS)
1780 PRINT"          -ENTER MODE
1800 INPUT"    ";M$
1820 IFLEFT$(M$,1)=""GOTO1740
1840 M$=LEFT$(M$+"    ",4)
1860 RETURN
```

```
1880 NN=M+1:LN=0
1900 PRINT"RD CONTEST LOG VK2PD■ NEXT NO. IS ";NN;"■"
1920 PRINT
1940 PRINT"1101-NN"■ CONTACTS LEFT    MEMORY CHECK
1960 REMARK ** YOU HAVE TO WORK OUT FOR YOURSELF HOW MANY CONTACTS POSSIBLE
1980 REMARK ** IN YOUR COMPUTER (MEMORY) AND CHANGE VALUR IN LINE 3165 (1101)
2000 PRINT
2020 PRINT"NEW NUMBER-■ LAST PG NO ■ PAGE HEADING ■"
2040 PRINT"DISPLAY LOG  -  F1■      HARD COPY  -  F2■
2060 PRINT"CHANGE:  BAND - F3■  MODE - F4■  DATE - F5
2080 PRINT"TIME - F6■      PRINTER ";
2100 IFP$="Y"GOTO2140
2120 PRINT"ON - F7■   OFF■ - F8■":GOTO2160
2140 PRINT"ON■ - F7■   OFF - F8■
2160 PRINT"PREVIOUS BAND CHECK  -  ";
2180 IFCB$="Y"GOTO2220
2200 PRINT"ON - ■   OFF■ - ■":GOTO2240
2220 PRINT"ON■ - ■   OFF  - ■
2240 PRINT"RECALL DISK FILES  ■   INDIVIDUALLY  -
2260 PRINT"ERASE LAST ENTRY  - ■   LOAD FRNT SHT -
2280 PRINT" CALLSIGN :      BAND:   MODE:■ -  TIME
2300 REM *** CONSTANT TIME DISPLAY ON SCREEN
2320 TH$=LEFT$(TI$,2)
2340 TM$=MID$(TI$,3,2)
2360 TS$=RIGHT$(TI$,2)
2380 TA$=TH$+":"+TM$+":"+TS$
2400 PRINT"";TAB(12);"";TA$;"■"
2420 PRINTTAB(16)"";Q$;"     ";M$
2440 REMARK *** CALLSIGN INPUT (SINGLE KEY - NO RETURN REQUIRED) FOR FIRST
2460 REMARK ** CHARACTER. PRESSING SCREEN COMMANDS ARE ACTIONED HERE. CHECKING
2480 REMARK *** CHECKING MEMORY CAN TAKE A LONG TIME ESPECIALLY AFTER CONTACTS
2500 GETBB$:IFBB$=""GOTO2320
2520 IFBB$=CHR$(13)GOTO1880
2540 IFBB$="■"THENGOSUB1560:GOTO1880:REM ** F3 CHANGE BAND
2560 IFBB$=""THENPRINT"MEMORY REMAINING = "FRE(0)"■ BYTES FREE":GOTO5160
2580 IFBB$="-"GOTO4380
2600 IFBB$="?"THENLN=1:GOTO5960
2620 IFBB$="!"THENCB$="Y":GOTO1880
2640 IFBB$="■"GOTO4140:REM ** F1 DISPLAY LOG ON SCREEN
2660 IFBB$="-"THENCB$="N":GOTO1880
2680 IFBB$="$"ORBB$="&"GOTO300:REM ** TO READ & RELOAD DISK FILES INTO MEMORY
2700 IFBB$="<"GOTO6460
2720 IFBB$="■"GOTO4500:REM ** F2 HARD COPY - TO PRINTER
2740 IFBB$="@"THENGOSUB5240:GOTO1880
2760 IFBB$="■"THENCD=1:GOSUB5380:GOTO1880:REM ** F5 CHANGE DATE
2780 IFBB$="■"THENP$="Y":GOTO1880:REM ** F7 PRINTER ON
2800 IFBB$="■"THENP$="N":GOTO1880:REM ** F8 PRINTER OFF
2820 IFBB$="■"THENGOSUB1740:GOTO1880:REM ** F4 CHANGE MODE
2840 IFBB$=">"THENGOSUB1360:GOTO1880
2860 IFBB$="■"THENGOSUB5600:GOTO1880:REM ** F6 CHANGE TIME
2880 PRINT"■"BB$"";
2900 PRINT""TAB(19)"RETURN■ TO START AGAIN
2920 REMARK *** INPUT FOR THE REMAINDER OF THE CALLSIGN.
2960 REMARK *** LIMITED TOTAL OF 9 CHARS. ONE AT LINE 2500 AND 8 HERE.
2980 REMARK *** ANY MORE WILL BE DISCARDED. COLAN ':' APPEARS ON THE SCREEN.
3000 INPUT"■";BC$
3020 IFLEFT$(BC$,1)=""GOTO1880
3040 B$=BB$+BC$
3060 B$=LEFT$(B$+"         ",9)
3080 E$=M$+Q$+B$
3100 REMARK *** CHECKS FOR PREVIOUS CONTACTS
3120 IFCB$="N"GOTO3220
3140 FORT=1TOM
3160 IFB$=MID$(A$(T),14,9)THENGOSUB6360
3180 NEXTT
3200 GOTO3300
3220 FORT=1TOM
3240 IFE$=MID$(A$(T),6,17)THENGOSUB6360:GOTO4420
3260 NEXTT
3280 GOTO3360
3300 FORT=1TOM
3320 IFE$=MID$(A$(T),6,17)GOTO4420
3340 NEXTT
3360 M=M+1
3380 PRINT" NOT WORKED YET ON THIS BAND
3400 PRINT" NUMBER TO BE GIVEN  "M"■"
3420 PRINT"        ENTER NUMBER RECEIVED
3440 INPUT"    ■";C$
3460 IFLEFT$(C$,1)=""THENPRINT"":GOTO3420
3480 IFLEFT$(C$,1)="-"GOTO4380
3500 C$=LEFT$(C$+"    ",4):C=VAL(C$):IFC<1THENPRINT"":GOTO3420
3520 TH$=LEFT$(TI$,2):TM$=MID$(TI$,3,2):TB$=TH$+":"+TM$:BT$=TH$+"-"+TM$
3540 GOSUB5780
3560 S$=MID$(STR$(C),2,5)
3580 A$(M)=TH$+TM$+K$+E$+S$
3600 REMARK *** APPENDS (ADDS) NEW ENTRY TO MEMORY
3620 REMARK *** IF NO PRINTER GO TO DISK FILE HANDLING
3640 IFP$="N"GOTO4000
3660 AC$="        )"
3680 AD$="   //     "
3700 N$=MID$(STR$(M),2,R)
3720 IFCD=1THENAD$=DA$+U$+DM$+U$+DY$+D$
3740 REMARK ** DEVIDES LINES BY PAGES AND WHEN VALUE = WHOLE NUMBER 17 SPACES
3760 DT=M/L
3780 ZX$=STR$(DT)
3800 IFDT>9GOTO3860
3820 IFLEN(ZX$)=2THENGOSUB5960
3840 GOTO3880
3860 IFLEN(ZX$)=3THENGOSUB5960
3880 PRINT"PRINTING":GOSUB6000
3900 REMARK *** PRINTS EACH CONTACT INDIVIDUALLY - FORMAT CAN BE CHANGED HERE
3920 REMARK *** TO SUIT ANY CONTEST PRINTOUT REQUIREMENTS
3940 PRINTAD$;TB$;" ";D$;Q$;D$;M$;D$;K$;B$;T$;X$;L$;N$;T$;V$;J$;C$;H$;AC$
3960 GOSUB6020:CD=0
3980 REMARK *** DISK FILES HANDLED HERE. IF NO DISK DRIVE GOES TO INPUT
4000 IFG$="N"GOTO1880
4020 DG$=STR$(M):DF$=TH$+TM$+" "+E$+S$
4040 PRINT"DISK APPEND■"
4060 PRINTDG$" ";DF$
4080 REMARK *** GOES TO LINE 200 FOR DISK FILES
4100 GOSUB200:GOTO1880
4120 REMARK *** FOR LISTING THE LOG ON THE SCREEN
4140 PRINT"NO.  TIME MOD BND CALLSIGN NO.RCD.
4160 FORT=1TOM
4180 PRINTTAB(5)A$(T)
4200 PRINT"PRESS 'RETURN' TO CONTINUE■ OR R■ETURN
4220 GETZ$:IFZ$=""GOTO4220
4240 IFZ$="R"GOTO1880
4260 PRINT""
4280 NEXTT
4300 PRINT"      END OF LIST - NEXT PRESS 'RETURN'"
4320 INPUT"    ■";X$
4340 IFLEFT$(X$,1)=""GOTO1880
4360 IFX$<>""THENPRINT"":GOTO4300
4380 M=M-1
4400 GOTO1880
4420 PRINT"WORKED ON THIS BAND
4440 GOTO5160
4460 GOTO1880
4480 REMARK *** TO DUMP ENTIRE LOG (ALL CONTACTS) TO PRINTER
4500 PRINT"      TURN THE PRINTER OFF■ THEN ON■
4520 PRINT"      C■ONTINUE OR R■ETURN TO MENU
4540 GETZ$:IFZ$=""GOTO4540
4560 IFZ$="C"THENGOTO4620
4580 IFZ$="R"THENGOTO1880
4600 IFZ$<>"C"ORZ$<>"R"THENGOTO4500
4620 PRINT"            PRINTING NOW
4640 OPEN4,4:OPEN6,4,6:PRINT#6,CHR$(30):CMD4
4660 PRINT"NO.  TIME MDE BND CALLSIGN N.RC."
4680 FORT=1TOM
4700 PRINTTAB(2)A$(T)
4720 NEXTT
4740 GOSUB6020
4760 GOTO5160
4780 REM *** DATE INPUT FOR PRINTER
4800 PRINT"     INPUT THE DAY 9TH=09
4820 INPUT"   ■";DA$
4840 DA$=LEFT$(DA$,2)
4860 DA%=VAL(DA$)
4880 IFDA%<1ORDA%>31GOTO4800
4900 RETURN
4920 PRINT"     INPUT THE MONTH MAY=05
4940 INPUT"   ■";DM$
4960 DM$=LEFT$(DM$,2)
4980 DM%=VAL(DM$)
5000 IFDM%<1ORDM%>12GOTO4920
5020 RETURN
5040 PRINT"     INPUT THE YEAR 1987=87
5060 INPUT"   ■";DY$
5080 DY$=LEFT$(DY$,2)
5100 DY%=VAL(DY$)
5120 IFDY%<1GOTO5040
5140 RETURN
5160 PRINT"     NEXT PRESS 'RETURN'"
5180 INPUT"   ■";X$
5200 IFLEFT$(X$,1)=""GOTO1880
5220 IFLEFT$(X$,1)<>""THENPRINT"":GOTO5160
5240 PRINT"        INPUT (LAST) LOG NUMBER
5260 PRINT"       CURRENT NUMBER IS"M
5280 INPUT"   ■",NM$
5300 IFLEFT$(NM$,1)=""GOTO5240
5320 M=VAL(NM$):IFM<1GOTO5240
5340 RETURN
5360 REM *** DATE CHANGE FOR PRINTER
5380 PRINT"CHANGE WHICH? D■AY M■ONTH Y■EAR A■LL R■ETURN
5400 GETX$:IFX$=""GOTO5400
5420 IFX$="R"THENRETURN
5440 CD=1
5460 IFX$="D"THENGOSUB4800:RETURN
5480 IFX$="M"THENGOSUB4920:RETURN
5500 IFX$="Y"THENGOSUB5040:RETURN
5520 IFX$="A"THENGOSUB4800:GOSUB4920:GOSUB5040:RETURN
5540 IFX$<>"R"GOTO5400
5560 REMARK *** THE COMMODORE USES THIS STRING (TI$) FOR ITS INTERNAL CLOCK
5580 REMARK *** SOME STRINGS & EXPRESSIONS ARE RESERVED WORDS OF COMMODORE
5600 PRINT"PLEASE SET THE CBM 24 HOUR CLOCK (GMT■)
5620 PRINT"E.G. 2.54 & 00 SECS. P.M. IS 145400
5640 PRINT"OR   9.15 & 25 SECS. A.M. IS 091525
5660 PRINT"I.E. 'HHMMSS'--RETURN'"
5680 INPUT"      ■";TJ$
5700 IFTJ$=""THENPRINT"":GOTO5680
5720 TI$=TJ$
5740 RETURN
5760 REMARK *** LEADING ZEROS ON NUMBERS GIVEN AND RECEIVED
5780 IFC<10THENJ$="  00":H$="":S=1
5800 IFC>9ANDC<100THENJ$="  0":H$=" ":S=2
5820 IFC>99ANDC<1000THENJ$="  ":H$="  ":S=3
5840 IFC>999THENJ$=" ":H$="   ":S=4
5860 IFM<10THENL$=" 00":R=1
5880 IFM>9ANDM<100THENL$=" 0":R=2
5900 IFM>99ANDM<1000THENL$=" ":R=3
5920 IFM>999THENL$="":R=4
5940 RETURN
5960 GOSUB6000:GOTO6140
5980 REMARK ** THIS ENABLES THE PRINTER AND GIVES LINE SPACING (LINES PER CM)
6000 OPEN4,4:OPEN6,4,6:PRINT#6,CHR$(10):CMD4:RETURN
6020 PRINT#4:CLOSE4:CLOSE6:RETURN
6040 REMARK *** ' (THIS LINE) CLOSES PRINTER (UNLISTENS) AND CLOSES FILES
6060 REMARK *** LINE SPACING AT BOTTOM OF PAGE TO AVOID PERFORATIONS AND
6080 REMARK *** PRINTS HEADING AGAIN. VALUE 'L' GIVES THE LINES PER PAGE.
6100 REMARK *** CHANGE 'L' TO SUIT YOUR PRINTER AT LINE 1000 OR AT PROMPT
6120 REMARK ** TEST HOW MANY LINES WILL FIT ON YOUR PRINTER OVER 2 OR 3 PAGES
6140 P=P+1
6160 PRINT:PRINT:PRINT:PRINT
6180 PRINT"PAGE ";P;" OF ":IFLN=1THENGOTO6240
6200 REMARK ** PRINTS 'PAGE 1 OF' THE 'OF' YOU FILL AT THE END OF THE CONTEST
6220 PRINT:PRINT:PRINT:PRINT:PRINT:PRINT
6240 GOSUB6020:IFLN=1GOTO1880
6260 PRINT" CHECK PAGING■                C■ONTINUE
6280 PRINT"(PAGE HEADING & CONTACT IS PRINTED NEXT)
6300 GETXZ$:IFXZ$<>"C"GOTO6300
6320 GOSUB1360:RETURN
6340 REM *** PREVIOUS BAND OR MODE CHECK
6360 PRINT"WORKED■ ON "LEFT$(A$(T),4)" ■ HRS. GMT. ";
6380 PRINT"BAND■ - "MID$(A$(T),10,4);"   ":PRINT"MODE■ - ";MID$(A$(T),6,4);
6400 PRINT"NO.SENT■ - ";T;"NO. RCD■ - "RIGHT$(A$(T),4)
6420 RETURN
6440 REM *** TO LOAD THE FRONT SHEET
6460 PRINT"LOAD THE FRONT SHEET    (Y-N■)
6480 GETFR$:IFFR$="N"GOTO1880
6500 IFFR$<>"Y"GOTO6480
6520 LOAD"RD FRONT SHEET",8
6540 REMARK *** REVERSE CHARACTER SYMBLE EXPLANATION
6560 REM "■" = CLEAR SCREEN
6580 REM "■" = CURSOR HOME (TOP LEFT OF SCREEN)
6600 REM "■" = CURSOR DOWN
6620 REM "■" = CURSOR UP
6640 REM "■" =  CURSOR RIGHT
6660 REM "■" = CURSOR LEFT
6680 REM "■" = INSERT SPACE
6700 REM "■" = DELETE CHARACTER
6720 REM "■" = REVERSE CHARACTER FIELD ON E.G. "■■■■■■"
6740 REM "■" = REVERSE CHARACTER FIELD OFF E.G. "SSSSSS"
6760 REM *** IF YOU HAVE NO FUNCTION (F) KEYS OR KEYS THE SAME AS DISPLAYED
6780 REM ** YOU CAN CHANGE WHAT IS DISPLAYED ON THE SCREEN ON LINES 2020-2260
6800 REM *** AND THEIR PROGRAMING ON LINES 2540-2860
6900 REM *** YOU CAN RUN THIS PROGRAM THROUGH 'PETSPEED' WHICH WILL SPEED UP
6920 REM *** THE CHECKING OF THIS PROGRAM BY ABOUT NINE (9) TIMES.
6925 REM *** YOU MUST CHANGE LINES 1300 TO READ - DIMA$(860), IN LINE 1940 THE
6930 REM *** 1101 TO 851 AND LINE 6000 THE CHR$(10) TO CHR$(14) THEN REASAVE
6935 REM *** IT UNDER ANOTHER NAME EG. 'RD CONT' THEN PETSPEED IT.
6940 REM *** THE SEQUENTIAL FILE IS PRIMARILY THERE IN CASE OF PROGRAM CRASH
6950 REM *** SO YOU MAY RECALL ALL THE PREVIOUS TO DATE AND CONTINUE WHERE
6955 REM *** YOU LEFT OFF.
6960 REM *** ONCE YOU HAVE A SEQUENTIAL FILE OF A CONTEST, YOU MUST EITHER
6980 REM *** RENAME THAT FILE OR USE ANOTHER DISK OTHERWISE THE NEXT CONTEST
7000 REM *** FILE WILL APPEND ONTO THE LAST FILE WHICH WILL MAKE RELOADING
7020 REM *** THE FILES BACK INTO MEMORY, IN CASE OF A PROGRAM CRASH, RATHER
7040 REM *** CONFUSING AND INCORRECT.
7060 REM *** THIS PROGRAM IN THE C64 WILL HANG UP AT TIMES. DON'T DO ANYTHING
7080 REM *** JUST WAIT FOR IT. IT WILL CONTINUE.
7100 REM *** I SUGGEST YOU DON'T CHECK THE MEMORY UNTIL YOU THINK YOU ARE
7120 REM *** RUNNING LOW OF MEMORY, OR YOU HAVE 5 MINUTES OR SO TO SPARE.
7150 REM *** FOR THE 128 SOME SCREEN DISPLAY LAYOUT ALTERATION IS REQUIRED
7170 REM *** AND IN LINE 2560 CHANGE FRE(0) TO FRE(1)

READY.
```

Aerials — Some practical aspects
WHAT IS AN AERIAL?

Ted Roberts VK4QI
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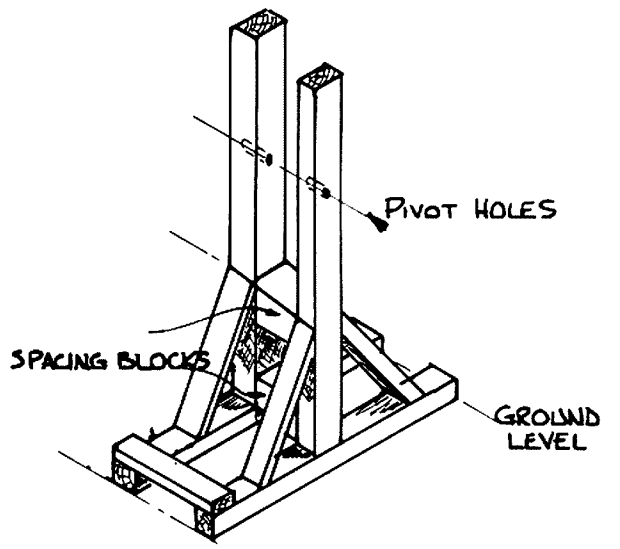
An aerial basically may consist of any length of wire, rod or tubing, mast or tower, metal sheet or designed aperture in a metal sheet or the skeleton version thereof, or a geometric shape, into which RF energy is fed, or, alternatively, from which RF energy is taken; ie transmitting or receiving modes.



A Typical Tabernacle.

The aerial may be a simple piece of wire of random length or it may be a very complex design of elements which are accurately determined and cut to size and space. It may be vertical, horizontal, or at an angle to either plane, or it may well be a helix. In the simplest case, it may be a combination of some of these to take advantage of existing trees or other supports.

In the great majority of cases that interest the average amateur fraternity, the basic aerial will be derived from the horizontal dipole and be made of some convenient and available type of wire or tubing. Most beam aerials will be of the ready-made variety, particularly at HF. However, we still see some very fine examples of home-brew beams, but they do not come within the scope of this article. In any case, descriptions of such aerials are frequently accompanied with the construction details used by the author.

AERIAL GAIN

We are all familiar with the doughnut or toroid shaped radiation pattern of our old faithful half-wave dipole in free space, but a surprising number of amateurs are unaware of the effect that gain has on the radiation pattern and what is meant by the term gain when applied to an aerial. If we look at another old friend, the isotropic antenna, this presupposes a spherical radiation pattern with the isotropic antenna as a point source of energy at the centre of the sphere. Now this is a purely theoretical device, as no such antenna exists, but it is a very handy tool for the aerial designer.

If we imagine ourselves looking from this antenna to any point on the surface of the sphere, then the field strength will be the same at all points. If, however, we arrange a practical aerial to "illuminate" only one or two points of the sphere, then our practical aerial must have gain in these directions by concentrating energy at these points. The point often overlooked by quite a number of amateurs and students for licenses is that this gain *only exists at the expense of radiation in other directions.* If we look again at our half-wave dipole, we see that it cannot evenly illuminate the full surface of the sphere, but concentrates most of its energy over a section of the sphere corresponding to the "fat" part of the doughnut radiation pattern. In the direction of the ends of the aerial, where zero radiation exists according to our radiation pattern, no illumination of our sphere takes place. Therefore, our dipole must have gain in the direction of maximum field strength. In fact, this gain is mathematically quoted as 2.15 dB over our isotropic antenna. It should be noted that our radiation pattern is three-dimensional, thus our dipole illuminates a belt around the centre of the sphere.

If we use an aerial of greater complexity and gain and investigate the results similarly, then a lesser portion of the sphere is illuminated by the signal from our new aerial being more concentrated, and a greater field strength exists over a smaller area of the sphere. This aerial has a gain "G" dB over our isotropic antenna or a gain of G-2.15 dB over our dipole. Now, if this aerial *could* also illuminate the remainder of the sphere to the original field strength, we would be getting something for nothing! Quite obviously the transmitter is not going to deliver any more power to the aerial so the extra field strength at the points of maximum gain can only be realised at the expense of reducing some areas of the sphere to less or no field strength at all. You can't get more out of the cake than first came out of the oven! To summarise, aerial gain in one or more directions can only be realised at the expense of other directions.

PRACTICAL CONSIDERATIONS

There are a number of ways of feeding a large variety of, more or less, complex aerials, but it is not intended to describe these; they have been described in literature by more able pens and designers than yours truly. The intention is to consider means of hanging these aerials up and bringing the feeders back into the shack, and, hopefully, pass on some practical hints that may save some time and trouble for the newer members on the amateur scene. If you like the look of a hanging bedspread or a simple dipole, or a thing with dog-legs all over the place, go for it! I will not comment on the performance, but hope to explain how to hang it up safely and connect it to the transceiver.

ERECTING AN AERIAL

There are a number of possible alternatives when it becomes necessary to elevate our new "U-Beaut" antenna sky-wards. If you live in VU-land or have access to a captive balloon of substantial dimensions, the problem is easily solved. Unfortunately, practitioners of the art of the Indian Rope Trick and balloons are few in this part of the world. In fact, the latter would raise the ire of local government bodies, except perhaps in the Simpson Desert. So, this leaves us with the more usual means of holding our aerial aloft.

Several things immediately spring to mind, such as the family homestead as one anchor point. Most suburban houses aren't quite high enough for the ideal, but can be quite effective if you don't intend to blast the birds off a DX stations antenna. Whether the local council sees eye-to-eye with you on this issue remains to be seen. Please don't quote me as an authority, you are on your own in this field as individual local councils have their own regulations.

Such fittings as television J-mounts, ridge-mounts, (and chimney fittings for those that aren't fortunate enough to live in the Sunshine State!), can assist you to engineer a quite effective system.

Having disposed of one end of our wire (tentatively) we have now to think of the other end. It seems pointless to run it down to a fence post (although this will often work surprisingly well), so just look around for a convenient tree. If one is found in approximately the right position and it is considerably bigger than a shrub, you're well on the way to success.

Trees house birds like magpies, their limbs break off at the most inconvenient times and they sway around in the wind. You take pot luck with the magpies and use your calculator to estimate if the particular branch will support the critical mass (yours, of course). The one that will concern us here is the fact that the wind plays "Rock-a-bye baby" with the end of the aerial. To cope with this well-known phenomenon, it becomes necessary to arrange a counter-weight method of support for the aerial. Continued straining and relief of the tension does not do the aerial any good. I don't think it would move the house at the other end, but something is going to give at the wrong time, such as when you are just into a rare bit of DX. So, don't forget that counter-weight, eh. Just tie a pulley securely to the tree and thread the halyard rope through the pulley and attach a counter-weight securely to maintain tension on the aerial.

GUYED MASTS

Some of us are gifted with a little more loot, or a larger desire to make our mark on the amateur scene than others, so we progress upwards toward the Ultimate Antenna System. There is no such animal as the National Debt wouldn't be able to purchase it, but there is no harm in trying! So the next rung up the ladder is one or two masts. They can be of either wooden or metal construction; there are points in favour of each.

White ants blunt their teeth on metal masts and they don't suffer from dry rot. On the negative side, they can and do have an effect on the radiation pattern and efficiency of the system. Guy wires should be broken up into non-resonant lengths by insulators, as indeed, should guy wires on wooden masts. If you are prepared for unpredictable effects, you can neglect the insulators; something will happen! A metal mast should not be used to suspend a vertical aerial, but is quite effective as a support for a ground plane or the centre of an inverted Vee aerial if supported from a short boom. If you use a wooden mast, please do not forget to seal it with an undercoat and a couple of coats of paint or varnish and renew these regularly. After all, the price of a decent length of timer is very high these days! Such publications as the ARRL and RSGB Handbooks give several designs for wooden masts.

If your heart is set on a metal mast, then there are several factors to take into account. There are a number of telescopic television masts available, but they have limitations from an amateurs point of view. They are very satisfactory for the purpose for which they are designed, but are not the ideal masts for the heavier duty we have in mind. However, in heights of nine, or perhaps 12 metres, they can be used with limitations. Their construction is very light and they are intended to operate with a relatively light load acting in compression and with a small wind-load acting horizontally. The individual sections of the mast are not nested very deeply into each other and need a large amount of guying to achieve any degree of rigidity. If you live in a region which doesn't suffer from cyclones or strong winds they can make quite a viable proposition. I have installed quite a number of these in Gladstone, Qld, with only one failure due to an eye-bolt fault. Mind you, these were used to support simple VHF aerials only.

If you intend making your own metal mast, you have several materials to choose from. Consider scaffolding or rigging aluminium alloy tubing if you can get it. It is costly, but a number of useful fittings are available to go with it. However, most of us will opt for the galvanised water-pipe type of construction. Whatever type of construction material is used, it is very desirable to use several sizes of pipe which will telescope one within the other. Start with three or four lengths of pipe, bury the top length of pipe approximately one-quarter of its length into the next larger size and securely pin or weld it in place. And so on, down the mast until you reach the bottom section. You can fit square guy wire plates which have been bored out to fit the pipe diameters you have selected for guying. Similar construction to television mast fittings are used. A large eye bolt, fitted some centimetres below the top of the mast and bolted through the mast to attach the pulley can also support the top guys.

Alternatively, a number of "U" pieces of heavy rod may be welded near the top of the mast to carry the guys and also the pulley. Do not forget to cover the welding in your construction with galvanised paint to prevent rust.

You can make your mast using the pipe couplings supplied with the pipe as joining fittings, but it will be at the expense of reduced strength overall. This can be improved by welding the couplings to each section of pipe, but it will still be a weaker structure than recommended except for heights of no more than two lengths of pipe.

GUYING METHODS

Masts are normally guyed for rigidity and to take the horizontal loads imposed by strain from the aerial, the wind load on the aerial and the mast itself. Over nine metres high, it is good practice to guy the mast from several levels. A tall mast, guyed from the top only, can reach a condition where a type of standing wave develops along the length of the mast in certain wind conditions. This can cause failure and collapse of the mast when this condition becomes excessive. This increases tension with your wife and upsets the operator when the mast gains unauthorised entry into the shack. The addition of a second, or even third set of guys at intermediate levels prevents this vibration from reaching alarming proportions, if indeed it becomes evident at all.

When you use galvanised thimbles to connect your guy wires to the mast fittings, be aware that these rust badly after a few years and will require checking and probable replacement; even more quickly in a salt or industrially corrosive area. An alternative is to make your own thimbles from split copper, or stainless steel tubing, but I doubt if it is worth the extra effort. Another approach is to use rope guys. This eliminates the need for insulators but there are problems with this method, too. Some ropes, such as nylon and polythene, stretch under tension. Polypropylene rope and terylene are quite good in this respect. Most ropes suffer from exposure to ultra-violet radiation in sunlight and eventually break down. Over the last few years this deficiency has been appreciated by the makers and a big improvement has been made in UV resistance. Do not overlook the fact that stranded galvanised wire will deteriorate with time also, particularly if the galvanised coating has been damaged, as by tools. Another "no-no" with wire guys is kinking the wire in the construction and, erection of the guys. The same also applies for aerial wire. Regardless of material, all guy wires and halyards should be checked regularly and replaced when wear is apparent. It should be routine to replace ropes every couple of years. Because guys are made of galvanised wire does not mean they are immune to rust or corrosion and they should be replaced when such faults are evident.

At this time it is advisable to consider how many guys are to be used around the mast. Many masts are erected using three sets of guys ad are quite safe and effectively guyed. What I consider to be a better method is to use four sets of guys displaced 90 degrees around the mast. This uses more material, but makes for much easier and safer erection, particularly if you do not have much experience in this field. If two sets of guys are made up at right-angles to the lay of the mast and made fast to their anchors, they will represent the mast getting out of control laterally during the actual erection. This only leaves the pull from the front and the paying out of the rear guys to think about and is a much safer way to go.

GUY WIRE ANCHORS

The guy wires may be secured at the ground end by several methods. The guys may be anchored to "Star" pickets which have been driven well into the ground with the open end of the Y facing the direction of the mast, to offer the greatest resistance against being pulled out of the ground. If the load seems too great for one Star picket drive a second picket into the ground a few metres behind the first. The top of the first picket may then be wired to the bottom of the second, thus greatly increasing the load capacity of the system. If plenty of reasonable sized angle iron is available, it may be used in lieu of the Star pickets.

An improvement is to dig a hole in the ground at each anchor point. Make up a very large eye-bolt (of, say ½ inch diameter steel), for each anchor and bolt these through substantial steel plates. Place the steel structure in the hole and fill the hole with concrete. It should not be necessary to point out that the metal structure should be slanted in the direction of the mast with the metal plate at right angles to the direction of strain.

Fence posts can be called into use if you are sure they will carry the load successfully. Another method is to dig a fairly deep trench in the ground at right angles to the lay of the guy and bury a large log with a heavy eye- bolt secured through the log and slanted in the right direction. Alternatively, to the eye-bolt, a number of turns of galvanised wire can be used. The hole is filled in and the dirt firmly tamped down. The wire method is definitely not meant for long term use, as the wire will rust away fairly quickly.

The base of the mast can be supported by a wooden post approximately 4 by 3 inches (101 x 76 mm), or a steel pipe, or angle, or even channel section can be used instead. This post can be placed in a post hole and some of the spoil from the hole mixed with cement powder and a little water and the hole filled about one third full with the mix. This is then tamped down and the next third filled and tamped. Finally completely fill the hole and tamp. Do not forget to check that the post is plumb in each plane and water may not be necessary in the mix if the soil is moist. The mast is pivoted on a bolt fitted through a hole drilled in the post and another drilled a few centimetres from the bottom of the mast. Allow at least a week for the cement to cure before raising the mast.

A big improvement can be made by digging a fair sized hole in the ground and concreting a "tabernacle" in the hole. A tabernacle consists

of two posts parallel to each other and spaced to allow the mast enough clearance to pivot. A structure below ground level is attached to support the two posts, which may be of timber or steel. The tabernacle is fitted in place, trued up plumb, and the hole filled with concrete. Again, allow the concrete time to cure before attempting to raise the mast. This cement treatment has an added bonus in that it delays or prevents rot in the timber.

As before, the mast is mounted on a pivot pin or bolt through the whole structure. Remember that the only load on the base support of a guyed mast is the downward or compression load of the dead-weight of the mast structure and a small part of the tension load, due to the guy tension. When the mast is being raised or lowered, however, the mast imposes a considerable sideways strain in the opposite direction to the way the mast is laying. Mast bases made of concrete have the added advantage that they can be built up above the ground in a simple box form and thus clear the back lawn or whatever, which makes for a lot less "cuss" words when you or your wife, or even the harmonics do the mowing. It is a good idea to ensure that the anchors are placed so that the mower can be used all around them if possible.

ERECTING THE MAST

To raise the mast, assemble the mast laying it away from the base support. Insert the pivot pin or bolt through the base support and the bottom of the mast. Rig all guy wires and the aerial halyard and pulley while in this position. Make off the side guys for lateral support during erection.

If a length of pipe or substantial timber is stood upright at the base of the mast and lashed to the mast base, then several pieces of rope are tied from the top of this "jury" mast to the tip of the mast and to several intermediate points on the mast, then the mast may be hauled upright by pulling on another rope from the tip of the jury mast. This may be assisted by several "Indians" lifting from the tip of the mast and walking down the length of the mast until the load on the hauling rope is easily managed. If the back guys are fed through the eye-bolt at the rear anchor point, then these guys can be payed out so as to steady the mast during erection. This should be considered a potentially hazardous operation and treated as such. Hard hats and a wary eye on the progress of the erection are necessary and standing directly behind and under the rising mast are strict "no-nos" for obvious reasons.

The whole operation is one of simple and controlled use of the necessary force to raise the mast to the vertical, in theory at any rate. After passing through the 45 degree mark in the erection, the force required becomes much less and the pull may be slackened off and the jury mast itself manhandled until the mast is erect.

It is probably wise to insist that there be one, and one only, "Chief" and the rest of the crew be content to be "Indians" only. Otherwise confusion added to chaos createth a crash! Once the monster is in its rightful place, adjustment of the individual guys can be carried out until the mast is plumb from all directions, and then the guy wires made fast permanently. If turnbuckles are used (a wise move) they should be tightened firmly but not excessively and some excess guy wire threaded through one eye, then the threaded portion and lastly through the other eye and tied to make the turnbuckle safe.

When the mast is secured, another hole can be drilled through the supports and the masts and another bolt fed through and tightened for greater security. You may need an extension rod welded onto your drill bit to do this.

It then remains to remove the ropes from the jury mast. There will be no need to shin up the masts if these ropes were a continuous length and were wound around the mast 10 or 12 times to connect them in the first place. By playing maypoles and walking around the masts with the rope in the opposite direction to the way the rope is coiled, you will soon have the ropes down.

It goes without saying that the halyard rope should have been rigged and the pulley fitted and greased before the mast was raised. The best idea is to make the halyard rope a continuous loop as otherwise you will have a large amount of rope at the bottom of the mast to dispose of somehow. I don't mean cut it off either, as you will then be in "heap big trouble" when you want to raise or lower the aerial. If you make a loop of the halyard you can tie a finger knot in one side of the loop leaving a small loop tied round a galvanised thimble to attach the aerial tail.

The halyard is very easily made from the hollow woven rope which is so popular with water skiers. One end can be fed back inside the other for 30 centimetres or so and the outer section pulled tightly over the inner section. The rope will then pass through the pulley easily. If you prefer a more secure method, you only need feed the inner section back out again and then feed it back inside again a short distance further along the outer. To simplify feeding the inner section into the outer, it is a wise idea to heat the end of the rope with a match or cigarette lighter and mould it to a neat tapering end with the fingers. If your fingers are too soft and tender for this, I can guarantee they will be a lot tougher after all the preliminary work has been done!

Well, it is all in the cause of greater efficiency and, hopefully, more DX, so what more can you ask!

ar

MODIFIED G5RV MULTIBAND DIPOLES

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The G5RV-type antenna is very widely used by many amateurs. It offers multiband operation from a single antenna. This is even more important with the new bands.

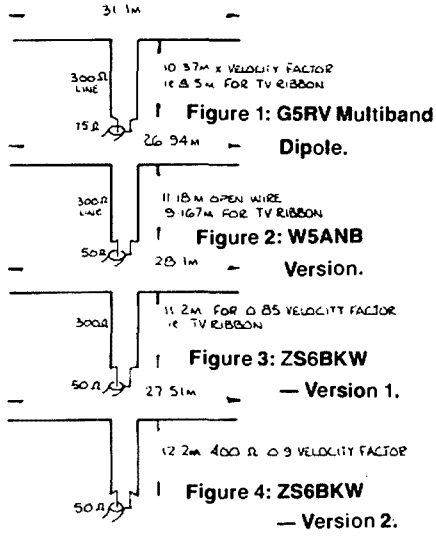
A new version was described in *Radio Communication* by ZS6BKW.

The newer breed of transceivers rely on the antenna feeder having a Standing Wave Ratio under 2 to 1. They also are all 50 ohm impedance. To ensure optimum operation the antenna must use 50 ohm feed with an SWR less than 2:1. To be truly multiband this must occur on a multiplicity of bands.

The original G5RV was an attempt at a multiband antenna. The antenna was useful, particularly with transceivers which could match to a range of impedances. Recent transceivers, without variable tuning to match the feeder impedance, need a better match.

The G5RV is shown in Figure 1, and a modified version by W5ANB is shown in Figure 2. The original G5RV is below 2:1 SWR on the bottom of 20 metres and on 12 metres. The W5ANB modification is under 2:1 SWR on the bottom of 40, 17 and the top of 10 metres.

A new version has been described by Brian Austin ZS6BKW, in *Radio Communication*, August 1985. This version comes in two models and offers improved feedline SWR performance.



Brian ZL6BKW, arrived at the designs by computer analysis of the lengths and impedances. He was thus able to optimise performance. He then carried out tests at various heights and also, using both straight and inverted Vee configurations.

Two versions of the basic antenna are shown in Figures 3 and 4.

The inverted Vee configuration resulted in a drop in frequency of the lowest SWR. This was from 0.6 percent to two percent.

The frequencies where SWR was less than 2:1 were measured by ZS6BKW:

ANTENNA	FREQUENCIES IN MHz				
G5RV Fig 1		14.000		24.890	
		—		—	
		14.180		24.990	
W5ANB Fig 2	7.000		18.068		29.150
	—		—		—
	7.100		18.168		29.800
ZS6BKW[1] Fig 3	7.000	14.000	18.068	24.890	28.400
	—	—	—	—	—
	7.100	14.340	18.168	24.910	29.300
ZS6BKW[2] Figure 4	7.000	14.050	18.068	24.890	28.600
	—	—	—	—	—
	7.100	14.340	18.168	24.990	29.200

Whilst the antenna will operate outside these ranges, an antenna tuning unit will be needed to reduce SWR to below 2:1.

The article in *Radio Communication*, contains extensive plots of SWR. The design approach is also explained in the article.

The G5RV articles in *Radio Communication* or the *RSGB Bulletin* as it was then known, appeared in July 1958 and in November 1966.

The ZS6BKW article, from which this *Try This* is derived, appeared in *Radio Communication* for August 1985.

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USING TECH-200 FILM

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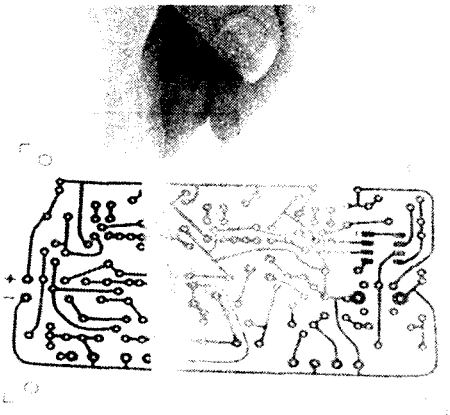
In the March 1987 issue of* Amateur Radio *(page 14), I introduced a method of making printed circuit boards using plastic film as a transfer medium[1]. Although the process outlined in the article can produce very good results, much better results will be obtained by using the film especially developed for the purpose.



AT THE TIME of writing this article, *Tech-200* film was not available in Australia but negotiations were in progress and, by the time you read this, a local agent should be able to supply this film[2].

Tech-200 is a very smooth plastic film having a long shelf-life and is capable of withstanding temperature of up to 160 degrees Celsius. With care, quality boards can be made using a similar procedure to that described in the previous article. Access to a good photocopier and a domestic smoothing-iron is all that is required.

The process involves photocopying the PCB pattern onto the film and then transferring it to the copper laminate using a hot iron. The transferred toner becomes the resist and the board can be etched in the usual way.

ARTWORK

Although the artwork from your popular monthly magazine may be used, it will most likely have to be reversed before transferring it to the laminate.

This can be done by placing an intermediate transparency upside-down in the photocopier and running a second copy. During this reversal process, the lines tend to become broader and may even merge on layouts having very closely spaced lines. With care however, an acceptable copy can generally be obtained.

Better results will be obtained if you are starting from scratch and produce your own artwork as a *component-side view* which does not require reversing. This is easier than you may think as suitable drafting material is readily available from most electronic suppliers and it is generally easier to produce a component-side view than a copper-side view anyway.

PHOTOCOPYING

A photocopier that heat-fuses a toner onto plain paper is suitable, although I have found that some absolutely refuse to heat-fuse the pattern onto *Tech-200* film. Instead of a nice hard image, a powdery facsimile results which is not suitable since the pattern will most certainly smudge when placed in contact with the laminate during the pattern transfer phase.

With this in mind, some experimentation will be necessary to gauge the settings most suitable for a particular photocopier. A good dark copy with a clear background and a hard image is required. When using *Tech-200*, the pattern may be reproduced on *either* side of the film.

Note that the final quality of the PCB depends largely on the quality of the photocopy used. Any small blemish caused by a dirty roller, should be carefully removed using a scalpel or sharp pocket knife before transferring the pattern to the laminate.

PATTERN TRANSFER

It is essential that the copper surface of the laminate is absolutely clean and dry before attempting to transfer the pattern. A suggested procedure is to thoroughly clean the board using a non-metallic scouring pad and then wash the surface with a PCB cleaning solvent. The board should then be handled with care to avoid further contamination.

The transfer process will require some practice to develop a satisfactory technique but this should be minimal if the steps outlined below are used as an initial guide.

1. Set the control knob on the smoothing iron to give a temperature of around 120 to 150 degrees Celsius. This was near the wool/rayon setting on my iron (sorry, the wife's iron) but this may vary considerably between individual appliances.
2. Cover the cleaned laminate with a lint free cotton cloth such as a well-worn handkerchief and warm the entire board with the iron. Remove the handkerchief.
3. Carefully place the film (toner side down) onto the warm laminate and cover with the handkerchief. Apply the iron with a firm pressure and carefully smooth the *entire* surface until the temperature of the board is close to that of the iron. This takes around 30 seconds or so.
   Particular attention should be paid to the edges of the pattern being transferred to ensure it is heated sufficiently.
   If the plastic film tends to slip during ironing, it is suggested that a small amount of double-sided "sticky-tape" be used to hold the film onto the laminate.
4. With *Tech-200 film*, it is essential that the film is removed when *cold*. In fact, once a reliable technique has been developed and you are sure that the toner has adhered to the laminate, the plastic film need not be removed until just prior to etching.
   Start from one corner and carefully peel the film from the board. If the pattern has not fully adhered, let the film return to its original position and repeat the transfer heating process. Any small imperfections in the transferred pattern can be touched up using a resist pen before etching.
   Incidentally, if the pattern transfers to the handkerchief instead of the laminate, you had the plastic film upside-down!

ETCHING

There is no restriction on the etching agent and your favourite solution should be satisfactory. A short etching time should be aimed for to reduce the problem of under-cutting.

Once etched, the board can be rinsed in water and the remaining resist removed using a solvent. Finally, the board can be sprayed with a PCB lacquer.

FINALE

If the *Tech-200* film is used correctly, all of the toner should come away from the film and be deposited as resist. This means that provided that the film has not stretched too much during the pattern transfer stage, the *Tech-200* film should be able to be used more than once.

If it is desired to make just one small board, a small piece of *Tech- 200* can be attached to a sheet of copy paper using double-sided 'sticky-tape' and run through the photocopier.

NOTES

1. No Fuss Printed Circuit Boards — *Amateur Radio*, March 1987, page 14.
2. South East Electronics, Odeon Plaza, Mount Gambier, SA. 5290.

REFERENCES

1. No Fuss Printed Circuit Boards — *Amateur Radio*, March 1987, page 14.
2. Making Printed Circuit Boards — *Radio and ELectronics World*, November 1985.
3. *TECH-200 Technical Bulletin* — The Meadowlake Corp.
4. *Printed Circuit Handbook* — C F Coombs.

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Tech-200 PCB Film is now available from South East Electronics, Odeon Plaza, Mount Gambier, SA. 5290. Please contact them for further information about this product.

SIMPLE SPEECH PROCESSOR

Lloyd Butler VK5BR
18 Ottawa Avenue, Panorama, SA. 5041

This processor uses two integrated circuit packages and requires little effort to construct.

A SPEECH PROCESSOR is a device which modifies the speech waveform, so that components which convey most of the speech intelligence make better use of the modulation capabilities of the transmitter.

In the device described, two processes are involved. The first is to shape the frequency response so that the gain increases with frequency increase over the speech range. Much of the speech intelligence is provided by the high frequency components which are lower in level than the low frequency components. The corrected response increases the level of the high frequency components so that they represent a higher proportion of the average speech power to provide a typical crystal microphone type response. Any old

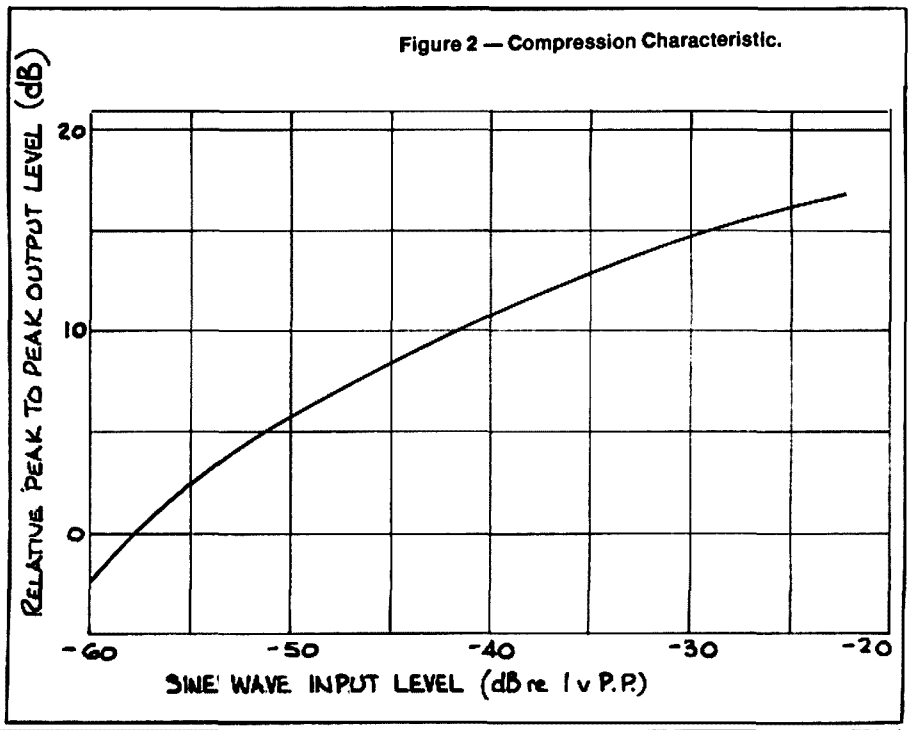

Figure 2 — Compression Characteristic.

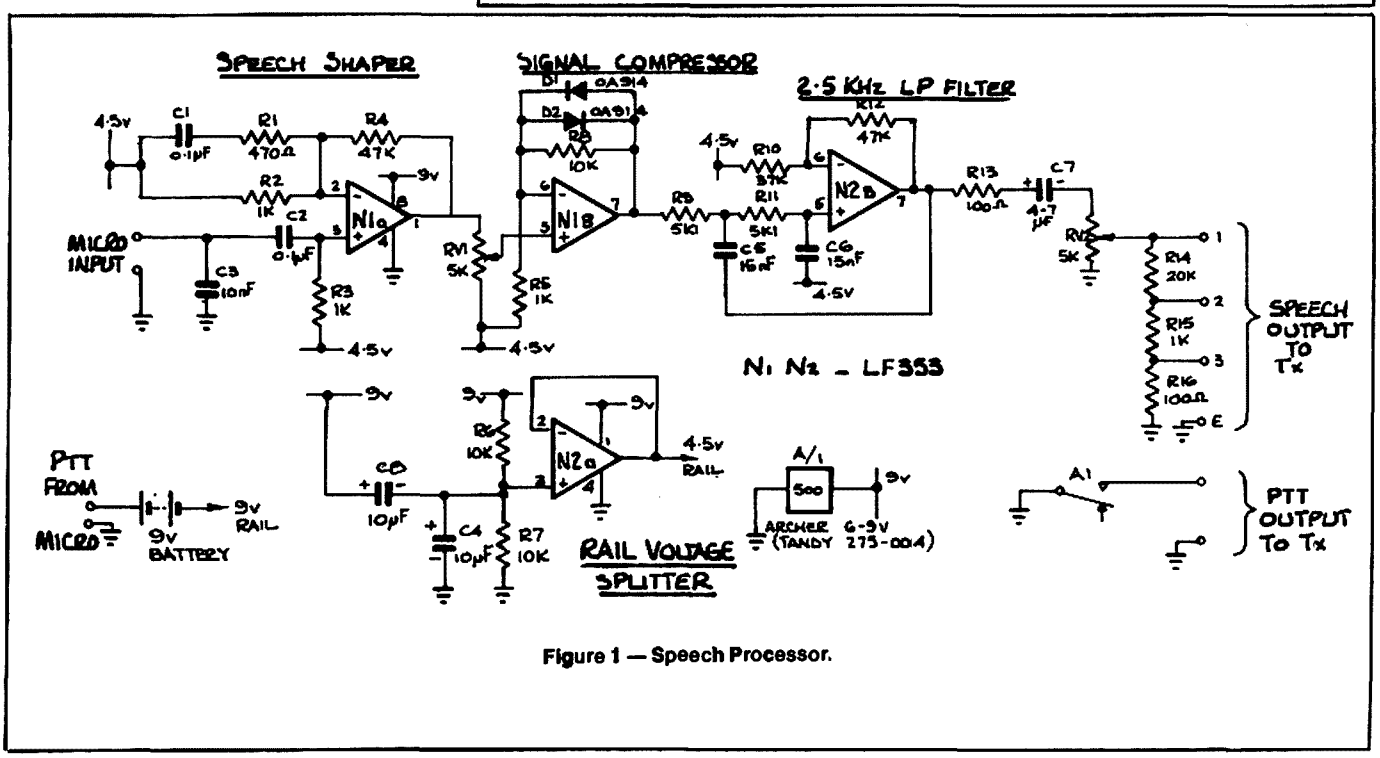

Figure 1 — Speech Processor.

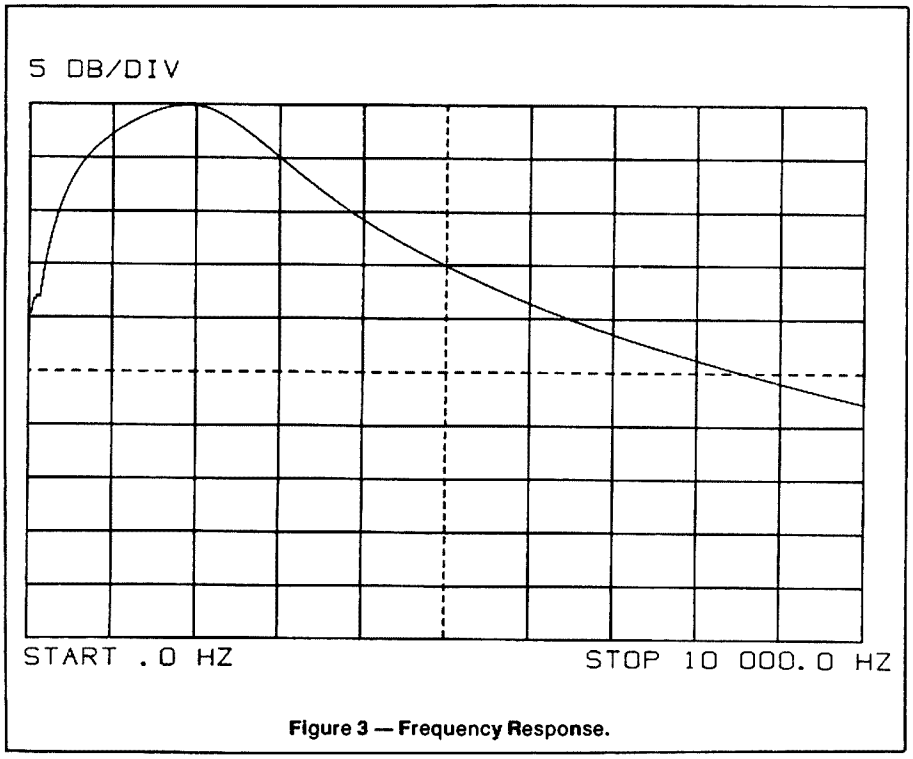

Figure 3 — Frequency Response.

time radio amateur will tell you that such response is better to copy in the presence of QRM or noise.

The second process is to compress the peaks of speech so that the average level of speech and hence the average modulation level, is increased. The process causes come degradation of speech quality and the amount of compression is governed by how much quality one is prepared to sacrifice.

OPERATION

The circuit of the processor is shown in Figure 1. Amplifier N1-A provides the frequency response correction and raises the level sufficient to drive the speech compressor. The frequency sensitive networks are C2, R3, and C1, R1, R2.

Amplifier N1-B provides signal compression. At low levels the gain is 11, fixed by the ratio of (R5 + R8) to R5. As the instantaneous signal voltage is increased, the diodes D1 and D2 conduct and shunt R8 with a resistance value which is roughly an inverse exponential function of the instantaneous voltage across N1-B output. Decreased resistance across R8 causes decreased gain of the stage and hence compression of the signal waveform. Potentiometer RV1 controls the degree of compression and is set to suit the level amplified from the microphone used. Figure 2 shows the compression characteristic; ie relative peak to peak output level as a function of sine wave input. Plotted data is for RV1 set at maximum.

Since the output waveform is distorted, harmonics are generated and higher orders of these must be reduced to prevent them generating undesirable sideband components in the modulation process. This function is carried out by N2-B, connected as a second order Chebychev low pass filter with a cut off frequency of 2.5 kHz. Figure 3 illustrates the overall frequency response of the speech processor. The falling response above 2 kHz is due to the filter. Below 2 kHz, the response falls due to the shaping by N1-A.

OPERATIONAL AMPLIFIERS

Dual JFET operational amplifiers type LF353 were selected because they use the small eight pin DIL package but there is no reason why the dual ua747 could not also be used or perhaps the quad LM324. The only problem with the quad package is the difficulty in mounting the large number of R and C components all around the one package.

DC SUPPLY

The unit, as constructed, is powered from a small nine volt battery. The battery is connected via the microphone PTT circuit so that the battery only supplies current while transmitting. The PTT is transferred to the transmitter via relay A. (If the processor were fitted permanently in the transmitter cabinet, the transmitter power supply could be used and this relay circuit would not be needed). A half voltage power rail is provided for the processing amplifiers by source follower stage N2-A.

MECHANICAL

The unit, as originally assembled, is hard wired on matrix board, the layout of which is shown in Figure 4. The board, complete with battery, is mounted in a 104 x 60 x 46 mm Dick Smith aluminium box.

The layout is not critical, but to guard against the possibility of RF feedback from the transmitter back into the microphone circuit, shielding is made continuous right through from the microphone, via the processor box, to the transmitter and earthed only in one place at the transmitter end.

PRE-SET ADJUSTMENT

The degree of compression is set by RV1 to suit the microphone output level. One way to observe the compression is to monitor the levels at pin 5 and pin 7 of N1-B with a dual trace CRO. The sensitivity of the CRO is set so that the input from pin 5 is 10 times that from pin 7. At very low speech levels, the displayed amplitude of the two waveforms should be similar. As the speech level is increased, the waveform at pin 7 should compress as compared to that at pin 5.

A more objective test is to record speech on a tape recorder for different settings of RV1 and play back the result. As the listener, it is then up to the individual to decide how much distortion is tolerable and whether a point has been reached where intelligibility is being impaired rather than being improved.

Output taps 1, 2, and 3, and RV2 provide for a wide range of output levels. For the usual transmitter input, designed for a moving coil microphone, tap 3 should be used. If it is necessary to feed one of those old transmitters with input designed for a carbon microphone, tap 1 is more suitable.

In conclusion, the old warning about using speech processing on SSB transmitters is given. The processor raises the average level of power in the speech and hence the average power dissipation in the transmitter power amplifier stage. If the PA stage is designed to the limit, on the basis of normal speech, indiscreet use of the processor could exceed the PA rating. There should be no problem with FM or straight AM.

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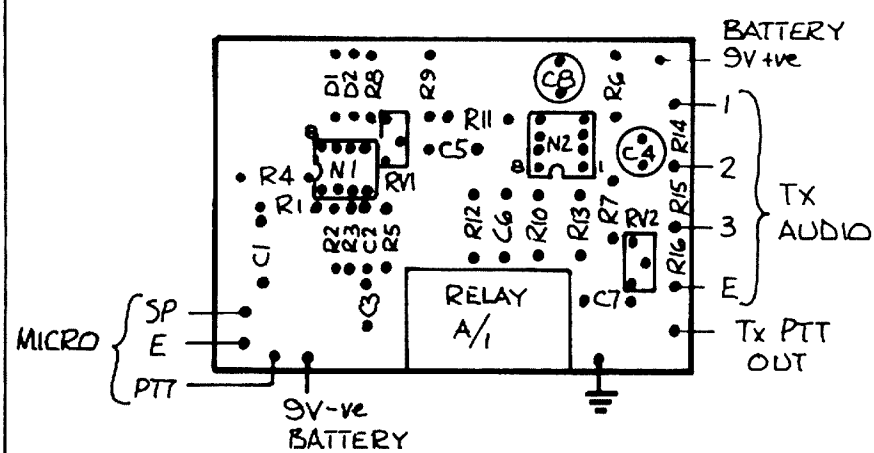

Figure 4 — Card Layout.

THAT UBIQUITOUS 2π

Dudley Stalker VK3KJ
62 Hart Street, Colac, Vic. 3250

The Inductive Reactance of a coil is:
$2\pi FL$ ohms.
The Capacitive Reactance of a capacitor:

$$X_c = \frac{1}{2\pi fC} \quad \text{(in ohms).}$$

where f is frequency (Hertz)
C is capacitance (Farads).

The resonant frequency of a circuit:

$$f_r = \frac{1}{2\pi\sqrt{LC}}$$

where L is Inductance (Henry)
C is capacitance (Farads)

and so it continues.

Many of our examination candidates can quote these expressions, and substitute data in them to achieve a result. However, many of them, no doubt, sometimes wonder why the ratio of the radius of a circle to its circumference appears so often in formulae dealing with electrical phenomena.

The following may be helpful to some candidates when confronted with questions involving 2π.

Perhaps the first step is to become familiar with the concept of angles expressed in radians instead of the familiar degrees. By definition, one radian is the angle subtended at the centre of a circle by an arc on the circumference equal in length to the radius.

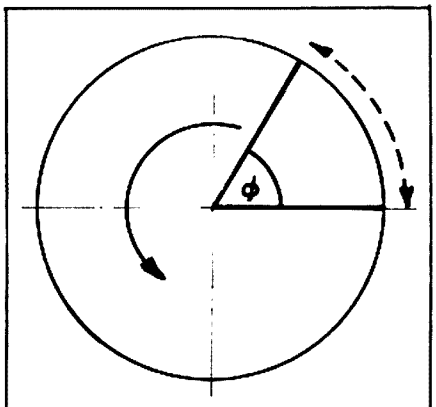

Figure 1.

$$Q = \frac{\text{arc length}}{\text{radius}}$$

(Note 1 radian = 57° 17.74' 57.29").

Note that it is the arc of the circle, not the chord, which is equal in length to the radius. In other words, if we lay a length of string along the circumference equal in length to the radius.

Referring to Figure 1, we now imagine the radius with the arrowhead free to revolve about the centre in the direction shown. Since, in making one revolution, the arrowhead traverses the circumference, it must cover 2π times the radius in returning to its starting point. The angular distance covered is therefore 2π radians.

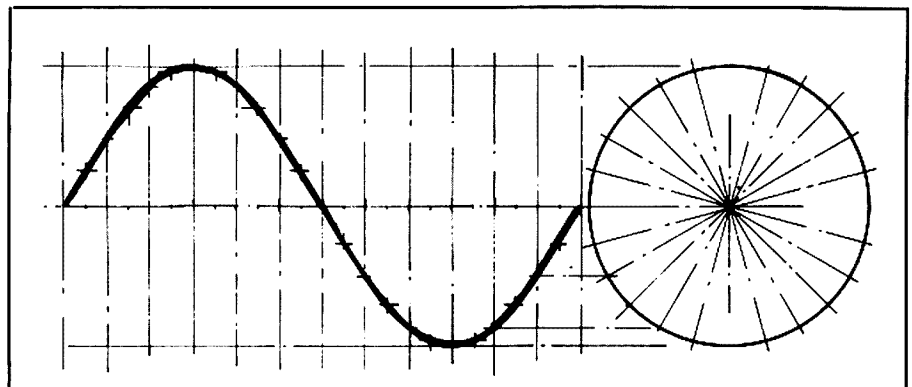

Figure 2: Redrawn Sine Wave.

Well, so what? How does this relate to resonant frequencies, etc? Good question!

Well, taking a horizontal diameter as reference, let us plot the position of the revolving vector (called a radius vector) against time. The result? A sine curve, since the ordinates of the curve at any instant are equal to the radius multiplied by the sine ratio of the angle between the horizontal and the radius at that instant.

So far so good, but we still have to relate this to electrical formulae. This involves relating the angle ϕ to some electrical equivalent.

The next step is to consider the radius vector revolving continuously. Since it sweeps 2π radians in one revolution, if it revolves N times per second, it sweeps out $2\pi N$ radians per second. The total angle swept out in any given number of seconds is therefore given by 2π times the number of revolutions per second times the number of seconds. This gives the familiar $2\pi FT$, which we now see as an angle.

Since one revolution corresponds to one cycle of a sine wave, and the amplitude of the sine wave is radius times sine ϕ, at any instant, we can now apply this information if we consider a voltage or current of sine waveform.

We can call our radius vector Vmax or Imax, and calculate the instantaneous value at any given instant.

As an example, let us take a sine wave voltage of maximum value 10 volts and frequency seven megahertz. What is its value after one sixth of a second?

We may write $v = V\text{max} \sin 2\pi FT$, where v is the instantaneous voltage. This becomes

$$v = 10 \sin (7 * 10^6 * 2\pi * 1/6)$$

Looks formidable, but it is really quite simple. The

$$\frac{2\pi \times 7 \times 10^6}{6}$$

is the number of radians swept out in one sixth of a second. Since 2π radians = one revolution, the number of revolutions is

$$\frac{7 \times 10^6}{6}$$

Dividing the $7 * 10^6$ by 6 (a pocket calculator is handy), we obtain 116 666.66. . . . The 116 666 represents complete revolutions, which would only return the radius vector to its starting point. We need only take notice of the 0.66. . . which, as a fraction is two-thirds. Reverting to degrees, two-thirds of 360 degrees is 240 degrees. So the instantaneous voltage is

$$10 \sin 240 \text{ volts},$$
$$= 10 \times (-0.866)$$
$$= -8.66$$

We have now established the significance of 2π in an electrical context. Now for inductive reactance.

The back EMF developed in a coil in which a current is flowing may be written as minus L di/dt, where L is the coil inductance, and di/dt is the rate of change of current. The minus sign indicates that the back EMF is 180 degrees out of phase with the applied voltage.

Writing $E = -L\ di/dt$, if i is a sine wave current, we can write

$$E = -L \frac{d}{dt} (i \sin 2\pi FT).$$

We will accept the result of differentiating this expression with respect to time, which gives

$$E = -L (2\pi Fi \cos 2\pi FT).$$

Dividing both sides by

$$-i \cos 2\pi FT,$$

we have

$$\frac{-E}{I \cos 2\pi FT} = 2\pi FL.$$

This is of the form of E/I, which by Ohm's Law is an impedance. $2\pi FL$ is therefore an impedance which, in this case is defined as inductive reactance.

In the same manner, the capacitive reactance of a capacitor may be obtained.

We write

$$V = Q/C$$

where Q is the charge on a capacitor, V is the instantaneous voltage, and C is the capacitance. Since current is the rate of change of charge, we can differentiate both sides of the above expression with respect to time.

If the voltage is of sine waveform, we can write:

$$\frac{d}{dt}(V_{max} \sin 2\pi FT) = \frac{I\ dq}{C\ dt}$$

Since

$$i = \frac{dq}{dt}$$

then

$$\frac{d}{dt}(V_{max} \sin 2\pi FT) = \frac{i}{C}$$

The result of differentiating this is:

$$V * 2\pi F * \cos 2\pi FT = \frac{1}{C}\ i$$

Dividing both sides by $2\pi F$

$$V \cos 2\pi FT = \frac{1}{2\pi FC}\ i$$

Dividing both sides by i gives

$$\frac{V \cos 2\pi FT}{i} = \frac{1}{2\pi FC}$$

Again, this is of form E/I which in this case is defined as capacitive reactance.

In both cases, it should be noted that the expressions are strictly true only if currents and voltages are of sine (or cosine) waveform. Now for resonant frequency.

This is defined as occurring when inductive and capacitive reactances are equal.

$$2\pi FL = \frac{1}{2\pi FC}$$

Cross multiplying, $4\pi^2F^2LC = 1$

$$F^2 \quad \frac{1}{4\pi^2LC}$$

And taking square roots

$$F = \frac{1}{2\pi\sqrt{LC}}$$

Since $2\pi F$ appears so often in calculations, it is often shortened to the Greek letter omega, which in lower case is ω. So, if you see an expression

$$i = I \cos\omega t,$$

you know it represents the value at any instant of a current of maximum value. I multiplied by the cosine of the angle $2\pi FT$.

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Thought for the Month

Beware of the man who slaps you on the back — he may be trying to make you cough up something.

MARKINGS

A NEW VHS TAPE marking technology has emerged from Japan called "CTL" which allows you to easily mark and find dozens of points on a tape.

An indexing track will be built into most VHS tapes for use with CTL equipped video cassette recorders.

CHESS AND AMATEUR RADIO

CARI — CHESS & AMATEUR RADIO INTERNATIONAL

Star Trek Captain James Kirk's famous line, ". . .to boldly go where none have gone before" sums up the way we felt about establishing an international organisation of chess-playing radio amateurs.

You see, several past groups had tried to organise, only in the US, but at this time only informal groups remain, and they come and go. Although the jury is still out on CARI after five years of dedicated effort by many of its members, and although we have an active Oceania chapter, the next few years will tell because that's when sunspot cycle 22 moves in for our benefit.

CARI was formed in 1982 following my article in *CQ Magazine* (Mat 1982) which included a cover photo of my son Jim WA2JNN, in radio-chess with Mike Sakarias KL7KE, in Alaska. That article brought in several joiners including our first VK, Kevin Moore VK3ASM.

Previously, one might say the real spark to CARI's takeoff had been my letter to the editor of *Chess Life* journal of the US Chess Federation. I had written to ask if any of their radio amateur members might sched Jim for radio-chess, as he was having a terribly difficult time finding chess players on the bands. When that letter was published, many wrote to ask that we organise them.

And so we did, starting something. I had no idea what would be its logical conclusion, but we've had a lot of fun in the process, particularly when our members set up matches with children who like chess, letting them play other children across the country. Or, when the band conditions were good, our own version of America's Cup, Chess Version. (We've had two such already).

Or, our letter in Russian to Box 88, Moscow, asking if they'd like to meet us on the air for radio-chess. Why not? After all, not everyone in Russia drinks vodka. But chess? You bet. Still, they responded (a milestone in itself) with a "nyet," although the tear stains on the letter suggested a defector or two might any day appear on our doorstep asking how to join CARI.

And we've helped Australian amateurs a bit because up until CARI there had been a VK restraint against radio chess, perhaps due to some outlandish notion of its "secret ciphers." A letter to ARRL President, Dave Sumner K1ZZ, resulted in a letter supporting WIA in negotiations with DOC. This soon resulted in recognition of the impractical nature of such restrictions and from that point on chess has been blessed and approved for VKers.

Whether you play chess or not, we think you might agree there's something to this CARI thing that might prompt you into joining now, while we are on the very upswing of an exciting cycle. For CARI information write to: Craig McMillan VK3CRA, 5 Sunview Court, Dingley, Vic. 3172. Please include an SASE.

—Contributed by Vince Luciani K2VJ, CARI Founder/President

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THE STAR HF RESONANCE INDICATOR

Bill McLeod VK3MI
42 Capon Street, Chadstone, Vic. 3148

The versatility of the Dip Oscillator is well-known, but, while it is essential for easy application and it's wide frequency coverage, there are some shortcomings.

Even used with a frequency counter, there is always the uncertainty of the "pulling" effect and of maintaining constant coupling. An uncertainty of five percent is enough for a quarter wave HF transmission line to fall outside event the 80 metre band!

The HF Noise Bridge is becoming more common. But it is after all a voltage operated device. It is calibrated and compensated for 50 ohms or 100 ohms. Lack of developed voltage across loads of less than 10 ohms coupled with the doubtful end resistance of the calibrated potentiometer results in a broad indefinite dip as the unknown sample approaches zero. For transmission line tests, do *not* take the advice of most texts viz *set the dial to zero and tune the receiver for the best dip*. Rather, measure a 10 ohm non-reactive build out resistor at the approximate frequency. Then leave the R and C dials set and connect a quarter wavelength stub in ***series*** with the resistor before adjusting the receiver for dip at resonance. A sharp null should be available.

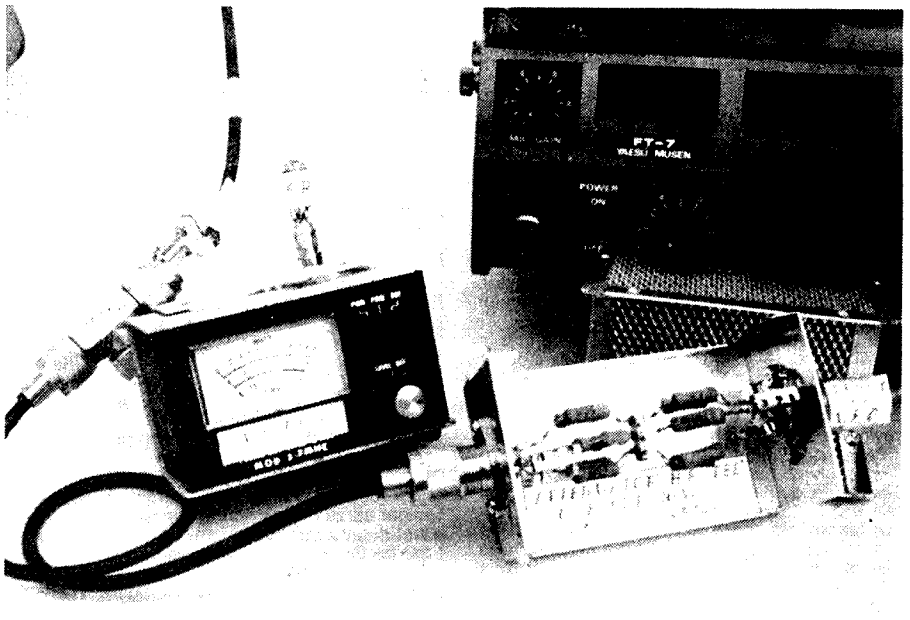
When close in, the R dial on the bridge can be readjusted slightly but *do not touch* C. As 5 pF of parallel reactance can mean 100 kHz at 3.600 MHz there is little margin for error when a resistive result is required at mid band!

This procedure can produce very good results but there is another way using a toroid transformer-type SWR meter as an indicator. These instruments compare the phase and amplitude of the voltage and current indicating sections. Like the Noise Bridge, they are calibrated and compensated for 50 ohm or 75 ohm transmission lines. Below 10 ohms the current meter section still indicates but the volt meter has starved while the opposite effect occurs over 250 ohms where the voltage is indicated, but there is insufficient current to affect the reading.

These characteristics can be used as an indicator for transmission line tests using suitable comparison terminations and a buffer pad for a power signal generator which can be the station VFO, a low power driver stage, or a QRP transmitter.

A 6 dB Attenuation Pad is normally used to reduce the voltage and current each to half the input value for a 50 ohm termination; ie it reduces the power to a quarter. When terminated by a non-reactive 50 ohm resistor it can become a dummy load. More importantly it also has the property of only changing from 30 ohms to 84 ohms at the input port when the output is either shorted or left open. Values well within the 2:1 capability of most solid state equipment designed for 50 ohms.

It is therefore an essential item to buffer equipment during initial tune ups or for antenna and transmission line testing. Also it is ideal to allow the use of 5 ohms and 330 ohms termination in tests using the SWR meter for a dip indicator as it tends toward a current limited source when the load approaches zero and as a constant voltage device for high impedance loads.



Power handling capacity of available non-reactive resistors is a difficulty but the metal oxide type are obtainable in two watt rating. So a pad capable of absorbing 10 watts of RF power with the output port open circuit can be built using the Tee-configuration as in Figure 1.

Then, for testing series tank circuits and quarter wavelength stubs, inverting sections, to an open circuit at the remote end and also half wavelength lines, repeating sections, to a short. The output port of the 6 dB pad can feed via a Tee-connector to both a 5 ohm termination, two ten ohm resistors in parallel, and the test section in parallel as in Figure 2. The SWR meter in the resistive leg does ***not*** indicate SWR as insufficient voltage is developed across the load for that section to materially affect the reading. However, in-phase current to the resistive termination shows a dip when it is robbed by the line section as it falls to it's lowest value at resonance.

Disconnect the line section for the dip to restore to maximum reading proving that it is not due to other circuitry. Then substitute a non- reactive resistor 1 ohm to 10 ohms usually for the same dip reading. This value is the equivalent series loss of the test section and for example RG58 cable will be about 2.5 ohms for a quarter wavelength section at 3.600 MHz. Increasing in resistance for poor quality or damaged cable. Expressed as a percentage of the nominal cable impedance this loss can be transferred to a set of dB tables to convert to the cable specification figures in dB per 100 feet. For other than USA specifications make that into metres.

Sections of cable can be cut five percent longer using the Dip Oscillator method. Then the percentage error checked using the Star — cut off two- thirds of this only then re-check and, on cutting two-thirds of this new error, the result should be very close indeed.

The similar arrangement in Figure 3 can be used for higher impedances from 200 ohms to 1000 ohms, where a bridge with a suitable range is unavailable. The 6 dB pad feeds via a 330 ohm series resistor to the Tee- fitting where the SWR meter indicates voltage across a single wire feeder to that mystery long wire. The ANT port of the SWR meter is left open so no through current affects the reading and the indicated voltage peaks at the resonant points as the frequency is varied across the band.

However this is of less practical value and accuracy than the low impedance case as the test sample is usually subject to other influences. For example, a half wavelength must include the distance to effective earth from the Tee- coupler and the capacity to earth from the remote end. Therefore, with the near end at an earth stake and the remote at say five metres high the section must be adjusted if it is subsequently raised to 10 metres horizontally. Of course, the same restrictions apply to Bridge and other methods of measurement and general practice requires these measurements to be made in normal operating position via a repeating section or half wavelength of cable which itself can be accurately cut by the previous low impedance method.

The frequency accuracy of this dip method can be somewhat better than one percent, of

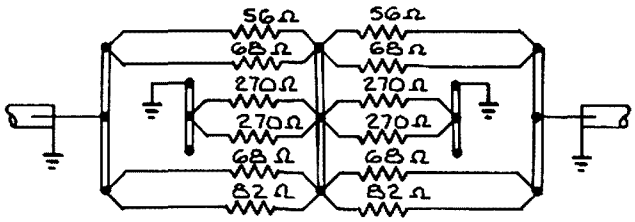


Figure 1: Attenuator Pad 6 dB 50 ohms.
Series Resistors: Each two watt Metal Oxide.
1 x 56 ohms.
2 x 68 ohms.
1 x 82 ohms.

Shunt Resistors: Each two watt Metal Oxide.
4 x 270 ohms.

Common Bars: Multiblock Inserts each drilled three ways transversely.

the same order as some commercial bridges, with a reasonable frequency readout from the VFO. After all this Star or Tee arrangement comparing the current fed to two branches from a current limited source is the inverse arrangement of the Delta or Bridge circuit which compares the voltages developed across two impedances.

A complete instrument along these lines can be constructed. However, for occasional use the station SWR meter provides a readily available indicator while the 6 dB pad limits and protects the source as well as it's other uses.

REFERENCES

RF Measurement of R and J *Amateur Radio*, July 1968

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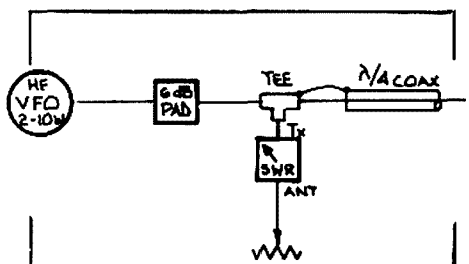


Figure 2: HF Resonance Indicator 1-20 ohms.

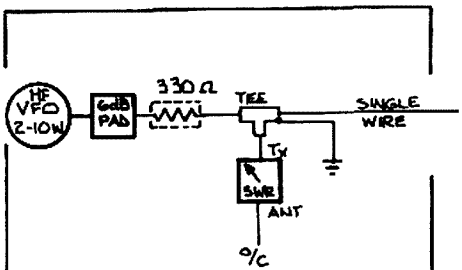


Figure 3: HF Resonance Indicator 200-1000 ohms.

Try This!

E C Brockbank VK2EZB
115 Myall Road, Cardiff, NSW. 2285

VHF-UHF VEE ANTENNA

The theory of such Vee antennas is not new and the gain to be expected can be found within the *ARRL Handbook:* Resonant Long Wires. The amazing thing is that it is simple to make, costs a trifle and works well. It can be constructed from continuous heavy copper wire, aluminum wire or tubing.

The good book says that the impedance is 300 ohms, but 75 ohm coaxial cable appears to cause little problem. Surprisingly it will work on high band VHF and across the UHF band at distance. At UHF, each element is a full wavelength long and phasing is one half wavelength. At VHF, each side appears to combine to create a halfwave dipole length.

Both sections are insulated from each other and fed at 'X'. A suitable support for the two sections would be a plastic, electrical T junction box. Place a washer to the inside of the T junction to support the rivet and then pop rivet each section. If using aluminum tubing, lugs may be pop riveted at point 'X' to accept the feedline.

If you are sceptical that the television antenna will work at all, then make up a mock model. That aluminum wire used for television harnesses, should do the trick.

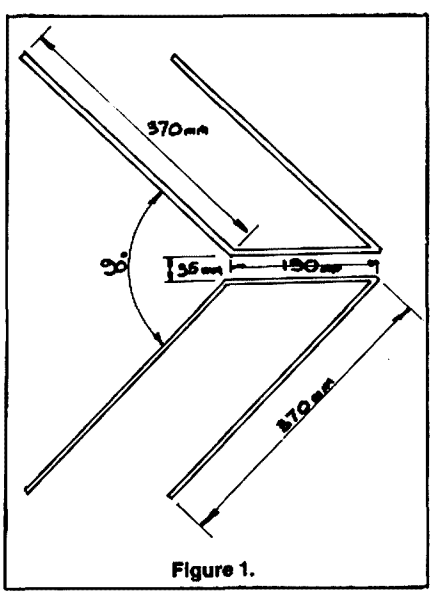


Figure 1.

Many years ago, the Tee Vee antenna was a popular antenna around the suburbs.

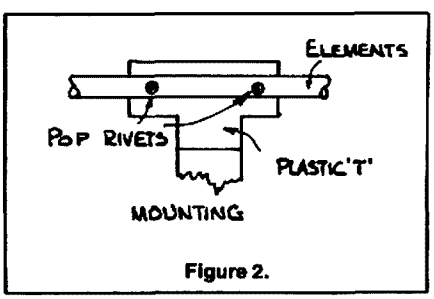
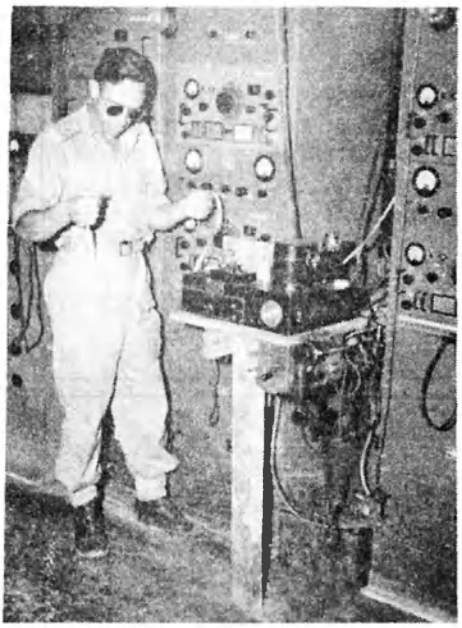


Figure 2.

REMEMBERING AROUND

* * One More World War Two Piece of Gear * *

THE TRANSMITTER TYPE 133



Inspecting the perforated tape. Control Panel with the AMR100 Receiver is in the background.

John Stone VK4NZ
25 Scrub Road, Coolum Beach, Qld. 4573

Joe unknowingly prompted the completion of an article which was drafted quite some time ago!

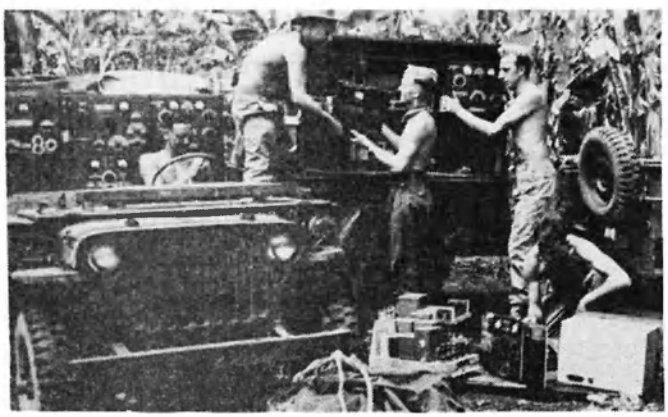
Reading Joe Baker's *Listening Around* (which I do with great interest) brings back my own memories of Morotai Island, where I spent 18 months of young life, in 1945/46, providing TLC (Tender Loving Care) to a flock of No 133 transmitters.

It is surprising that I did not meet with Joe — and I may well have done so — as our camp was right next door to the Boomerang (open-air) Picture Theatre, at Advance Land Headquarters (Landops) mentioned by him. I do well remember that 9AD, Radio Morotai, played quite a few records which were, at that time, "persona non grata" back in Australia, such as *Rum and Coca Cola* and Max Miller's pert numbers (*Mary Ann — Let's do our Lovin on the Five Year Plan*).

However, I do not remember having seen the 133 Set featured in AR, and Joe has unknowingly prompted me to complete an article thereon which I drafted quite some time ago.

The 133 Transmitter was a 300 watt, mainly CW transmitter produced by AWA, presumably to Defence Department specifications, and was designed along, what I would expect to be, good normal civilian practices.

Glueing the Undulator Inked Morse Tapes onto sheets prior to reading.



HF 300 watt portable — 1945-style. Type 133 Sets mounted in jeeps.

Original 'Landops' transmitter shack at Morotai — a leaky marquee with two 25 kVA alternators (Ford Mercury) outside.

It covered 1.5 to 12 MHz, using 807 Crystal and VFO Oscillators, to 807 Buffers, 807 Driver to push-pull 813s Output with 1800 volts on the plates. Provision was made for grid modulation speech or tone (MCW), and for either local or remote control.

Construction in six roll-out sub-units simplified service operations. My one lament was the fibre insulation in the finals, rather than ceramic — there being no suitable plastics for the job in those days. The RF and the humidity of the tropics had an unfortunate rheumatic effect, and after 18 months on Morotai the preamplifier tuning shafts and associated equipment were assuming the likeness of mushroom stalks, upsetting tuning operations no end.

Otherwise, we had very little trouble from these rugged work-horses. Not like the AT13, 500 watt RAAF set, we had at one stage (see AR, January 1987, p7). It developed a short to earth from the transformer filament winding feeding the 866 mercury vapour rectifier filaments, which, of course, were at "X" hundred volts above earth. No spare transformer was available so we jacked the faulty one up on insulating pillars and suitably labelled it "DANGER HI VOLTS." I hope that the label never came off with disastrous results to later users! I wonder if the initial fault was caused by one of Ted Roberts' mice (AR reference above)!

At one stage we had 13 133 sets in the "shack" working forward to Borneo (various points) and the Philippines, and later, when the 10 kW SWB8s of High Speed Wireless Section had gone home, working back to Melbourne. All using 600 ohm line to Delta matched dipoles, hung on pipe section-type masts at 70 feet (21 metres).

One photograph depicts a 133 set detachment setting up for portable use. Each detachment consisted of one 133 set, 5 kVA alternator (Howling Howard, or if lucky, a Ford Ten power unit), two receivers and about eight people (bods) of various "trades", all were transported in two jeeps and trailers, together with the equipment.

I fortunately did not have to operate our sets "portable" however, I would guess that many readers did. I can also imagine the trauma of transporting the "Little Brother" of the 133 set, the 100 watt AT5/AR8 (112 set) pedestrian/portable in

Papua New Guinea, together with its hungry genemotor and associated batteries and charger.

Should anyone be interested, I have the workshop manual of the 133 set, also copious notes received at a Sydney course devoted largely to these sets.

As an associated point of interest, a couple of years ago a photograph appeared in AR of an oval mast section, with a query as to its origin. It appeared very similar to the 90 foot (27 metres) portable telescopic masts used on Morotai to carry the rhombics for the SWB8s (10 kW), which were being used on the Melbourne link, High Speed Morse to Creed Perforator Heads and Teleprinter when conditions were good enough. The mast junction shown was at 30 feet (9 metres), tapering away to the ground, and up to the remaining 60 feet (18 metres).

Whilst on nostalgia, a query on Further Veteran Nostalgia. Does any former Army Signals persons recall the ancient (probably circa 1920s/30s) "Ack" or "Cork" sets (transmitters), which I can vaguely recall doing some training on very early in WWII, probably 1939. Al VK4LT, recalls that they had a big Douglas motor/generator to drive them. There are probably a few samples still hidden in some Ordinance or Signals Depot somewhere!

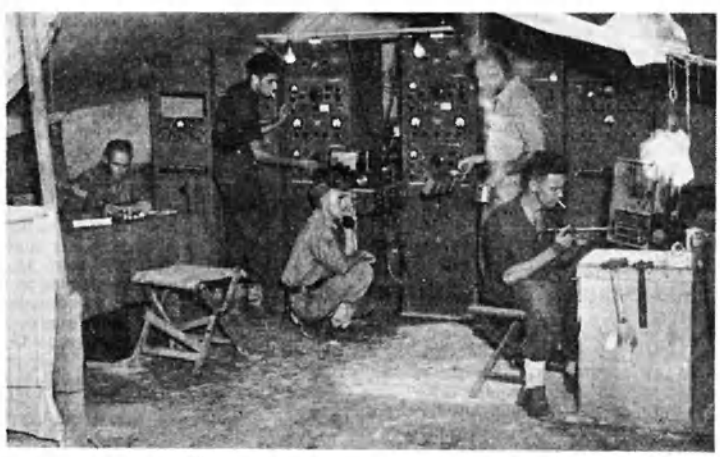
ar

The new shack in May 1945 — approximately 100 x 35 feet (30 x 10 metres) with a pile of the 94 and 95 Wireless Sections equipment waiting to be unpacked. Corpulent Sergeant Wal Badge supervisors from the top of the heap.

Boring holes in Morotai Island. They did actually do this through the coral crust to "great nothingness."

The "Slaves" at work erecting a PL (permanent line). "Wot, no back hoe?"

Signal Office Staff, Morotai 1945.



The receiver racks for the double diversity reception of the High Speed W/T terminal from Melbourne. Two AMR100 (101?) receivers with Undulator head between them on Morotai 1945.

Ian Hunt VK5QX
FEDERAL CONTEST MANAGER
Box 1234, GPO, Adelaide, SA. 5001

JULY

1		Canada Day Contest
4	— 5	Venezuelan SSB Contest
11		**AHARS National Sprint CW**
11	— 12	IARU World Championship
18		**AHARS National Sprint SSB**
18	— 19	CQ WW WPX VHF Contest
25	— 26	Venezuelan CW Contest

AUGUST

1		YLRL YL-OM SSB Sprint
15	— 16	Remembrance Day Contest (Rules this issue)
15	— 16	New Zealand Memorial Day Contest
22	— 23	All Asian CW Contest (Rules this issue)
1	— 31	40th Anniversary Pakistan Award (See notes below)

SEPTEMBER

19	— 20	Scandinavian CW Contest
26	— 27	Scandinavian SSB Contest
26	— 27	CQ WW RTTY Contest

OCTOBER

14	Australian Ladies' Amateur Radio Association Contest

Contests listed in bold type are WIA sponsored contest.

Well, it appears that this month I have a great deal of material to deal with. The Federal Convention has been held, the VK Novice Contest is coming soon and, as I write these notes, I am also completing work on the Field Day Contest Logs. I have also present the rules for the *Big One* namely the Remembrance Day Contest. So, life is certainly not dull.

It seems to me that we each have a wonderful opportunity to learn. As we progress throughout our lives we find that there is nothing better than experience as a teacher. Some of us are fortunate and seemingly have little difficulty in most of what we do, others have to work harder at it and others again find things somewhat of a struggle. Nevertheless life goes on. I believe that our hobby of amateur radio can be a great help to us in assisting us to develop and that we can also encourage others to improve as well.

I am reminded though of the story of a man delivering a lecture on the subject of "self-improvement". As part of his talk he pointed out that we should strive for perfection, but that we could never really be perfect. He then asked anyone who thought themselves to be perfect to stand up. To the lecturer's surprise one man stood. Asked if he really considered himself perfect the man replied; "Certainly not. I am standing as proxy for my wife's first husband."

Well, practice can make perfect and I would suggest that you can always gain experience and thus improve by going in contests, trying them if we haven't tried a contest before, planning our station and operational approach, preparing our logs, etc, with an eye to doing better each time.

And, so now to the rules for the Remembrance Day Contest. You will find them pretty well unchanged from last year. Again I would point out that my aim has been to try and establish a set of rules for each contest which can remain stable. Times and conditions however do change and I do not mean to infer that we should remain hide-bound about everything, thus, at times, the need for change can become apparent.

REMEMBRANCE DAY CONTEST, 1987

First of all I will list the names and call signs of those operators who lost their lives whilst on active service during the Second World War, and who are commemorated with their names being engraved on our Remembrance Day Contest Trophy. It is these names you will hear read out as part of the Opening Ceremony prior to the commencement of the Contest.

VK2BQ	F W S Easton	Royal Australian Air Force
VK2JV	C D Roberts	Australian Military Forces
VK2VJ	V J E Jarvis	Royal Australian Air Force
VK2YK	W Abbott	Royal Australian Air Force
VK2AJB	G C Curie	Royal Australian Air Force
VK3DQ	J D Morris	Australian Military Forces
VK3GD	T Stephens	Royal Australian Air Force
VK3HN	J McCandlish	Australian Military Forces
VK3IE	J E Mann	Royal Australian Navy
VK3NG	N E Gunter	Australian Merchant Marine
VK3OR	M D Orr	Royal Australian Air Force
VK3PL	J F Colthorp	Royal Australian Air Force
VK3PV	R P Veall	Australian Military Forces
VK3SF	S W Jones	Australian Military Forces
VK3UW	J A Burrage	Royal Australian Air Force
VK3VE	J E Snadden	Royal Australian Air Force
VK4DR	D A Laws	Australian Military Forces
VK4FS	F J Starr	Royal Australian Air Force
VK4PR	R Allen	Royal Australian Air Force
VK5AF	C A Ives	Royal Australian Air Force
VK5BL	B James	Royal Australian Air Force
VK5BW	J G Phillips	Australian Military Forces
VK6GR	A H G Rippin	Royal Australian Navy
VK6JG	J E Goddard	Royal Australian Air Force
VK6KS	K S Anderson	Australian Military Forces
VK6PP	P P Paterson	Royal Australian Air Force

They shall grow not old as we that are left grow old
Age shall not weary them nor the years condemn
At the going down of the sun and In the morning
We will remember them.

With the notes in connection with the Remembrance Day Contest last year, I remarked on the number of operators listed who were members of the Royal Australian Air Force. I asked whether anyone had any historical information regarding that era of Australian amateur radio. Up to now I have not heard from anybody.

It occurs to me that most of those who served during the Second World War and who might have information, will now be getting along in years. It would be a dreadful shame if so many stories went unrecorded. So I would again request anyone who has such information to pass on, please forward it to me. I will see that the details are preserved. Did you perhaps know any of the amateurs listed above?

Where did they serve, etc? Do you have a story to tell about your operations in the Forces? Any information will be welcomed. It may be that, after finishing my term as FCM, I could put a small series together. Don't worry if you don't think you are any good at writing, still send the information and I will undertake to put it into shape. Maybe you may find it easier to place the details on an audio cassette!

Following are the rules in detail.

1987 REMEMBRANCE DAY CONTEST — RULES

This contest is held to commemorate those amateurs who died during WWII, and is designed to encourage friendly participation between all amateurs and to help in the improvement of operating skills of all participants.

This contest is held annually during the weekend nearest August 15, the date on which hostilities ceased in the south-west Pacific area.

The contest is preceded by a short opening address by a notable personality, which is transmitted on various WIA frequencies during the 15 minutes immediately prior to the commencement time of the contest. As part of this opening ceremony, a Roll Call of the names of those amateurs who paid the Supreme Sacrifice, is read.

A perpetual trophy is awarded annually for competition between Divisions of the Wireless Institute of Australia. It is inscribed with the names of those Australian amateurs who made the Supreme Sacrifice and so perpetuate their memory throughout amateur radio in Australia.

The name of the winning Division each year is also inscribed on the trophy and in addition, the winning Division will receive a suitable certificate. The winning Division also holds the trophy for the next 12 months, after it is presented at the Annual Federal Convention.

Objectives

Amateurs in each VK call area will endeavour to contact other amateurs:

* in other VK call areas, P2 and ZL on bands 1.8 to 30 MHz, except the 10, 18 and 24 MHz bands.
* in any VK call area, including their own, P2 and ZL on bands above 52 MHz, and as indicated in Rule 5.

Contest Period

0800 UTC August 15, to 0759 UTC August 16, 1987.

All Australian amateur stations are requested, as a mark of respect, to observe 15 minutes silence prior to the commencement of the contest.

It is during this period that the Opening Ceremony Broadcast, referred to above, will take place. (We invite even those stations who do not intend to participate in the contest to join with us in this mark of respect).

Rules

1. There will be two contest categories.
   (a) High Frequency (HF) — for operation on bands below the 52 MHz band.
   (b) Very High Frequency (VHF) — for operation on bands from 52 MHz and upwards.
2. In each category there will be three sections.
   (a) Transmitting Phone
   (b) Transmitting CW
   (c) Receiving.

Modes applicable to each section are as follows:
   (a) AM; FM; SSB; TV
   (b) CW; RTTY
   (c) Receive (a) or (b).

3. All Australian amateurs (VK call sign), ZL and P2 stations may enter the contest, whether their stations are fixed, portable, or mobile. Members and non-members of the Wireless Institute of Australia are eligible for awards.
4. Cross Mode Operation is permitted. (eg SSB to CW). Cross Band Operation is not permitted excepting via a satellite repeater.
5. Scoring Contacts
   (a) All contacts score one point.
   (b) On all bands a station in another call area may be contacted once on each band using each mode. That is; you may work the same station on each band in Phone, CW, RTTY and TV.
   (c) On the bands 52 MHz and above, the same station in any call area may be worked using any of the modes listed, at intervals of not less than two hours since the previous same band/mode contact. However, the same station may be contacted repeatedly via satellite not more than once by each mode on each orbit.
   (d) Acceptable logs for all entries must show a minimum of at least 10 valid contacts.
6. Multi-Operator Stations Are Not Permitted (except as in Rule 7), although log keepers are allowed. Only the licensed operator is allowed to make a contact under his/her own call sign. Should two or more operators wish to operate any particular station each will be considered as a contestant and must submit a log under the individual call sign which applies to that operator.
7. Club Stations may be operated by more than one operator, but only one operator may operate at any time; ie no multi-transmission. All operators at any club station must sign the declaration.
8. Ciphers. For a contact to be valid, serial numbers must be exchanged between stations making the contact. The serial number will comprise three figures commencing at 001 for the first contact and incremented by one for each successive contact. Should the serial number 999 be reached, the serial number will revert again to 001.

9. Terrestrial Repeaters — Contacts via terrestrial repeaters are not permitted for scoring purposes. Contacts may be arranged through a repeater and if successful on another frequency will count for scoring purposes. The practice of operating on repeater frequencies in simplex mode is not permitted.
10. Portable Operation — Log scores of operators located outside their allocated call district will be credited to that call area in which the operation takes place; eg VK5XY/2 — this score will be added to the VK2 Division score.
11. Entries — A log of all contacts must be submitted. This should be in the format as shown in the example and must be on one side of the paper only.

A Front Sheet must also be included showing the following information in this order:
Category (HF or VHF). Section (Phone, CW or Receiving). Call Sign, Name, Address, Total Score, Page Tally.
Declaration: *"I hereby certify that I have operated in accordance with the rules and spirit of the contest."*
Signed: . . . . . *Date:* . . . . .

Logs are to be forwarded to the Federal Contest Manager,

C F Beech VK7BC, 37 Nobelius Drive, Legana, Tas. 7251.

Envelope to be endorsed **REMEMBRANCE DAY CONTEST** on the **FRONT** outside. Entries must be forwarded in time to reach the Federal Contest Manager by September 28, 1987. Any entries received later than this date may be used as Check Logs only.
12. Disqualification — See the general disqualification rules as printed in detail in the August 1986 issue of *Amateur Radio*.
Any station observed during the contest as constantly departing from the generally accepted codes of operating ethics may also be disqualified.
13. Awards — Certificates will be issued in accordance with the *Guidelines for Certificate Issue — Remembrance Day Contest* details of which are published below.

DETERMINATION OF WINNING DIVISION
Scores by stations in VK0 are added to VK7. Scores by VK9 stations are added to the mainland call area which is geographically nearest. Scores claimed by ZL and P2 stations are not included in the scores of any VK call area.

The formula used to determine the winning WIA Division is applied on a Divisional basis using a combination of three factors, namely, involvement, activity and weighting (Handicap).

The Weighting Factor is calculated such that should each WIA Division perform equally as well in 1986 as in a set number of previous years, the result would be a seven-way dead-heat.

Consequently, the most improved Division will win the trophy and also earn a revised and lower weighting factor for the following year.

DUPE SHEETS
Where stations make a reasonable number of contacts it is most helpful that they use some form of checking system to ensure that they do not have invalid duplicate contacts. A form of sheet which provides a convenient method of making such checks was described in *Amateur Radio*, December 1984, page 54. I would suggest that you should use such sheets. Whilst it is not mandatory that you do so, it could be of assistance to the contest manager if you forward a copy of same, together with your log.

RECEIVING SECTION RULES
1. This section is open to all shortwave listeners in Australia, Papua New Guinea and New Zealand. No active transmitting station may enter this section.
2. Contest Times and logging of stations on each band are as for transmitting.
3. Logs should be set out as per the example. It is not permissible to log a station calling CQ. The detail shown in the example must be recorded.
4. Scoring will be as per Rule 5 for transmitting with other aspects of that same rule also applying.
5. Club Stations may enter this section. All operators must sign the declaration.

AWARDS FOR SWLs
Certificates will be awarded to the highest scorer in each call area. Further certificates may be issued at the discretion of the FCM.

GUIDELINES FOR CERTIFICATE ISSUE, REMEMBRANCE DAY CONTEST
Certificates will be issued on the following basis:
1. Top scorer in each section. (See also 4 below)
2. Top Novice Class Station in each section, but as per proviso 3 below. (N/K calls compete on an equal basis when operating in HF (Novice) Band Segments, therefore there is no justification for separate certificates for each different type of call sign).
3. Where an entry other than top scorer is concerned (as per 2 above), a certificate will only be issued to a station if that station's score is equal to, or greater than, the average score in the applicable section for that State/Division.
4. Where only one entry exists in any section, a certificate will only be issued when the score for that entry is equal to, or greater than, the average national score for that category/section of the contest.
5. On VHF, the top scorer only in each section will be awarded a certificate. (There is no justification for separate certificates for holders of Full, Z or K calls as each competes on an equal basis on VHF).
6. The above rules apply with the understanding, as already determined policy, that the Federal Contest Manager has the power of discretion in such matters and may either award additional certificates where he considers it warranted or not issue a certificate if he considers one unwarranted.

GENERAL COMMENT
You may again wish to mote the fact that the NZART Memorial Day Contest is being held on the same weekend as the VK Remembrance Day Contest. This is not just a coincidence but results from an agreement between myself and Jock White ZL2GX, who is Contest Manager for New Zealand. Following the 1986 Federal Convention, Jock and I had some quite lengthy discussions as to the best ways to rationalise contests in each of our countries. We decided that it was possible to at least have the Field Day Contests coincide as well as the two previously mentioned. It was also agreed that contacts in each contest could count for either.

Therefore, if you wish you can enter both the Remembrance Day and Memorial Day Contests and utilise the same contacts where they can be applied on a common basis under both sets of rules.

At this time, I do not have a copy of the Memorial Day Contest available, however, I hope to receive a copy in time for publication in this issue of *Amateur Radio*. If you do not find the rules published herewith I will try and ensure that they appear in the August issue. That should still give you enough time to study them prior to the contest date.

While I am on a subject allied with the New Zealand scene, I would like to make some comment regarding Jock ZL2GX, who I understand is retiring as Manager for the VK/ZL Contest after at least 40 years of administering same. This is undoubtedly a tremendous effort and I am sure that he will be missed both for the work involved and also for his incisive humour which often came to the fore in Jock's comments with the contest results.

I would also like to acknowledge Jock's kind and gentlemanly co-operation in matters concerning contesting in general and, particularly, where the interests of both the WIA and NZART were involved. I have enjoyed working with Jock and I wish him well as he perhaps takes a well-earned rest. (I don't believe for one moment that he will rest anyway. He is bound to have some other activity to more that fill his time!). Congratulations and thanks on behalf of so many who have benefited from your efforts, Jock.

So, now my final words in connection with the Remembrance Day Contest: "Go to it, try hard, have fun, and ***please do help the incoming Contest Manager by presenting logs of a high standard.*** Also ***please read the rules and comply fully with them,*** they are not really too hard to follow. Best of luck to you in this, the classic event on the VK Contest Calendar."

EXAMPLE FRONT SHEET

Remembrance Day Contest 1987
Category: HF **Section:** (a) Transmitting Phone
Call Sign: VK1XXX **Name:** Joe Brown
Address: PO Box 123, Farm Orchard, ACT. 2611
Total Score: 1498 points

Page Tally	10 Sheets	1498 points
	Page	Score
	1	40
	2	39
	3	40
	-	-
	-	-
	Pages 10	Total 1498

Declaration: I hereby certify that I have operated in accordance with the rules and spirit of the contest.
Signed: J Brown **Date:** 20.8.87

EXAMPLE RECEIVING LOG
Remembrance Day Contest
NAME/SWL NO: L30371. **CATEGORY:** HF
SECTION: (c) Receiving Phone

Data Time (UTC)	Band (MHz)	Mode	Stn Calling	Stn Called	No Sent	No Rcd	Pts
15.8.87							
0800	14	SSB	VK1XXX	VK200	001	002	1
0802	"	"	VK1XXX	VK6LL	002	001	1
0805	"	"	VK5ANW	VK1XXX	011	003	1
0807			ZL2AGQ	VK1XXX	003	004	1
0809	"	"	VK7AL	VK2PS	007	010	1

Page 1 of 7 Page Total 40

EXAMPLE TRANSMITTING LOG
Remembrance Day Contest 1987
Call Sign: VK1XXX **Category:** HF
Section: (a) Transmitting Phone

Date Time (UTC)	Band (MHz)	Mode	Call	No Snt	No Rcd	Pts
15.8.87						
0800	14	SSB	VK200	001	002	1
0802	"	"	VK6LL	002	001	1
0805	"	"	VK5ANW	003	011	1
0807		ZL2AG-0	004	003	1	
0809	"	"	VK4XX	005	007	1

Page 1 of 10 Page Total 40

40TH ANNIVERSARY PAKISTAN AWARD

I have received a copy of details for the 40th Anniversary Pakistan Award in the mail. Whilst this is not a contest, I am providing the rules for this award as it appears the information was sent to me rather than to the Awards Manager. I know that he will forgive me for "poaching" and also that he would not want any of you to miss out on the information.

The rules for the award are as follows:

The Pakistan Amateur Radio Society has sponsored an award to commemorate the 40th Anniversary of Pakistan on August 14, 1987.
The Society will issue special award certificates and gifts to all amateur stations making five contacts with different AP2 stations on CW or SSB on any band/s from August 1 to August 31, 1987.
Special QSL cards will also be issued by AP2 operators.
During the period of the award, operators will be using their own call signs with stroke 40; ie AP2UR/40, etc.

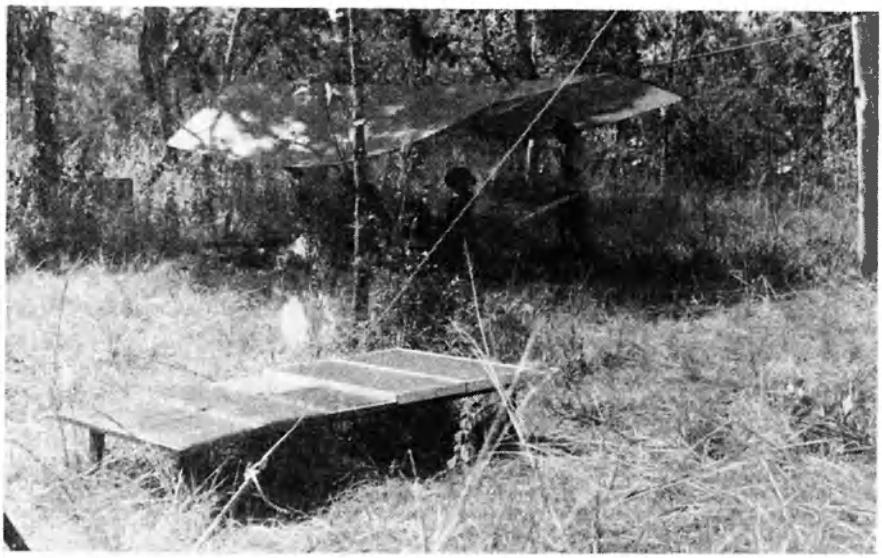
A certified copy of your log book/sheet, along with five IRCs should be sent to the Secretary, PARS, Box 65, Lahore, Pakistan, to reach there not later than September 30, 1987.

The information about this award was kindly supplied by AP2ARS, above the signature of the Secretary of the Pakistan Amateur Radio Society.

JOHN MOYLE MEMORIAL FIELD DAY CONTEST 1987 — RESULTS

I am pleased to be able to provide the results of this contest for you and also that of the President's Cup Award.

A PICTURESQUE JOH



The Solar Panels catch the sun in the foreground, whilst the operators of VK8BP take refuge under a tarpaulin.

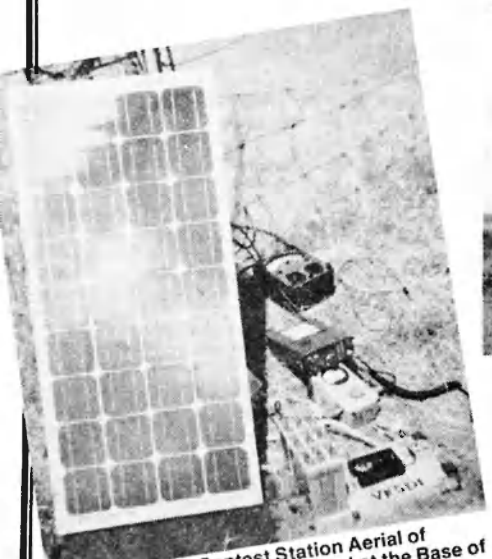
Battery Power for VK8BP.

VK6ANC, used an exercise bike and solar panels for power.

Lewis VK2LS, operates VK2BOR.

Allan VK2ALI (left) and Keith VK2KDL, President of the Oxley Region ARC, operate VK2BOR, during the Contest.

VK6A

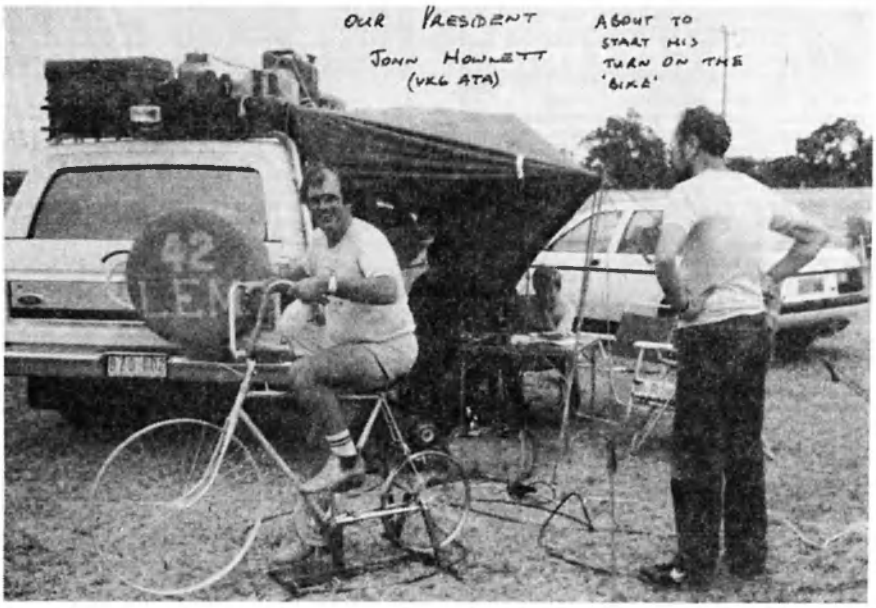


The JMMFD Contest Station Aerial of VK5DI/P, with the Solar Panel at the Base of the Pole.

The Operations Caravan of VK4WIR.

VK2DVU, portable Brindabella.

N MOYLE FIELD DAY!



John VK6ATA (pedalling), Phil VK6ZPP (operating) and Dennis VK6ZN (observing) at VK6ANC.

The Fire-Spotter, David Wiggins, provided Gil VK3CGG, with some company during the Contest.

John VK6JY, provides the power? at VK6ANC.

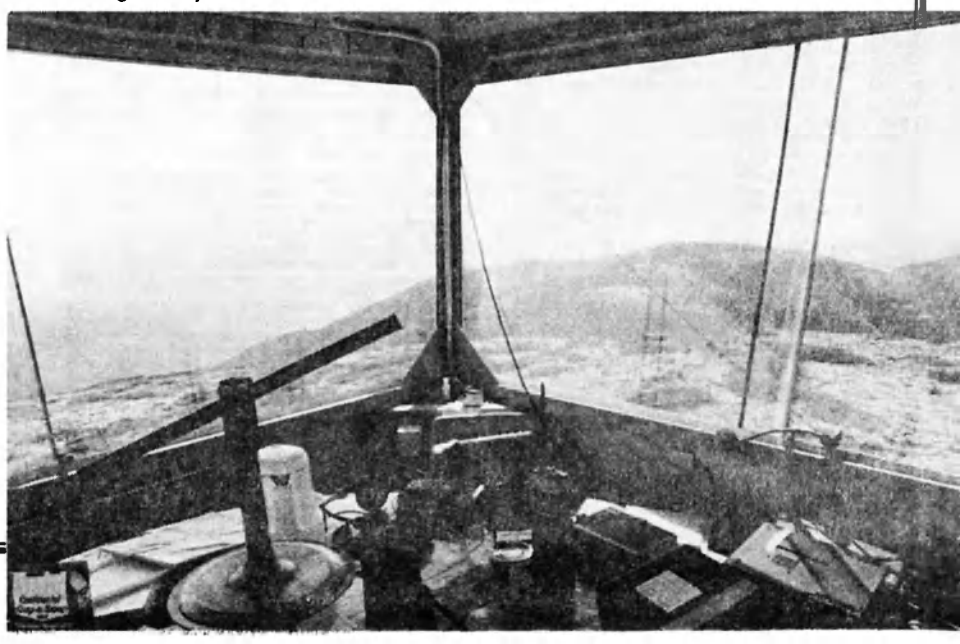
"The Shack" on Mount Hotham.

Wind Generator, Mount Hotham.

ANC.

Gil VK3CGG, operated from Mount Hotham and was treated to magnificent views of the surrounding countryside.

The VK6ANC John Moyle Field Day Site.



The Field Day Contest was again well patronised with the number of participating stations almost the same as for last year. Most entrants seem to have enjoyed the event and quite a number forwarded photographs taken at their Field Day sites. I have already provided some material, which was published last month. I thank all who have contributed with stories, comments and photographs. Such contributions certainly add to the amount of interest.

PRESIDENT'S CUP

Again, the President's Cup has been won by Gil VK3CGG (now VK3CQ). It seems that Gil is determined to stay at the top in contesting as you will note from the June issue of *Amateur Radio* that he was the winner of the CW Section for the Contest Championship Trophy, 1986.

Congratulations to you, Gil, for your perseverance and determination. I hope that you will continue your contesting efforts for many more years to come. Perhaps your example will help spur others on to try and emulate your activities.

When it comes to contesting I feel that is just what it should be — ***a contest*** — and the more competition the better it is.

Now for the detailed results which are listed in order of Section, both six and 24 hours, and showing the number of contacts and points scored by each station.

24 HOUR DIVISION ***SIX HOUR DIVISION***

CALL	QSOs	PTS	CALL	QSOs	PTS
		Section (a) Phone, Single Operator			
VK3YH	276	5296	VK3ADW	74	1758
VK3AJU	209	2927	VK5QX	164	1365
VK2TR	45	1674	VK3BRQ	137	1247
VK4JM	100	1537	VK2DVU	57	871
			VK4AIZ	48	687
			VK2ENU	63	668
			VK3VF	42	408
		Section (b) CW, Single Operator			
VK3CGG	176	3184	VK3CFI	16	410
			VK2JM	8	118
		Section (c) Open, Single Operator			
			VK3AFW	72	1898
			VK2BRC	66	805
			VK3AOJ	33	608
			VK2ARZ	47	483
		Section (d) Phone, Multi-Operator			
VK3BCG	390	13185	VK4WIZ	448	4397
VK3ANR	830	9981	VK4WIN	416	3750
VK4IZ	604	7437	VK5BAR	159	2298
VK1WI	410	6173	VK6YG	60	867
VK5BAD	213	5523			
VK4WIT	212	2521			
VK2SCC	168	2507			
VK3AWS	152	2473			
		Section (f) Open, Multi-Operator			
VK3CNE	641	26065	VK2BOR	91	2106
VK2WG	473	17126	VK4QC	169	1682
VK3SCD	547	9134	VK4WIM	104	1297
VK4WIR	309	8231	VK4BPA	35	384
VK5AJQ	275	6092			
VK5LZ	226	4888			
VK6ANC	303	4798			
VK2HZ	456	4039			
VK2FFG	334	3659			
VK5ARC	275	3391			
VK8BP	147	3326			
VK8DA	166	2091			
VK2ESL	113	1839			
VK4HM	127	1520			
		Section (g) Transmitting, VHF			
VK3YSY	166	8101	VK5DI	23	2945
VK2BN	94	5909	VK1RH	5	61
VK3BML	96	3252			
		Section (h) Home Station, Emergency Power			
VK2MB	274	3112	VK4AGQ	56	1549
VK5ADD	111	1136	VK5NOD	122	1121
VK6ARD	68	319	VK2BQS	66	573
VK2OD	24	265	VK4YJF	22	445
			VK6AFW	6	134
		Section (i) Home Station			
VK6DA	53	349	VK3ZI	26	192
VK6ED	11	271	VK3KS	4	42
VK6ARD	42	260			
VK3XB	7	102			

Section (j) Shortwave Listener

L60036	64	690

Check Logs

VK6WZ	VK3CIS
VK5AJG	VK5DI
VK5AUS	

I have reduced the number of points claimed by one club station by an amount of 10 percent of the points scored as a penalty for not having provided a summary sheet of contacts made for which distance multipliers were claimed. This reduction did not affect the final result, however, I would have been within my rights had I disqualified the log altogether. Attention to detail is important when you make out your contest entry. So please **check you logs before submission.** Generally speaking the standard of logs was fairly good for this contest with again the entry from VK3CNE being an outstanding example of how it can be done.

I have no doubt whatsoever as to the operations carried out by the station VK6ANC, as those concerned with that station had gone to the trouble of filling out a Statutory Declaration witnessed by a Commissioner for Declarations, indicating just what the operating conditions, etc, for that station were. This is the first time that I have received a Statutory Declaration as such with a log, however, it certainly Indicates that those concerned wanted to make sure that their entry was properly accounted for. At least one log submitted was incorrectly scored to an extent that I did not accept it as an entry and have instead included it as a check-log. In cases where I can re-score logs without too much difficulty, I have done so in a number of contests, however, where such action would require too much of my time I have either disqualified the log concerned, returned it to the sender for correction and/or re-submission, or discarded same.

It always seems to me to be a pity when entrants have their logs disregarded due to the fact that, after having carried out their operations in a contest, they neglect to read the rules regarding log layout and submission and fail to follow the instructions given.

The letter accompanying the log from Maggie VK3CFI, deserves comment. Maggie operated CW-only and with solar power. I quote: "Except for a few CW QSOs over the past two years, I had not done much serious operating in that mode. For a while it was hard to sort through all the dits and dahs. I think I asked each operator to repeat the number two or three times. Even then, I wasn't quite sure. The ZLs all were good operators, but their CW was very fast.

"I was afraid the solar charged batteries might get drained too much, but the worry was for naught. Sunlight for four of the six hours helped, I think.

"This was my first contest solo. I'm glad there was a six hour Division — 24 hours would have been too long. The OM and harmonics brought me some tea and provided me with company, about halfway through.

"Thanks for the contest, I'll be better prepared with my CW next year." Well done, Maggie. Keep up the good work. (FCM)

Now for comments from other logs.

"First time I've entered the JM. . .This yaar activity had to compete with duties as Acting BC Officer VK6 Division, preparing tha Sunday Morning Broadcast, a bachelor's household tasks and our first really trying period of humid weather this summer. Enjoyed taking part. . .beginning to wonder if contests are getting to me! Only the RD has had anything like regular participation from me in the past. . .other contests have been dismissed as a bore! BUT. . .?" —VK6WZ.

"I still think that Section (h) warrants inclusion in the Contest Championship points. eg the mobile does nothing unusual and only drives somewhere and in fact he need only park in the neighbour's driveway. The Section (h) needs to do something and of course try to make it as realistic as possible. I wonder if I am "portable" and not "home"? The only thing common to my "Emergency HF" and my "Home Station" is the G5RV itself, even the feedline and earths are changed. Even the beams are not used as emergency power does no extend to the rotators. VHF is different, it is standard shack gear on battery power (which I had to carry out) although no beam. Perhaps I am portable after all. Just some Idaae." — VK2BQS.

Here I think I might make some comment. The rules for the contest used to stipulate that no normally occupied premises could be used to house a field day station, also that the venue for operation must be a certain minimum distance from the home location. In fairly recent times, prior to my term as FCM, these parts were dropped from the rules. I have no strong feelings on the matter in view of the fact that in an emergency, a station may need to be set up almost anywhere. I had considered that a "Home Station — Emergency Powered" would be a normal home station running from such as batteries, generator or solar power, etc. It seems to me that Jim VK2BQS, has gone to much greater lengths than I envisaged to make his entry more worthwhile. For this, he is to be commended. Yes! He comes close to his station being acceptable for the "portable" category. Maybe all that is needed is another antenna as I know that he sets his equipment up in another part of his house away from his normal operating location. The approach to the Contest Championship competition is such that "Home Stations" either on emergency power or mains power generally do not require the amount of work necessary as applies to setting up a Field Station. It would seem that most operators do follow the spirit of things and also that very few entries are received from operators simply pulling up somewhere in their usual "mobile" unit and participating in the Field Day.

Whilst on general comment, I would refer you to my remarks regarding my report to the Federal Convention and the outcome of my recommendations to same. I would expect that from the next Field Day Contest the new FCM will have addressed the various points concerned and thus the rules for next year will be somewhat different. Now for even more comments from logs.

". . .There could be a new section added to the contest which would cater for the QRP operators. . .I am not suggesting that special bonuses should be given for distances. This should however be discussed with the QRP fraternity. What I am suggesting however is a new section where the maximum power output is limited to say five-10 watts. This would encourage more operators to join the contest. I have operated QRP since 1979 and have entered the contest or operated in it since that time and have found it annoying when contestants use high power and do not give the small fry a go. Anyway, I had a good time this year, especially as there appeared to be better conditions. Until next year, 73 and all the best." — VK2ENU. (Well, what do other QRP operators think? Any other comment? I am sure that new FCM will be interested to hear from you. FCM).

"As a Home Station — Emergency Powered, I only just made it, erected telescopic mast with beams for six and two and two metre Ringo on Saturday afternoon, G-clamps to facia boards, new two-storey house, all very temporary. Was then worn out so didn't start operating until Sunday morning. . .disappointed by lack of field stations on the Sunday, especially after the number of call-backs following the local WIA broadcast 2300 hours Sunday. Practically all stations had something better to do because they were not heard again until contest finished. I hope the contest continues and next year I will try and be a field station." — VK4YJF

"This was a day of 40 over S9 trouble for me, so had limited time to operate. Luckily, it was a pleasant day for once. I noticed greater use of full RST in reports this year." — VK2JM.

"Sorry for the feeble effort this year. I was unable to go portable and divided my time with the BERU. Next year, I am determined to be there with wind power." — VK6ED.

"Really enjoyed the contest. Didn't expect to make any two metre contacts due to my location in a valley surrounded by two to three thousand feet high mountains, however, a couple of the VK1 boys were up there and I had one contact with Wagga, 125 km to the west of me, on backscatter from the mountains to the east." — VK2DVU.

"VK4WIT was located at Camp Brosner in the Barvey's Range about 30 km west of Townsville. The equipment used included an FT7, IC751A, IC735, TS120S, dipole antennas, powered by a portable generator." — VK4CD, Station Manager.

"Batteries were one Lucas Marathon (truck size), one 15-plate Pulsar and one 10-plate Pulsar. Generator was smallest size Honda — EM500 — easily carried by one person. Rigs were generally run at less than full throttle. One battery was recharged during operations but was not brought back into service. Antennas were supported by ex-Army tripod mast. Difficulties in getting it to full height of 33 feet obliged use at 24 feet. . .inverted Vees for 80, 40 and 20 metres (with 40 metres doubling for 15) and five-eighth ground plane for 144 MHz on six foot extension to mast. Shack was a tent with folding table within. The only man-made structure at the QTH was a concrete water tank, presumably for tire-fighting in the surrounding pine tree plantation. At one time the QTH was an airstrip but has been abandoned as such." — VK3AJU.

"This year, my second, I had a great time. The weather was a bit chilly overnight, down to one degree Celsius, but I survived. I did enjoy my second contest in the Field Day." — VK3YSY.

". . .a bit disconcerting coming up against the BERU Contest after seeing nothing in AR about it. . .managed to work the whole 24 hours. . .found my Morse was still as

good at the end as at the beginning. I wonder how long one could go. The Forests Commission, now CFL, was helpful in letting me get out of the wind into the fire tower right on top of Mount Hotham, there was an old telephone pole about 20 feet away which was just right for my antenna. I am sure this is the way to go in future, but I hope to get an old caravan to turn into a mobile shack, together with a buddy we can operate HF and VHF. There were plenty of guys breaking the squelch on my two metre hand-held in the middle of the night, some from a good distance away, too. . .Solar Panel, 14 volts by one amp measured. Wind generator, a failure, out of balance." — VK3CGG.

"Station sited on Mount Coree, 1421 metres elevation. Just inside the ACT side of the NSW border. . .a KDK two watts FM into a HL160V amplifier. . .100 to 120watts depending on state of charge of the vehicle battery. . .topped up by a Kawasaki alternator feeding a 20 amp power supply. . .the antenna, a 6 dB 18 feet collinear on top of a 27 foot telescopic mast pocketed into the bull-bar with six guy ropes. Wife, Keth VK2ACP provided the meals and ruled up some log pages." — VK2BN.

"Thanks for an enjoyable contest." — VK3AOJ.

"Our operators and club members generally always enjoy the opportunity to co-operate as a club and the Field Day provides valuable training for our members." — VK4BIF for VK4WIN.

"Thanks for including Section (h) in the contest. I was unable to go portable that weekend and was very happy to be allowed to participate with at least simulated conditions. Hops to be portable somewhere next year." — VK5AOD.

". . .unable to attend this year, but the boys told me they thoroughly enjoyed the contest once again, , ,have enclosed our 'ready reckoner' type score card. . .It was a great help to all the boys as they could identify the sections easier. It also helped me no end in checking their efforts, perhaps it could be improved upon and used in AR for guidance of contestants in the years to come." — VK2BFP for VK2BOR.

The "Ready Reckoner" as used by the Oxley Region Amateur Radio Club.

Section Letters to be used in our Log;

LETTER	STATION TYPE:	TRANSMITTING:	OPERATOR:	POINTS SCORED WITHIN AUSTRALIA: OUTSIDE VK2	POINTS SCORED WITHIN AUSTRALIA: WITHIN VK2
A	PORTABLE FIELD	PHONE	SINGLE OP	20	15
B	PORTABLE FIELD	C.W	SINGLE OP	20 CW to CW	15 But =Double
C	PORTABLE FIELD	OPEN	SINGLE OP	20	15
D	PORTABLE FIELD	PHONE	MULTI OP	20	15
E	PORTABLE FIELD	C.W	MULTI OP	20 CW to CW	15 But = Double
F	PORTABLE FIELD	OPEN	MULTI OP	20	15
G	PORTABLE FIELD	VHF	Either	20	15
H	HOME STATION	EMERGENCY POWERED	Either	10	5
I	HOME STATION	MAINS POWERED	Either	2	1

Note: The above table does not apply to stations outside of VK (Overseas Stations) as they only score 2 points anyway.

NB: See rules re CW to CW.
NATURAL POWER adds additional 10 points

". . .equipment used was an FT707 12 volt DC input. . .power generating system was a single 12 volt truck battery. . .had been fully charged before the *contest. . .car battery was* available fully charged and could have been used via jumper leads from car. . .HF antennas were one two-element closed spaced Yagi for 14 MHz, Webster Bandspanner mobile whip for 3.5 to 28 MHz. VHF antennas were a seven-element crossed Yagi for 144 MHz and a 14 element Yagi for 432 MHz." — VK2OD.

"The competition this year was most enjoyable as we all got sunburnt at our location — Mount Wombat — the site of the Channel 1 Shepparton repeater. Would it be possible for next year to change the rules in some way to promote the early hours (2 am to 6 am) VHF and UHF contacts." — VK3KIR for VK3BCG.

"The scoring system was too heavily biased in favour of long distance VHF and UHF contacts. It almost seemed that a single-handed six metre operator could, on a good weekend, defeat the efforts of a group like us single-handed. Something else we also lacked was a good CW operator. VK3DCA and I were game enough to make a few contacts with the key, although almost all of them were tail-ended onto a phone contact. Invariably, when I suggested to another station that we QSY to CW for an exchange, we would be obliged to wait while a CW operator was found at the other end." (At least that way two operators had the experience of a CW contest QSO, FCM) . . .you might be able to clarify a point in your column. We often padded out our CQ-Contest calls with invitations to explain contesting to any stations who didn't know what was going on. We would also say that any station could work us and that it wasn't necessary to formally enter the contest in order to make an exchange. Doing this in the quiet periods was obviously in our interest. At one stage, however, we were chastised by an anonymous station who accused us of going outside the spirit of the rules. I'd be interested in your opinion. It's worth pointing out that such CQ-calls often resulted in lengthy QSOs where we explained contesting in great detail to the other station, and these other stations then started handing out numbers to many other serious entrants." — VK3CRA for VK3SCD CRETINS (Cheltenham Radio, Electronics and Technology in Scouting).

The previous comments do warrant a reply. It is my very strong opinion that stations operating in a contest can do a great deal to benefit the hobby by taking an active interest in helping others understand what contesting is about. The actions of the operators at VK3SCD are to be encouraged and, far from being against the spirit of the contest, are in fact enhancing same. They also add to the friendly spirit of our hobby and follow well "The Amateur's Code" which sometimes, unfortunately, seems to be forgotten. I have also, during a contest, when things become rather slow, gone scanning the bands to find other stations who may not be in the contest and spent quite some time "encouraging" them to provide me with a contest exchange. This has resulted in some cases in disappointment, but in others, the extra points I wanted and as well the stations concerned have also gone on to provide other contacts. So you can see that I understand what you mean in your comments. My advice is to "go for it" and make as many contest contacts as possible as long as you are not breaking contest rules, Departmental regulations or doing anything which is not within the spirit of amateur radio in general. Unfortunately, some people have fairly narrow views on some of these subjects. — FCM.

"I enjoyed the Field Day (my first attempt) and hope to do better next year from a better location nearby and when I am better organised, and equipped for solar panel operations without battery. (Provided the sun shines). I hops to be able to operate VHF and HF (100 watts PEP) next time using solar panels and capacitors but I must choose a better operating time-slot for more activity." — VK3DI.

And, finally comment from the boys from the Wagga Amateur Radio Club, VK2WG. "A disparity in point scoring between HF and VHF with the greater emphasis on the VHF spectrum is of concern to the HF operators. HFs unproductive yield of points in comparison to VHF may attract field starters away from HF bands. *Some* of the regular HF stations did not appear this year or pursued VHF as a prime thrust. A middle road needs to be struck, to continue stimulation of activity on ALL places of spectrum or a continual degradation of HF participation may result. This current situation would, we feel, distract from the object of the field day and the spirit of the entire event."

The Wagga boys go on to comment on the portions of the rules dealing with ZL Field Day Stations which were originally omitted. The April notes for this column did point out quite clearly that it was too late to do anything about the rules for the Field Day Contest and the omissions which had occurred. There does seem however, that there was some doubt left in the minds of some of the entrants. I apologise if such is needed and I have ensured that, where any doubt existed, the logs concerned were correctly scored or suitably amended. My notes pointed out the reason the missing portions of the rules were published was to provide a more or less permanent record of same for reference by the incoming FCM next year.

On the subject of VHF operation, I would again refer you to my notes elsewhere in this issue of the column dealing with my report to the Annual Federal Convention.

ROSS HULL VHF/UHF MEMORIAL CONTEST 1986

The results of the Ross Hull Contest as published in the April issue of *Amateur Radio* included an unfortunate oversight, for which I offer my humblest apologies. In listing the entrants I did so by call area and thus omitted to indicate that VK4FXZ/7 was entitled to a certificate for his operation from Tasmania. I received a nice letter pointing out this anomaly and express my thanks for same. When one goes to the trouble and effort that I know were involved so as to operate from a temporary location under various forms of difficulty, a certificate is certainly warranted. So, rest assured that, whilst this FCM is prepared to admit to making mistakes, he is also prepared to rectify them.

Whilst on the matter of certificates, I almost have all certificates up to date. These are gradually being processed through the Federal Office for mailing and I have promised the incoming FCM that he will have absolutely no backlog of certificates to deal with. This will include all certificates up to the 1987 VK Novice Contest. (Not yet held when this is being written). So, please be patient just a little longer if you are an expected recipient. All will be well before too much longer.

1987 FEDERAL CONVENTION REPORT

Should you wish to see a copy of the Federal Contest Manager's Annual Report, you can approach your Federal Councillor. Copies were mailed to all Divisions prior to the Convention.

My report to the Convention included comment on all the contests run throughout the year under FCM auspices, as well as the Contest Championship Competition Trophies, Certificates for the VK/ZL Contest and the Adelaide Hill Amateur Radio Society Sprints. In my report I acknowledged the help of Earl VK3BER and Jock ZL2GX, during the year. I also expressed the benefit of being able to consult with Ron VK1RH,on a personal basis as his visits to Adelaide permitted.

My report then dealt with various recommendations to the Federal Council. It is upon these that I would like to pass some comment.

It is necessary that recommendations be viewed in the light of as much information as possible and to this end I supplied a number of attachments to the report. So that the average member reading this can be fully aware of the background, I will supply as comprehensive a coverage of matters as can be allowed in these notes.

A working party at the Convention, chaired by the Alternate VK1 Federal Councillor, considered the FCM recommendations.

REMEMBRANCE DAY CONTEST

I proposed that the new FCM might look at the duration of this contest. It is suggested that 24 hours for same is excessive. Two periods within the 24 hours could be adopted or two Time Sections similar to the Field Day could be applied. The matter could be examined to allow discussion at the 1988 Federal Convention.

It can be clearly shown that the formula as applied over the past several years for determining the winning Division for the Remembrance Day Contest does not include any participation as it should. This is because the component containing participation has been cancelled out. Despite

the fact that the mathematical approach may have been correct, if a factor cancels out, then it plays no real part in determining the result.

Attachments to my report included a copy of the letter by Colwyn Low on the subject which was printed in *Amateur Radio* for March 1987, and a sheet detailing the arrangement of the formulas as it has been used and proposing a correction in line with the VK5UE suggestion such as to rectify the anomaly.

On these recommendations, the working party decided that the new FCM should report next year if the duration to the Remembrance Day Contest needed changing thus adopting my recommendation.

In the matter of the formula to determine the winning Division, the decision has been indicated as indeterminate. The minuted sheet provided to me states "no change but note the proposal is within existing guidelines."

It would thus appear that with the existing guidelines to control the actions of the Federal Contest Manager, I really had no need to bring this matter under the notice of the Federal Convention. You will note that I have not spelled out the format of the formula in the Remembrance Day Contest rules in this issue. Rather, I have shown the content of the guidelines in the FCM's "Terms of Reference." These show that the formula to be applied should contain the three factors, involvement, activity and the weighting (handicap).

My recommendation to the Convention was:

"That the scoring system used to determine the winning Division in this contest be changed in such a manner as to retain the concepts of Participation and Activity as factors within the formula."

I then went on to say that "The current formula effectively deletes the participation element."

I have prepared the rules this year with practically no changes from last year and with the incoming FCM in mind. I will be handing the reins of appointment over to him with a copy of the references quoted, previous details provided to the Federal Council on this subject and a strong recommendation that the proposal should be implemented and applied by him to the 1987 Remembrance Day Contest.

JOHN MOYLE MEMORIAL FIELD DAY CONTEST

I quote directly from my recommendations.

"That this be an "HF ONLY" contest.

"This was the original concept for the National Field Day Contest. It is interesting to note that this approach is adopted by quite a number of other national societies. VHF was added and recent evidence is that VHF operation does not attract a great deal of interest. For 1985 it was deleted as a separate section with not much comment being received. 1986 saw an attempt to encourage VHF participation with distance multipliers applied. The present rules seem biased towards VHF operation insofar as scoring is concerned. Thus a genuine attempt to improve the contest has resulted in an imbalance.

"See also the Discussion Paper, recommendations regarding Ross Hull Memorial VHF/UHF Contest and letter from Geelong Amateur Radio Club from *Amateur Radio* April 1987 issue."

The decision of the Working Party was minuted as follows:

"John Moyle Field Day — create two sections HF and VHF/UHF"

It appears that this decision goes part way towards adopting the recommendation made. It virtually means that TWO contests will be run. One, an HF Field Day Contest and the other a VHF/UHF Field Day Contest. At this stage, I am somewhat still surprised, as the evidence provided to anyone who has looked properly at the subject is that there appears to be little interest in VHF field day operation as such. This proposal now really means that there will be at least 40 separate sections in the John Moyle Memorial Field Day Contest. You find that surprising? Well, they will be sections (a) to (j) inclusive for HF six-hour Division, 24-hour Division and VHF six-hour and 24-hour Divisions.

I will venture to say at this stage that this seems to me to be somewhat ridiculous, however I provide this information to allow members to be able to discuss same, provide their comment and also to put the details into print in a formal fashion for the guidance of our new FCM.

ROSS HULL MEMORIAL VHF/UHF CONTEST

My recommendation to the Convention was "That this contest be abandoned in its present form and that it be replaced with a VHF/UHF Field Day Contest bearing the Ross Hull name."

I also stated "See Discussion Paper, Notes in *Amateur Radio* April 1987 issue and remarks from the 1986 FCM Annual Report."

The Ross Hull Contest has had an incredible history of problems going back for many years. FCM after FCM has tried to come to grips with the problems of such a contest with little success.

It would seem that the results of this contest have been dependent on such as a prime location under one set of rules, eg Kerry VK5SU, when he was located at Ceduna in a prime geographical location for long distance six- metre propagation and won it easily against all comers for several years before he transferred out, or under more recent rules whether or not you had equipment and specialised in VHF/UHF/Microwave bands up as far as you could go. In the latter case there would be only several stations in Australia who could hope to win the contest. In other words, it became an "elitist" contest.

Now, I do not wish any of you to think that I thus decry the efforts of any of our "VHF/UHF and above" enthusiasts. In fact, I give them great credit for their dedication to a particular area of amateur radio activity. I do not believe though, that contesting and experimentation necessarily go hand in hand, nor that contests should be such as to obviously restrict the number of operators who could enter with a reasonable chance of success.

I have received a few letters on the subject which indicate that those writing seem to have only their own outlook on the matter. No one has come up with any other suggestions which would help to expand our ideas and horizons and encourage an increase in participation in the Ross Hull Contest.

I did circulate a "Discussion Paper" to all Divisions in May, 1986, however I received the courtesy of a reply from only ONE of the Divisions. That is really how much interest there is.

I must acknowledge the great help that Eric VK5LP has been to me as, without Eric wishing for any kudos, he has been most instrumental in making proposals to try and breathe some life back into the contest. Between us, I could rightly claim that we have given the Ross Hull Contest more publicity than it has received in ages. We have tried quite a few different approaches, all to no avail.

I again wish to point out in no uncertain terms that the measure of success of a contest can only be shown by the numbers of entrants in the contest. That applies no matter how many people claim that they gave out numbers. If they did not put in a log they cannot be counted. Some people would claim otherwise, however I would ask where is their proof? Such an approach as adopted by these persons is just woolly thinking and I venture to suggest that they have not really had too much to do with organising contests.

The Convention answer to my recommendations was "Change scoring to locator squares — Maidenhead System — create all band experimenters and limited bands contesters section. Adjust timing to commence Boxing Day for approximately three weeks."

My Comment: Locator Squares approach does not answer the problems. It is perhaps fine for Award purposes. How do Locator Squares provide an answer to scoring anyway? All band experimenters and limited bands contesters are virtually what we have had with Eric and myself trying to tackle the problem. This has not worked. (See log entries for the last several years). I have no idea just how well Boxing Day for three weeks will go down with most people. Many suggestions up to this point indicate that the Ross Hull Contest always ran for too long.

Over to you for comment and I am sorry that I just have to drop this one in the lap of my successor.

VK NOVICE CONTEST

Don VK5NOD, has done a great job in this contest for quite a number of years. I respect his efforts and I know that he will understand my approach as he is always a great guy to make contact with.

My recommendations read "That incoming FCM consider a change of rules to restrict the number of times a station may consecutively be awarded the trophy.

"An excellent effort has been put up by VK5NOD in winning this contest for the last three years. It may be considered undesirable should this station have further consecutive wins."

Now again, let no one think that I am having a shot at Don VK5NOD. There is, however, precedent for such suggestion. In quite a few of the large international contests there are provisos which follow the lines proposed. I surely think that it is only human nature for people to say in the situation as presented that there is no point in them entering a contest if the same person is going to continue to receive the trophy.

I say this without fear or favour, and leave you to judge just what is the best and fairest approach.

I would also say to Don, "Go to it mate, and all the best to you." The rest of my report was of small event, so I will leave the subject of the Federal Convention at this point.

Recent copy received from Frank W1WY, provides the announcement that Katashi Nose KH6IJ, has been elected to the "Contest Hall of Fame." This is of course a great honour.

In determining eligibility, the Contest Hall of Fame Committee uses the following parameters in considering their decision. The nominees should have made extraordinary and unselfish contribution to the sport of contesting, often at great personal sacrifice of time and resources. They must be amateurs who have given much to the enjoyment of the sport by others over a long period of time. Examples of activities which meet these criteria include the engineering, maintenance and operating of leading-edge contest stations; the planning and support of contest expeditions (DXpeditions coinciding with major DX contests); and the conception, development and administration of major contests.

Katashi Nose, was first licensed in 1932 as K6CGK, while he was a junior at Honolulu's McKinley High School. In those early days, Hawaii was considered part of the US Sixth Call District and there was no KH6 prefix. His first rig used a 210A tube and was powered by a 45 volt battery. He called and answered CQs for the better part of six months without an answer, until he suddenly made consecutive contacts with W6AM, W6CUH and W6ENV. Nose had stumbled across the ARRL DX Contest, and he never forgot the thrill.

In 1934, Nose entered his own station in the ARRL DX Contest for the first time and finished in 12th place in Hawaii on CW. In 1935, he moved up to third place and over the next five years, became the man to beat, making the top score in Hawaii in four of those years. In 1935, he entered the ARRL Sweepstakes for the first time and was top score for his section on CW.

Prior to World War II, the contest we know today as the CW WW DX Contest was sponsored by CQ's predecessor publication *Radio Magazine* and was introduced in 1939 as the Radio World-Wide DX Contest. Unfortunately, there was only one contest before amateur radio was silenced for the duration of the war, but the first CW winner of that contest was Katashi Nose K6CGK, using a Vee beam and a four section 8JK. In that depression period, economics dictated that Katashi home-brew his equipment with whatever was available and he made his own capacitors using tinfoil from cigarette packets an waxed paper. His variable condensers were fashioned from refrigerator ice trays.

Nose has consistently been a "giver", not a taker, to amateur radio. He is the author of 30 technical articles in major amateur radio magazines, including contest related articles on subjects such as loading a tower on 160 metres, constructing home-brew rotating towers and making lightweight beams. He served as the President of the Honolulu Amateur Radio Club for several terms, was a charter member of the WARC-79 Advisory Committee, served on the ARRL Contest Advisory Committee. representing all the US Sixth

Call Area for two terms, and was advisor to the University of Hawaii Amateur Radio Club.

In the mid-1950s, Nose was selected by the Shell Foundation as one of the 100 most outstanding high school teachers in the US. Later he moved up to the University of Hawaii as a Professor of Electrical Engineering. He is now retired.

No story about Katashi Nose is complete without mention of his loyal and devoted wife, Matsuyo, without whose help and encouragement his marvellous record would not have been possible.

There would be very few amateurs who enter in the major contests who have not had KH6IJ appear in their logs. The KH6 multiplier is guaranteed, coming from a well-engineered and maintained contest station. You may wonder whether his location is on a remote mountain top, but no, his QTH is on a 5000 square-foot city lot. This man is an inspiration to each of us who operates from an urban environment.

I wish to acknowledge the source of this story from the material provided to me by Frank W1WY, which material is also published in *CQ* magazine.

Well, I have provided probably the largest amount of copy I have ever submitted to *Amateur Radio* for any issue. Next month, should be my final submission, in this capacity, to the magazine and I am currently in the situation of conversing with our new FCM who should introduce himself to you in the September issue. We are talking to each other and we both hope that the changeover will be smooth. Logs for the VK Novice COntest will still be received by me. I will carry out the work on them and then forward the results to the FCM for publication. I will also take care of the certificates for that contest.

Following are the rules for the All Asian DX Contest and the Venezuelan Contest. Again, I did not receive the rules for the All Asian Contest in time for publication for the Phone Section.

So, that is all for now. Hope to see you in the Remembrance Day Contest. Good luck and 73, de Ian VK5QX.

28th ALL ASIAN DX CONTEST — 1987

The purpose of this contest is to enhance the activity of radio amateurs in Asia and to establish as many contacts as possible during the contest periods between Asian and non-Asian stations. It is supported by the Ministry of Posts and Telecommunication of Japan.

Contest Period:

Phone — 48 hours from 0000 UTC June 20, 1987 to 2400 UTC June 22, 1987.

CW — 48 hours from 0000 UTC August 22, 1987 to 2400 UTC August 23, 1987.

Bands: Amateur bands under 30 MHz.

Entry Classification:

1 Single operator, 1.9 MHz band (CW-only).

2 Single operator, 3.5 MHz band (including 3.8 MHz band, and so forth on).

3 Single operator, 7 MHz band.

4 Single operator, 14 MHz band.

5 Single operator, 21 MHz band.

6 Single operator, 28 MHz band.

7 Single operator, Multi-band.

8 Multi-operator, Multi-band.

Power, Type of Emission and Frequencies: Within the limits of own station licence.

Contest Call: Phone . . . CQ Asia. CW . . . CQ AA.

Exchange:

For OM stations — RS(T) report plus two figures denoting operator's age.

For YL stations — RS(T) report plus two figures 00

Restriction on the Contest:

No contact on cross-band.

For participants of single operator's entry — transmitting two signals or more at the same time, including cases of different bands is not permitted.

For participants of multi-operator's entry — transmitting two signals or more at the same time within the same band, except in case of different bands, is not permitted.

Point and Multiplier:

Contacts among Asian stations and among non-Asian stations will neither count as a point or a multiplier.

For non-Asian stations — a perfect contact with Asian stations (excluding US auxiliary military radio stations in the Far East, Japan) will be counted as follows for point scores: *1.9 MHz band . . . 3 points; 3.5 MHz band . . . 2 points; other bands . . . 1 point.*

Multipliers are the number of different Asian **Prefixes** worked on each band, according to the WPX Contest rules. Eg JS1ABC/7 will count for prefix JS7.

Scoring: The sum of the contact points on each band times the sum of the multipliers on each band.

Instructions on the Summary and Log Sheet

Summary sheet — write in your declaration and signature to give evidence of following the rules of the contest, together with your DXCC country, call sign, entry class, multiplier by band, point by band and total score.

Log sheets — use a separate sheet for each band and keep all times in UTC. Fill in the blanks of multiplier by countries or prefixes only the first time on each band.

Awards: Certificates will be awarded to the highest scorers in each category on each continent and medals will be awarded to highest scorer in the single operator multi-band and multi-operator multi-band sections.

Reporting: Submit a summary sheet and logs of only one classification to JARL, All Asia DX Contest, PO Box 377 Tokyo Central, Japan. Please indicate phone or CW on the envelope. Envelopes should be postmarked no later than July 30, for the phone-section and September 30, 1987 for CW.

Disqualification: Violation of the contest rules, false statements in the report or taking points from duplicate contact on the same band in excess of two percent by the total will be deemed reasons for disqualification.

Announcement of Results: Phone about February 1988 and CW about April 1988.

Countries List of Asia: A4, A5, A6, A7, A9, AP, BV, BY, EP, HL/HM, HS, HZ/7Z, JA-JS/7J, JD1 (Ogasawara Island), JT, JY, OD, S2, TA2-8, UA/UN/UV/UW, UZ9-0 (AsRSFSR), UD, UF, UG, UH, UI, UJ, UL, UM, VS6, VU, VU (Andaman & Nicobar Islands), VU (Laccadive Island), XU, XW, XX9, XZ, YA, YI, YK, ZC4, 1S (Spratly Island), 3W/XV, 4S, 4W, 4X/4Z, 5B4, 7O (S Yemen), 8Q, 9K, 9M2 (W Malaysia), 9N, 9V (Singapore), J2/A (Abu Ail)

VENEZUELAN CONTEST

Times: 0000 UTC Saturday to 2400 UTC Sunday.

Phone: July 4-5, 1987. CW: July 25-26, 1987.

This is the 26th yearly contest celebrating Venezuela's Independence. It is a world-wide type contest; therefore do not confine your activity to working YVs only. Use all six HF bands, 10 through to 160 metres. There are four classes: Single Operator, Single and All-band and Multi-operator single and Multi-transmitter.

EXCHANGE: RS(T) plus a QSO number starting with 001.

POINTS: Contacts between stations in different countries, two points. Between stations in the same country zero points, but permitted for multiplier credit.

MULTIPLIER: One for each YV call area, and each country (including own) worked on each band.

FINAL SCORE: Total QSO points from all bands multiplied by the sum of the multiplier from each band.

AWARDS: A plaque to the highest scorer in each class. Medals to the highest scoring single operator in each continent and the Bolivian countries (Bolivia, Colombia, Ecuador, Panama, Peru). Certificates to stations in the Americas working 15 YV stations and 10 different countries: and Asia and Oceania stations working five YVs and 10 countries. Use a separate log sheet for each band, and a summary sheet showing the scoring, your name and address (in block letters), and the usual signed declaration. It is requested that all award applicants include a remittance of US$2 or its equivalent in IRCs. Mailing deadline is September 15, 1987, for phone entries and October 15, 1987, for CW. Post to: Radio Club Venezolano, PO Box 2285, Caracas, 1010-A Venezuela.

THE SUNSHINE STATE JACK FILES MEMORIAL CONTEST

All licenced operators throughout the world are invited to participate. The contest is also open to shortwave listeners. The aim of the contest is to perpetuate the memory of the late Jack Files and to enable amateurs to work stations for the Worked All Queensland Award, and other awards issued by amateur radio clubs in Queensland.

This years contest commences on Saturday, July 18, 0830-1230 UTC and Saturday/Sunday, July 18-19, from 2330-0130 UTC.

Divisions and Sections —

1. Stations within VK4:
   (a) Transmit all bands.
   (b) Transmit HF only.
   (c) Transmit VHF/UHF only.
   (d) Transmit QRP only.
   (e) Club stations.
2. Stations outside VK4:
   (a) Transmit all bands.
3. Shortwave Listeners:
   (a) Receive all bands.

Suggested Frequencies —

PHONE	CW
3.570- 3.590 MHz	3.525- 3.535 MHz
7.100- 7.120 MHz	7.010- 7.020 MHz
14.180-14.200 MHz	14.050-14.060 MHz
21.180-28.520 MHz	21.100-21.150 MHz
28.480-28.520 MHz	28.100-28.150 MHz

Operation — Phone and CW operation.

Each station may be counted twice on each band for credit; once on phone and once on CW.

All contacts must be made in accordance with operator and station licence requirements. No net or cross-mode contacts will be valid for scoring purposes.

Station may be worked repeatedly on all bands and modes provided that one hour has elapsed since the previous contact on that band and mode.

Procedure —

Phone: call CQ Jack Files Contest.

CW: call CQ Test Jack Files.

Exchanges — The usual RS/T together with serial number commencing at 001.

Scoring — For scoring on HF, VK4 is divided into two zones. The dividing line being the Tropic of Capricorn. On all bands, a bonus of 10 points may be claimed for the first contact to a Queensland City or Shire on each band during both, not each session. Also, a bonus of 10 points may be scored for each contact with a club station. Double points may be claimed for CW contacts, but not double bonus points.

(a) Stations in VK4:

HF contacts within the same zone — three points. Contacts with stations in opposite zone — five points. Contacts with stations outside VK4 — one point.

(b) Stations outside VK4:

HF, VHF and UHF contacts with VK4 stations — one point. Bonus points apply. No points for contacts with stations outside VK4.

(c) Shortwave Listeners:

Three points for each VK4 station logged.

Logs — Must show full name, call sign, and address of the operator, section entered, and show the total number of points being claimed. Logs submitted must be legible and signed by the contestant. Logs will not be returned and the decision of the Contest Manager will be final.

Logs to be received by the Contest Manager, Joe Ackerman, 5 Koomooloo Court, Mermaid Waters, Qld. 4218, not later that August 7, 1987.

Trophies will be awarded to the highest scorer in each section. However, should a contestant receive an award in one section they will not be eligible for an award in any other section.

—Contributed by Joe Ackerman VK4AIX, Qld Contest Manager

THE ADELAIDE HILLS AMATEUR RADIO SOCIETY, INC NATIONAL CW AND PHONE SPRINTS

The Adelaide Hills Amateur Radio Society Inc, is delighted to announce the second running of the National Sprints, a pair of "quickie" contests for CW and phone operators, to be held during July 1987. The rules for the July Sprints will be similar to those for last November, the only differences being:

The Sprints are open to all operators in VK, ZL and P2 call areas.

The time period has been shortened to one hour.

Only VK, ZL and P2 contacts can be scored.

The National Sprints are endorsed and supported by the South Australian Division of the Wireless Institute of Australia, which will provide certificates and trophies.

The reasoning behind the National Sprints is this — there are too many "big" contests each year; they require a lot of time and the rules are complex, thus discouraging many operators from participating. The National Sprints are short, sharp and simple, requiring a minimum of time while providing a significant operating challenge.

Object of the Sprints

The operator's basic goal in the Sprints is to make as many contacts as possible (without duplication) during an hour of operation on a single band. Any contact with a VK, ZL or P2 station on 80 metres during the Contest Period can be counted, but a station may only be claimed once.

Eligibility

The National Sprints are open to any licensed amateur or group of amateurs using a single call sign (eg club stations), anywhere in Australasia (VK, ZL and P2 call areas).

Contest Period

1200-1300 UTC July 11, 1987 (CW Only)
1200-1300 UTC July 18, 1987 (Any legal phone mode)

Frequencies

For the CW Sprint, frequencies between 3.500 and 3.700 MHz may be used.

For the Phone Sprint, frequencies between 3.535 and 3.700 MHz may be used.

Regulations

Irrespective of any provision contained in these rules, operators are reminded that they must operate in accordance with the terms and conditions of their respective licenses and applicable regulations.

CONTEST CALLS

CQ Sprint or CQ Test or CO Contest.

EXCHANGES

Minimum exchange for a valid contact will consist of signal report and a three digit serial number. The serial number may start at any number between 001 and 999, but will revert to 001 if 999 has been reached.

Logs

Contest logs must show for each contact the time (UTC), call sign of station worked, report/serial number given and report/serial number received. Each log must be accompanied by a cover sheet showing the date and name of the Sprint (CW or Phone), the total number of contacts claimed, and a statement that the operator has abided by the rules of the contest, signed by the operator/s. Any special conditions such as QRP or mobile operation should be mentioned in the statement.

Logs are to be in the hands of the Society no later than Friday, August 14, 1987, and can be addressed to:

National CW (or Phone) Sprint Manager, c/- AHARS, PO Box 401, Blackwood, SA. 5051.

Awards

Certificates will be awarded to the highest scorer in each VK call area, ZL and P2 for both the CW and the Phone Sprints. Trophies will be awarded to the outright winner of each Sprint.

Certificates may be awarded to other operators whose performance was, in the opinion of the organisers, exemplary.

Any entry which is patently in violation of the rules or spirit of the Sprints, or which contains an excessive number of claimed duplicate contacts (this does not refer to duplicates which have been indicated as such and are not claimed), may be disqualified.

The decisions of the Society in respect of the interpretation of these rules, granting of awards, or disqualifications will be final.

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Thought for the Month

Nothing is impossible to a man who hasn't got to do it himself.

CONFIDENCE WORKSHOP

A VK6 Pre-examination Innovation

Harry Atkinson VK6WZ
5/97 Railway Parade, Mount Lawley, WA. 6050

Practical Morse Key Demonstration. From left: Dave VK6IW, Bart VK6CH, Barrie VK6AF, Larry VK6ZLW, Malcolm VK6LC and Glen VK6KY.
Photograph courtesy Andrew Baumanis VK6WB

"You're all very special people here today. . .because you're taking part in something which is unique in Western Australia. Nothing like this workshop has ever happened before."

Workshop 10 WPM Receiving Test.
Photograph courtesy Andrew Baumanis VK6WB

Bruce Hedland-Thomas VK6OO, WA Divisional President speaking at the WIA "Confidence" Workshop held on Saturday, April 11. VK6 Practice Morse Co-ordinator, Malcolm Johnson VK6LC, had spent weeks organising a pre-AOCP examination exercise designed to instill confidence in candidates, give them practical experience in an environment as much like the examination room as possible and place special emphasis on Morse sending — something which hitherto had been more or less left to each candidate's own devices.

Bruce, who had acted as chairman throughout the proceedings, outlined what Malcolm had planned, what was to happen and named the lecturers, demonstrators and other volunteers.

There were 21 student participants from the young to the seniors and a volunteer staff of 19. The latter included off-duty DOC staff, rostered operators from the on-air VK6WIA practice sessions and various office- bearers and council members from the Division.

The hall was set out with adequate tables and chairs, PA and recording/replay equipment, plenty of Morse keys and sufficient 'kits' for each student to have one. . .the kits providing writing paper for the various tests and an authoritative paper (illustrated) on how to learn and study code sending and receiving.

Students came from all over the Perth metropolitan area, as well as from Fremantle, Australind, Marangaroo and Kelmscott. Each demonstrator took a particular aspect of code and dealt with it clearly and concisely using taped signals for receiving and various hand keys for sending. In sending, the correct use of the commencement signal and end of message signal and the right and wrong way to correct a sending mistake were demonstrated.

DOC officers were at great pains to point out that the Department was not staffed with orgres, nor was it in the business of failing people just for the fun of it! It was obvious from comment afterwards that candidates found it a novel and heartening experience to meet with examiners in a casual, off-duty atmosphere while still learning valuable points about the code. It seems that when these candidates meet Glen and Barry again at the DOC examinations in May they will feel at ease with people they have already met and with whom they have swapped experiences and problems.

To some OTs present it came as a shock to hear an examiner say he had known cases of examination candidates who had never previously held a Morse key until they reached the examination room!

Excellent advice was given on the importance of setting the key to one's own choice of gap and tension before starting the sending test. . .and — when receiving — the need to keep going and not stop writing to puzzle over a letter missed, and the wisdom of using block letters if one's handwriting is not the best.

Candidates were advised to look on the Morse receiving examination as a test of accuracy, not a test of comprehension.

The program began at 9 am and at the conclusion of the three-and-a-half hour workshop many of those present said it had given them an entirely new outlook on the Morse side of the AOCP examination — and a very changed view of DOC staff! Praise was bestowed on VK6LC, the WIA and DOC for a really professional exercise. These confidence-building workshops could well become a regular feature in VK6.

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Thought for the Month

Beware of half truths — you may have the wrong half.

AMATEUR BARGAINS • AMATEUR BARG

Huge Amateur $avings all this month!!

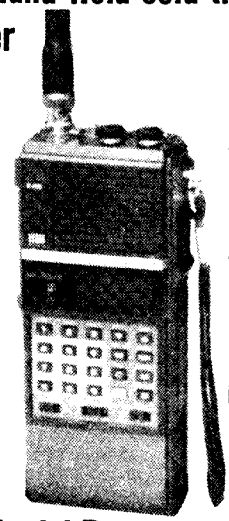
FREE! With every Hand-Held sold this month we're giving away a FREE Welz Power Meter valued at $29! Cat Q-1343

The $100 Yaesu bonus offer!

You won't believe your luck! The incredible Yaesu FT-209RH 2 metre hand-held is now better value than ever. With every FT-209RH sold we're giving away a FREE battery valued at $98.90!! Yes, you can now have all the features and quality of Yaesu at the lowest price ever! With up to 5 watt output (3.7W with FNB3 battery) 10 memories (it even remembers the repeater split), keyboard entry for everything, huge range of scanning options and much, much more!
Cat D-3503

FREE!!! **$599**

FNB-3 NiCad Battery valued at $98.90
Cat D-3506



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We realize that you amateurs are a bright lot and we'd hate to see your base stations zapped out. So here's a great value station protector! The Welz Coax Lightning Protector. Fits easily to your antenna system and it'll absorb that surge if your antenna gets zapped!
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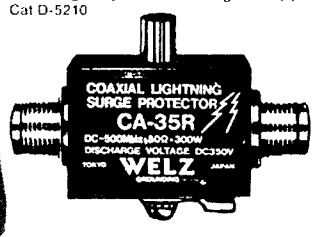

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This'll make life easy! Suits all Yaesu transceivers with scanning function. Has 8 pin plug for easy hook up and the compact design makes it easy to hold for long periods. 500 ohms impedance. Cat C-1116

WAS $56.95
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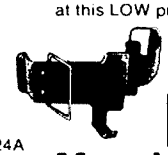
Huge Mobile Saving!

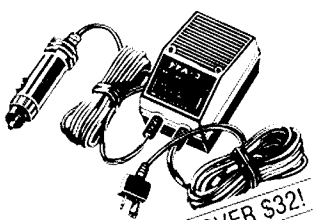
Here's value! The MMB-21 Mobile Bracket to suit the FT-203/209/709 transceivers — and it's ½ PRICE!! Saves your equipment slopping all over the car and saves you money to boot. But hurry, they can't last forever at this LOW price! Cat D-3501



WAS $29.95
NOW $14.95
½ PRICE!!!

Below cost charger!!

Just what your mobile needs! The PA-3 Car Charger is intended for operating 10.8 volt transceivers from a car cigarette lighter socket. Includes charging as well as power and now it's BELOW COST!! Suits FNB-3 pack as well as older style transceivers.
Cat D-2899



SAVE OVER $32!
WAS $62.65
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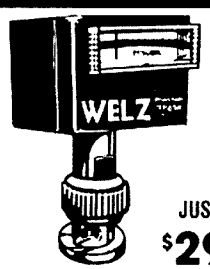
Hand-held Power Meter

The perfect way to check the power output of your hand-held — anywhere between 6 metres and 70cm!! Famous Welz brand so you know it's quality. Simply replaces your antenna and you get a direct readout of power!
Cat Q-1343

This Power Meter FREE with all hand-helds sold this month!!!



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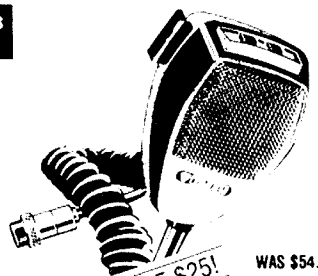

SAVE $25!
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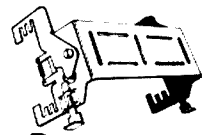
ONLY $29.95

More below cost mobiles!

We've done it again! The MMB20 mobile bracket is designed specifically for the FT757GX. Allows mounting in either standing or slung position with three different mounting angles!
Cat D-2949

JUST $29.95



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• All mode, all band super transceiver

Take a bow Yaesu! The FT767GX is everything when it comes to transceivers. If a transceiver could get up and dance this one would be the Prima Ballerina! The very latest in technology so you can drag in those illusive signals or to make sure your signal is heard above the QRM. All modes on ALL amateur bands, continuous coverage triple conversion superhet receiver, built-in automatic antenna tuner, die-cast aluminium and ducted cooling giving an incredible 30 minutes output at full power and much, much more! Try Yaesu at DSE — the advantages are easy to see!
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Specifications
Receiver: 100kHz to 29.9999MHz, 50 to 53.999, 144 to 147.999, 430 to 439.999MHz
Transmitter: All WARC bands to 30MHz, VHF and UHF as above.
Output: 100W (AM 25W carrier) on HF, 10W (2.5W AM) VHF & UHF
Antenna Impedance: 20-100 ohms HF (nominal 50 ohms), 50 ohms UHF/VHF
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Sensitivity: 0.25uV (SSB/CW/FSK, 1.5-450MHz, 10dB stn/N)

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JUST $4995
Includes 2m, 6m & 70cm and auto antenna tuner modules

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LINTON-HARRISON LICENCE RESTRUCTURE PROPOSALS

This document follows on from the discussion paper: *Amateur Radio — Future Direction* co-authored by Jim Linton VK3PC and Roger Harrison VK2ZTB, in December 1985. Like that document, its purpose is to promote discussion. It does not necessarily reflect the official viewpoint of the WIA or any Division of the WIA.

The need for restructure of Australia's licence system has been ignored by the 1987 WIA Federal Convention proposal to give Novices the entire two metre (144-148 MHz) band.

That proposal, generated at the Convention, and supported by Federal Councillors from all Divisions except VK1 arose out of two considerations.

The first was the desirable "common band" for all grade of licence.

The second, which was the major factor in intense lobbying at the Convention, was the impact of the JA/VK reciprocal licensing agreement.

That agreement, effective from February, has consequences for the Novice licence, and Australia's licence restructure generally.

Japan has a long-established Telephony licence, with an exam of a lower level than the Australian Novice and no telegraphy exam. The JA Telephony licensees operate on low power on HF bands other than 10 and 14 MHz.

Under the JA/VK reciprocal agreement such JA licensees visiting Australia have been given permission to use FM (10 watts) on all bands 50 MHz and above.

How the agreement was reached, the WIA's involvement, and the full story about that exercise is unclear. But what is plain is that the agreement now has a direct influence on the licence structure in Australia.

The fact is that should an Australian Novice licensee take the Department of Communications to the Administrative Appeals Tribunal on equal opportunity grounds, DOC could not defend the denial of Australian Novices telephony privileges on all bands 50 MHz and above. It has brought about a de-facto Telephony licence in Australia.

In hindsight a two-year tenure should have been placed on the JA Telephony licensees operating in Australia under the reciprocal agreement. It is essential that the agreement be re-negotiated to include a tenure.

To attract the bottom rung beginner interested in radio and to expose them to the broad scope of the hobby of amateur radio, a Telephony licence should be introduced in Australia.

The theory syllabus for this licence could include the necessary elements of basic electricity, magnetism, radio frequency generation, modulation, propagation and interference.

This grade of licence could have FM telephony privileges on 52.500-54.000 MHz, and a segment on 70 cm, at a maximum power of 10 watts.

The Australian Telephony licence must have a limited tenure of two years.

An integral part of restructuring the licence system is restoration of the Novice licence syllabus and question bank pool. It has become clear that the Novice licence with its recently revised syllabus, no longer adheres to its original intention or definition.

The Novice licence should be given additional privileges identical to the Telephony licence on six metres and 70 cm, but with a maximum power output of 30 watts — plus SSB on the segment 52.030-52.200 MHz.

The enhancement for the Novice proposed above are designed to be greater than those given to JA Telephony licensees under the reciprocal agreement, meet the common band requirement, yet are not a dis-incentive to upgrade by giving Novices the entire two-metre band.

A further aspect of licence restructure should be the introduction of an Intermediate licence, to serve two purposes:
firstly to bridge the gap between the Novice and AOCP/Limited licences, and secondly to attract those people who increasingly these days gain an interest in electronics through computers and computing. It is an essential step if the Amateur Radio Service is to survive by being more attractive to people of all ages.

The Intermediate licence would require a candidate to have passed the Novice theory, plus a supplementary exam on elementary digital subjects and FM. It would have the six metre privileges afforded to the Novice licence, plus 70 cm segments 433-435 and 438-440 MHz covering FM simplex FM repeaters and digital modes, but selected to avoid the satellite band.

A candidate who passed the Intermediate theory exam/s and the Novice telegraphy exams, would have the Novice HF privileges, plus permission to use RTTY, AMTOR, ASCII, FAX, SSTV and Packet on the segment 28.200-28.300 MHz.

The data mode privileges would enable Australian Intermediate licensees to communicate with USA Novices who have those privileges on that band segment.

Being examined on FM, the Intermediate licensees should either be permitted into the FM international segment 29.000-29.700 MHz and/or FM repeaters be allowed in Australia within the current Novice band.

Intermediate licensees should have access to the 1.200 GHz band in the future.

Holders of the Combined Novice/Limited (K-call) licence would automatically be given the digital and other HF privileges of the Intermediate licence.

The above restructure of Australia's licence system would make the hobby appropriate to today's technology and improve its attractiveness to potential radio amateurs. It sets out new entry points into the hobby, and a logical upgrading path leading to increased numbers of licensees with AOCP and Limited licence qualifications.

The particular privileges proposed in this document represent a balance between a number of conflicting considerations including the consequences of the JA/VK reciprocal agreement. These privileges are intended to encourage upgrading by those who have the motive to attain the skills.

The aim is to give newcomers an attainable entry into the hobby. Later the Intermediate licence gives a taste of digital modes, encouraging further upgrading.

LINTON-HARRISON LICENCE RESTRUCTURE CHART

Unrestricted (AOCP)	All bands and modes. Full power.
Combined (K-Call)	Limited privileges plus Intermediate HF privileges.
Limited	All bands 50 MHz and above. No mode restrictions. Full power.
Intermediate (without CW)	Novice six and two metres, plus FM and digital on 70 cm.
Intermediate (with CW)	As above plus Novice HF bands, 10 metre digital and FM.
Novice	HF 80, 15 and 10 metres. Six metre SSB and FM. 70 cm FM. VHF/UHF power 30 watts.
Telephony (Two year tenure)	Six metres, 70 cm, 10 watts FM.

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BEACONS AND REPEATERS

Tim Mills VK2ZTM
FTAC BEACON CO-ORDINATOR
PO Box 204, Willoughby, NSW. 2068

This month I will briefly report on two items from the recent Federal Convention.

A draft of the Beacon Policy Paper was presented. There is further work to be done during this year, particularly in the microwave segments. Input is still required from those with an interest in planning the orderly operation of the various beacon systems. By now most beacon groups should have received a copy of the draft report. Anyone interested in seeing the report should contact your local Federal Councillor or you may write to the address shown above for a copy to be sent to you.

The agenda item concerning pager interference to the top end of the two metre band, in particular, was discussed and has been referred to FTAC for investigation and reporting back to the Council. This subject will be expanded in detail in this column in a later issue, but it is an area requiring considerable input from both amateurs and repeater groups.

There is concern from time to time about operation on the old two metre channel known as "B" — 146.000 — and its effect on the adjacent satellite segment. The subject was first raised at the Albury repeater meeting in July 1972, where it was decided that its use as a net frequency should be discouraged. Some of the satellite systems have used frequencies which fall close to the sidebands of a transmission on 146.000 MHz. This frequency has not been included in any recently published band plans. The international Amateur Satellite Service Sub-band extends from 145.800 to 146.000 MHz, so if a guard band is included it extends from about 145.750 MHz as a lower limit to 146.010 MHz as the higher limit. The first active frequency above this is the input to repeater 6625 which is on 146.025 MHz.

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How's DX?

Ken McLachlan VK3AH
Box 39, Mooroolbark, Vic. 3138

THE TIME HAS COME

Regrettably the time has come that I have personally found that writing this column is no longer a challenge. This is due to a number of factors.

The six years that I have had the honour of collating the material and writing many thousands of words has *been a very* gratifying experience. There has also been a thrill from the hundreds of letters of support, comments and notes of thanks received.

At times it has not been easy to foresee future DX, as I am not a reliable astrologer and even if I were, it would be a hazardous task.

Over the period I have made many friends from all continents and my sincere thanks go to those that have contributed and supported my efforts, including our family, particularly my wife Bett. It is hoped that the readers have gained some interest and lots of new countries. My sincere thanks to three editors of the magazine over the period, all contributors and to every reader. Thanks again and good future DXing in Sunspot Cycle 22, which is just around the corner by my reckoning. Nevertheless, the DX is always there, if you are persistent.

I have commenced one article for this magazine concerning commercial movie theatre projectionists, past and present who are amateurs. I have received a lot of input and still a lot of research is required, but it will appear later this year or early next year depending on the Editor's indulgence.

AUSTRALIAN DX ACHIEVEMENT AWARD

The late Hugh Spence VK6FS, bequeathed a sum of money to the VK6 WIA Division on his untimely death in 1984. The VK6 Council has decided to create three perpetual annual DX Achievement Awards in the memory of an amateur who enjoyed chasing the elusive DX station and probably gained more satisfaction in assisting some other amateur to gain a new country, than receiving the QSL himself.

The award in Hugh's memory will be known as the *VK DX Achievers Award* and is open to all VK amateurs who submit proof of having worked and confirmed:

(1) 100 DXCC Countries.
(2) 150 DXCC Countries.
(3) 200 DXCC Countries.

on any mode or frequency except the WARC Bands and within the terms of their licence during one calendar year commencing on January 1, 1988, Australia's Bi-Centennial year.

The three awards consist of one years free membership to the recipients WIA Division plus an engraved plaque to commemorate the operators prowess.

Watch for further details in *Amateur Radio* and it is felt that this award is quite fitting to the memory of Hugh, a gentleman of unblemished integrity whom it was a pleasure to know and call a friend, which he was to so many.

A MEANINGFUL REPORT

The mailbox has been full of letters regarding my recent remarks about dubious reports. For once no one has dissented from my views, and that is quite refreshing. I am still amazed that amateurs from all continents still continue with the 599 or 59 report and consistently ask for repeats during the QSO. Thanks to all readers that took the trouble to write and concur with my thoughts.

ST PETER AND ST PAUL'S ROCKS

From all reports, not many were able to subscribe to their State's fottery as it appears that only three or four recorded the last expedition's call sign in their log. Ladies and gentlemen, all I can say is better luck next time and it may be a while unfortunately, as it is quite a costly exercise to place a 'crew' in that area and the economic down-trend is applicable to all continents unfortunately.

CONFUSION

Please do not send any QSLs to Mary Ann WA3HUP. for AP9P. This 'con-merchant' has caused Mary Ann some problems as she has never heard of him or her let alone discussed acting as the stations QSL Manager. Never mind Mary Ann, every DXer throughout the world knows your policies and track record which is unsurpassable.

GOOD NEWS FROM BANGLADESH

It appears that the authorities in Bangladesh are reviewing the licensing of nationals during this year. This must be very heartening to the radio-orientated in that country and let us all hope that it will not be too long before some genuine S2s appear in the logs. One will have to watch out for the unscrupulous who will pirate the prefix just to gain a 'pile-up' on their frequency.

BEST SHACK PICTURE

The photograph depicted this issue is the shack of Gil VK3CQ. This contest will be judged by Greg and his staff at GFS Electronics, who have kindly donated a magnificent prize for the winner.

Ironically I am going to bequeath this segment of my notes to Gil, who hasn't been advised of the fact as yet. I am sure Gil will carry it on and please send all pictures to him and whilst doing so, participants may care to encourage him with some ideas on his excellent column of *Pounding Brass.*

Gil's shack is less than a metre wide, the desk is just over a fraction of a metre deep, has an area approximating just in excess of one square metre in floor area and to save on coaxial cable it is nearly five metres above ground, in an area above a stair-well that Gil has added a window to and lined for comfort.

The key to the photograph — on the left of the shack is a 'long wire' tuner, which any of six switched antennas can be selected for the HF bands. Also this is the termination of two two-metre and a 432 MHz coaxial cable fed antennas. The right wall occupies the output of 12 amperes at 12 volts from batteries and solar cells.

Other equipment on the table area consists of a UHF FM coupled to an antenna directed at the Mount Stanley Repeater, a 35 watt two-metre receiver. Also pictured is an IC251A and IC751A of course with a CW Filter fitted.

Gil really knows how to fit a lot of equipment in to a small space.

GOING QRT

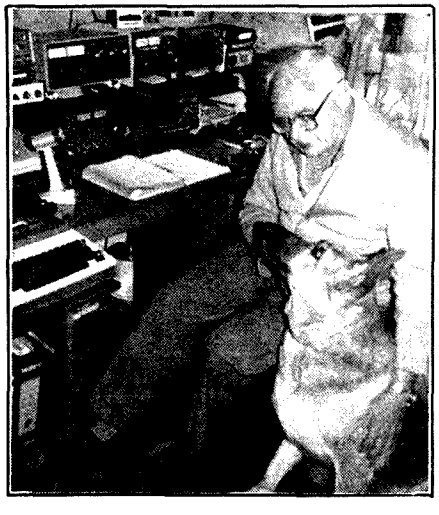
Peter 9V1TL, will be missed when he goes QRT this month. Peter has been a stalwart to the hobby on all bands but particularly to 20 metres and the South East Asia Net on 14.320 MHz at 1200 UTC which is QRV each day of the year. Every good wish from all who have received assistance from you over the years Peter, and please 'pop up' from your new QTH soon.

THE USER PAYS CONCEPT! ! !

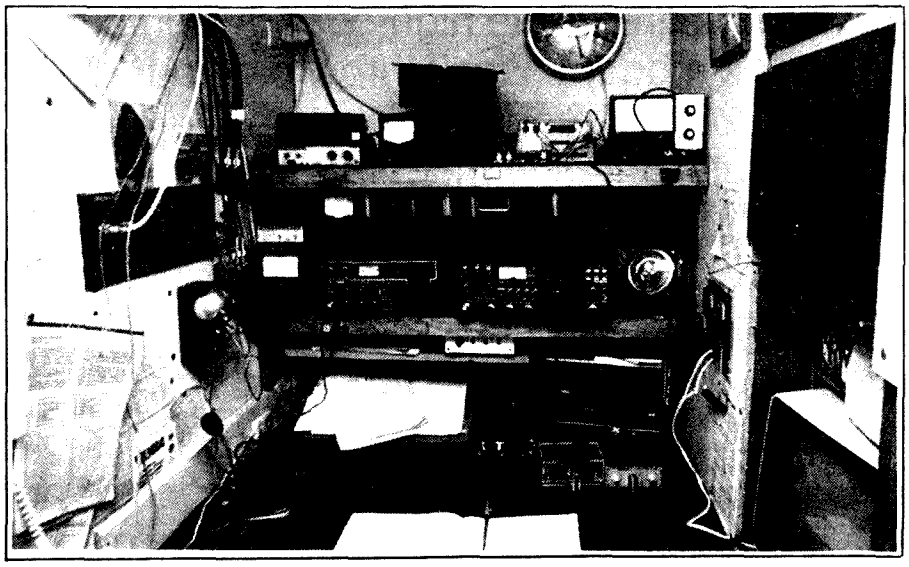
The saying is almost worn out, but it has become a catch line in other countries apart from Australia. The gentleman that created it should be proud, as it appears a number of countries have used the same approach with their radio licensing fees. Near neighbours, please do not blame us and remember we were hit with the salvo first.

UNIQUE YES — VALID NO

It appears that Jerry, operator of 4W1AA, got 'verbal' permission to operate 'outside of business hours' from the authorities and thought that the suffix of 'AA' was as good as any for the first amateur operation from that country for over a decade. Does Don Search W3AZD, Manager at the ARRL DXCC Desk suffer from ulcers? With all the contentious items incessantly placed before him he must be a number one candidate.



The late Hugh Spence VK6FS, with his devoted companion Reece.



THE VALID ONES

The good news is that 5A0A, A61AA, A61AB, T50DX, VU4APR/NRO and XF4DX cards are all 'true-blue' and acceptable for DXCC. Now for the bad news — A51PN (from date unknown as my contact with Pradhan was accepted), A6XB, A6XL, 5U7LD and stations signing from the following countries Afghanistan, Angola, Burma, Ethiopia, Mozambique and South Yemen are not. There may be a further update sooner than one expects.

THE WARC BANDS

The member societies of the following countries have notified the International IARU Secretariat of the availability of new bands for their use.

10 MHZ BAND

10.100 to 10.150 MHz: Algeria, Andorra, Antigua and Barbuda, Argentina (10.1005-10.103, 10.119-10.1215 and 10.1435-10.14650), Australia (less 10.126-10.134 and 10.1375-10.1455), Austria, Bahamas, Belize, Bermuda, Botswana, Brunei, Canada, Cayman Islands, China, Colombia, Costa Rica, Cyprus, Czechoslovakia, Denmark, Djibouti, Dominica, El Salvador, Faroe Islands, Fiji, France, Gabon, German Democratic Republic, Federal Republic of Germany, Gibraltar, Greece, Grenada, Honduras, Hong Kong, Indonesia, Ireland, Israel, Italy, Japan, Republic of Korea, Kuwait, Luxembourg, Malaysia, Malta, Mauritius, Monaco, Montserrat, Netherlands, Netherlands Antilles, New Zealand (10.100-10.127 and 10.133-10.150), Nicaragua, Nigeria, Norway, Panama, Papua-New Guinea, Peru, Philippines, Portugal, San Marino, Senegal, Solomon Islands, South Africa, Spain (10.1075-10.1135), Sri Lanka, Sweden, Switzerland, Syria, Tonga, Trinidad and Tobago, Turkey, United Kingdom, USA, Vanuatu, Western Samoa, Yugoslavia and Zambia.

18 MHZ BAND

18.068 to 18.168 MHz: Algeria, Andorra, Antigua and Barbuda, Argentina (18.073-18.0765, 18.0835-18.0895, 18.0965-18.1085, 18.1215-18.149 and 18.1515-18.1675), Australia (less 18.071-18.079, 18.101-18.109, 18.121- 18.134, 18.141-18.149 and 18.156-18.164), Austria, Bahamas, Bahrain, Botswana, Brunei, Canada, Cayman Islands, China, Colombia, Costa Rica, Cyprus, Denmark, Djibouti, El Salvador, Faroe Islands, France, Gabon, German Democratic Republic, Federal Republic of Germany, Gibraltar, Greece, Grenada, Honduras, India, Ireland, Israel, Italy, Kuwait, Luxembourg, Malaysia, Malta, Mauritius, Monaco (less 18.103-18.116, 18.129, 18.135 and 18.165), Montserrat, Netherlands, Netherlands Antilles, New Zealand (10.100- 10.127 and 10.133-10.150), Nicaragua, Nigeria, Norway, Oman, Panama, Peru, Portugal, San Marino, Senegal, South Africa, Sri Lanka, Sweden, Switzerland, Syria, Tonga, Trinidad and Tobago, Turkey, United Kingdom, Vanuatu, Yugoslavia and Zambia.

24 MHZ BAND

24.890 to 24.990 MHz: Algeria, Andorra, Antigua and Barbuda, Argentina, Australia (less 24.896-24.904), Austria, Bahrain, Botswana, Cayman Islands, China, Colombia, Costa Rica, Cyprus, Denmark, Djibouti, El Salvador, Faroe Islands, France, Gabon, German Democratic Republic, Federal Republic of Germany, Grenada, Honduras, India, Indonesia, Ireland, Israel, Italy, Kuwait, Luxembourg, Malaysia, Mauritius, Monaco, Netherlands, Netherlands Antilles, Nigeria, Norway, Oman, Panama, Papua New Guinea, Peru, Portugal, San Marino, Senegal, South Africa, Sri Lanka, Sweden, Switzerland, Syria, Tonga, Trinidad and Tobago, Turkey, United Kingdom, USA, Vanuatu, Yugoslavia and Zambia.

Now is the chance to get those antennas in the air for these bands and when the new Solar Cycle commences you will be in business to notch up quite a few countries. They are not acceptable for DXCC, but it is quite a challenge. Who will be the first VK to make a 100 countries on each band? No cheating, that is 300 two-way contacts on the three bands.

(Thanks to *Region 3 News* — Number 23 — December 1986).

APOLOGIES

I was proved wrong, as were many other DX Editors, regarding the DL7FT/SV/A expedition by Frank. I didn't regard it as a legitimate expedition, neither did the Greek Radio Society. I apologise and congratulate you Frank on your persistence in convincing the ARRL DXCC Desk to accept your credentials. You have achieved something that the neighbours to the scene have been unable to do. It has been a long drawn out affair but through investigation by the ARRL, is typical of the credibility of the ARRL DXCC.

Now that one has been put to 'bed', when is the next operation going to occur and by whom?

TECHNIQUES OR BAD OPERATING

Some operators on the bands are complaining about 'bad signals' particularly from an *area* where 'home-brew' is a must, if one is going to get on the air.

Please politely tell the offending station that his or her signal is not Q5, or they are drifting and/or splattering or whatever is concerning you.

Most amateurs will accept the criticism in the spirit that it is made. Some will not but that is life. Please let us nurture the 'home-brewer' and assist. I, as many others have also heard, some terrible signals from all points of the globe, the majority using 'black boxes' that are being over-driven. We all had to have a first QSO and I know a VK3 who many years ago built a magnificent 40 metre transceiver and was not brave enough to put it on the air. He eventually did put a signal into the ether and it was very Q5, however he is one of many who are wary of placing a signal that is not Q5 in the spectrum. Is this one of the reasons that quite a few amateurs are reluctant to build and experiment? There are a considerable number of talkers across the bands that have never used a soldering iron or possess one, let alone those that even don't possess a multimeter.

RESOURCES GALORE FOR THE WEST

The VK6s who are interested in clubs are very lucky in having a Telecom Public Relations Resource Centre at their disposal. This centre loans free of charge videos, films, displays, even historical and modern telephones are available for that special demonstration.

Think how an amateur communications display promoting our hobby would be set off with these extras.

It is believed that quality brochures covering telecommunications in Australia are also available for such events. It has been said that the information available is quite unique and a source of knowledge that is invaluable to anyone studying communications.

Further information may be obtained by phoning Colleen Chipper or Rosemary Pearce on (09) 420 7018. Mention that you saw it in AR!

SPRATLY ISLAND

It seems that China is again accusing Vietnam of invading one of the islands in the Spratly area. A Foreign Ministry spokesman said that Vietnam had again been called upon to withdraw its troops from all occupied islands in the group which are strategically important because of the proximity to vital shipping lanes.

Again I suggest that this area be deleted from the DXCC list of all societies, before some amateur or amateurs get into serious trouble or lose their lives in a foolhardy attempt to activate this prefix.

GUESS WHO?

The newly appointed Director of Telecommunications for the Republic of Nauru for a period of two to four years has held many call signs including his latest of C21A. Some of the previous calls for C21A are FW8DY, VR3DY and KH6GLU. Have you guessed who it is yet?

The answer is none other than Ed ex-VK4LX and VK8XX.

QSL to PO Box 17, Republic of Nauru.

EVENTUALLY SETTLED? ? ?

Willy de Roos ex-VK9XR/MM, a gent who has been everywhere has eventually settled in VK6. Willy has taken out the call of VK6AWD.

PETER 1 ISLAND

One reader of this column did take my advice of buying a lottery ticket to celebrate working the island and like myself received zero dollars. Bad luck Gwen and if you had won, I know that you would have passed on my commission.

Did you work Peter 1 Island? Here are the operators of that first, Kare LA2GV/3Y2GV, Luis LU1BR and Einar LA1EE/3Y1EE taken during a stopover on the way home in Buenos Aires.

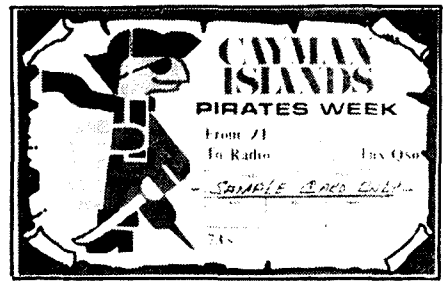
—Picture courtesy of QRZ DX and WA2VUY

ANOTHER PREFIX

Exasperation! It is really getting necessary to have a computer mind with a lot of RAM to keep in touch with all the prefixes that are floating around the spectrum of late. The newest is C33 which will be activated next month by a group of Spanish operators. Another one was CN32FIC which was used at the Casablanca International Fair. Another KT4A, was on Tangier Island (IOTA NA-83) and wait for it — was operated by the members of the Maryland Apple Dumpling Radio Amateur Society better known as MADRAS.

PIRATES WEEK

Another special call ZF10PW, has been allocated to the Cayman Amateur Radio Society for 'Pirates Week' which is to be held between October 24-31, this year. A special card has been struck and may be obtained by sending your card for any QSO with the call plus US$1 to CARS, PO Box 1029, Grand Cayman.



One of the special cards.

CENTRAL AFRICAN REPUBLIC

A newly licensed YL amateur is Margie TL8DN, who is getting amongst it quite well, but please give her a go when you hear her trying to control a pile-up. It can be quite a frightening experience to be on the receiving end and I have heard seasoned operators go QRT or QSY under the strain.

NORTH COOK ISLANDS

Ronald 'Bing' Crosby VK2BCH, should be still signing from the North Cook area. Bing's call last year was ZK1XV and he hoped to obtain it again. All cards for the operation with a SASE to PO Box 344, Forster, NSW 2428. Bing, though a WIA *member* requests please no cards via the bureaus. One question Bing, how will the USSR amateurs and SWLs, receive confirmation of a rare country with no bureau cards?

FREQUENCY STANDARD

Reliable sources indicate that VNG, the frequency standard, presently run by Telecom is to be officially shut down at the end of March 1988, due to no other Government Departments being interested in taking the equipment over.

This will leave the amateur, some mariners and other users without a reliable frequency or time standard at their disposal, as WWV does not have the coverage or frequencies that are readily tunable on some amateur equipment.

Sad but true, and it all comes back to the economic trend that is affecting our lives at the present.

UNWANTED CARDS

VE5RA and VE5SV who operated the calls ZF1MM and ZF9SV respectively have advised the Cayman Amateur Radio Society that they do not want the 500 odd cards that are lying in their bureau.

There are going to be many disappointed amateurs. But why go to a semi- remote area, operate through the 'pile-ups and then not want to QSL. Not everyone can afford the direct postage and isn't that what the bureaus are for. It really leaves me speechless!

Elephants are supposed to have a long memory and it is trusted that these two operators are treated the same way when they require that 'special card'!

SMILE AWHILE

Some quotable quotes. "The secret of success is sincerity. . .once you can fake that. . .you have got it made! ! !" and "Remember:. . .madness takes its toll! ! !. . .We've always been crazy. . .but it keeps us from going insane! ! !" and "Just when you were winning this 'rat race'. . .along come faster rats! ! !)".

These are some of the quotable quotes from none other than Lee KH6BZF, the voice of Rainbow Bay, Hawaii. Thanks Lee for the smile from these and we hope Laura is not subjected to such mirth at the breakfast table. Laura, if you are, you have our sympathy.

THE ARRL DXAC SURVEY

Ross WB6GFJ, drew my attention to the ARRL DX Advisory Committee Survey which will play a big part in structuring the ARRL DXCC that will be carried into the next century.

Due to space restrictions I will only highlight a few of the questions. A complete copy is obtainable by sending a SASE to DXAC Survey, C/- WIA Federal Office, PO Box 300, Caulfield South, Vic 3162. This questionnaire will assist the Committee which has been tasked by the Directors of the ARRL to formulate a workable plan.

I urge all interested DXers to obtain a copy, answer the questions and post it off to the ARRL as some of the questions such as 'Should DX stations or DXpeditions that solicit donations over the air, be disqualified for DXCC credit." 'Would you like the DXCC country criteria relaxed to allow for more countries?' and 'Are you in favour of a 'fresh start' with the DXCC program as happened in 1945?'

These are three of the 19 questions which I again urge you to obtain and send off to John W4FRU, and his fellow helpers, as a considerable input is required from all areas. Australia in itself constitutes nine different countries, approximately three percent of the present DXCC total.

Thanks Ross for drawing my attention to the survey, and I do hope that your operation of FO0FB this month is quite successful. Ross will use 14.145, 14.180 and 14.240 MHz and will pick up his VK call during another visit to Australia next month. Melbourne is on his itinerary, as he wants to arrange the Air Mail delivery of the magazine rather than by Surface Mail through his membership and it is trusted that we can eventually meet.

AWARDS

If you go to the Antarctica and operate an amateur station all is well until you go to apply for the Worked All VK Call Areas award (WAVKCA) and then the fun starts. The rules state that if you are an overseas amateur you require 22 confirmations and a total of 77 if you are a resident VK.

A French, Russian or any other amateur using a prefix other than VK, even if they are operating alongside each other only has to obtain 22 confirmations, yet the VK has to obtain the 77 confirmations to obtain the award.

It has happened, so please let us all learn from our mistakes and amend this anomaly now, backdating the amendment to the date of the initiation of the award by changing the wording to mean mainland Australia (VK1-VK8 inclusive) and classify the VK0 and VK9 prefixes as overseas amateurs. This alteration would allow those that have operated from these areas to achieve the handsome award they deserve.

SCOTLAND

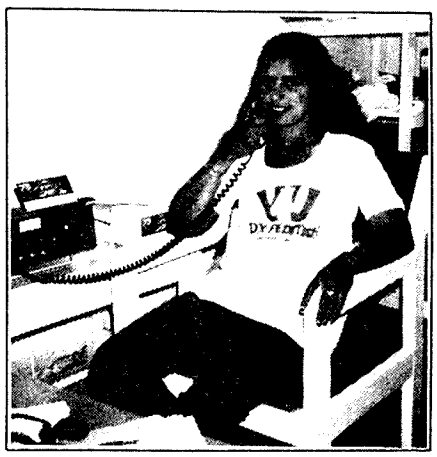
The special call GB2NTS, was being aired in May from the Culzean Castle in Scotland. Plans are that three other special calls will be heard for June, July and August from other historic locations. A nice certificate is available for all four and QSLs are via the bureaus. No rip off on this one folks.

SOME YL CALL SIGNS

The following YL calls have been worked of late. Clelia I5ICY, a YL Club Station OK5YLS, Elizabeth VE7YL, Mary 5W1FM and Mary Ann WA3HUP Incidentally UZ9MYL is a YL and QSLs too.

WHY? ? ?

Why did the DL operator visiting Monaco have to sign with the 3A before the DL5FF, while the French station put the 3A after his call? Intriguing to say the least!



Bharathi VU2RBI. A dedicated Public Relations Officer for our hobby.

—Photograph courtesy *QRZ DX*

JITTERY JOTTINGS

Is **YA0DX** genuine or not? QSL to **PO Box 1, Kabul** sounds doubtful. ** **XU1SS** is still quite active. ** It appears that **Peter OH1RY,** after getting all his cards answered eventually, is again thinking of doing another Pacific jaunt in October. ** **BV0AE** was activated by a group of JA operators. All QSLs to **JA1UT.** ** If you hear **9Q5YL,** give Tina a call. Tina is the 13 year old daughter of **9Q5NW.** ** **Tom VR6TC,** his wife **Betty VR6YL** and Frank **DL8FL** are still continuing the scheds that they have been having for a decade. ** **Operation Raleigh** cards are all clear for **ARRL** DXCC. ** **EX3TM** was a special USSR call. ** **TV8DEC** was aired from **Le Palais de la Decouverte** during May and worked by many VKs ** **4K1AH** is located at the **USSR Mirny Base** in the Antarctica. ** **Bharathi** advises that the Nicobar Island plans fell through. No reasons and no intention of any activation was intimated. ** **Sierra Leone** is using the unusual prefix of **29L** to celebrate 29 years of independence. Is **29L** allocated to that country? Maybe it is like spinning a 'lottery wheel' use what comes up!! ** Another **P8** has appeared. This one has the suffix of JP. No QSL info was forthcoming so my advice is to save your time, effort and money.

ANOTHER SMILE

Wayne Gregson, a columnist with the Melbourne *Sun* has picked this little piece of trivia up. Wayne, always with a sense of humour, notes that the Melbourne based computer firm of Webster Computer Corporation has been hitting the United States market recently.

The company has announced the release of a new mini computer aimed squarely at the IBM small business market.

The new gizmo is named Piranha and Wayne says 'go on and ask why?'

'It is small, fast, lightweight, with plenty of byte and has been spawned for small business users with caviar hardware tastes on a PC budget.'

You had to ask didn't you?

CW SWL-ING WITH ERIC L30042/VK5

10 METRES
VK6JQ and Beacons VK2RSY, VK5WI, ZL2MHF.
15 METRES
FK8DD, NI6P, UR2RKG, VE6CSR, W4CN, YC0BAQ, YC3KDL, YC7JM and YD2HAX.
20 METRES
DJ3FW, FK8FW, HA1AES, IV3ZCZ, I8AOH, HB9NL, HK1ANP, KH6WT, OK3JW, OK2KOD, OK3JW, RA4HX, RB4IXO, RW9IM, UA9NN, UB4DWW, UL8CWW, UL8LWO, UZ3AZO, UZ6AXJ, YU4EBL and YV1AD.
30 METRES
DJ6FO, DK5LI, DL8MX, F3NB, F6FMP, G3LGW, G4FM, OZ4LP, PA3EHE, SM5AHK, VE2GZD, VE3NXB, VK0ML, W0IDW, W2FJ, W3PA, W6PRL and W8ZD.
40 METRES
4N7EP, 4S7RO, 6Y5AL, CO2OM, EI8AK, G3SED, G4ODV, HB9BZA, HK1AMN, HL2ACS, K5HKX/M, KB6RGG/AA, TI2OY, VE3IY, YU1ABA, ZF2KI, ZK2EKY and ZL7DE.
80 METRES
KS7V and N4PGL.
160 METRES
ZL1BEK and ZL1LS.

HEARD AND WORKED ON THE WEST COAST

40 METRES SSB
C31LBL, FT8WA, LT1A, TL8TG, TU2QU/3X4, V85NT and ZL7AA.
40 METRES CW
3A/DL5FF, FD1AKC/3A, 4K1H, 5L2CU, FG/W2QM/FS, FM5ES, KP2J, LU8DO and VP9C.
80 METRES SSB
OY9JD, P40AR, TF3BM, TR8JLD, TU4CG and ZS1MH.
HEARD AND WORKED ON THE EAST COAST ON 20 METRES
5B4SA, 8J3ITU, 9M6AE, 9M8GH, A92EV, BV6IA, BY4RB, CU1CB, JW5E, JW1LK, JW6WDA, JY5CI, KH0AC, LJ2Z, OY8I, P40AR, SV2WT, TI2LTA, V85RM, VK9LM, ZK1AC, ZS1AU and ZS1FJ.

SOME BUREAU QSL INFORMATION

3A/DL5FF:DL5FF, C31LBL:EA3DPP, FD1AKC/3A:FD1AKC, TL8TG:N4NW, TU2QU/3X4:F6FNU and ZF2KI/9:K1KI.

SOME DIRECT QSL INFORMATION

5B4SA	PO Box 1531, Nicosia, Cyprus.
9M6AE	PO Box 14277, Kotha Kinabalu, East Malaysia.
9M8GH	PO Box 2870, Kuching, Sarawak, East Malaysia.
A92EV	PO Box 2, Bahrain, Arabian Gulf.
BY4RB	PO Box 4B, Janzhew City, Peoples Republic of China.
JY5CI	PO Box 616, Amman, Jordan.
V85RM	PO Box 191, Muara, Brunei.
YV6BJG	PO Box 655, Puerto Ordaz, Venezuela.

INTERESTING CARDS RECEIVED

Steve VK2PS, has received some interesting cards amongst the hundreds he receives yearly. Listed below are a small selection.

4K1C, 4S7NMR, 5W1EK, 8J3JST, 8J8EXP, 8R1RPN*, 9M2FP, 9M6AE*, A92EV*, BV2DA*, EW3AP, EO3AWK, FK025AT, GB2SM, HC1OT, HG6N, HG19HB, HK9BRW, HV1CN*, JW6VDA, KC4AAC*, KI84O, OA4ED, TI4BGA, UA1OT†, UO5AR, V85RM*, VE7EXPO, VK0DA‡, VS6AU, VS6JH, VU2AIG, VU2PNU, XE2BJC, YB8VM, YV1QP, YV4DZJ, A71BK*, ZS6AIS and ZL8HV*.

KEY
* Card received direct
† Franz Joseph Land
‡ Direct Card via Manager

THANKS

Sincere thanks to the Editors of weekly, bi-weekly and monthly publications such as: *ARRL Newsletter; BARG; CQ QSO; The DX Family Foundation Newsletter; Inside DX; 'KH6BZF Reports; Long Island DX Bulletin; NIAR News Letter; Papakura Radio Club Bulletin; ORZ DX; RSGB DX News; ORZ DX, RSGB DX News* and *The W6GO/K6HHD OSL Manager List.*

Magazines including *Break In; DX Post; JA CQ; JARL News; KARL News; Meteorological News; QST; Police Life; RadCom; Region 3 News; Telecom- WA; Weather News* and *Worldradio,* to mention but a few.

Some of the individual contributors this month include VKs, 2PS, 2BCH, 2EBX, 3IO, 3PA, 3YL, 3DYL, 4BHJ, 6NE, ON7WW, WB6GFJ, ZL1AMN and staff of the Lillydale Municipal Library.

Sincere thanks to all that have made the column possible over the years, good future DXing and like the famous Bugs Bunny cartoon ending with the catchy tune, I will say "That's all folks" de Ken VK3AH.

ar

Packet Radio

Part 4: HAPN/SADCG MASTER CONTROL SUBSYSTEM

Steven Blanche VK2KFJ
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If you are planning to write your own packet software you may consider installing a Master Control Subsystem, the system discussed here is used in the VADCG TNC. It was originally written by Stu Beal VE3MWM, of Hamilton Area Packet Network (HAPN) and Doug Lockhart VE7APU, of VADCG, and improved by the SADCG.

The Master Control Subsystem is essentially a controller and dispatcher for the TNC, by use of a menu which gives options such as choice of protocols; ie AX25 protocol and Vancouver V3 protocol, a Monitor function with various facilities including debugging tools and on-line help. This monitor program is provided for diagnostic purposes during software development. It can be used by those users who are interested to view the link and terminal buffers so you can see the actual form of each packet. Let us look at these functions of the Master in more detail:

RESET

This may be caused by a Power-On-Reset (at switch on) or by pressing the RESET button and is processed within the MASTER module in the following manner.

1 The DCD line (pin eight) is held low for about 800 ms and then set high. This can be used by Remote Bulletin Board Services (RBBS) to sense when the TNC has been reset by a hardware watchdog timer.
2 An AUTOBAUD routine is entered which allows the TNC to adjust itself to your terminal's speed and format. Just type alternate commas and periods until you see the TNC sign on with the following text:

VADCG Terminal Node Controller
SADCG Master Control Subsystem
January 28, 1985. VK2KYJ

The date shown will be the date of your version of the MASTER and it will be followed by your call sign.

3 The MASTER then examines each additional ROM in the TNC. For each ROM it finds, it prints a menu item number and a description of the protocol supported by that ROM. Once all ROMs have been examined, the user may select from the protocols displayed by typing the menu item number. This will be followed by a message to identify the software version. The TNC is then ready for use. Alternatively, you may enter a monitor program.

TRAP

TRAP interrupts generated by the TRAP button (if fitted to the TNC) cause control to be passed to the AUTOBAUD routine. Once the AUTOBAUD process is complete, you will enter the monitor within the MASTER ROM.

MONITOR

The monitor can be entered in several ways.

1 After a TRAP interrupt.
2 From the initial master menu.
3 By issuing a monitor command while executing a protocol.

NOTE: Entry after a TRAP interrupt requires an AUTOBAUD.

Upon entry to the monitor, the contents of the registers of the 8085 microprocessor, the 8250 serial interface and the 8273 HDLC protocol controller are displayed as shown below. The status of the "connect" LED (if fitted) is not changed unless the Save command is given.

TRAP REGISTERS

8085 PC=3748 SP=43F4 IM=88 A=1E F=54
BC=FC00 DE=6024 HL=6025
8250 RBR=0D IER=09 IIR=01 LCR=03
LSR=60 MCR=07 MSR=70
8273 Status=00 Result=F4 RXIR=05 TXIR=0D

Commands are Initialise, eXamine, Return, Dump, Load and Save.

Type the capital letter only.

MON> (this is the monitor prompt)

NOTE: If the 8085's Stack Pointer is outside the normal range when the monitor is entered, the register display will be like the following:

TRAP REGISTERS

8085 PC=084D SP=405C**BAD** IM=80
A=60 F=54 BC=612E DE=0949 HL=601F
8250 RBR=2C IER=09 IIR=01 LCR=03
LSR=60 MCR=07 MSR=70
8273 Status=00 Result=F4 RXIR=0A TXIR=0D

This display is normally only seen if a TRAP is received while in the monitor. Once the monitor prompt (MON>) is seen, the user may then enter a one character command (upper or lower case) from the following list:

I Initialise. The TNC will display Initialise TNC. This is almost equivalent to a RESET (AUTOBAUD will not be required). The initial signon message and protocol menu will then be displayed.
R Return. The TNC will display Return to interrupted program. If the monitor was entered from the master menu, the initial signon and menu will then be displayed. If the monitor was entered from a protocol ROM (by monitor command or by pressing the TRAP button), control will be passed back to that ROM.
D Dump. The user may dump (view) parts of memory in Hexadecimal and ASCII. This command requires a hexadecimal memory address to be entered (0000 is assumed if no address is given). Leading zeros are not required. The Line Buffer is from 5000h to 53FFh and the Terminal Buffer is from 6000h to 63FFh.
L Load. The user may examine and change a series of (RAM) memory locations. This command requires a hexadecimal memory address to be entered (0000 is assumed if no address is given). Load is terminated by typing a ctrl C (control C).
S Save. This command allows the user to download the contents of the TNC's memory to a host computer for later analysis. It requires a special program to control the save and to capture the data (TNCDUMP) is available for computers running Digital Research's CP/M operating system).
X eXamine. This command will display the contents of the processor registers at the time the monitor was entered (or the TRAP button pressed).
H Help. This is the on-line help facility, which displays a short form list of the X.3 parameters, which can be accessed and viewed without disrupting a connection. Using the Return functions returns you to where you left off.

A TYPICAL SESSION

A typical monitor session is shown below. User input is in italics. Comments are in brackets.

(Initial power-on reset — the user types ,,,, (AUTOBAUD) until:)

VADCG Terminal Node Controller (initial prompt)
SADCG Master Control Subsystem
January 28, 1985. VK2KYJ

1 AX.25 Protocol (protocol menu)
2 Vancouver Protocol — V3.

Select a Protocol from the preceding, or press RETURN to enter Monitor: 1
(select AX25 protocol)

Executing selected Protocol

AX25 LIP 053186 AX25 NIP 053186 AX25 TIP 053186 (signon)

se 7 8 (set parameter 7 = 8)
hello test from VK2KYJ
(a short test message sent over the air)
*mo (command to enter monitor)
(Note the * is the TNC response to an escape key of the terminal)

TRAP REGISTERS (register display)
8085 PC=2A4C SP=43F6 IM=81 A=48 F=04
BC=0002 DE=4F4D HL=2A48
8250 RBR=0D IER=0D IIR=01 LCR=03
LSR=60 MCR=07 MSR=70
8273 Status=00 Result=F4 RXIR=05 TXIR=0D

Commands are Initialise, eXamine, Return, Dump, Load, Save and Help. Type capital letter only.

MON>*DUMP:5000* (dump link buffer)

5000:1D FE FF FF 3B 53 13 01 00 68 65 6C 6C 6F
20 74 ....;S. . .hello t
5010:65 73 74 20 66 72 6F 6D 20 56 4B 32 4B 59
4A 0D est from VK2KYJ.
5020:0A 00 00 00 00 00 00 00 00 00 00 00 00 00
00 00 ....
5030:00 00 00 00 00 00 00 00 00 00 00 00 00 00
00 00 ....
5040:00 00 00 00 00 00 00 00 00 00 00 00 00 00
00 00 ....

MON>*LOAD:7000* (load a few bytes into RAM)
7000:00-1
7001:00-2
7002:00-3
7003:00-4
7004:00-5
7005:00-6
7006:00-7
7007:00-8
7008:00-9 (load terminated with ctrl C)

MON>*DUMP:7000* (check the load)

7000:01 02 03 04 05 06 07 08 09 00 00 00 00 00
00 00 ....
7010:00 00 00 00 00 00 00 00 00 00 00 00 00 00
00 00 ....
7020:00 00 00 00 00 00 00 00 00 00 00 00 00 00
00 00 ....

(dump stopped by pressing any key)
MON>*X* (have another look at registers)

TRAP REGISTERS
8085 PC=2A4C SP=43F6 IM=81 A=48 F=04
BC=0002 DE=4F4D HL=2A48
8250 RBR=0D IER=0D IIR=01 LCR=03
LSR=60 MCR=07 MSR=70
8273 Status=00 Result=F4 RXIR=05 TXIR=0D

Commands are Initialise, eXamine, Return, Dump, Load, Save and Help. Type capital letter only.

MON>*S*ave TNC memory to host computer.
(save memory to host computer)

Please load and run TNCDUMP on your computer. Type "X" if this is not possible.
(connect LED flashes while waiting for response — pressed x, so back to monitor)

MON>*R*eturn to interrupted program.
(back to AX25 protocol)

This is not an exhaustive demonstration of the monitor — it is intended as a guide only. That covers the Master Control Subsystem and ends this series on the SADCG AX25-X3 Protocol. Unfortunately, this only covers the terminal interfacing portion of the AX25 protocol, for the Link Interface and Network Interface portions you will have to refer to the AX25 Specification, available from the ARRL. It is hoped this information will be of help to those amateurs developing their own packet radio software and also to those who are just interested.

VHF UHF — an expanding world

Eric Jamieson VK5LP
1 Quinns Road, Forreston, SA. 5233

All times are Universal Co-ordinated Time and indicated as UTC

AMATEUR BANDS BEACONS

FREQUENCY	CALL SIGN	LOCATION
50.010	JA2IGY	*Mie*
50.060	KH6EOI	*Honolulu*
50.075	VS6SIX	*Hong Kong*
50.109	JD1YAA	*Minami Tori-shima*
52.013	P29BPL	*Loloata Island*
52.020	FK8AB	*Noumea*
52.100	ZK2SIX	*Niue*
52.200	VK8VF	*Darwin*
52.250	ZL2VHM	*Manawatu*
52.310	ZL3MHF	*Hornby*
52.320	VK6HTT	*Wickham*
52.325	VK2RHV	*Newcastle*
52.345	VK4ABP	*Longreach*
52.350	VK6RTU	*Kalgoorlie*
52.370	VK7RST	*Hobart*
52.411	VK0MA	*Mawson*[1]
52.420	VK2RSY	*Sydney*
52.425	VK2RGB	*Gunnedah*
52.435	VK3RMV	*Hamilton*
52.440	VK4RTL	*Townsville*
52.450	VK5VF	*Mount Lofty*
52.460	VK6RPH	*Perth*
52.465	VK6RTW	*Albany*
52.470	VK7RNT	*Launceston*
52.485	VK8RAS	*Alice Springs*
144.019	VK6RBS	*Busselton*
144.400	VK4RTT	*Mount Mowbullan*
144.410	VK1RCC	*Canberra*
144.420	VK2RSY	*Sydney*
144.430	VK3RTG	*Glen Waverley*
144.465	VK6RTW	*Albany*
144.470	VK7RMC	*Launceston*
144.480	VK8VF	*Darwin*
144.485	VK8RAS	*Alice Springs*
144.550	VK5RSE	*Mount Gambier*
144.565	VK6RPB	*Port Hedland*
144.600	VK6RTT	*Wickham*
144.800	VK5VF	*Mount Lofty*
144.950	VK2RCW	*Sydney*
145.000	VK6RPH	*Perth*
432.057	VK6RBS	*Busselton*
432.160	VK6RPR	*Nedlands*
432.410	VK6RTT	*Wickham*
432.420	VK2RSY	*Sydney*
432.440	VK4RBB	*Brisbane*
432.445	VK4RIK	*Cairns*
432.450	VK3RAI	*MacLeod*
432.535	VK3RMB	*Mount Buninyong*
432.540	VK4RAR	*Rockhampton*
1296.171	VK6RBS	*Busselton*
1296.420	VK2RSY	*Sydney*
1296.480	VK6RPR	*Nedlands*
10300.000	VK6RVF	*Roleystone*

1. Mark VK0AQ, at Mawson, indicates the VK0MA beacon has been running consistently for several months now and the frequency readout has settled on 52.411 MHz and seems to be staying there. Having done some work on the beacon to overcome the dropouts which were occurring, Mark is loath to attempt to bring the frequency down to 52.400, as it may prejudice the present reliable operation as the crystal may prefer to operate where it is at present! The outside temperature at Mawson on May 7 was minus 25 degrees Celsius and getting colder.

QUEENSLAND

A letter from Lyn VK4ALM, in Rockhampton, updates his Six Metre Standings with a confirmation of his contact with VK0SJ. He was somewhat irked by not being able to make contact with Neville and his DXpeditions to ZK2, 5W1 and 3D2 despite much monitoring and trying. He could hear the VK2 and VK3 stations working Nev but no sign of him in Rockhampton. (I can imagine the frustrations, Lyn . . . 5LP).

Lyn also reports the VK/JA TEP season has not been particularly good so far this year. Openings have been few and far between, although he knows the Alice Springs VK8 Group have had a good share of contact to JA. The far North Queensland boys have been amongst it as usual. Lyn worked 31 stations in JA spread over 20/3, 28/3, 29/3, 10, 11, 12/4, 23/4, 29/4 and 2/5. Russian television signals have been logged about 25 times, but are generally at low level and short time duration — the late April/May openings usually occur in the 0830 to 0945 UTC time slot. Thanks for writing Lyn.

EME NEWS

Chris VK5MC, from Hatherleigh, advises the ARRL EME Contest dates for 1987 have been set at October 17, 18, and November 14, 15. As in the past, he is prepared to give a moon printout to any interested people who supply a large SASE.

The first 2304 MHz EME signals were heard at VK5MC on Sunday 10/5 at 0630. WE2WEB was heard T-M copy over a 30 minute period calling ZL2AQE. WE2WEB was The East Coast VHF Society operating from the QTH of K2UYH using a 28 foot dish and 100 watt solid-state amplifier.

Equipment used at VK5MC is a 20 foot dish with a 3.5 dB noise figure converter using a Ne64535 in the front end. This can be improved in future using a GaAsFET as the low noise amplifier.

The antenna is starting to be very sharp and is showing up some tracking readout error and some mechanical flexing in the wind, so some more work needs to be done before any two-way communication can be considered.

Good to hear from you Chris and that you are well on the way to being on another band for EME. Now that VK2AMW is no longer operational as an EME station, I will have to rely on you and Doug VK3UM for EME happenings in Australia. Good luck.

THE MALAYSIAN SCENE

David Rankin 9V1RH/VK3QV, has written from Malaysia to say that there is a slow development of VHF usage in that part of the world. Two metre repeaters are now operational in Malaysia with one each in Kuala Lumpur, Penang, Singapore, Brunei and Sabah. The last three named have only come into operation during the past 12 months, or so. Apart from the repeater networks there is virtually no other amateur activity on VHF in most of these countries, the only exception being OSCAR working. However, some local amateurs are grasping the idea that "DX" is possible. From time to time Indonesian YC/YD stations 100 km to the south of Singapore will access the Singapore machine whilst well elevated 9V1s (eg 70 metres up a high-rise building) can occasionally access the Kuala Lumpur repeater. There is plenty of room for further development.

USSR VHF/UHF RECORDS

The letter from David Rankin 9V1RH, also enclosed an English translation of a short article which appeared in the Russian *Radio* magazine No 12 or 1986. It lists the current USSR records for a number of VHF/UHF bands. We wish to acknowledge the translation work done by Dex Anderson W4KM.

144 MHz tropo: UA6IE to DK0TU 26.10.85 3025 km.
144 MHz aurora: RB5EU to PA1AGJ 9.02.86 2160 km
144 MHz meteor scatter: UW6MA to GW4CQT 12.08.77 3099 km
144 MHz ionospheric scatter: UA1ZCL to DK3UZ 27.06.82 2150 km
144 MHz EME: UA1ZCL to ZL2BGJ 14.10.84 17523 km
430 MHz tropo: UA6LGH to OZ2OE 26.10.85 2786 km
430 MHz aurora: RA3LE to PA0RDY 8.02.86 1800 km
430 MHz EME: UA3LBO to ZL3AAD 3.12.82 18907 km
1260 MHz tropo: RB5EU to OK1AXH/P 26.10.85 1922 km
5650 MHz tropo: UK5ECZ to UK5EFL 6.08.82 1166 km
10000 MHz tropo: UK5ECZ to UK5EFL 8.08.82 1166 km

The article goes on to day that beginning in 1980, a table of achievements of Soviet ultra-shortwavers has been published annually, by mode and band, although delayed this year due to late receipt of some information.

"Data analysis suggests a relationship between recent achievements and geography. For example, on 26.10.85 several Soviet ultra-shortwavers increased distances on three bands all at once. These are impressive results, but are 500 to 700 km less than European results because the latter were established over ocean or sea rather than continental paths.

"In the course of a single day in February 1986, the fartherest communications were established here in our country via 'aurora'. In contrast to 'tropo' the nature of aurora propagation favours ultra- shortwavers on the USSR located at medium latitudes, leaning to the hope that Soviet amateurs will better the European records on 144 MHz.

"The results for moon communication are fast approaching the limits. Their improvement depends on the appearance of new EME stations, Soviet as well as foreign, in specific areas.

"It is still too early to speak of limits when it comes to Es communications. Both our own and European achievements result from two-hop propagation, yet three or four hop propagation, though far less probable, is fully possible.

"Our results are noticeably behind the European ones on 5.6 and 10 GHz. We must hope this situation will change, first of all on 5.6 GHz, which, beginning only last year, began to be opened up by Soviet amateurs."

It is interesting to read of propagation modes and path distances from other parts of the world as it all helps to keep those presently holding records on their toes and attempting to further their own records as well. Thank you, David.

TWO METRE METEOR SCATTER

Doug VK3UM, has sent me an outline of an article he is preparing for *Amateur Radio* on the very interesting subject of meteor scatter on two metres. A National Two Metre Calling Frequency has been chosen on 144.350 MHz bearing in mind this may be more useful for those affected by Channel 5A and also may be left alone by the local ragchewing element.

I will not spoil Doug's article by picking too much out of it but one point which he believes to be very important is that of frequency accuracy although not to the degree of being paranoid about it! Time sequencing is probably even more important.

In support of meteor scatter activities, a very brief note from Doug VK3UM mentions a contact with Angus VK4ADQ, which was via random meteor scatter on April 20. Five second sequencing is used between 2000 and 2200 by VK3UM to VK4 and Gordon VK2ZAB used 2100 to 2200 to VK4. Despite the paucity of contacts, Doug believes there are quite a few listeners nevertheless.

FROM NEW ZEALAND

Pleased to receive two letters from Paul ZL1TZA, with a lengthy report on conditions on six and two metres as they appeared in New Zealand during the past six months. Since I do not receive *Break In* now, I have had little to report from that country, but it seems Paul is willing to write from time to time so his offer is gratefully accepted as conditions in their country do not necessarily follow those of Australia. As the first letter covers back to

October 24, 1986 I will only briefly report the earlier period and provide more detail from the later letter:

It appears the Es season started in New Zealand on 24/10 at 0944 to VK2. 6/11 to VK3, 4, 5 and FK8EM on 11/11 and again on 16/11. ZK2AZ on 18/11 and ZK2 beacon 26/11 and heard VK0SJ calling CQ on 28/11. On 2/12 worked VK6KEW at 0800. Then through to 13/12 with mainly VK1, 2, 3, 4, 5 and 8 being worked, on that day conditions were superb. Worked 5W1GA, ZL3, FK8, VK4, 5, 6 and 8. VK beacons being heard from many places. Malaysian television sound heard.

On 14/12 VK2, 3, 4, 5 and 7; VK1, 2, 5 on 18/12; FK25A, 3D2ER, 3D2MR and VK2BGG on 20/12. But the best day for the season was 21/12 which started at 2012 with FK25FL, VK8ZLX, VK8ZCU, VK4WF, VK4ZGB, VK4KU, VK8ZMA, VK2FJR, VK2BA. Then two metres opened to VK4LC VK4KJL, VK2DCC (who was in for an hour), VK2ADY, VK4ZSH, VK2DVZ, VK4ZAZ. Also heard VK8 on two metres while working VK2DDC who also heard them and worked them. Then back to six metres to VK1, 2, 3, 4, 5, 6 and 8. Good conditions prevailed through the Christmas period to New Year.

Paul asks where were the Darwin stations this year? None worked at the VK5LP establishment either! He also says it appears VK5 and VK6 stations do not QSL else the service is very slow. (I cannot answer for others, but I have a policy of QSLing stations from areas I have already worked and confirmed if they send me their card first. A card may not go out with the next mail but one will eventually be sent. . .5LP).

In the second letter dated 6/5, Paul says he generally only monitors the bands during the early morning, sometimes at lunchtime, and evening and weekends. His location is not a prime one due to a distant island and local television on 50.740 MHz which puts plenty of crud on the band. This the take-off etc is rather poor towards VK. He does operate portable from the coastal regions at times and this helps.

3/1/87: P29ZEF heard at 1010 working ZL2s and VK4; 5/1: FK1TK 0930; 6/1: VK2 and 4; P29ZEF again at 0720; 7/1: VK2, 4 and heard VK0SJ for 45 minutes; 8/1: VK2, 3 and VK0SJ beacon in for hours, then worked ZL3 and 4; 9/1: VK7ZIF, VK5LP, VK3YDE; 12/1: VK2XJ, ZL3 and 4; 13/1: FK1TK at 0015, all VK2 beacons but no VK2s to work; 14/1: VK4, 5; 15/1: VK2 beacons again, but no one to work!!! 16/1: VK4KU; 17/1: VK3DQJ heard; 18/1: VK7, 3; 19/1: VK4KU; 20/1: VK5KMW, 3D2ER heard; 22/1: VK3ZKP; 23/1: VK2XJ; 25/1: VK4KU; 26/1: VK4KU, ZL3 and 4; 27/1: VK4KU in for 1¼ hours; 28/1: VK2 and 6. VK5AYD heard calling CQ YD. VK FM stations audible but no two metre activity. VK9NS heard working VK5 and 6, but not able to get him in ZL; 29/1: VK2XJ, ZK2 beacon 0615 to 0900.

2/2: ZL3 and 4; 3/2: Worked ZL1QL on two metres who said he was hearing VK two metre beacons and VK Channel 0 stations were affecting his Channel 1 television! 4/2: VK2XJ; 8/2: VK2; 9/2: VK2 and 3; 12/2: VK7FB; 13/2: VK2XJ; 14/2: VK4KU, VK2 and seven beacons; 15/2: VK2 beacons; 17/2: VK2 beacons; 28/2: VK2XJ; 8/3: VK2 beacons 0245 to 0335; 15/3: excellent opening to VK4KU from 2355 to 0246, VK2RSY, VK2RHV and VK3RMV beacons; 26/3: FK1TK at 1100; 11/4: VK2XJ 2351, VK4ABP 2335, VK3RMV 2345 to 0015 also VK3RGG but no stations to work; 12/4: VK2RSY 2310 to 0220, VK8ZLX heard calling CQ at 0305, carrier on 52.427 at 0335 for some time; 14/4: thought heard KH6 at 1215; 18/4: Japanese and Taiwanese trawlers operating near NZ using 51.750 SSB at 2100; 19/4: VK2RSY 0020 then worked VK4KU at 0118; 29/4: voices heard briefly mentioning 'about their beam' as Argentinian Airlines aircraft flying over, beam pointing to VK4. Was this aircraft enhancement on six metres?

1/5: VK7RST beacon good copy 1105 to 1115. VK2RSY Sydney beacon also but no contacts.

Whilst the earlier part of this information is somewhat dated, I have included it because it indicates the great number of times the band is actually open across the Tasman and seems to indicate that, at least for half the year, six metres is open to somewhere at sometime! It would seem therefore, that more operators should call and not just listen for someone else to do so. Paul also mentions working into VK5 when the beacon was not audible nor were there any Channel 0 stations heard. He asks if the six metre propagation is frequency and/or location selective. There have been many instances where propagation exists on 50 MHz but not 52 MHz and this proved very irksome to VK stations before they could put any signals on to 50 MHz. During the peak of the last cycle many more stations could have been worked here if we had been able to use 50 MHz. And locations can be selective too. When David VK5KK was at Wasleys, it was not unusual for him to work JA stations 10 minutes before I could and for a short period after they left me as the band closed. This is even more pronounced on two metres. Last year, when I was at Meningie, Roger VK5NY was working VK4s 10 minutes before I could. So, you need to live in the right place at times!

SCATTER SIGNALS

Doug VK3UM. sent me a copy of a letter from Ross VK2DVZ, which gives an outline of how those doing scatter work are recording their information. Ross reported hearing VK3UM on the night of 3/4/87 from 1055 to 1103 plus some meteor pings, on 144.350 MHz. The next morning he listened again from 2000 to 2200.

The equipment at the VK2DVZ QTH consists of an IC290H and fie element Yagi (inside)) with VK5 preamplifier and about 10 metres of RG213, headphones used. In the report, 111111 = six times copied; ie fully identified within that minute; 1 trace = heard, but not identified; 1 'K' trace = heard 'K' only.

2117 nil (CZJ aircraft reported at light level 350)
2118 nil
2119 nil (Canberra beacon 5x9)
2220 1 K trace only
2221 2 K traces (EWC reported at flight level 280)
2222 nil
2223 1 trace and 1 K trace
2224 4 K traces pulse 1 complete — very very weak
2225 1111 very weak
2226 2 traces
2227 1 K trace plus 11 very weak (Canberra 5x8)
2228 1 K trace plus 1111 weak
2228 plus 34 secs small ping
2229 111111 — weak (CZJ checked into Melbourne control)
2230 1111 plus 1 K very very weak
2231 1 trace plus 1 K trace
2232 1 K trace plus 111 very weak
2233 111 very weak
2234 VK3UM trace only (EWC left flight level 280)
2235 nil
2236 three K traces and 1 very weak and so it goes on!

A certain amount of dedication is necessary when dealing with such weak signal levels, but it is obvious signals are there a large part of the time and there is some aircraft enhancement from time to time.

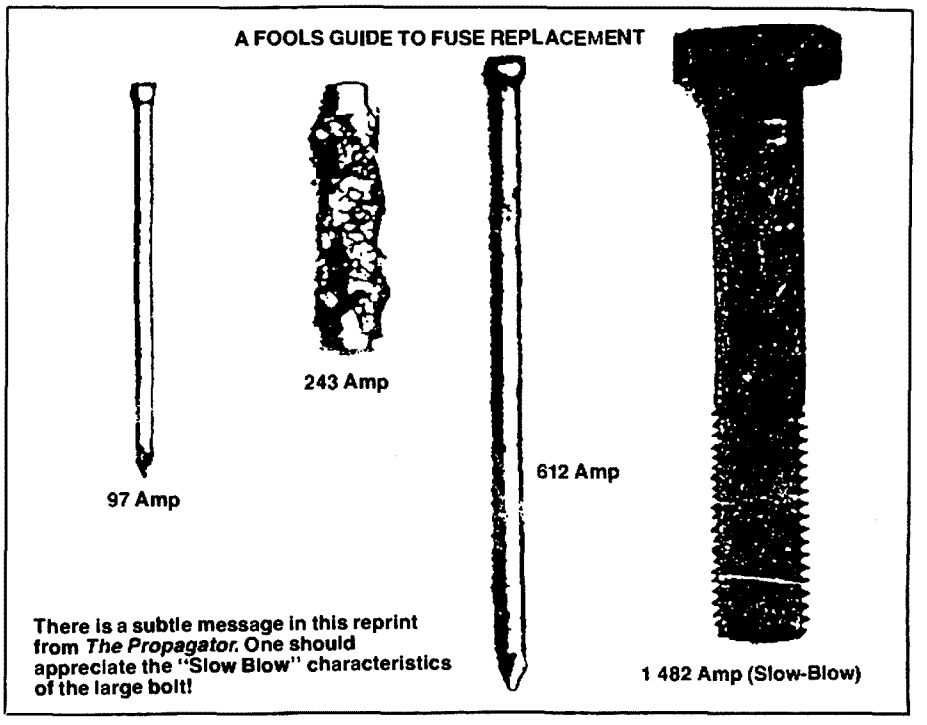
The above, read in conjunction with the projected two metre meteor scatter article by Doug VK3UM, may encourage more people to try their hand and skills at scatter contacts.

GENERAL NEWS

I was very sorry to learn that Ray VK3ATN, had his antenna manufacturing factory destroyed in a fire on April 7. Such a disaster would tend to make one wonder if it is worth going on, but I expect Ray will continue. Antennas must be a great cause of concern to him when we remembers his accident with a large tower being destroyed in a gale while he was on it, resulting in serious personal injuries. We hope all your troubles are now behind you, Ray.

I note from the *SERG Newsletter* that the VK5RSE beacon on 144.550 MHz has had more problems. This time the antenna and chimney on which it was mounted was blown down. Since then, Peter VK5KBF and Trevor VK5NC, erected a tower at the beacon site and reinstalled the old dipole antenna about two metres higher than previously. This will have to do until Trevor can come to light with his projected high gain omni-directional antenna! In the meantime, reports seem to indicate improved coverage from the beacon. Unfortunately, the VK5LP two metre system is still not operational so I cannot give a local report.

The Mount Gambier boys are hoping the VK3 gang can give their beacon, VK3RTG, a valve grind and improve its performance. Surely if the beacons are operating properly it should be possible to hear the Melbourne beacon in Mount Gambier at any time if living in a reasonable situation, and the converse should be the case in Melbourne. Before all the damage was done to VK5RSE, it was always available here at VK5LP 24 hours a day despite my poor location.



Last month, I congratulated Les VK3ZBJ and David VK3AUU, for their wins in the Ross Hull Contest. In addition, I should have congratulated Trevor VK5NC, who came second on an Australian-wide basis for seven day scoring and had the second highest score in the two day section, but, as he received the VK5 State Award, the winning certificate for the two day section went to David VK3AUU. Trevor certainly put a lot of time into the Contest and has reaped his rewards. Peter VK8ZLX also did very well.

VK5LP recently received a Ross Hull Award for the 1985 contest. Apparently the back-log of certificates is being cleared so hopefully all those so entitled will have received their certificates by now.

I came across an item I seem to have missed in a letter from David VK3AUU, on 4/11/86 which reads "I have a rather good time on two metres since putting up a new antenna system on 19/10 so thought I should share the news.

"I now have 19 elements on a 38.5 foot by 40 mm boom at 40 feet on 144 MHz, 33 elements on a 27 foot tapered boom at 34 feet on 432 MHz and nine elements on a 36.5 foot by 50 mm boom at 27 feet on 50 MHz. I have masthead GaAsFETs on the two higher frequencies with about 150 watts to the antenna on 50 and 144, and 50 watts on 432. All the antennas are home built DL6WU designs, with elements mounted through the boom. I have all that lot on a homemade 26 foot high tilt-over tower with a full length of 1.5 inch water pope at the top. Incidentally, the tower is guyed.

"Since the antennas went up I have worked seven separate call areas on two metres by the following means: VK1 by aircraft reflection and tropo, VK2 by aircraft reflection, VK3 and VK4 twice by meteor scatter, VK5 by tropo, VK7 by tropo, and W5UN by EME. Dave's signal was 12 dB above the noise in the 100 Hz bandwidth filter and we exchanged 0 reports on CW. I also have a very good tape of Chris VK5MC, off the rising moon on 29/9. We had a very good tropo path between us at the time and I was able to hear both the transmitted and reflected signals with the doppler shift and the two and a half second delay easily audible. I have been running a sched with VK7JG for about two years now each evening at 8 pm on 144.100 and the only time we miss out is when one of us is not on. Since putting up the antennas the Mount Gambier beacon is audible virtually all the time even without the help of aircraft.

"I have materials on hand to make four more 144 MHz Yagis for a separate moonbounce array which should have a gain of about 21 dB." (Since the above was written I believe David has completed the four bay array and reaping the benefits of his work. . .5LP).

Band activity has been rather low lately. Did hear a VK4 on six metres on 5/5 but he faded out before I could have a contact. I still feel very lost without two metres and hope the position can be corrected before too much longer.

CLOSURE

By the time you read this we will be right in the middle of winter, so bear in mind that a certain amount of Es often appears during this time on six metres. It is little use everyone monitoring without calling — nothing will be heard then! So do make some calls, you may work someone even if no Channel 0 stations can be heard.

Two thoughts for the month: *Progress is like a wheelbarrow — push, or it stops* and *A young man never realises that some day he will know as little as his father.*

73 *The Voice in the Hills*

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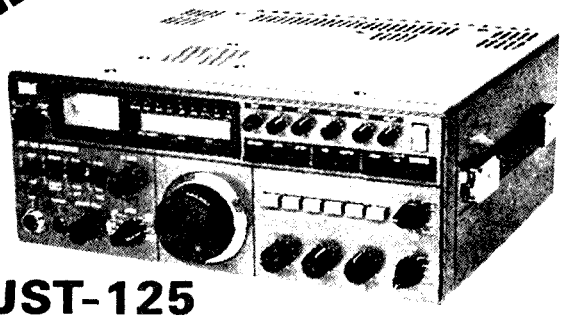

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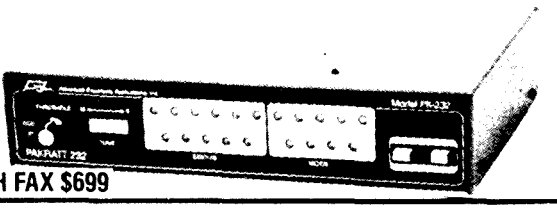

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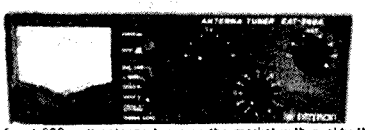

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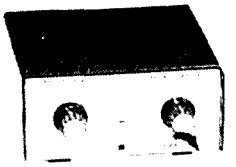

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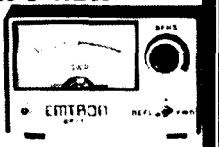
EMTRON'S NEW HF SWR METER EP-1



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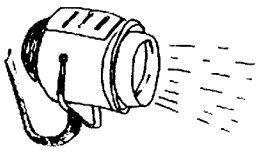


Spotlight on SWLing

Robin Harwood VK7RH
52 Connaught Crescent, West Launceston, Tas. 7250

The telephone rang at 9.45 am one Thursday morning recently. "This is Australian Associated Press in Melbourne. Have you heard any Fijian amateur stations in the last hour or so?"

"Why?" I replied, "Has there been a cyclone or other natural disaster?"

"No, there has been a military coup in Suva. All telephone links have been cut and we are wondering if you have heard any amateur stations coming on with any news."

"Well, I don't think any amateur would be so daring to transmit under those circumstances" I stated and also informed them that there was no external or shortwave outlet of the domestic broadcasting service from Suva.

I was well and truly caught on the hop by this call. The place was all confusion as we were having renovations done to our home. Everything was a little haywire and I was not able to do some serious scanning of Pacific circuits until later in the day. I did monitor the BBC, but found that Radio New Zealand and our own Radio Australia far more informative on what was happening.

Later in the day, another telephone call came from Peter Jones on an FM station in Brisbane. He also requested the frequencies for any Fijian shortwave services. News was scarce and, as cable and phone circuits were congested, it was imperative that any shortwave media outlet be quickly found. Brisbane has many resident people from the South Pacific region and naturally they had been keen to be kept abreast with the latest news.

I was not able to assist him as the shortwave outlets of the Fijian Broadcasting Corporation were closed early in the 70s. The only SW outlet that was consistently heard was Nadi Air Traffic Control on 8.867, 5.643 or 3.467 MHz USB. Ironically, I received a mail request from Bud VK4QY, for those very frequencies that day.

At deadline time, the situation is still very confused. Because of the tight censorship imposed on the local media, most Fijians relied on shortwave news broadcasts, especially Radio Australia.

Just a few weeks ago, RA's "Talkback" program repeated Peter Bunn's series on DXing the South Pacific. This is very timely. As you are probably aware, the South Pacific has become very important of late. Many of the Pacific island nations have low powered senders on the tropical broadcasting allocations and we are in a very favourable location to hear them. I highly recommend that those seriously interested in monitoring South Pacific broadcasters obtain copies of Peter's script, which is readily available from "Talkback", Radio Australia, GPO Box 428G, Melbourne, Vic. 3001.

Incidentally, RA has commenced a daily propagation forecast, in co- operation with the IPS Radio and Space Services in Sydney. It is presented six days a week at 0425 UTC, and repeated every four hours until 2025 UTC, by Mike Bird. It contains the solar flux for the previous day and the appropriate sunspot number, together with predictions for the next 24 hours. On Sundays, there is a weekly summary of the weeks conditions in "Talkback", which is almost identical to that on Radio Netherlands "Media Network" on Thursdays. I find this service from RA, indispensable and much easier to digest than the WWV propagational forecasts at 18 minutes past the hour. Often I am unable to hear WWV because of WWVH or JJY. or BPM.

Conditions are picking up and 14 MHz is alive with Europeans and Americans again. This is a reliable indicator to me on how propagation is behaving, yet appearances can be deceptive. I am positive that we have turned the corner far as as the sunspot number is concerned, but I think it will be a long haul up to the peak we experienced seven to eight years ago.

Those casual shortwave listeners who would like to obtain current schedules from various international stations, but are reluctant to write to the stations individually, may be interested to learn that there is a service in Australia. Known as the "DXer's Schedule Service" it is handled by Howard R Moore and the cost is $20 per annum. For more information, write to Howard at 33 Brooklyn Avenue, Salisbury, SA. 5108. He is also one of the Australian agents for the respected "International Listening Guide" which is $25 per annum.

In April, the World Service of the "Christian Science Monitor" commenced operations from Scotts Corner, Maine with a 500 kW sender. As reported in earlier columns, they bought KYOI on Saipan and plan to link up via satellite with WCSN later in the year. I also am informed that they plan to have a sender in Texas or Florida, to serve South America.

By now, the BBC Hong Kong relay will have commenced testing their senders, preparatory to a September start. This will improve audibility to China, Japan and Northern Asia generally. The frequency to watch is 15.280, during our local daytime and the station will probably have identification announcements on test.

It has also been recently confirmed that Swiss Radio International and the Central Broadcasting Network of the People's Republic of China will be commencing sharing transmitting facilities. No date has yet been given, but it is possibly later in the year. SRI recently extended use of the Africa No 1 site in Gabon for their transmissions to Latin America. This makes Africa easy to hear, because Radio Japan and Radio France International also utilise their facilities to relay their transmissions.

In conclusion, I would like to thank several people who have been providing me with research and information, especially Bill Perleberg L70043, of "Sunrise Gardens", Ferntree, Tas. Bill has consistently forwarded the latest schedules of some station. Also, to Don Rhodes VK3BMB and Ted Carter VK7EC, for background brlefings. Other sources are the Australian Radio DX Club and the Southern Cross DX Club, through their excellent bulletins.

Keep your ears on the South Pacific, as I do not think we have heard the last of this area. In the meantime, good listening and monitoring.

73, Robin VK7RH

ar

MORSEWORD 4

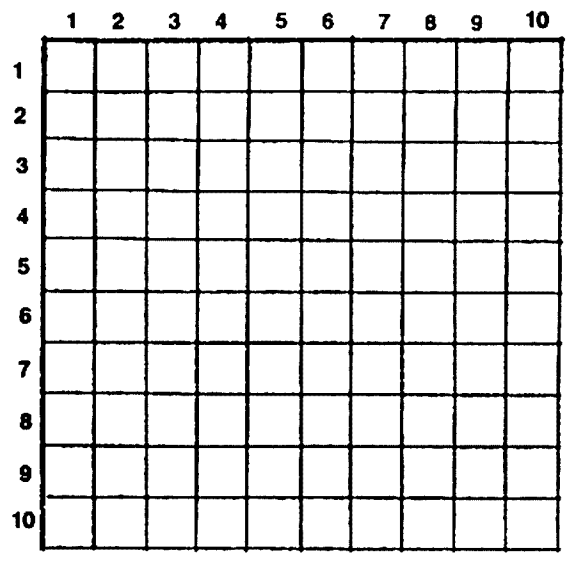
Compiled by Audrey Ryan
Wife of Joe Ryan VK3ABA

ACROSS

1. Stoop
2. To lose strength
3. Disguise
4. Mink is one
5. Employs
6. Nobleman
7. Intertwine
8. Dry with cloth
9. Likeness
10. Hand

DOWN

1. Suffix for killing
2. Second-hand
3. Rhizome
4. Dread
5. Misdoings
6. Present
7. Mountain
8. Top
9. Contend
10. Repair



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Education Notes

Brenda Edmonds VK3KT
FEDERAL EDUCATION OFFICER
PO Box 883, Frankston, Vic. 3199

From time to time I receive information from various sources about community programs or amateur radio activities.

I try to file them so that I can refer to them later but usually find they disappear into the "must do sometime" basket.

One item which has just re-surfaced and which I feel is worthy of some publicity is the leaflet about the "University of the Third Age" at Monash University in VK3.

I quote the introduction to the leaflet:

"The University of the Third Age is a learning community organised by and for people who can best be described as being active in retirement — the so-called 'Third Age' of their lives.

"The overall aim is to satisfy such people's needs for the stimulus of mental activity."

Leading the list of topics planned for 1987 is amateur radio. (There is some advantage in having a course title starting with 'A').

Rob Carmichael VK3DTR, who has been running a Novice Class for two hours per week since February tells me that the pace is set to suit the students, that some practical activities are included and that trial examinations are a regular feature.

There are no fees except the membership of the association which, according to the leaflet, is $15 for individuals or $25 for couples at one address. There are no required qualifications except a wish to learn and share knowledge, and no assessments or awards. Students in the Novice course, however, can sit for the DOC examinations if they so desire.

In all the debate about how to attract more qualified participants to our hobby, the attention has been focused on youth. This U3AM course is directed specifically to the more senior recruit.

This seems to me to be an admirable idea. Retirees and near retirees have experience, maturity, potential spare time and usually more disposable income than the school leavers or young family person. And amateur radio is an eminently suitable hobby as mobility and ability to travel decline.

I would be very interested to hear of any similar courses in other institutions, and look forward to hearing how Rob's students perform at their examinations.

I have recently had correspondence with candidates in their 70s or older. Let us encourage these new members as much as we can. As I have stated previously, I am always pleased to be informed of classes being run by groups or individuals as I do get queries from potential amateurs seeking help. I would very much like to have lists of members who would be willing to devote a little time to talking to and encouraging students in their localities.

As mentioned in my report to the Federal Convention, the Education Net seems to have died for lack of interest. I feel this is a pity. It seemed a good idea to have a way of sharing problems and bright ideas with the possibility of immediate feedback or action.

In the hope that this will stir up some action I will continue to call each Thursday evening at 1130 UTC, somewhere about 3.680 MHz.

Thank you to all those whose inputs helped to make the discussions at the Convention a little easier. The recommendations regarding the devolvement of examinations have been publicised elsewhere.

Further information will be distributed as available.

75, Brenda VK3KT
ar

Awards

Ken Hall VK5AKH
FEDERAL AWARDS MANAGER
St George's Rectory, Alberton, SA. 5014

AWARDS ISSUED IN APRIL 1987

HEARD ALL VK CALL AREAS
125 Steve Anderson L20440

WORKED ALL VK CALL AREAS
1525 Bob Hyndman ZL7AA
1526 J T Kelleher VK3DP
1527 Karl Ditgens DF5KX
1528 Uldino Cavallaro I0JTV
1529 Elvio Pizzo I0ZQ
1530 Surace Giovanni I8IGS
1531 Walt del Conte WD6EKR
1532 John E Daluas YB5NOF
1533 Asterios Barbatsalos SV1IX
1534 Yoshitaka Chida JA7EAI

DXCC — OPEN
355 Abet Suhaian YB4FNN

DXCC UPDATES IN APRIL

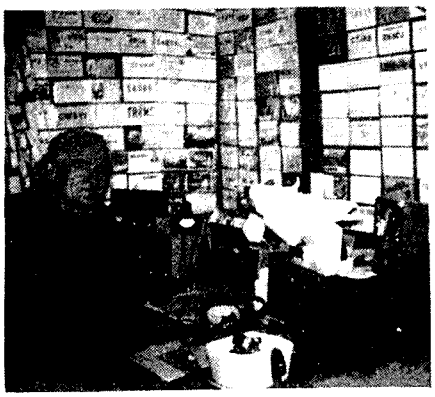
	PHONE	CW	OPEN
VK2BQS	161		168
VK3YJ	298(1)		
VK4AIX	184	143	204
VK4KS	316(31)		316(39)
VK6AJW	282(2)		
VK6MK	316(43)		316(43)
VK6RF	311(13)	294(24)	312(30)
VK7BC	296(5)	200(6)	304(6)

ar

INTERNATIONAL TRAVEL HOST

Bill Wells VK4CWB and VK1WB
8 Eacham Avenue, Paradise Lakes, Qld. 4216

The International Travel Host Exchange Scheme involves more than visits!



Bill VK1WB with Colonel "Hogy".

Bill VK1WB with International Host Exchange Visitor, Mariko Ichikawa JP1TVK, from Tokyo, during her visit in January/ February this year.

As the VK1 mentioned in paragraph two, page 3 of the May AR, I would like to explain how the scheme involves more than visits.

Since my participation in the scheme in mid-1986 the following events have taken place:

A visit by —
K0BJ and JP1TVK (she stayed for one week)
Exchanged correspondence with—
N6HYK re operating in Sydney via a club station whilst visiting Australia
JP1QZZ visiting Australia via Western Australia
KB2AUG planning a visit to Australia
KA9UNL/DJ0DAJ re immigration to Australia

So far we have not been overloaded in providing transport and accommodation, and I would like to be able to recommend other VK hosts in other areas of Australia to like visitors.

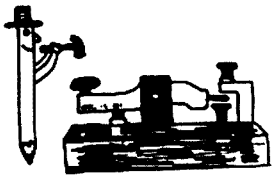
Having visited amateurs in Canada, the United States, and Jamaica I know how helpful it is to have a knowledgeable "local" contact to make the visit flow smoothly.

Colonel "Hogy" is a certain "ice-breaker" with guests but he is very efficient in chopping up cables so has to be well supervised during his walk-abouts in the shack!

The advice guidelines by Ash are excellent, but be diplomatic re costs of meals, petrol, etc — when visiting offer to cover some costs even being a little aggressive, but tactful.

I urge many more VK amateurs to join the scheme. Participation is very rewarding.

ar



Pounding Brass

Gilbert Griffith VK3CQ
7 Church Street, Bright, Vic. 3741

Q & Z CODE BOOK

If you, like me, occasionally have trouble remembering your Q- Codes, there is a new publication available containing all the current Q and Z codes.

The English language, 82 page booklet by PA0BFN and PA3ALM, is a handy reference book for every shack, and its intention is to stimulate greater use of the codes. While today's Q-code takes up 36 pages, the original 1912 version is contained on one page. QSB meant *Is my tone bad?* or *Is my spark bad?;* QRG was *What* (shipping) *line do you belong to?;* QRZ, *Are my signals weak?;* and QSL, *Did you get my receipt?.* Many changes have taken place since 1929 and, of course, amateurs have adapted many of the codes for their own use.

The Z-code is hardly known by amateurs today, although there are still some examples in the RSGB *Radio Communication Handbook.* There are 23 categories covering every type of signal, from various aspects of aviation, to meteorology, traffic generally, and 'various.' This last category includes ZUF1, 'Air Raid Warning'; ZUF2, 'Air Raid in Progress'; and ZUF3, 'All Clear'. I hope we will not have to use any of these particular signals, but there are certainly a number of Z-codes which could be revived for amateur use with advantage.

The Q/Z booklet costs three pounds, post paid, just send a bank cheque to Morsum Magnificat, 1 Tash Place, London, N11 1PA.

CONTESTING

My belated thanks to the scores of enthusiasts whom I worked, and all the others who came up on air in the John Moyle Memorial Field Day Contest, to make it so enjoyable. Together with the Commonwealth Contest and the ZL Field Day participants, altogether a lot of numbers swapping around made whichever contest you were in that much more fun. It is certainly a pleasure to hear so many Morse fans and to renew old friendships, however briefly, during a contest. With my average of 7.25 contacts per hour, there was occasionally time for a quick chat. Even though much of the time is spent 'hunting and punching' it is nice to hear so many different 'fists' on the bands. I suspect that a lot of the fun of a contest is meeting some calls on all five bands, sometimes more than once in the same contest. One seems to have a circle of friends met only in contests, and it is great to hear that some of the rag-chewers are enjoying their first taste of contesting. Why not scout around your local club and see if they would like a Morse operator for their next entry? It is much easier, especially for your first time, if there is a group of people doing the setting up. There is usually a roster system so you need not sit at the rig for the whole time, but can change jobs or even take a nap. A mere hour on the key and I promise you will be hooked.

CALLING XU2UU

Tony Smith G4FAI, says, "Ray Hunting G3OC, has sent me an account he wrote in *Mercury* the journal of RSARS, July 1984, about an experience in France during 1940.

"Ray was sending important traffic back to the UK when the enemy got a fix on his frequency and jammed his signal. The UK operator gave up, and the key was taken over, Ray believes, by the Sergeant-in-Charge, who told him over the air that he was previously XU2UU.

"After that, the two operators abandoned Army procedures and worked as amateurs, using QRQ, QRX?, QSY, etc, to outwit the interference. At this distance of time, Ray recalls the other operator's call as XU2UU, although he only heard it once through bad QRM. Can anyone help identify this operator, who was obviously a Royal Signals amateur operating in China pre- war?

"Two names have been suggested so far — 'Blanco' White and Frank Lawson. Maybe someone has a *1938/9 International Call Book* they could look up to see if either of those names, or the call, is to be found there? If you can help, please write to Rev Ray Hunting G3OC, 25 Station Road, Thurlby, Lincs PE10 0JA, England."

WANTED

Does anyone have one or two Curtis 8044 ICs for sale? I have passed on my three-year-old EA-78 keyer to a budding local Morse enthusiast and now need to build another spare keyer. On the other hand, if none are available locally, I will have to order direct from the USA. So let me know if you want one, and I will see what I can do.

I was reluctant to part with my "first" keyer as it was my first attempt at home-brewing, the kit was no longer available so I had a lot of chasing to do to collect all the parts. I would have kept it but he pointed out that my new rig had a spare already built-in. Along with my three hand keys, now two, things should be okay until I can build another.

I only hope he takes my advice and does not practice too much on the iambic keyer before he sits his 10 WPM examination using the hand key.

THE SPIRIT OF MORSE, an excerpt from *Morse Magnificat*

I wonder how many of us are aware that it is still not necessary to regard our old brass hand key as an ancient monument. It seems that modern technology has tried to oust the hand key but has not succeeded so far.

We now have electronic keys, automatic keys, keyboards, and computers, that can make perfect Morse, and sometimes receive it too. But, wouldn't it be a pity if we tuned around the bands and only heard this antiseptic machine-CW, with the recognisable characteristics of the personal fist, and unique individual style, lost forever?

We don't want to stop progress, but we think there is room enough in every shack for the things of yesterday, as well as those of tomorrow. It is in the character of the amateur, and the spirit of amateur radio, that we regard with interest, and respect, the achievements of the past while looking, at the same time, to the future.

The key has its part in this process. "When we take the operational end of our hand key between thumb and two fingers, feeling as if they were specially created for signalling, we imagine ourselves in communication with the early pioneers of 'wireless', while we dream with them of technological improvements and progress in the field of communications."

If we, radio amateurs, ever lose this view, we may as well take our licences off the wall, and look around for another hobby.

NEWS

In the May column I mentioned a couple of ideas for a new class of entry license. I do hope you have had a think about it. The Federal Convention, in May, passed a motion to give the two metre band to novice operators. If this goes through, I imagine the novice examination will become harder than ever to pass. Morse enthusiasts are the logical choice if anyone is going to push for a simple CW only class of licence as an entry point for amateurs. Discuss your ideas with your Zone representatives of the WIA, if you wish to be represented, that is!

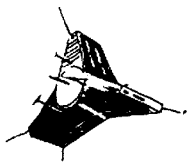
The advantages, as I see them, are that newcomers will be able to build their own equipment, design their own antennas and generally get on air with a minimum of expense. Those who do not want to build will still be in the market for all the secondhand home-brew equipment too.

A good grounding in the basics will make it much easier to understand the latest technology when it comes time for them to upgrade to the now difficult novice level. And, a more informed decision made when deciding which equipment to buy when going on to the other bands and modes.

For example, if there was a CW only rig, you and me, as 'knights of the key', would save plenty of money. We really do not need speech compressors, USB, LSB, FM and all the extras they involve.

73 and 88, Gil VK3CQ

ar



AMSAT Australia

SATELLITE ACTIVITY FOR THE MONTH OF MARCH 1987

1. LAUNCHES

The following launching announcements have been received:

INTL NO — 1987	SATELLITE	DATE	NATION	PERIOD min	APG km	PRO km	INCL deg
023A	Progress 28	Mar 03	USSR	88.8	272	191	51.6
024A	Cosmos 1825	Mar 03	USSR	97.7	677	649	82.5
025A	Cosmos 1826	Mar 11	USSR	90.3	483	288	72.9
026A	Cosmos 1827	Mar 13	USSR	113.5	1489	1393	82.6
026B	Cosmos 1828	Mar 13	USSR	113.7	1489	1392	82.6
026C	Cosmos 1829	Mar 13	USSR	114.0	1412	1408	82.6
026D	Cosmos 1830	Mar 13	USSR	113.9	1409	1405	82.6
026E	Cosmos 1831	Mar 13	USSR	113.8	1409	1388	82.6
026F	Cosmos 1832	Mar 13	USSR	113.9	1409	1398	82.6
027A	Cosmos 1833	Mar 18	USSR	101.9	878	851	71.0
028A	Raduga 20	Mar 19	USSR				
029A	Palapa B-2P	Mar 20	USSR				

2. RETURNS

During the period 31 objects decayed including the following satellites:

1975-121A	Molniya 2-15	Mar 07
1985-109E	Oex Target	Mar 02
1987-016A	Cosmos 1820	Mar 06
1987-019A	Cosmos 1822	Mar 05

3. NOTES

1987-023A — Progress 28 carried expendable materials and varied cargoes for the orbit station MIR.

1987-029A — Palapa B-2P was launched by the USA from the Eastern Space and Missile Center for Indonesia. It will provide 24-transponder C-band (6/4 GHz) communications to Indonesia and nearby countries.

1987-022A — GOES-7 has orbital parameters: period 1382.1 min apogee 36 084 km; perigee 33 363 km; inclination 0.6 degrees.

—Contributed by Bob Arnold VK3ZBB

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Electro-Magnetic Compatibility Report

Hans Ruckert VK2AOU
EMC REPORTER
25 Berrille Road, Beverly Hills, NSW, 2209

RFI ASSISTANCE LIST IN PRACTICE

We were pleased to find the "RFI Assistance List" in *QST*, February 1978, May 1981 and earlier, as well as in AR March 1982. Of course, no manufacturer or salesman could afford to say that he is not willing to help in RFI collision cases, when his equipment is involved. He may not be aware of the complexity of the job, that perhaps redesigning of the equipment would be required. The difference between the expressed willingness to help and actual effective help lies in the experience, know how, availability of technical means (filters), and the design features, which may or may not make help by the manufacturer possible. Some have done their homework very well at the design stage, whilst others still have a lot to learn. (See AR November 1986, pps 43-44, EMC Report).

More recently we seem to go backwards in the scope for EMC improvement due to less shielding and earthing, so that even the best added filters often cannot help. If now a manufacturer says to DOC or at a court hearing, that he did everything possible and with a reasonable financial effort, this may be a hypocritical statement, but might indicate to a non-technical-minded and uninformed judge that the particular amateur must have an especially bad transmitter, and is to be blamed after all. The manufacturer, importer or dealer is not likely to admit in court that the technical means to achieve EMC have been eliminated or left out of the equipment at the design stage, so that the apparatus cannot meet EMC design standards as they have existed in technically advanced countries for years.

All RF transmitting services should aim at obtaining a High Court ruling, that DOC licensed fundamental-wave radiation is not responsible for unwanted effects on other equipment. Affected equipment should have been EMC designed according to the state of the art. This has been and can be done economically (see AR, December 1986, EMC Report). If we go on as in recent years with the proliferation of electronic equipment and with little regard for EMC, we may soon reach the point where apparatus A interferes with apparatus B of the same manufacturer and vice versa, if both sets of equipment are operated side by side.

Then perhaps the right thing will be done at last, and the radio amateurs may be permitted to come back on the air unmolested.

TWO CORE MAINS CABLE, AND TWO PIN PLUGS

Old-timers will remember, that 30 years ago or so all locally made electronic equipment (receivers and measuring apparatus) had to have a three core mains cable and a three pin plug, providing an earth connection for the metal chassis and the transformer internal shield. Imported equipment with two core mains cable and two pin plugs was held back by the authorities and only released to the purchaser after modifications — three core cable, three pin plugs — had been carried out to meet the Australian Standards.

My *Tandy* Hi Fi AM/FM tuner/amplifier, *Kriesler* colour television set, and *Sony* reel-to-reel tape recorder have three core mains cables and three pin plugs. All were bought several years ago. Some of this equipment has a separate earth terminal as well, a metal chassis and metal chassis bottom cover. These design features help greatly to avoid RFI or to stop what may still get through.

RF susceptibility of a new *AIWA* cassette tape deck was reduced by 90 percent after an earth lead was added between the mains earth and the metal case of the recorder, replacing the now missing earth in the old- fashioned way.

Manufacturers of more recent home electronic equipment have found that they can improve their profit by saving one copper lead in the mains cable and one brass pin in the plug. They now point out that modern electronic appliances did away with the metal chassis in many cases. With nothing to earth one needs no earth wire and earth plug-pin. This means, as far as EMC is concerned, that RF and high-pass filter cases or contacts cannot be earthed at the appliance. This makes these devices more or less useless, and RFI is the result. Ferrite-core chokes are often the last hope to improve the RF immunity. EMC improvements are therefore, more than in the past, a job for the appliance manufacturer — not for the legally operating radio amateur.

RFI FROM OUTER SPACE

Radio astronomers complain that the signals from stars are often interfered with by the man-made signals from satellites. This causes "black spots" on their maps of the heavens. Is there any EMC solution to this problem?

/88

INTERNATIONAL WROCLAW SYMPOSIUM ON ELECTROMAGNETIC COMPATIBILITY

The ninth Wroclaw Symposium and Exhibition on Electromagnetic Compatibility will be held in Wroclaw, Poland, on June 28-30, 1988.

—Contributed by W Moron, Organising Chairman

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Electronics Australia

NEW MANAGING EDITOR FOR EA

The Federal Publishing Company recently announced the appointment of Mr Jamieson (Jim) Rowe as Managing Editor of *Electronics Australia*.

Jim is well-known to the electronics industry. His former 20-year association with *Electronics Australia* included five years as Technical Editor and nine years as Editor. He returns to head the staff of the magazine after time with Dick Smith Electronics, Microbee and, recently, as a journalist for *Electronics News* and *Broadcast Engineering News*.

As a most respected magazine in its field, *Electronics Australia* looks forward to a strong future under Jim's leadership. With the support of National Advertising Manager, Selwyn Sayers, and backed by Australia's special interest publisher, Jim's appointment will prove a springboard to further growth.

"It's an exciting challenge," he said, "to be involved in building the magazine into an even stronger, even better publication. *Electronics Australia* has a long, respected history, and a responsibility — to both its readers and its advertisers — to be relevant, dynamic and up-to-date. I like to think I can appreciate the past at the same time as looking towards the future, and I'd like to see the magazine reflect this."

Jim took up the appointment on June 16, 1987.

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CAROL ELECTRONIC CABLES NOW IN AUSTRALIA

Electronic cable produced by North America's largest cable and wire manufacturer is entering the Australian for the first time.

Multi-Contact Australia Pty Ltd has announced its appointment as exclusive distributor in Australia for Carol Cable Company Inc of USA which, with its affiliates, manufactures about one billion dollars worth of wire and cable every year.

Carol is one of the world's few totally integrated cable manufacturers, rigidly controlling the quality through every step of production from its parent company's copper mine to the finished products. Unlike many competitors these are all manufactured in its own plants.

A director of Multi-Contact Australia, Mr Derek Harris, says that his company will be distributing Carol cables for computer, audio, electronics and instrumentation usage.

"The availability of Carol cable will allow these industries to have a second major American cable supply source for the first time," he said.

"Until now Belden has been the dominant overseas supplier into these specialised markets, but manufactures will now be able to specify Carol cables using a comprehensive Carol-Belden cross-reference listing."

"These cross-references, showing both Carol and Belden product code numbers, are contained on a separate sheet which is inserted into Carol catalogues," Mr Harris said.

Multi-Contact can now supply, ex-stock, two types of Carol Paired Shielded Computer Cables especially designed for use in data transmission, control circuits and signal applications. These cables feature semi-rigid PVC insulation, UL style 1061, CSA Type SR-PVC, conductors cabled in pairs, overall 100 percent Flexfoil aluminium foil/Polyester shield and stranded tinned copper drain wire. The conductor strand is 7/32,

C0601 contains two pairs of conductors whilst C0602 has three pairs of conductors.

The third cable (C1352) is a Shielded Quad Cable with PVC Jacket designed for audio, communications and instrumentation use. It has tinned copper conductors, colour-coded polypropylene insulation, each pair shielded with 100 percent Flexfoil aluminium/polyester shield, foil facing outside, #24 stranded tinned copper drain wire and cables paired on common axis to reduce OD. The conductor strand is 7/30.

Catalogues are also now available from Multi-Contact on the specialised cables they are distributing for the Carol Company.

For further information about Carol cable or the new Carol cable catalogue, contact Multi-Contact Australia Pty Ltd,

NSW: 53-55 Whiting Street, Artarmon, NSW. 2064 ph (02) 438 3600.

VIC: 10 Nicholson Street, Coburg, Vic. 3058, ph (03) 383 3733.

WA: 2/115 Howe Street, Osborne Park, WA. 6017, ph (09) 443 3933.

QLD: 3 Marie Street, Milton, Old. 4064, ph (07) 369 0544.

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AR Showcase

Intruder Watch

Bill Martin VK2COP
FEDERAL INTRUDER WATCH CO-ORDINATOR
33 Somerville Road, Hornsby Heights, NSW, 2077

The number of unauthorised transmissions reported for the month of March, 1987, was a little down compared with the same period for 1986. However, the following people are still giving good support to the Intruder Watch, and are making an effort to preserve our band-space:

VK2s DEJ, EHQ, PWS, QL, SG, Arthur Bradford; VK4s AKX, BG, BHJ, KHZ; VK5s GZ, TL; VK6RO; VK7RH; VK8s HA and JF

There were 186 Broadcast Mode (A3E) intruders reported; 152 CW (A1A); 116 RTTY (F1B); other mode intruders totalled 58 and 36 intruders supplied us with their call signs.

"Gib" W7JIE, reports that the US amateurs are suffering QRM from Japanese fishing vessels on the 80 metre band, on lower sideband. These are difficult to classify in VK as intrusions, as, if they are in International Waters, they cannot be considered to be intruders. And, who knows where they are? Gib also nominates that the slow "V" beacon on 7.002 MHz is "beacon for USSR Maritime use, QTH Vladivostok" — interesting . . .

April 20 last was a pleasant day for me, with a visit from Bob Knowles ZL1BAD, the IARU Monitoring System International Co-ordinator. Bob was formerly the IARU Region 3 M-S Co-ordinator, and had been active in Intruder Watch in ZL for many years. Bob was accompanied by his wife, Barbara, and we all had a very pleasant meeting, and discussed many things, including, of course, Intruder Watch business. I think we all enjoy eyeball OSOs, particularly with those who we have worked on air frequently, and have never met in person.

So keep those reports coming, and if you have never sent in a report, then please do so, and give all our regular helpers a hand. See you next month. Good DX.

Bill VK2COP

ar

Australian Ladies Amateur Radio Association

Joy Collis VK2EBX
PUBLICITY OFFICER, ALARA
Box 22, Yeoval, NSW. 2868

MEMBERSHIP LIST & DATE OF JOINING as at March 31,1987

Charlene VK1NEJ	21 February 1982
Kathleen VK2ACP	1 October 1980
Betty VK2AMU	9 March 1981
Dorothy VK2DDB	17 March 1983
Norma VK2DJO	20 August 1975
Beryl VK2DVL	11 August 1979
Joy VK2EBX	25 January 1980
Heather VK2HD	22 October 1976
Marlene VK2KFQ	11 November 1983
Joyce VK2MI	5 November 1976
Margaret VK2MV	20 March 1982
Maree VK2NKN	6 August 1981
Nancy VK2NPG	7 November 1985
Margaret VK2PNG	23 March 1981
Bobbie VK2PXS	6 October 1977
Freda VK2SU	26 July 1980
Wendy VK2YQK/VKD	20 March 1982
Jean Darling	23 November 1983
Lorrie VK3AGO	6 May 1979
Rae VK3AYL	20 April 1976
Mavis VK3BIR	23 August 1975
Joan VK3BJB	2 August 1976
Mona VK3BRE	1 September 1976
Janet VK3BTU	1 September 1977
Barbara VK3BYK	1 February 1984
Margaret VK3CWA	25 March 1981
Kim VK3CYL	8 November 1983
Margaret VK3DML	8 June 1977
Marilyn VK3DMS	24 October 1977
Valda VK3DVT	25 March 1981
Bron VK3DYF	6 November 1982
Gwen VK3DYL	20 April 1981
Jan VK3HD	24 Jul 1985
Marjorie VK3HO	3 October 1976
Mavis VK3KS	22 August 1975
Joan VK3NLO	19 October 1981
Bonnie VK3PBL	11 May 1983
Liz VK3PSG	20 March 1987
Clarice VK3UE	29 October 1976
Jessie VK3VAN	12 February 1981
Joyce VK3VBK	17 March 1979
Austine VK3YL	5 April 1976
Jean Truebridge	3 August 1975
Raedie Fowler	16 November 1976
Muriel May	9 June 1979
Margaret Hamilton	20 July 1986
Chris VK4ABN	14 July 1979
Sandra VK4ACJ	22 July 1980
Margaret VK4AOE	10 October 1980
Jill VK4ASK	8 October 1984
Connie VK4ATK	1 September 1982
Alma VK4BAE	4 March 1985
Dulcie VK4BDH	6 January 1981
Eleanor VK4BEM	1 May 1985
Betsy VK4BET	24 September 1985
Wendy VK4BSQ	2 March 1982
Anne VK4FAB	12 June 1981
Phyl VK4JFA	12 January 1981
Anne VK4KZX	12 November 1986
Dorothy VK4NAM	21 May 1976
Candy VK4NES	23 December 1985
Valarie VK4NNJ	21 August 1979
Mary VK4PZ	9 March 1981
Cecily VK4QW	9 September 1983
Josie VK4VG	27 February 1985
Val VK4VR	7 April 1983
Jenny VK5ANW	21 April 1976
Meg VK5AOV	26 November 1983
Maria VK5BMT	9 April 1986
Judy VK5BYL	20 March 1982
Vicki VK5FK	30 January 1987
Lorraine VK5LM	4 April 1976
Marlene VK5QO	12 February 1981
Denise VK5YL	20 April 1976
Pauline Koen	24 December 1983
Gill Wardrop	13 March 1986
Christine VK5ZCQ	24 May 1986
Bev VK6DE	2 March 1980
Helene VK6HI	23 November 1983
Bobbie VK6MH	14 December 1976
Peggy VK6NKU	15 February 1983
Sue VK6NSU	2 October 1980
Debra VK6OJ	9 December 1986
Inge VK6OV	31 March 1985
Margaret VK6QM	21 June 1980
Poppy VK6YF	3 July 1978
Gillian VK6YL	15 September 1976
Christine VK6ZLZ	17 December 1983
Olive Couch	21 October 1977
June Greenaway	24 December 1983
Lynda Francis	13 May 1985
Helene VK7HD	29 December 1977
Grace VK7NNN	9 July 1985
Moira VK8NW	9 April 1986
Kirsti VK9NL	1 June 1980

OVERSEAS MEMBERS

Christel DF1LV	11 December 1982
Christa DJ1TE	15 September 1979
Anny DF2SL	15 September 1979
Heidi DF3LX	12 March 1983
Margot DK5TT	1 November 1981
Aimee FK8FA	22 October 1984
Sheila G3HCQ	20 May 1981
Ann G4EYL	28 March 1981
Diana G4EZI	19 December 1978
Rae G4JMT	8 March 1984
Cilla G4KVR	1 November 1981
Sylvia G4VBT	28 November 1986
Dee G4VFC	17 December 1984
Angelika G0CCI	25 February 1986
Shirely GM4LUS	20 December 1980
Anne GM4UXX	23 May 1984
Kay GM6KAY	17 December 1984
Fumi JA1AEO	21 September 1984
Akiyo JH1GMZ	6 February 1985
Nanako JI1VLV	8 July 1984
Mizuyo JE6JQC	30 January 1984
Etsuko JA6KYP	14 January 1985
Jean K1IJV	23 March 1981
Karla WA1UVJ	10 December 1979
Phyllis W2GLB/7	23 July 1976
Christine WB2YBA	1 June 1978
Jeanne KA3CEO	19 January 1984
Liz W3CDQ	1 November 1978
Mary Ann WA3HUP	6 October 1981
Ruthanna WB3CQN	30 March 1981
Lois WB3EFQ	19 October 1983
Edith WA4SRD	17 October 1979
Betty KA5ONE	20 November 1985
Mary KE5UO	10 February 1986
Carol KK5L	11 May 1983
Darleen WD5FQX	16 January 1985
Jerrie K6INK	9 June 1979
Joanie KA6V	16 October 1982
Elizabeth KA6NZK	19 November 1986
Mary KB6CLL	22 October 1984
Maxine N6GGR	28 December 1982
Claudia N6GZW	27 June 1985
Joanne N6LFZ	1 August 1985
Jessie WA6OET	17 January 1984
Martha KA7CRO	2 March 1982
Daurel KC7TE	21 December 1977
Gerry KD7RA	19 January 1984
Alice KD7SH	26 April 1984
Joan KD7YB	11 April 1983
Shirlee KQ7Y	1 October 1980
Marion WA7TLL	29 January 1986
Lee KB8RT	2 October 1980
June KM8E	10 February 1985
Shirley WD8HEV	1 February 1984
Ann K9RXK	22 August 1983
Eeva OH3ST	11 February 1987
Zdena OK2BBI	13 February 1986
Marie-Jeanne ON4AYL	1 September 1985
Agnes PA3ADR	12 June 1981
Hil PA0HIL	12 June 1981
Paula PA0ULA	1 November 1981
Inge PY2JY	23 June 1984
Hallie VE6AUP	1 October 1980
Elizabeth VE7WL	1 October 1979
Bobby VE7CBK	28 October 1978
Rae VE7CIX	28 May 1978
Margaret VE7DKC	7 January 1987
Muriel VE7LQH	10 October 1985
Betty VR6YL	26 September 1986
Tuti YD0TTK	28 January 1987
Junia YJ8NJW	6 February 1985
Aola ZL1ALE	12 December 1979
Celia ZL1ALK	1 November 1981
Win ZL1BBN	26 December 1985
Clarrie ZL1BDZ	18 March 1977
Elva ZL1BIZ	17 April 1982
Lesley ZL1BOR	11 May 1980
Ethel ZL1BWQ	1 December 1986
Gail ZL1FV	8 November 1983
Shirley ZL1MY	20 November 1983
Vicki ZL1OC	11 September 1977
Cathy ZL2ADK	30 October 1982
Dawn ZL2AGX	9 March 1987
Alma ZL2AWP	17 December 1984
Biny ZL2AZY	11 January 1981
Jos ZL2BAO	1 November 1981
Marilyn ZL2BQA	16 September 1984
Jeanne ZL2BOD	26 December 1982
Anne ZL2BOV	23 January 1984
Lynn ZL2PQ	25 December 1982
Pauline ZL2QW	4 November 1983
Pearl ZL2QY	22 April 1976
Gail ZL2TZG	17 January 1985
Carol ZL2VQ	30 October 1983
Lee ZS1YL	27 January 1986
Mimi ZS5YO	13 January 1987
Diana ZS6GH	1 June 1978
Pat ZS6VC	20 November 1983
Mary 5W1FM	20 February 1987

BIRTHDAY ACTIVITY DAY

Happy Birthday once again to ALARA. Our Birthday Activity Day will e held on Saturday, July 25, from 0400 to 1200 UTC. All bands, suggested frequencies as for the ALARA Contest.

We hope propagation will permit some of our DX members to join us on this occasion.

The ALARA Birthday Net will be held on Monday, July 27, at 1030 UTC. The customary net frequency, 3.580 MHz, ±QRM.

The VK3 Annual Birthday Luncheon will be held this year on July 26 at the home of Raedie and OM Ray VK3BHL, commencing at 11.30 am. A small plate required, tea and coffee available. For further information contact Raedie or Bron VK3DYF

The VK5 girls will be holding a Birthday Get-together at the home of Meg VK5AOV and OM David VK5OV, on Sunday, July 19. Lunch at 12.30 pm (BYO). Interstate and overseas friends welcome. Contact Meg for further details.

ALARA-MEET

A reminder to all who have not yet sent in their registration forms, or booked accommodation for the second ALARA Get-together (ALARA- Meet) to be held on September 26-27 — the time is getting short. Do not delay any longer, but get your Registration to Maria VK5BMT.

Accommodation can be booked at:
The Granada Motor Inn Flag Motel, phone (08) 272 8211, mentioning the ALARA Group Booking.

Alternatively try:
Brownhill Creek Caravan Park, Brownhill Creek Road, Mitcham, SA. 5062. Phone (08) 271 4824. Their on-site arrangements are said to be very good.

ALARA AWARD UPDATE

No	Date	Name & Call Sign
125	29.12.86	Jim Ballinger VK3NK
126	14.01.87	Hallie M du Preez VE6AUP*
127	18.03.87	Harry Petrodaskalakis VK3ABO

* Three Endorsement Stickers

ALARA are justly proud of their Award, which must e one of the most beautiful awards offered. The floral emblems of each State of Australia are delicately hand-coloured by Valda VK3DVT, who deserves a very special vote of thanks for the thoroughly professional job she does.

NEW MEMBERS

Welcome to new members:
Liz VK3PSG, Wendy (wife of Barry VK1BB) and Joanne VK4LCD. Joanne is one of our younger members, 16 years old.

Change of call sign:
Alma VK3BAE is now VK4BAE. Hope you are enjoying the sunshine, Alma!

YL NEWS

Two ALARA members have been elected to the WIA VK6 Divisional Council, namely Gill VK6YL and Christine VK6ZLZ. Christine is Vice-President of the Council. Congratulations to you both.

Maggie VK3CFI, worked the John Moyle Field Day Contest solo from a hill, accompanied by cows, sheep, and two active little harmonics. She used a G5RV antenna, and 10 watts output power. She worked 20 stations in spite of the difficulties. Nice going, Maggie.

Bev VK6DE and OM Brian VK6AI, using the special event call sign, VK6CUP, (America's Cup) logged nearly 200 calls during their rostered time.

June Greenaway L60068 was the first VK6 SWL to qualify for the award, and her grand-daughter Leeanne, the youngest SWL to earn the award. A great family achievement.

Congratulations to Helene VK7HD, who is the recipient of a 75th Anniversary Medallion.

The WARO Club Station, ZL2YL, has been very active during this WARO Silver Jubilee Year. Many people have the attractive Silver Jubilee Award, obtained for WARO contacts during the month of March.

CLARA, the Canadian Ladies Amateur Radio Association, will be 20 years old in September 1987.

JLRS are celebrating their 30th Anniversary this year, and will be holding a convention in Tokyo on July 26. Overseas YLs welcome.

VI3PVA

I have received a letter from the Amateur Radio Club "Polonia" VK3CRP, regarding the call sign, VI3PVA, in operation from October 1, to December 1, 1986, to commemorate the Papal visit to Australia.

This special call sign was issued to the "Polonia" Club, formed by Polish born amateurs, and not to Jan VK3DMH, as stated in the ALARA Column, April 1987, AR. (See page 15, November AR, for their special QSL).

I would like to apologise to the Amateur Radio Club "Polonia" for any inconvenience caused as a result of this genuine mistake.

Until next month:

73/33, Joy VK2EBX

ar

Club Corner

TUMUT & DISTRICT AMATEUR RADIO CLUB

The Tumut and District Amateur Radio Club meets each Wednesday at 7.30 pm at the Tumut High School. It is open to all ages and all levels of experience.

Club President is VK2DPZ.

The Club anticipates having its VHF Repeater operational shortly, receive 146.800, transmit 146.200 MHz. Visitors to the area are welcome to call- in.

—Contributed by Butch Chapman VK2BYS, Publicity Officer

ar

SUMMERLAND AMATEUR RADIO CLUB

The AGM was held in February and completed a very successful year. Membership increases all the time (currently 69), and, due mainly to a good raffle, finances have markedly improved. With the exception of Tom VK2DDG, who has moved to Queensland, the committee remains unchanged. Lance VK2NVF has filled the vacancy. Welcome Lance!

It was decided to make 1987 one of much social activity with an outing monthly. The following are typical activities envisaged for the balance of the year.

AMTOR & PACKET DEMONSTRATION

A very pleasant evening was enjoyed by about 17 members. The talk and demonstration was very competently put over by Gordon VK2AGE, who was ably assisted by Harold VK2CHM, with Brian VK2CMC providing the DX link. The packet demonstration went well but RF interference upset the AMTOR. Nevertheless, the lecture went over well. Afterwards the usual ragchew, supper and trades, etc, was enjoyed by all.

JOHN MOYLE CONTEST

A small group of quasi enthusiastic beings fronted for this event. We beat all previous records and got our score into double figures at last. Apart from contesting and ragchewing, various beings attacked more Channel 8 equipment and reduced it to cashable brass, copper and bits. The weather was kind and a pleasant afternoon was enjoyed by all.

PICNIC AT BYRON BAY

Who says that RF energy doesn't affect the weather? It did the trick on the day. The collective talk power dissipated the damp and the Bay had its best fine day for weeks. Nine members, 15 in all including family, attended and a good ragchew was had. It was good that two of our associate members were able to make it which enabled the two-way contact to be made. Only two energetic (or weight-watching?) souls, VK2DLR and Liz, stirred up the energy to walk up to the lighthouse. Some others did stray a bit and Blue did some beachcombing, or was it bird-watching?

—Contributed by Jim Cunningham VK2ESI, Publicity Officer SARC

ar

THE WIA URUNGA CONVENTION

The Urunga Radio Convention is the oldest radio convention in Australia. Now in its 39th year it has been held at Easter each year since 1948.

Following are the results of the 1987 Convention.

Saturday

1000 — 40 metre hunt, no winners

1130 — two metre, two transmitter hunt, First Jeff VK2BYY Second Ken VK2DGT

1400 — two metre, two transmitter hunt, First Greg VK2JPR Second Jeff VK2BYY

1430 — 80 metres mobile hunt, First Ken VK2DGT Second Greg VK2JPR

Sunday

1000 — The Urunga Scramble, First Graham VK2ZZV Second Allen VK2EFM

1130 — two metre, three transmitter mobile hunt winner Allen VK2EFM

1430 — two metre Multi-transmitter hunt, First Ken VK2DGT Second Greg VK2JPR

1530 — two metre, three transmitter hunt winner Greg VK2JPR, Runner-up Peter VK2EVB

Other Contest

CW Sending — First Allen VK2EFM, Second Jeff VK2BYY

Non-Technical Quiz — Louis VK2LS

Technical Quiz — Allen VK2EFM

Lucky Door Prizes — Mrs M Smith and Mr D Walker

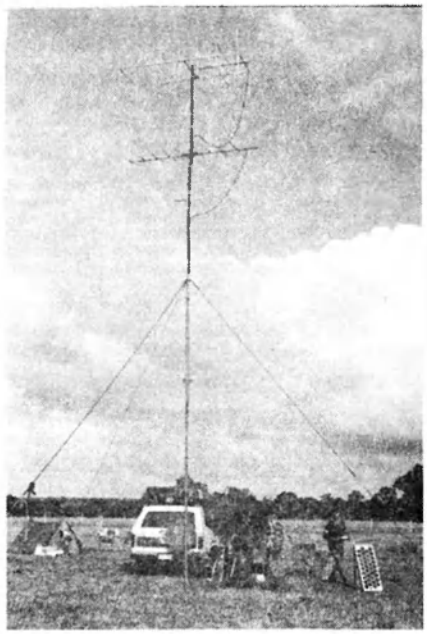
Raffles

Planet Studio Light — Graham VK2ZZV

Easter Rabbit and Eggs — Peter VK2EVB

ar

RADIOACTIVITY FROM THE NORTHERN CORRIDOR RADIO GROUP



Preparing for the Contest.

Last year, the Northern Corridor Radio Group took part in the John Moyle Memorial Field Day Contest for the first time. Members agreed there was room for improvement!

This year, they sought a location with the potential for plenty of sky- hooks, offered shade, water and easy access to the local tavern. The site chosen was offered by a friendly farmer, located close to Bullsbrook, about 45 km north-east of Perth, near the Pearce RAAF Air Base. It fitted the bill perfectly.

A later reconnaissance party also discovered a refrigerator and shed were available for the group's use, too!

Nicholas VK6NRD (standing) with Alek VK6APK, operating on 80 metres.

A general view of the site with the Delta Loop for 20 metres in the foreground.

Bob VK6MQ, operates CW whilst Peter VK6PK, was in charge of AMTOR.

Natural Power Supply. From left: Des VK6NWU, Tony VK6ZTL, VK6AHC (seated), Alek VK6APK, Son of Ian VK6ZIC and Ian VK6ZIC.

Antennas were precut and pretested by members of the group for most bands. Antennas used were: beams for 70 cm, two and six metres; a 2-element delta loop for 20 metres; an end-fed wire for 15 and 40 metres; wire Vee-beam on 80 and a halfwave dipole on 160 metres.

FM, CW, SSB and AMTOR were used at some stage during the contest. VHF stations were operated exclusively on 'natural' power — solar and pedal (ERP = Exhausted Rider Power! ? !). Some HF contacts were made using these sources also, but the HF transceivers proved to be power-hungry, which necessitated using the generator.

Throughout the 24 hours, approximately 25 group members pedalled, pulled, climbed, struggled and operated their way through the contest, rejuvenated by liberal quantities of OHM cooked food washed down with 807s.

The success of the event was measured by a high level of participation and the enjoyment members derived from the experience.

Although tired at the conclusion, the main topic of conversation was

We will do even better next year!

ar

VK2 Mini-Bulletin

Tim Mills VK2ZTM
VK2 MINI BULLETIN EDITOR
Box 1066, Parramatta, NSW 2150

DIVISIONAL COUNCIL

The vacancies on the Council for the year were filled by May and is now up to the full strength of seven. Joining Council were Andy Keir VK2AAK and Dennis Williams VK2XDW. The other members of Council are Roger Henley VK2ZIG/NWH, Mike Burns VK2AUE, Tim Mills VK2ZTM, Peter Jeremy VK2PJ and Dave Horsfall VK2KFU.

President	Roger Henley VK2ZIG/NWH
Vice-President	Mike Burns VK2AUE
	Tim Mills VK2ZTM
Secretary	Peter Jeremy VK2PJ
Treasurer	Dave Horsfall VK2KFU
Administration Secretary	M Lavery
Returning Officer	Peter O'Connell VK2EMU

Other Office Bearers for 1987/88. Some rearrangement will be done now that Council is up to strength.

Federal Councillor	Jeff Pages VK2BYY
Alternate Federal *Councillor*	Tim Mills VK2ZTM
Federal Observers	Barry White VK2AAB
	Max Smith VK2YKF
Divisional Historian	Jo Harris VK2KAA
Correspondence Course Supervisor	Cec Bardwell VK2IR
Education Service Co-ordinator	Ken Hargreaves VK2AKH
Slow Morse Supervisor	Vince Roberts VK2CVR
Intruder Watch Co-ordinator	Bill Martin VK2COP
Library Officer	Aub Topp VK2AXT
Assistant Treasurer	David Thompson VK2BDT
Property Officer — Dural	Jeff Pages VK2BYY
Property Officer — Parramatta	Mike Burns VK2AUE
Broadcast and Publications Officer	Dave Horsfall VK2KFU
Components/JOTA Officer	Roger Henley VK2ZIG/NWH
QSL Bureau Liaison	Dennis Williams VK2XDW
Mini-Bulletin Editor/ NTAC Co-ordinator	Tim Mills VK2ZTM

RD CONTEST

At the moment VK4 is the holder of the RD Contest and trophy. The rules for this years event will be in the Contest Notes in this issue so please have a look at them and then set aside some time over the weekend to take part for VK2. While it may almost be the turn of another State to win, it would be nice for the trophy to spend a little time in VK2.

VK2 AWARDS

Currently the Division does not have any awards for working VK2. It has been decided to introduce a range of *Awards* for contacts made on and after the beginning of 1988. The awards are based on those being successfully conducted by other States. The major one will be a VK2 — 1988 — AWARD. It will require the working of 200 contacts in a single or mixed combination of modes. After next year the award will continue as a VK2 award. It is based on the VK1 award.

The next award to be introduced is a *Worked All New South Wales*. It is based on the VK4 Shires Award. The third major award being introduced is based on the VK3 National Parks Award. Greater detail will be given in these notes in a month or two. Some of the design work still has to be done for the certificates so Divisional Council would like to hear from anyone able to assist in this regard.

Some other special awards will be considered for activities during the 1988 year. There are many Shires and National Parks where there is little or no resident amateur activity. This will be a chance for both clubs and individual amateurs to establish stations for a weekend, or similar, to activate the area.

810s WANTED

VK2WI operates three AWA J54-800 AM transmitters in the main HF broadcast network. (See report in May AR). The final and modulator valves are 810 triodes but our stocks are getting low. Does anyone have any which are no longer required? If so, we would like to hear from you so that arrangements can be made to obtain them.

Either write to the Dural Committee, PO Box 1066, Parramatta, NSW. 2150, phone (02) 689 2417, 11 am to 2 pm Monday to Friday or 7 to 9 pm Wednesday, or call VK2WI during the call-backs.

WICEN

The new repeater unit for VK2RWS 7150 went into service from Chatswood on May 14, last. It is now a diplexed system, about eight watts to a three dB gain antenna.

A reminder of coming exercises —
Sun City to Surf on Sunday morning, August 9.
Possible car rally at Batemans Bay, September 26-27.
Canoe Classic on the Hawkesbury River, Saturday afternoon and Sunday morning, October 10-11.

ANNIVERSARY QUIZ

The top places were close. The first place went to Arthur Twomey VK2KAT. Runners-up were Jo Harris VK2KAA, Jim Swan VK2BQS and Peter Ritchie VK2HC. Thanks to all who took part, I hope some new knowledge was gained. A small group attended Dural on May 17, to celebrate the day. The fireworks evening had to be rescheduled to late May due to difficulties in obtaining a permit on the original planned date.

ATV IN SYDNEY

Regular ATV activities are being provided in the Sydney by the Gladesville ARC. They have a transmission every Wednesday evening beginning at 7.30 pm on UHF, slightly higher than channel 35, from Lane Cove West. A recording is made and replayed at 7.00 pm on Friday evening. Video tapes of some of the class instructions are put to air. These tapes are also available for borrowing. The Gladesville ARC may be contacted via their Post Box 48, Gladesville, NSW. 2111, or phone (02) 427 0530.

The Sydney ATV Group has had to leave the site of their ATV repeater and, at the time these notes were being prepared, had not established a new site.

NEW MEMBERS

We would like to welcome the following to membership of the WIA. They were in the May intake.

L A Brill Assoc	Ganmain
N Cohen VK2OP	North Bondi
N B Cupitt Assoc	Seven Hills
W J Elphick VK2DRY	Wolumla
F C Mellon Assoc	St Marys
R G Pelham VK2XDX	Griffith
S D Smith VK2MAG	St ives
J H Sutherland VK2BJQ	Camden
J Thomas VK2AU	Greystanes
W P Truscott VK2EWT	Wahroonga
H S Virik VK2MJH	West Killara
L Wood VK2MBH	Bermagui

SUB-COMMITTEE ANNUAL ACCOUNTS

Reproduced below are the Education Service and WICEN Sub- Committee Accounts for the year ending December 31, 1986.

WIRELESS INSTITUTE OF AUSTRALIA
AUDITORS REPORT

In accordance with Section 285(3) of the Companies (New South Wales) Code we hereby state that in our opinion the accompanying accounts are properly drawn up:

1) So as to give a true and fair view of the matters required by Section 269, to be dealt with in the accounts.
2) In accordance with the provisions of the Companies (New South Wales) Code.
3) In accordance with applicable approved accounting standards.
4) The accounting records and other records and registers required by that Code to be kept by the company have been properly kept in accordance with the provisions of that Code.

Signed at Parramatta
this 26th Day of February 1987
GIBSON PEARS & CO
Chartered Accountants

WIRELESS INSTITUTE OF AUSTRALIA
NEW SOUTH WALES DIVISION EDUCATION SERVICE
TRADING STATEMENT
FOR THE YEAR ENDED 31ST DECEMBER 1986

		THIS YEAR $	LAST YEAR $
INCOME			
Sales		12 220	13 803
TOTAL SALES		12 220	13 803
LESS: COST OF SALES			
Opening Stock	13 139		10 805
Purchases	3 812		8 118
Less: Closing Stock	11 213		13 139
		5 738	5 784
GROSS PROFIT FROM TRADING		$6 482	$8 019

WIRELESS INSTITUTE OF AUSTRALIA
NEW SOUTH WALES DIVISION EDUCATION SERVICE
INCOME & EXPENDITURE STATEMENT
FOR THE YEAR ENDED 31ST DECEMBER 1986

		THIS YEAR $	LAST YEAR $
GROSS PROFIT FROM TRADING		6 482	8 019
Add: OTHER INCOME			
Interest Received	2 606		2 618
Hire of Equipment	10		20
Donations	0		5
		2 616	2 643
TOTAL INCOME		9 098	10 662
Less: EXPENSES			
Advertising	2 440		2 408
Audit Fees	350		300
Bad Debts Written Off	0		5
Bank Charges	20		30
Depreciation	629		629
Insurance	274		275
Out of Pocket Expense for Service Members	663		821
Post Office Box Rental	23		0
Postage	1 403		1 871
Printing and Stationery	214		83
Repairs and Maintenance	150		33
Fixed Assets Scrapped	0		130
		6 166	6 585
NET PROFIT		2 932	4 077
Retained Profits — Beginning of Year		40 219	46 142
		43 151	50 219
Less: EXTRAORDINARY ITEMS			
Special Transfer to WIA — NSW		0	10 000
ACCUMULATED FUNDS 31ST DECEMBER 1986		$43 151	$40 219

WIRELESS INSTITUTE OF AUSTRALIA
NEW SOUTH WALES DIVISION EDUCATION SERVICE
BALANCE SHEET as at 31ST DECEMBER 1986

		THIS YEAR $	LAST YEAR $
ACCUMULATED FUNDS 31ST OECEMBER 1986		$43 151	$40 219
ACCUMULATED REVENUE RESERVES		$43 151	$40 219
Represented by:			
CURRENT ASSETS			
Cash at Bank	28 969		23 487
Cash on Hand	444		310
Trade Debtors	103		232
Stock on Hand	11 213		13 139
		40 729	37 168
		40 729	37 168
FIXED ASSETS			
Hire Equipment	960		960
Less Provision for Depreciation	480		384
		480	576
Office Machinery & Equipment	4 684		4 684
Less Provision for Depreciation	2 742		2 209
		1 942	2 475
NET ASSETS		$43 151	$40 219

The Secretary
NSW Division WIA
PO Box 1066
PARRAMATTA. NSW 2150

Dear Sir,
I have completed an audit on the WICEN accounts as presented to me for the year ended December 31, 1986. I have found the books to have been kept in a correct manner and consider that they are adequate. I am satisfied that the Trading Account and Balance Sheet show accurately the financial position of WICEN.
A copy of the accounts follows.
Yours faithfully,
D S Thompson VK2BDT.

WIRELESS INSTITUTE CIVIL EMERGENCY NETWORK
TRADING ACCOUNT FOR YEAR ENDING DECEMBER 31, 1986

SALES			135.35
Less Purchases	Nil		
Opening Stock	1470.38		
		1470.38	
Less Closing Stock		1341.38	
Cost of Good Sold			129.00
Trading Profit for Year			6.25

Profit/Loss Account for the Year Ending December 31, 1986

INCOME		
Trading Profit	6.25	
Subscription (69)	342.00	
Grants	1750.00	
Interest	355.71	
Donations	1200.00	
		3653.96
Less Expenses		
Bank & Gov Charges	6.82	
Licenses	23.00	
Postage/Stationery	84.55	
Promotion & Training	86.38	
Travel Reimbursement	64.40	
VRA Expenses	80.00	
Repairs & Maintenance	93.90	
	439.05	
Add Depreciation W/off	225.12	
		664.17
Surplus for Year		2989.79
BALANCE SHEET AS AT DECEMBER 31, 1986		
ACCUMULATED FUNDS		
Balance Brought forward 1.1.86		8156.18
Add Surplus for Year		2989.79
	$	11145.97
REPRESENTED BY		
Cash at Bank		3560.72
Stock on Hand, Badges, Clothing, etc		1341.38
Fixed Assets at Written Down Value		
Repeaters	1080.76	
Transceivers	969.73	
Generators	264.79	
Sundry Equipment	352.60	
Radio Equipment	447.19	
Packet Equipment	3141.80	
		6256.87
		11158.97
Less Subscriptions Paid in Advance		13.00
	$	11145.97

Signed: D S Thompson
Auditor 1.3.87

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VK4 WIA Notes

Bud Pounsett VK4QY
Box 638, GPO, Brisbane, Qld. 4001

EXPO 88

At the time of writing these notes the VK4 Division is somewhat in the dark as to our participation in Expo 88. This event will take place in 1988 from April to October, in Brisbane. The site of some 40 hectares is already in preparation and is nearing completion.

Negotiations were started with the Expo Authority in 1984 and, after repeated representations by our Secretary, Theo Marks VK4MU, an interview was finally arranged with Sir Lew Edwards. Sir Lew heads the Authority. A very professional illustrated portfolio was prepared, setting out the potential of amateur radio to Expo and this paved the way to a very encouraging meeting between Sir Lew Edwards on one hand and Theo Marks and John Aarsse VK4QA, on the other.

Sir Lew has promised to recommend to his committee that the Wireless Institute be given several thousand dollars worth of space, and assistance with QSL cards. These should be forthcoming soon, as publicity for Expo around the world. Word is expected to confirm this before this issue is available.

The task lacing the Division is nothing less than enormous. Setting up the exhibit is, relatively, the simple part. Putting a station on the air from the site with a special call sign, VI4XPO (maybe?), will not present any insurmountable problems. The frightening problem is people. Something like four to six people, every day, 10 hours per day for 184 days, are we equal to the task?

Bud VK4QY

ar

VK3 WIA Notes

NEW MEMBERS

The following applications were received for the month of April 1987, and accepted by Council on April 23, 1987. A warm welcome is extended to these members.

Geoffrey Agar VK3BGT, John Boyce VK3AXF, John Buxton VK3XMX, John Hawkins VK3ZLL, Roy Jones VK3CJR, David McFarlane, Paul Shane VK3KPC, Dale Smalley VK3XLN, Trevor Starritt VK3HG, R K W Steedman VK3XRS, David Webster, and Henry Yong.

ar

Magazine Review

Roy Hartkopf VK3AOH
34 Toolangi Road, Alphington, Vic. 3087

G *General*
C *Constructional*
P *Practical without detailed constructional information*
T *Theoretical*
N *Of particular interest to the novice*
X *Computer program*

HAM RADIO — February 1987. Propagation Predictions (X). Diodes — Types and Characteristics (G N). UHF Amplifiers (C)

WORLDRADIO — March 1987. News of Amateur Activities, Marine Mobile, DX Reports, etc (G).

BREAK IN — April 1987. New Soldering Techniques (P N). 1986 SSB Contest Results (G).

CO-TV No 137 — February 1987. News, Information and Circuits for ATV, SSTV, etc (G).

ar

Five-Eighth Wave

Jennifer Warrington VK5ANW
59 Albert Street, Clarence Gardens, SA. 5039

April is always a busy month in this Division and this year proved no exception.

The Clubs' Convention, which was held on the weekend of April 25-26, was well attended with the following clubs represented:

Lower Eyre Peninsula, South East Radio Group, Alice Springs, Lower Murray, Adelaide Hills, South Coast, Elizabeth, Port Adelaide, 2nd Adelaide Scouts, SA ATV Group, ACBRO, and, for the first time, Barossa ARC. Our afternoon speakers this year were even briefer and more informal than previously, if that is possible. Mitch VK5AZM, discussed the Mount Lofty 70 cm repeater, John VK5SJ, spoke about the National Old Timers Club, and Rick VK5KRX, gave a demonstration of audible and sub-audible tone access. It was probably just as well that they were brief as we ran out of discussion time on the Sunday as it was.

Despite our fears to the contrary, we managed to get enough ladies to help with the catering, although one or two more would have made life even easier. Jill Wardrop did an excellent job as our only full time helper, but she was joined at various times by Lorraine Maddern, Joy VK5YJ, and Jann Westerman. We thanked the ladies with a small gift each, but Gill has also asked me to thank those people who did help at various times with washing up, floor sweeping, etc, all of which was greatly appreciated.

Our speaker on Saturday evening was Graham Horlin-Smith VK5AQZ, who showed a video of the many activities which took place during our Jubilee year and spoke a bit about the year in retrospect. We thanked Graham by presenting him with a Jubilee Mug and a brass key ring which read: "Expensive, but worth it!" a sentiment which I felt summed up our feelings. Actually, I had to admit to Graham, that he had proved us all wrong, and, despite our fears to the contrary at various times last year, the Jubilee Activities had not only come out "in the black" but were showing a healthy profit! I would like to thank all those people mentioned, plus the members of Council and anyone else who did anything to make it successful once again.

The following Tuesday night saw us not only holding our AGM, but also celebrating the 10th Anniversary of the Official Opening of the Burley Griffin Building as our Headquarters.

At the Annual General Meeting the following were elected to Council for the next two years — (the positions have been decided since).

Jenny Warrington VK5ANW	President
Don McDonald VK5ADD	Secretary/Vice-President/Alternate Federal Councillor
Hans Van Der Zalm VK5KHZ	Clubs and Country Members Representative
Alan Mallabone VK5NNM	Education Officer and Assistant Membership Secretary
We join	
Bill Wardrop VK5AWM	Treasurer & WICEN Director
Ken Westerman VK5AGW	Membership Secretary
Rowland Bruce VK5OU	Federal Councillor & Vice-President
Dick Boxall VK5ARZ	Immediate Past President
Bob Allan VK5BJA	Public Relations/ DOC Liaison/SATAC Co-ordinator
Peter Maddern VK5PRM	Minutes Secretary

I hope that Hans and Alan will enjoy their time on Council and find it a worthwhile experience.

At the special part of the evening, to celebrate our 10th Anniversary of the opening of the building, an edited version of the video of the original opening ceremony was shown by John Ingham VK5KG, and I would like to thank John for taking the time to edit it and also arranging the large-screen monitor on which it was shown. Many of our invited guests were unfortunately not able to be with us due to illness of one sort or another, but amongst those we were able to welcome back were:
Geoff Taylor VK5TY, Bob Murphy VK5MM, Gerry Preston VK5PI, Keith De Kock, and Ian Hunt VK5QX.

The showing of the video was followed by a special supper and I would like to thank Gill Wardrop, Lorraine Maddern and Joy VK5YJ once again for their invaluable assistance. Joy also organised a delicious Birthday Cake with 10 candles, which were blown out, and the cake cut, all with due ceremony.

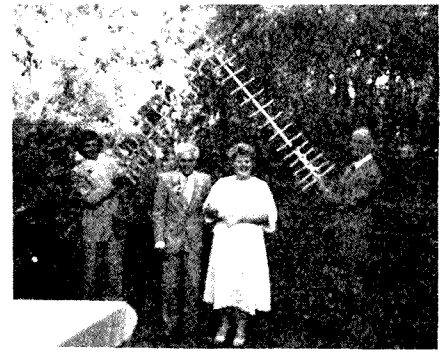
Jenny VK5ANW cuts the cake at the celebrations to mark the 10th Anniversary of the Opening of the Burley Griffin Building (Headquarters of the VK5 Division). Joy VK5YJ (left of Jenny) organised the cake.

Steve VK5AIM and bride Sue, cut the cake.

I may not have been an official function, but I was very pleased to be present, on Saturday May 2, at the wedding of Steve Mahony VK5AIM (our Disposals Officer and sometime Auctioneer), and the *former* Sue Cocceti. Tony *Chapman* VK5JJ was the Bestman, Steve's daughter, Pam, was the Bridesmaid, and there were five or six amateurs amongst the guests, so perhaps it was not surprising when, after the Ceremony, a Guard of Honour was formed by Rob Gurr VK5RG and Tony holding "Crossed Yagis."

We wish Steve and Sue all the best for their future together.

Steve VK5AIM and bride Sue sign the Marriage Certificate watched by Steve's daughter Pam (Bridesmaid) and Tony VK5JJ (Bestman).



Bestman, Tony VK5JJ (left) and recently retired DOC State Manager, Rob VK5RG, provide a guard of honour at the wedding of VK5 Disposals Officer, Steve VK5AIM and his bride Sue, in May.

AUGUST MEETING

We hope to have a very special speaker from overseas for our August meeting — keep listening (and watching) for more information. In the meantime, ensure you keep August 25 free.

MORE JUBILEE 150 AWARDS

1384	KX6BF 1st Marshall Island
1385	G4BNB
1386	VK6AEM
1387	VK6KBE
1388	ZF1RC 1st Grand Cayman
1389	YC9BMU
1390	YC7ZAC
1391	YC0MED
1392	ZL1AXV

ar

Over to You!

Any opinion expressed under this heading is the individual opinion of the writer and does not necessarily coincide with that of the publisher.

MUCH APPRECIATED

We are pleased to note that the excellent standard of *Amateur Radio* magazine has been maintained over the years and urge all involved to keep up the good work as it is very much appreciated.

Thank you,

The Urunga Radio Convention Committee
PO Box 433,
Coffs Harbour, NSW. 2450.
ar

OF GENERAL INTEREST

Following is a copy of a letter from the Department of Communications, Canberra, received by me.

I believe this letter should be published in the interests of amateur radio.

73,

Ken Richards VK3CKK,
2/15 Nelison Street,
Bayswater, Vic. 3153.

Dear Mr Richards

I refer to your letter seeking reconsideration of the conditions recently advised in relation to soliciting by amateurs for Third Party Traffic (TPT).

Decisions taken in connection with the amateur radio service cannot be made in isolation from the demands of other radiocommunications users and private network operators in general. To allow amateurs to solicit to carry TPT, except in emergency circumstances, could set a precedent for policies involving other radiocommunications users. I must therefore re-affirm the Department's previous advice that amateur operators can only solicit for messages as an aid to providing TPT communications in a declared emergency situation or natural disaster.

You may be assured that the Department is very conscious of the valuable contribution made by dedicated amateurs in times of emergency. This restriction on soliciting, however, does not detract from the ability of the Amateur Service to carry TPT messages and I believe is in the best interests of the amateur fraternity when the primary purpose of the amateur service is taken into account.

Your sincerely,

Signed: D HUNT,
Manager Regulatory,
Operations Branch,
Radio Frequency Management Division
Canberra.
April 28, 1987.
ar

GOOD CUSTOMER RELATIONS

Over the years there has been several letters to the Editor *Over to You* published which slate some of the advertisers in *Amateur Radio* and elsewhere for some shady practices. It is more often dissatisfied customers who write letters of complaint and issue warnings to others where people are less inclined to write letters of a complimentary nature.

I wish to relate one such excellent customer relations exercise which occurred recently.

In July 1983, on a very rushed business trip to Sydney, I visited "Emtronics" with the intention of purchasing a CW filter for an FT101. At that time, unfortunately, I didn't have with me the technical information (eg frequency, etc), so had to rely on the company's advice that the filter was okay. On returning to Auckland after checking the manual, I discovered that the filter was for the FT101Z and not for the FT101.

As I travel to Sydney from time to time, I decided to return the filter on the next visit however, the opportunity didn't again arise until April 1987.

A lapse of some four years had occurred and I was unable to locate the original receipt. The situation was explained to the Emtronics staff. The filter was gladly accepted back and exchanged for another electronic item for the shack.

As the gap of some four years had occurred since the original purchase I had expected and would have accepted a point blank refusal, especially as I has lost the original proof of purchase.

To me this is what good customer relationship is all about, a more than satisfied customer. I must without qualification give them a well earned 10 out of 10.

Thank you Emtronics.

Yours faithfully,

David A R Rosan ZL1AFQ,
PO Box 65-147,
Mairangi Bay,
Auckland 10, New Zealand.
ar

THE FUN OF DXING

DXing is like deep sea fishing, you never know what will come up next.

I recollect a J-station who did not want a QSL card. Another USA amateur who claimed an antenna on a hill 700 feet (213 metres) high using coaxial cable 600 feet (182 metres) long. He apparently lived in a valley and had a fairly good signal.

On another occasion I had a QSO with three J7-stations, worked on three different frequencies on 15 metres at different times in the morning and the same town, surely a coincidence. An amateur in Israel was using a tower 150 feet (45 metres) tall and had a good signal.

Finally, there was the amateur in Florida whom I QSOed on 15 metres and after a long contact he began to drop-out. He made some remarks about the wife which I queried twice, still couldn't understand, so gave him my 73 and commenced a contact with a fellow amateur on a two-metre sched.

My wife called out to say I was wanted on the phone. I said to tell them to hold on, but she called out that it was America so I rapidly went to the phone. It was the amateur from Florida to explain what he had said about the wife, not to send a card as he would write and went off after sending his best. What next!

Lately, 20 metres has been kind to us. I would beseech those keen VKs when calling CQ to first check the frequency in use before engaging in long calls and interrupting others working on the band. Please do not spoil the fun!

Regards to all.

J Brinkman VK2IS,
61 Gundagai Street,
Coffs Harbour, NSW. 2450.
ar

OLD PIECE OF GEAR

This sketch is of an old piece of radio gear that I have recently bought, which may be of interest to others. Is is a variable inductor, beautifully made of moulded bakelite. It came in the original box with mounting instructions and had not been used. I thought about using it for an antenna tuner of some sort for receiving only. I have an FRG7 receiver, but the pre-select does nothing for 0-500 kHz reception as the receiver was not designed for reception below 500 kHz, although many beacons can be heard "down" there.

Whilst experimenting with the old variometer and connecting it in series with my wire antenna, I was surprised to hear the beacons below 500 kHz become much louder and, with better selectivity when the inductor was tuned. I was very impressed that an old piece of radio gear could make such a difference to a modern set.

Yours sincerely,

Dave Mann VK3DBJ,
94-96 Felix Crescent,
Ringwood, Vic. 3134.
ar

NOVICES ON TWO-METRES

I am of the opinion that nobody should be given any privileges without passing the appropriate examinations.

Would you not agree that when someone has done his or her study and passes the exams that the chances are that they will appreciate the privileges much more and by doing so creating better amateurs at the same time.

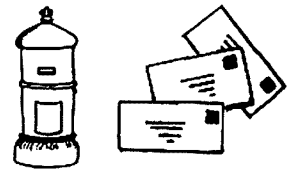
Where is all this going to end?

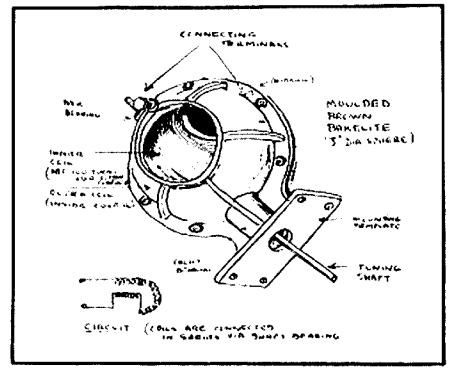
The next thing to happen is Limited Operators asking for the whole 20-metre band.

Of course I would be against that too.

The qualifications to become an amateur has to be kept up at all times. There is no way you can force anyone to obtain his or her licence. One has to be interested in the hobby otherwise the "quality" of operators will suffer.

G Elijzen VK2XMM,
9/22 Putland Street,
St Marys, NSW. 2760.
ar





Sketch of a Radio Variometer.
The year of manufacturer is unknown, however it was made by Gilfillan Bros Inc, Los Angeles, New York and Kansas City.

SINCERE THANKS

The *Traveller's Net* can be heard on 14.106 MHz daily at 0300 UTC, and having been using it to keep in touch with VK3BII, I can recommend it to anyone travelling.

I would like to thank VK3s KV, PN, YK, UX; VK5s FV, ARM; VK6s BO, YE and, last but not least, ART. I am sure that anyone travelling could receive news from home if messages were left in Melbourne with Arthur VK3UX, Adelaide Richard VK5ARM, and Perth Arthur VK6ART.

C James Pope VK3DPO,
23 Ayr Street,
Doncaster, Vic. 3108.
ar

IT'S A SHAM!

I have taken *Amateur Radio* for several years and I have enjoyed it greatly. I very often quote from it when selecting material for our Amateur Radio News Service Bulletin. It is excellent.

On page 54 of the January 1987 issue, there is an article relative to the origin of the word "Ham." We have been trying for several years to halt this information because it is a pure sham!

The ARRL, many years ago investigated this story. No record has ever been found of such a meeting in the records at the capital. Further, the ARRL found that the word "Ham" had been used for an amateur radio operator many years previous to 1911 when this meeting is supposed to have been held.

I would suggest that, if you wish, contact the ARRL who will corroborate the above.

Sometimes a sham goes all over the world once it gets started! How about sending those cards to

the fellow in Great Britain? He was inundated with cards, but it turned out to be a pure sham!

Probably 40 years ago I wrote an article "Beware of a radio amateur for he is a strange being possessed of many devils" as the start. A YL/YF organisation in South Africa reprinted it but gave no source. It was reprinted all over the world with credit given to them, not me!

Oh, well! Keep up the good work, you are doing excellently.

73,

Amateur Radio News Service,
Ralph V (Andy) Anderson K0NL,
Editor,
528 Montana Avenue,
Holton, Kansas 66436, USA.

ar

HF BEACONS

Most amateurs by now will be familiar with the beacons on 14.100 MHz, using a single frequency time sharing system. Also, most would know of the 28 MHz beacons and the proposal to group them into 28.190 to 28.199, with a world-wide timer sharing network on 28.200 MHz.

However, how many are aware of the expansion of the International Band Plan on 21 MHz? This is to be undertaken after consideration by the HF Working Group of Region 1 (Europe) and the nominated frequency is 21.150 MHz. So, be warned now, you could be asked to QSY because you are on or near a beacon frequency. I have not seen any comment from our Region 3 organisation on this subject.

Neil Penfold VK6NE,
2 Moss Court,
Kingsley, WA. 6026.

ar

NON-RENEWAL OF WIA MEMBERSHIP

I am very concerned about the tenor of your editorial in the May 1987 issue of AR. My impression is that you do not believe the 1000 individuals who did not renew their WIA membership for 1987 when they say "the cost was more than they could afford."

I also suggest that there is an insignificant minority of the 1000 who do not wish the WIA to represent our amateur radio interests. In fact, I believe that the high cost of membership is now a valid reason for non- renewal.

We all know that our general living expenses are now increasing at a greater rate than our incomes, whether we are pensioners or wage and salary earners and it is becoming harder to manage family and personal budgets.

This is not the forum to discuss the reasons for this change in fortune but, suffice to say, I now believe that the cost of WIA membership is too high for some individuals.

In such financial circumstances, we all have to make priority decisions on where we can spend our cash. The first to go are the non-essential expenditures and, no doubt, some of our previous WIA members have, of financial necessity, decided not to renew their membership.

In my own case, I have deferred or abandoned some projects/activities in my amateur shack because there are now other priorities for which I must allocate my spare or "hobby" cash. I have deferred my intended experiments in packet radio because I am loathe to spend the $300 plus at this time for the hardware and software required to get going on packet radio. However, I hope I can proceed with these experiments prior to the end of 1987! It is quite possible that by the end of 1987, my WIA membership renewal may be included in my "non-essential" expenditure which may be cut from my 1988 budget!

Therefore, I think it is time for FE to make some hard decisions to minimise further loss of members, and avoid the inevitable financial collapse for which there are clear warning signs.

My first suggestion is to cease publishing *Amateur Radio*. We could replace this with a two or three page bulletin sent to members, say each quarter. This would be produced in the WIA Federal Office and contain all necessary policy items, important extracts from FE minutes of meetings and correspondence with DOC etc. This would result in a dramatic reduction in the annual membership fee. This is a very painful suggestion, but it is clear that the excellent AR magazine is no longer financially viable, in spite of the large voluntary effort that goes into its production and distribution.

My second suggestion is even more important. The WIA should immediately cease negotiations with DOC to take over responsibilities for conducting amateur certificate examinations. This is not and never has been a function that should be taken over by a non-Government organisation such as the WIA.

Under the ITU Conventions which Australia has signed, DOC has been charged, inter alia, with the responsibility of licensing amateur radio operators and looking after their interests. It is clear that DOC is seeking to abrogate (not devolve) its responsibility to conduct amateur radio examinations, for which it charges a fee for service anyway. If DOC succeeds in unloading this function, I would expect some compensating reduction in my annual amateur licence fee of $26. If there is no reduction, I am entitled to ask "What is DOC doing with the money?" If there is no satisfactory explanation forthcoming, I always have the option of advising the Minister of Communications through my local Federal MP, that I will be expressing my opinion of his Department in the ballot box at the next Federal election!

Yours faithfully,

W D Verrall VK5WV,
7 Lilac Avenue,
Flinders Park, SA. 5025.

ar

As a fully paid up member of the WIA, I feel qualified to comment on your editorial in the May issue of AR. I have not been a radio amateur for very long but have quickly developed a passion for the hobby. My own particular financial circumstances dictate that the demands of three young children at primary school, a mortgage, etc, take precedence over my desires to achieve "state-of-the-art" in radio technology. My immense enjoyment is solely derived from a pre-loved FT101B, a home-brew QRP (thank you Drew Diamond) and three wire dipoles at 30 feet. I can sympathise with others in a similar position who find it hard enough to find the annual licence fee, never mind the WIA subscription.

In my spare time I have started a radio club at the school where I teach and been involved in running a JOTA station. I know only too well that the barrier these interested youngsters meet is financial. Parents are only too keen to finance a computer to assist their children's education but see little worth in helping to buy a transceiver. If it is the true desire of the Institute to attract and encourage new blood into the fraternity and achieve a representative membership, it is high time the financially secure considered those in a different position.

Might I suggest that the membership subscription be purely nominal, say $5 per annum — hopefully enough to cover the costs of registration. Thereafter, members to subscribe to a range of other services such as the journal, *Amateur Radio*. Surely it is highly desirable that many more amateurs join the WIA even if they look over someone else's shoulder to read AR. With increased membership, the negotiating stance of the organisation would be enhanced and it could truly call itself a representative body. Additional services could be offered particularly attractive to the young and less financially secure. How about each State running a surplus parts pool? I'm sure a garage somewhere could be used to store and recycle all those surplus goodies sitting redundant in the junk box. As an option, members could subscribe to a quarterly newsletter listing items that could be theirs for a nominal service charge an the return postage.

WIA Executive, what is needed is a great deal of lateral thought and not an attempt to shame and embarrass those whose financial situation precludes them from the organisation. The public at large needs re-assuring that amateur radio is a hobby for all regardless of race, colour, creed or bank balance.

Yours sincerely,

Steve Curtis VK3CAX,
13 Barakee Drive,
Somerville, Vic. 3912.

ar

Your May Editorial was no doubt interesting to those who read it, but how many of the "offenders" do you really think would read it and react favourably?

I would suggest that a more positive approach be made to those people by the WIA, and journal space be devoted to more important factors which are eroding amateur radio and hence WIA membership.

Why are an alarming number of members failing to renew subscriptions? In my opinion they are disillusioned re the present scene. Amateur radio was established as a scientific hobby. Today it is becoming a farce.

For instance, what is being done to combat the policies and tactics of the manufacturers, retailers and advertisers who are "ripping us off" with the promotion of "black boxes" and denying us the supply of certain components required to construct projects presented in the journal?

What is being done at basic operator-training level to educate aspiring operators in simple factors pertaining to "human-relations; and "on-air" behaviour? I could go on and on to list many more factors which are degrading amateur radio.

Our hobby is being corrupted by commercial interests and selfish ignorant people. None the less it will continue long after any possible demise of the WIA. If you wish amateur radio to continue and members to remain financial please fire a heavier salvo with the medium at your disposal.

There are probably thousands of members sharing my concern re this matter. It is not simply a case of "How much is the Wireless Institute worth?" It is a case of "How much is amateur radio worth?"

Restore amateur radio to its original concept and the "black sheep" will flock back to the treasury to once again enjoy the journal, other WIA facilities and the true spirit of amateur radio.

Yours faithfully,

Maurie Dewhirst VK5PMD,
4 Hawke Street,
Linden Park, SA. 5065.

ar

EXCELLENT SUGGESTION

With reference to AR, May 1987, the following comments:

1. Page 47, *Pounding Brass*, excellent suggestion Gil, but a low licence fee should be applicable, if only to prove "the value for money" they are getting.
2. Page 51, *Frequency Hopping*, I am sorry, but the RSA (Republic of South Africa) Armed Forces were one of the first, if not the first, to employ this method of communications. The first I read about it was some seven or eight years ago.
3. Pages 1-64, very interesting issue, keep it up.

73 de

John Aarsse VK4QA,
PO Box 211,
Nambour, Old. 4560.

ar

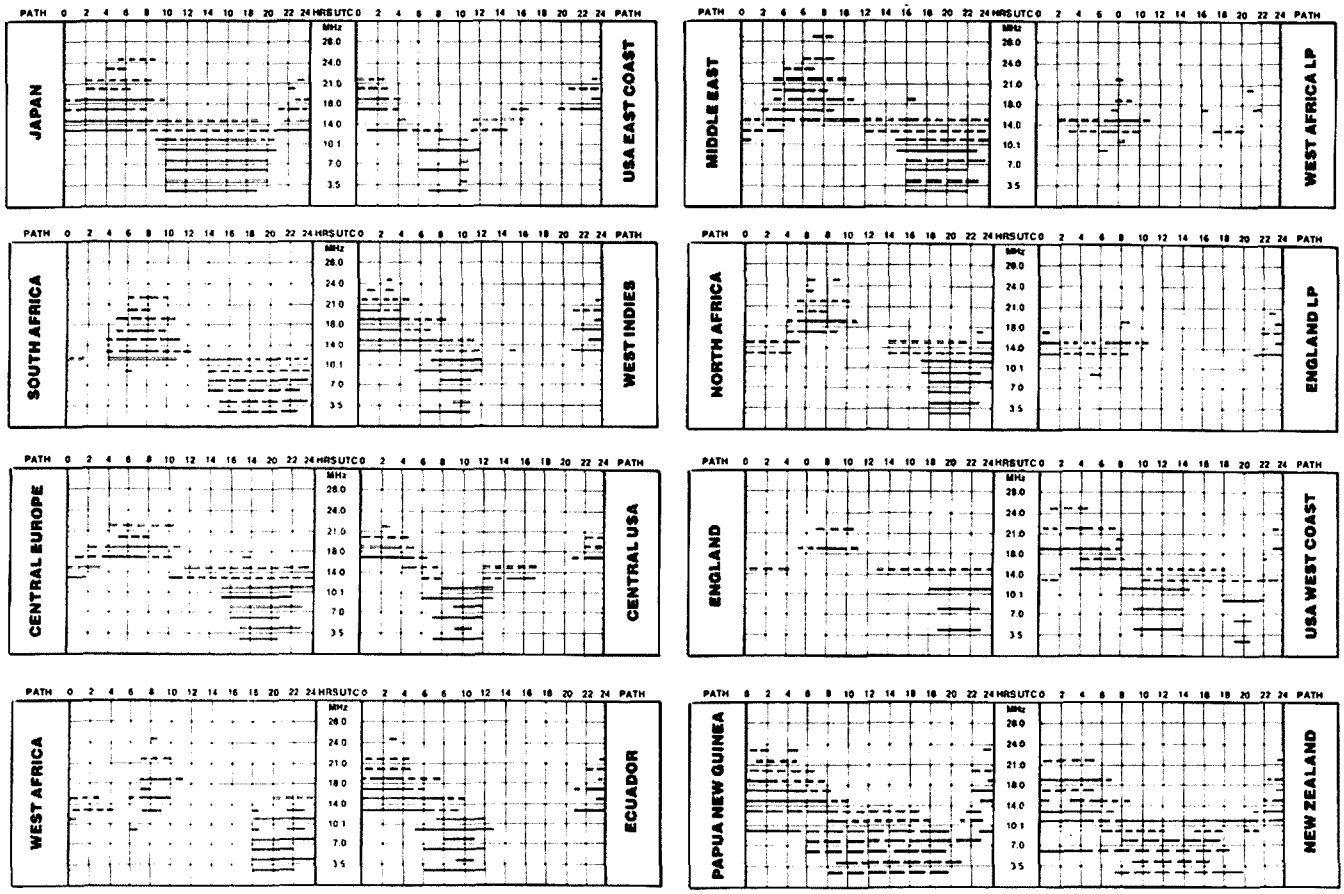
Silent Keys

It is with deep regret we record the passing of —

MR I S GRAHAM	VK4QO
MR B E HARDINGE	VK3TA
MR T D LACKENBY	VK2BOQ
MR A R S ANDERSON	L40137
MR RAY JONES	VK3RJ
MR DONALD LONGFIELD	L30516
MR G W MALLOWS	VK3AWM

Ionospheric Predictions

Len Poynter VK3BYE
14 Esther Court, Fawkner, Vic. 3060



LEGEND
From Western Australia (Perth)
From Eastern Australia (Canberra)

Mixed mode dependent on angle of radiation (long broken lines).

Better than 50% of the month, but not every day (continuous lines)

All paths unless otherwise indicated; lie LP = Long Path) are Short Path.

Less than 50% of the month (short broken lines).

Predictions are presented courtesy of the Department of Science, IPS Radio and Space Services, Sydney.

Solar Geophysical Summary —MARCH 1987

QSP

SOLAR ACTIVITY

Solar activity was low with no energetic flares being observed, though an important type was observed on the 13th. The sun was without spots on 12,13 only. At other times, there were a number of small sunspot regions visible on the solar disc.

The 10 cm flux values ranged from a low on 70 (12,13th) up to a high of 78 (8th). The monthly averaged value was 74, the highest since November 1986, reflecting the increase in the number of days with visible sunspot regions.

The abundance of 'new cycle' regions in the last few months make it very likely that we have already passed the solar minimum. If so, then it is likely that the minimum occurred in October or November last year. The yearly averaged value sunspot number for September 1986 was 12.4. The yearly averaged value should again drop in October and perhaps November. The monthly average sunspot number was 14.8, the best also since November 1986.

GEOMAGNETIC ACTIVITY

March was more disturbed than recent months with a number of disturbed days. Most were fairly weak; the most disturbed day was the 27th when the A-index reached 25.

Solar activity increased quite dramatically over the period April 5 to 24 with the 10 cm flux figures reaching 101 on the 11th. Band conditions were extremely good for over two weeks going down after the 24th.

—Extracted from Solar Geophysical Summary as supplied by the Department of Science IPS Radio and Space Services

ar

COMPUTER HAND SIGNALS

SOME PEOPLE LIKE to talk with their hands. Now you can use your hands to talk to your computer, using an electronic glove and ultrasonic sound.

The theory, apparently, is that the hand is quicker than the mouse, the small roll-around devices that correspondingly move a pointer on the computer screen. When you are pointing to what you want, a click of a button triggers it.

The new glove is wired with sensors that can tell when each finger clenches, and with two ultrasonic transmitters, like those used in many television remote controls. A receiver attached to the computer can follow the position of the glove in three dimensions.

The *Z-Glove* is available in three sizes for left or right hand use. The first model was only available for Commodore 64/128 versions, but an IBM PC version is believed to be coming.

Perhaps some day, this will be the only way to beckon our robot dogs! ! !

—Adapted from Gernsback's Outlook, February 1987

MORSEWORD SOLUTION

	1	2	3	4	5	6	7	8	9	10
1	—	•	•	•	•	—	•	—	•	•
2	•	•	—	•	•	—	—	•	•	•
3	—	—	•	—	•	•	•	—	•	—
4	•	•	—	•	•	•	—	•	—	•
5	•	•	—	•	•	•	•	•	•	•
6	•	•	—	•	—	•	•	—	•	•
7	—	•	—	—	•	•	•	•	—	—
8	•	—	—	•	•	•	—	—	•	•
9	•	•	—	—	•	—	—	—	•	•
10	•	•	—	•	•	•	•	•	•	—

Across: 1 bend 2 fade 3 mask 4 fur 5 uses 6 earl 7 twist 8 wipe 9 image 10 fist
Down: 1 cide 2 used 3 root 4 fear 5 sins 6 give 7 alp 8 cap 9 vies 10 fix

DEADLINE

All copy for inclusion in the **September** 1987 issue of *Amateur Radio*, including regular columns and Hamads, must arrive at **PO Box 300, Caulfield South, Vic. 3162, at the latest, by 9 am, July 20, 1987.**

Hamads

PLEASE NOTE: If you are advertising items FOR SALE and WANTED please write ***each*** on a separate sheet of paper, and include all details; eg Name, Address, Telephone Number, on both sheets. Please write copy for your Hamad as clearly as possible. ***Please do not use scraps of paper.***

- Please remember your STD code with telephone numbers
- Eight lines free to all WIA members. $9.00 per 10 words minimum for non-members
- Copy in typescript, or block letters — double-spaced to ***Box 300, Caulfield South, Vic. 3162***
- Repeats may be charged at full rates
- QTHR means address is correct as set out in the WIA current Call Book

Ordinary Hamads submitted from members who are deemed to be in the general electronics retail and wholesale distributive trades should be certified as referring only to private articles not being re-sold for merchandising purposes.

Conditions for commercial advertising are as follows:
$22.50 for four lines, plus $2.00 per line (or part thereof)
Minimum charge — $22.50 pre-payable

Copy is required by the Deadline as indicated on page 1 of each issue.

TRADE ADS

AMOON FERROMAGNETIC CORES: Large range for all receiver and Transmitting Applications. For data and price list send 105 x 220 mm SASE to: **RJ & US IMPORTS**, Box 157, Mortdale, NSW. 2223. (No inquiries at office . . . 11 Macken Street, Oakley). Agencies at: Geoff Wood Electronics, Lane Cove, NSW. Webb Electronics, Albury, NSW. Truscott Electronics, Croydon, Vic. Willis Trading Co, Perth, WA. Electronic Components, Fishwick, Plaza. ACT.

WANTED — NSW

FC-707 ANTENNA COUPLER: FV-707DM Digi VFO. Frequency counter late model, no kits please. Valve type GDO. Data & reference books on Ics, transistors, PLL chips, late model 35 MHz dual beam CROs. Items would have handbook & be in 1st class cond. A Walsh L20181, OTHR. Ph:(048) 61 2092.

HANDBOOK/WORKSHOP MANUAL: for the FTDX-400. Also Yaesu FT- 101 or FT-77. Price & particulars to VK2DLM, QTHR. Ph:(075) 36 5868.

VK2WI REQUIRES 810 TRIODES: as spares for the AM HF Txs. See VK2 Minibulletin notes for more details.

WANTED — VIC

CHEAP HF LINEAR: Old commercial such as FL-1000, FLDX-2000, FL-2100, *etc*, or *home-brew multi or mono* band unit working or not. Anything capable of 400 watts considered. Will collect SE Australia. All replies answered. Steve Jenkinson VK3YH, *c/-* Post Office, Leitchville, Vic. 3567.

KENWOOD TS-120V HF TCVR & MANUAL: Reasonable price paid for good unit. VK3CXP, QTHR. Ph:(03) 366 5060.

WANTED — QLD

EX-SERVICEMAN RESTORER: requires 2 volt valves for Army 62 set CV1331 (APR12, VP23) CV1306 (AR8, HL23DD) CV65 (PEN25). Also 7700 kHz crystal for Air Force AR17 receiver & manuals for BC348 & BC639 US Air Force Receivers. VK4EF, QTHR. Ph:(07) 38 1803.

IC-740 MOBILE TCVR: or similar in top condition. Details to John VK4SZ. Ph:(070) 61 3286.

WANTED — SA

MINI-PRODUCTS HOI HYBRID QUAD MINI-BEAM: in working condition. Reasonable price. Also rotator to suit but not essential. Bill VK5NWL, QTHR. Ph:(08) 255 6976.

WANTED — WA

YAESU MUSEN FT-7 OR FT-7B HF TCVR: in working order. A Benbow VK6NSX, *c/-* PO Karridale, WA. 6288 or Ph:(097) 58 5527 between July 3-20. After July 20 Ph:(095) 25 1275 in the evening please.

WANTED — TAS

NETWORK ANALYSER ACCESSORIES: for GR model 1710. P2 transmission reflection bridge 50 Ω, P5 immittance probe, Pi transmission tee, 1 coaxial line U-shape with GR874 locking connectors 2 inches long. 3 coaxial lines (as above) with built in 14 dB pads. Plus various terminations, pads & lines, etc. Trevor VK7TB, 9 Norfolk Street, Perth, Tas. 7300. Ph:(003) 98 2118 (BH) or (003) 24 4289 (AH).

TAIT 196: Circuits, manuals, tune-up data, parts, etc. for Tait T-196 UHF tcvr & Telair car phone. Rick L30350, QTHR. Ph:(004) 96 1240.

FOR SALE — ACT

YAESU FRG-7700M: 50 kHz to 30 MHz, all options; FM, VHF, memories, antenna tuner. $850. Yaesu FT-290R, all options; cradle, scan mic, desk mic, nicads, port case. $450. Kenwood TR-2500, all options except mobile stand. $450. IDS-60 RS232 break-out box. $160. Osborne Executive, 128k, CP/M 3-plus, tons of S/W inc DBASE 11, modem progs, $1800. Brother HR 25 daisywheel printer, cut sheet & tractor feeders, 3 char sets. $1300. All as new & with all manuals. VK1ZVR. Ph:(062) 58 9333.

FOR SALE — NSW

COAXIAL CAVITY FILTERS: 4 TCA brand, high band VHF What offers? VK2DLI, QTHR. Ph:(049) 32 6311.

ICOM PS-20 POWER SUPPLY: with internal speaker, 13.5V ■ 20 amp. Excellent condition very little use. $200. KW Electronics multi-band dipole all-weather traps. $60. Assorted 2m & 70 cm 6, 12 & 17 element Yagis built to NBS specs. Offers? Larry VK2EOY. Ph:(02) 949 3124.

KENWOOD TS930S TRANSCEIVER: fitted with YG-455N-1 250 Hz CW filter. Excellent condition. $2100 ONO. BNOS 25 amp (continuous) power supply with 30 amp meter $225. Green screen 12 inch VDU (Hitachi) $100. Owner returning to UK. George VK2EZA/G6VS, 12 Selwyn Avenue, Cambridge Gardens, NSW. 2750. Ph:(047) 30 1666.

SWAN 500C & P/S: Linear amplifier pair 813. Valves 6HF5, 813, 7360, 6GK6, 6LQ6/6MJ6. Buyer to collect. VK2TG. Ph:(02) 651 3006.

YAESU FT-101Z: modified digital, fan, mike, service manual & spare valves. $550 plus freight. Jim VK2IS, QTHR.

FOR SALE — VIC

ICOM IC-271A 2 METRE ALL-MODE TRANSCEIVER: 32 memories C/W instructions in box, 25W output $1000. Mirage linear amp 2 metre all-mode 160W output 16 dB preamp. $400. R-1000 Kenwood communications receiver digital display 200 kHz-30 MHz. C/W instructions & service manual. 240 VAC- 12 VDC. $450. Ph:(03) 786 7902.

KENWOOD R-1000 GENERAL COVERAGE COMMUNICATIONS RECEIVER: 200 kHz-30 MHz range, AM (wide & narrow), SSB, LSB &CW, quartz clock. Ex cond $350. Valves. 6BZ6, 12AT7, many others $2 ea; 4x6146B (new) $7 ea; 4x4CX250B, $40 each new. AWA carphone junior installation & 20W FM. MR20A carphone instruction *books. Skyphone VC-10 transceiver* handbook. AWA carphone base station test power unit w cables, good cond. Best offer. 'Ham Radio' magazines 1968-1985; '73' 1965-1974 period incomplete; 'QST' 1960- 1968 period a few issues; 'CQ' 1959-1970 almost complete; 'VHFer' 1965-1967; Australian Call Books /58-/66. Best offer. All GC. Ph:(055) 62 6016.

REALISTIC *PRO-2020 VHF/UHF* SCANNING RECEIVER: 20 memories. VHF — 30-50/108-136/138-174 MHz. UHF — 410-512 MHz AM-FM. Very good condition. $300. John L30479, QTHR. Ph:(058) 21 0846 AH.

SHACK CLEANOUT: Pair of 3-1000Z, pair 4-250, pair 4-125 valves. All new & with sockets to suit. Four 6JE6C (6LQ6). Many other new & used valves. Home-brew HF linear using four 811As, not working. HT plate transformer, centre taped 3.5 kV, 2 kV, 2 KVA, new. Many roller inductors, wide spaced air variable capacitors, etc, etc. VK3DBB, QTHR. ph (059) 41 1351 AH.

TANDY LCD POCKET TV VHF/UHF: Also ideal as video monitor, ex cond $200. 4 channel pocket scanner, VHF/UHF Good cond. $90. DX-100 analogue comms receiver. Good cond. $60. Sanyo BCST HF receiver. Good cond. $50. Station Master vertical antenna. $60. Darrin. Ph:(03) 877 2412.

VZ-200 RTTY DECODER KIT: (Dick Smith) $30. Ian VK3CH, OTHR. Ph:(03) 329 6949.

YAESU 207R HAND-HELD: C/w Yaesu NC3 fast pulse charger (auto cut-out). PA2 DC power adaptor for mobile & brand new FNB2 nicad pack. External hand mic. Original packing & manuals. $290. VK3XV. Ph:(03) 555 6281 after 5 pm.

FOR SALE — QLD

DRAKE C-LINE R4C & T4XC: Full coverage capability receiver, amateur band transmitter. Very reliable rig in good condition, with many features found on more modern sets, including dual VFOs, notch filter, etc, manuals. $550. John VK4SZ, QTHR. Ph.(070) 61 3286.

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FOR SALE — WA

YAESU FT-101E: with 27 MHz. $240. Lindsay VK6ZID.

Advertiser's Index

Coaxial Cable Specials

Low Loss VHF/UHF Cables

Description	Trade & U.L. Type Number	AWG (Stranding) Dia. in In. Nom. D.C.R.	Insulation & Nominal Core O.D. Inch	Insulation & Nominal Core O.D. mm	No. of Shields & Material Nom. D.C.R.	Nom. Imp. Ω	Nom. Vel. of Prop.	Nominal Capacitance pF/ft.	Nominal Capacitance pF/m	Nominal Attenuation MHz	Nominal Attenuation db/100 ft.	Nominal Attenuation db/100 m
	**9913** 80C	9½ (Solid) .108 bare copper .90Ω/M' 2.95Ω/km	Semi-solid Poly-ethylene 285	7.24	Duobond II* + 88% tinned copper braid 1.8Ω/M' 6.0Ω/km 100% shield coverage	50	84%	24	78.7	50 100 200 400 700 900 1000 4000	0.9 1.4 1.8 2.6 3.6 4.2 4.5 11.0	3.0 4.6 5.9 8.5 11.8 13.8 14.8 36.1
						Black PVC jacket.						

BELDEN 9913 low-loss VHF/UHF coaxial cable is designed to fill the gap between RG-8 to RG-213 coaxial cables and hall-inch semi-rigid coaxial cable. Although it has the same O.D. as RG8/U coaxial, it has substantially lower loss, therefore providing a low-cost alternative to hard-line coaxial cable. Your special price from ACME Electronics is only $4.84 per metre.

BELDEN Broadcast Cable RG-213/U MIL-C-17D is only $5.23 per metre, or BELDEN 22385 YR Commercial Version RG213, the same specification as 8267, for only $2.14 per metre. *Prices do not include Sales Tax.

For more information about the above, or any other BELDEN cable, simply contact our resident amateur radio operator, Colin Middleton (VK3LO) or our sales department.

Coaxial Cables

Description	Trade & U.L. Type Number	AWG (Stranding) Dia. in In. Nom. D.C.R.	Insulation & Nominal Core O.D. Inch	Insulation & Nominal Core O.D. mm	No. of Shields & Material Nom. D.C.R.	Nom. Imp. Ω	Nom. Vel. of Prop.	Nominal Capacitance pF/ft.	Nominal Capacitance pF/m	Nominal Attenuation MHz	Nominal Attenuation db/100 ft.	Nominal Attenuation db/100 m
 **RG-213/U MIL-C-17D**	**8267**† UL 1354 60C	13 (7x21) .089 bare copper 1.87Ω/M' 6.1Ω/km	Poly-ethylene .285	7.24	Bare copper 1.2Ω/M' 3.9Ω/km 97% shield coverage	50	66%	30.8	101.0	50 100 200 400 700 900 1000 4000	1.6 2.2 3.2 4.7 6.9 8.0 8.9 21.5	5.2 7.2 10.5 15.4 22.6 26.3 29.2 70.5
						Black non-contaminating PVC jacket.						

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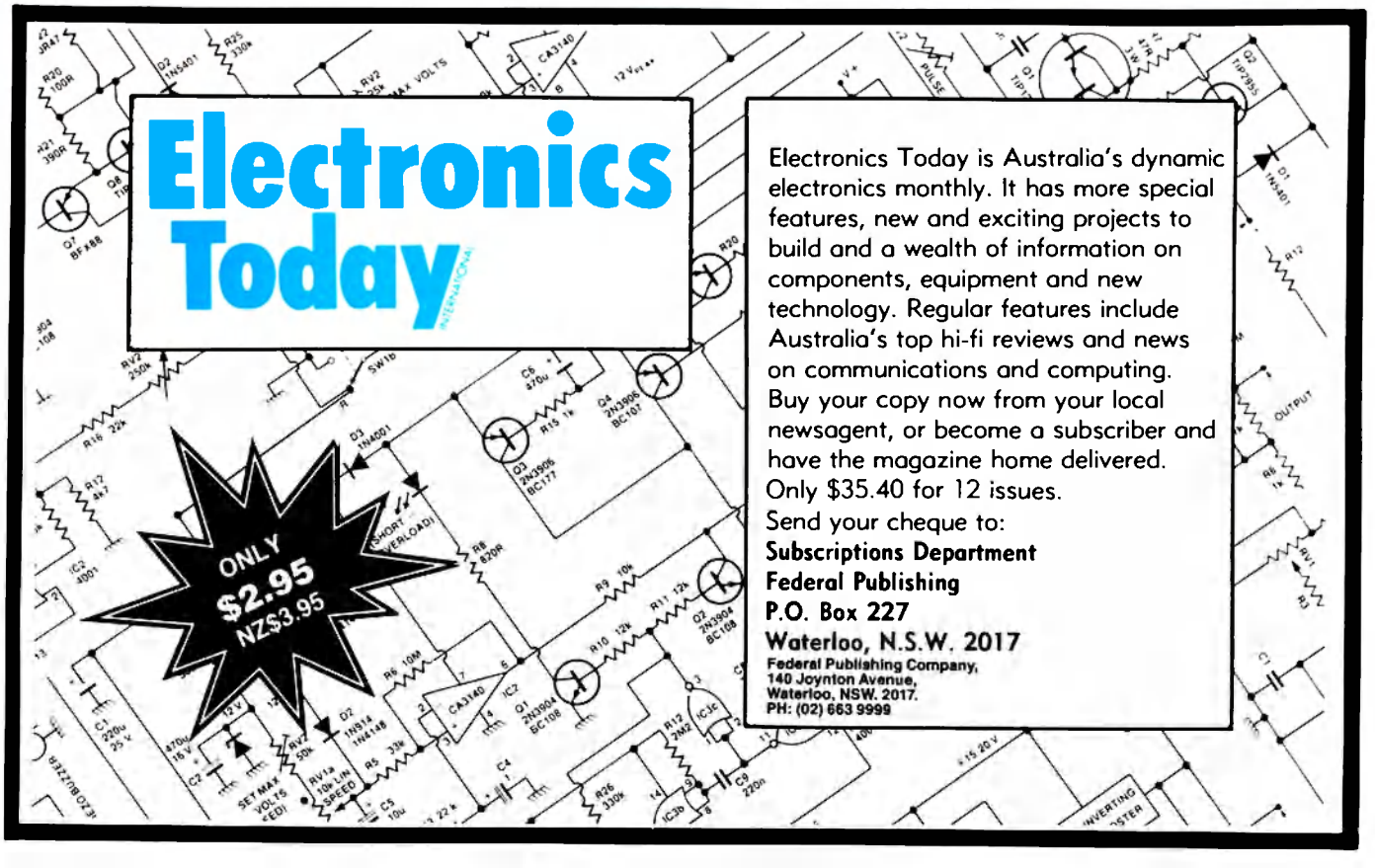

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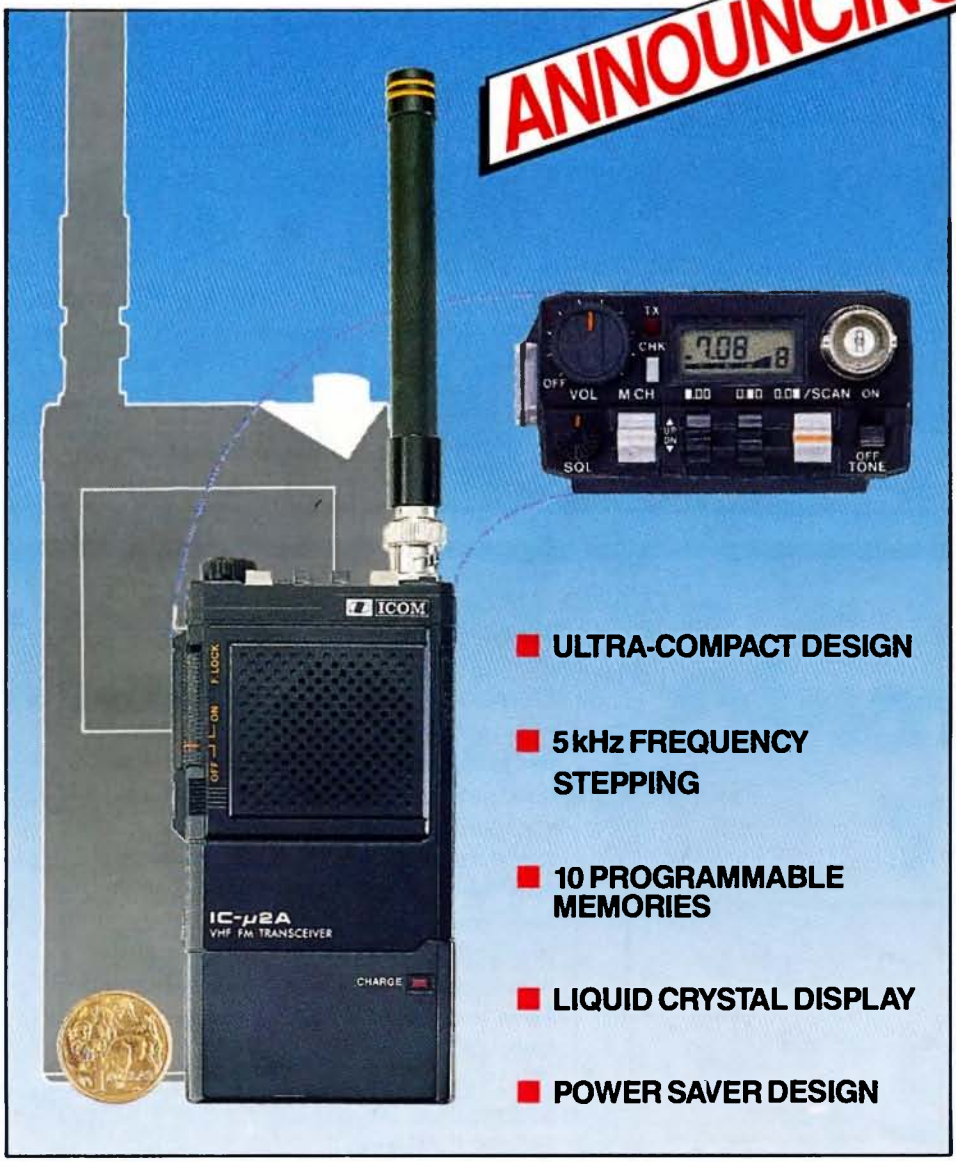
ANNOUNCING THE NEW



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A Pocket-Size Masterpiece. This small, lightweight, ultra-compact handheld transceiver is designed for ultimate ease of operation and convenient portability, but without compromising the traditional high standards of ICOM transceivers. It is only ⅔ of the size of the IC-2A.

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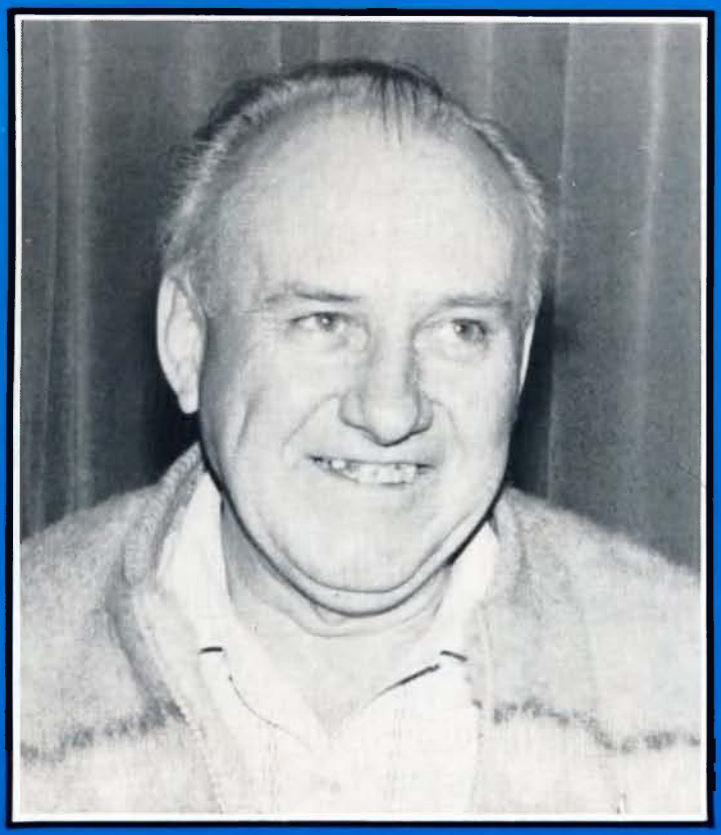
ICOM3743

Amateur Radio

JOURNAL OF THE WIRELESS INSTITUTE OF AUSTRALIA
VOL 55, No 8, AUGUST 1987



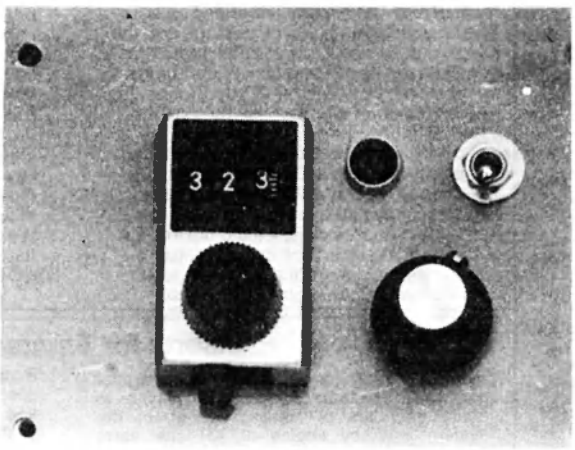
HAPPY BIRTHDAY INTRUDER WATCH
USSR CALL SIGNS
TRIBUTE TO VK3RJ
VHF/UHF BUILDING BLOCKS
2-METRE METEOR SCATTER
TREASURER'S REPORT

Amateur Radio

FRONT COVER: This year the Intruder Watch service enters its 21st year. Henry Andersson VK8HA, has been a stalwart supporter of the IW since 1975.

Special Features

Technical Features



Regular Features

DEADLINE

All copy for inclusion in the October 1987 issue of Amateur Radio, including regular columns and Hamads, must arrive at PO Box 300, Caulfield South, Vic. 3162, at the latest, by 9 am, August 20, 1987.

Amateur Radio

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Inquiries and material to:
The Editor,
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Caulfield South, Vic. 3162.

Material should be sent direct to **PO Box 300, Caulfield South, Vic. 3162,** by the 20th day of the second month preceding publication. **Note:** Some months are a few days earlier due to the way the days fall. Check page 1 for deadline dates. **Phone: (03) 528 5962.**

HAMADS should be sent direct to the same address, by the same date.

Acknowledgment may not be made unless specifically requested. All important items should be sent by Certified Mail. The Editor reserves the right to edit all material, including Letters to the Editor and Hamads, and reserves the right to refuse acceptance of any material, without specifying a reason.

TRADE PRACTICES ACT

It is impossible for us to ensure the advertisements submitted for publication comply with the Trade Practices Act 1974. Therefore advertisers and advertising agents will appreciate the absolute need for themselves to ensure that, the provisions of the Act are complied with **strictly.**

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Editor's Comment

WHERE DOES THE MONEY GO?

From time to time we are asked to publish the amounts of the various Divisional subscriptions. This is a subject about which some Divisions seem a little reticent, as indicated by the success (four votes to three) at the 1985 Federal Convention of a motion to prohibit publishing by any WIA publication of a comparative table of all States subscriptions. These vary considerably between States. It seemed a good idea to explain not only why so, but also how the funds are spent.

Basically, the reason for the differences is that some Divisions provide more services to their members than do others. All have to support, equally, the Federal body by an amount of $27 per member this year. So, adding to this enough to cover their own expenses, we find the Divisions asking from each full member a maximum (in VK3) of $44 and a minimum (in VK4) of $33. All amounts mentioned from here on are per member in 1987.

Federally, the biggest single cost is the publishing of AR ($16.25). Our IARU subscription costs 75 cents. Everything else totals $10.00, including salaries of office manager and staff. What do they do? Mainly, they look after the impressive volume of Executive and administrative correspondence to and from DOC, the Divisions, commercial suppliers, advertisers and members. They order and sell books (Magpubs). Inevitably, they receive and make many telephone calls. The cost of lighting, power, postage and the telephone service is substantial. More time goes into the continuing task of updating membership data and other information, for which each staff member has their own terminal into the office computer.

One significant area of Federal expense is the annual Federal Convention, ($1.60). Executive is keenly aware, as are all the Federal Councillors, that some reduction here would be welcome, if it did not imply a corresponding reduction in the Institute's administrative coherence. Even in these days of sophisticated communication systems using broadband interstate links there still seems no substitute for meeting face-to-face around the convention table. But it is noteworthy that VK4, because of the expense, did not hold a Clubs' Conference this year. Some VK4's may claim, as a result, that their representatives at the Federal Convention were less well-briefed than they might have been. The result of a similar Federal cancellation would, I suspect, be much more serious.

And what does your Division do with its share? This varies greatly from State to State. VK3 for example (on $17 a head) has until very recently supported virtually all the State's 2-metre and 70-centimetre repeaters. Its outwards QSL bureau is free. It owns its own meeting room and office premises (as does VK2) and all the equipment used for the Sunday morning news broadcast, plus a considerable amount of WICEN equipment. VK4, on the other hand, with only $6 per year, owns no real-estate and depends on privately-owned equipment for its broadcast arrangements.

Some people might argue, in spite of these divergences, that the range of services to members does not vary commensurately. Obviously VK4 depends much more on Club and volunteer support than does VK3. But VK3, more than any other State, has its available pool of volunteers diminished by the Federal need for people. Some hold both Federal and Divisional office, but generally this is impractical.

As you see, we have in the WIA a complex organisation with many interstate differences, perhaps tending to reflect the Australian political scene and suffer from the same problems. Do we need State Governments? Do we need State Divisions? Should the Federal body have more influence? Or less? There are no simple answers, but one thing is certain. We can only have what we are willing to pay for.

Bill Rice VK3ABP Editor

Inserts for *Amateur Radio*

Many Divisions, Zones or Clubs make regular use, as a newsletter distribution facility, or to notify members of coming events, of the system whereby copies of AR can carry inserts, usually just for one State. This facility is provided by the mailing service organisation (Automail Pty Ltd) and the WIA Federal Office at a nominal cost.

In order to comply with postal regulations and WIA policy, it is necessary that all inserts should meet certain specifications. Some of these appear not to be very widely known, and this QSP has been put together to spread the information.

Sizes must be as follows:

Unfolded — Minimum 75 x 130 mm ... Maximum 192 x 250 mm
Folded — Minimum as above ... Maximum 177 x 240 mm

The paper used should be bond, minimum 80 gsm, maximum 100 gsm.

Each Club submitting an insert must have it approved by their Division, then send a proof copy to the Editor for checking at least 14 days before the due date at Automail (see list below). The proof copy must be addressed via the Federal Office (PO Box 300, Caulfield South, Vic. 3162) to ensure that the relevant account entries are made and Automail notified.

All inserts must carry the wording "Insert into Amateur Radio (month) (year)". This is required by Australia Post regulation.

When approved, bulk inserts must then be sent to Automail Pty Ltd, 14-16 Stamford Road, Oakleigh East, Vic. 3166. Under no circumstances are Automail to be contacted directly by Clubs or Divisions, as all requests for inserts, bookings, etc, must be via the Federal Office.

Due dates for delivery to Automail for the remainder of 1987 are

September 1987	by August 20
October	by September 23
November	by October 21
December	by November 22
January 1988	by December 10

Neither the Federal Office nor Automail necessarily accept any responsibility for omission or incorrect insertion of inserts. Surplus inserts are returned to the office. If requested, they will be returned to the originators at the latter's expense, and otherwise destroyed.

TREASURER'S REPORT

Following the Federal Convention in May, I am pleased to place before you pertinent figures relating to year ended December 31, 1986, which have been audited by our Accountants, Touche Ross and Co.

The main highlights were:

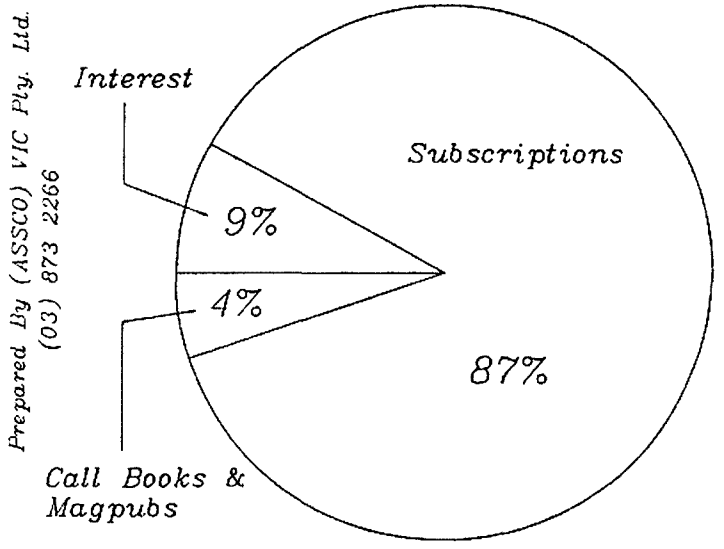
CATEGORY	BUDGET	ACTUAL
TOTAL INCOME	+ $230 000	+ $234 000
TOTAL OFFICE EXPENDITURE	— $130 000	— $121 000
TOTAL AMATEUR RADIO MAGAZINE	— $100 000	— $111 000

We had a surplus in 1986 amounting to approximately $2000, and in 1985 a loss of approximately $1000. We are satisfied with the final outcome for 1986.

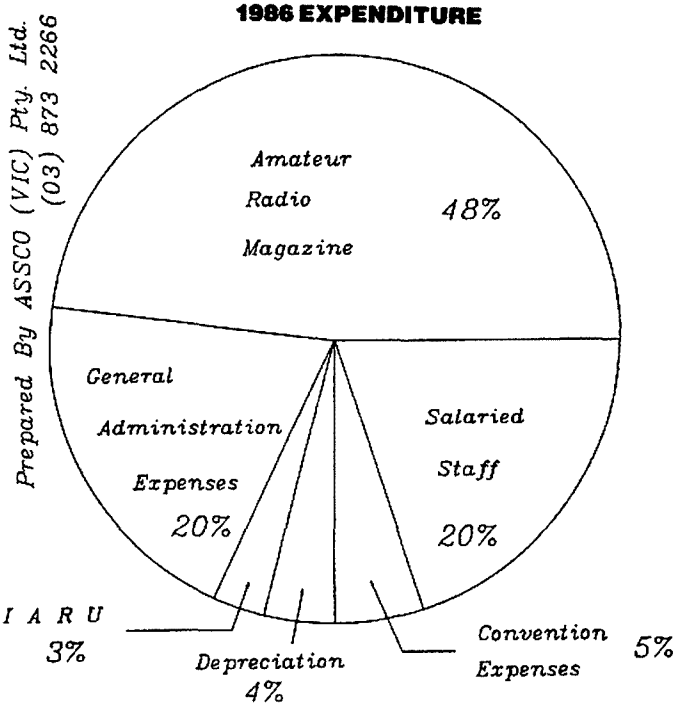
Abridged Balance Sheet as at December 31, 1986

Current Assets	$191 000	Deposits $165 000, Trade Debtors $10 000, remainder spread
Fixed Assets	$ 25 000	Office equipment, furniture (valued at $53 000 in 1983, but since depreciated by $28 000 eg computer)
	$216 000	
Current Liabilities	$142 000	Subscriptions in Advance $107 000, Amounts payable to Divisions $22 000, Trade Creditors $5 000, remainder spread
Members' Funds	$ 74 000	
Working Capital Current Assets less Current Liabilities	$191 000	
	$142 000	
	$ 49 000	This amount is the cash resource held to meet our future commitments

1986 INCOME



1986 EXPENDITURE



We perceive however, that looking in to year 1987, there are *some* ominous signs emerging in figures relating to income and expenditure. They require immediate attention which will affect all of us as members of the WIA in terms of a drop in standard in some of the services offered. If these steps are not implemented now to cut expenditure and increase income, we have calculated a deficiency of $30 000 in 1987 and possibly a similar result in 1988. We do not have the financial resources to meet such an eventuality and steps are being taken now to get our finances in order for 1987 with a view to going into 1988 with hopefully a balanced budget being achieved as at 31/12/88. In 1987 we expect a loss of around $16/20 000 with the above measures being *put* into place. With time against us it may be difficult to achieve a better result.

The reasons for these problems emerging are:

1 Membership is dropping with less income anticipated.
2 Advertising has decreased significantly and in money terms could reduce by 25 percent. One of the reasons for this decrease is cost of amateur equipment caused by the devaluation of the Australian Dollar against the Japanese Yen. Approximately 18 months ago $A1 could buy say 200 Yen, today it is about 100. Consequently amateurs are not buying the equipment they were in the past, and therefore advertisers are cutting back on their advertising budgets.
3 Cost of Insurance, eg Workcare, wages, high interest rates, fringe benefits tax and other increased costs caused by inflation at around nine percent are effectively passed on to us and have to be absorbed into our finances. These costs are passed on to us by the companies with whom we deal.
4 We use a considerable quantity of paper, eg Amateur Radio Magazine, photocopying, etc. Cost of paper has risen by 20 to 30 percent and is affecting our finances considerably.

At the May Convention it was recommended by the Financial Sub-Committee that the Federal Element of the subscription be increased from $27 to $30 for 1988. This increase should cover the inflation rate but is not nearly enough to meet all increased costs. That is why we must also cut out expenditure and try to increase our income to keep our "finance house" in order for the future.

We expect the next 12 to 24 months to be tough and your support and understanding of the foregoing situation will be appreciated.

Should members require the detailed audited Financial Statements of foregoing figures for 1986 including my Report tabled at the Convention, please write to the Federal Office.

73 Ross Burstal VK3CRB
HONORARY FEDERAL TREASURER

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TR-751A 2 METERS
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VHF-UHF BUILDING BLOCKS

Part 1

John Day VK3ZJF
5-7 Old Warrandyte Road, Donvale, Vic. 3111

This article is the first of a new series of designs for home-brewed amateur equipment for the VHF and UHF bands. During the design phase, the writer has consulted closely with Harold VK3AFQ, to ensure these efforts will be as compatible as possible.

With the increasing prices for commercial amateur equipment in recent times there has been a marked increase in home-brewing. It became obvious that if I wanted good equipment at a reasonable price I would have to build it myself. What began as a simple exercise to build a new six-metre transceiver has, through the interest of others, turned into a major design and construction project absorbing 18 months of spare time and appears set to continue for some time to come.

First, let us lay down some of the ground rules, then we shall look at what is in store for constructors.

DESIGN RULES

At the outset, several major guidelines had to be decided upon and adhered to throughout the project.

1 The mechanical size of the boards is 6 x 1.5 inches (150 x 38 mm) compatible with the VK3AFQ building block format.
2 The power supply for all modules operating at outputs of +7 dBw (five watts) or less should be 12 volts ± 10 percent. For modules operating at outputs in excess of this the power supply should be 28-30 volts, moderately regulated.
3 Any RF signal entering or leaving a module should do so at 50 ohms.
4 State of the art components and techniques should be used where possible, dependent on local availability.

Throughout this series power levels will be quoted in dBm (dB above 1 milliwatt into 50 ohms), dBw (dB above 1 watt into 50 ohms) and relative levels in dBc (dB relative to desired carrier).

Whilst it may seem unusual to mention impedance levels for external connections, if the modules are to be generally and easily applicable in a variety of situations this is desirable.

The use of state-of-the-art components and techniques poses a series of interesting problems. In this series, the latest technology readily available in this country, has been used. The availability of components has been thoroughly investigated and where necessary, sources will be identified.

THE MODULES

Detailed circuits and discussion relating to each of the modules will be given as this series progresses. The brief description, features and some possible applications of the modules are printed hereunder for your interest.

MODULE A — TWO-METRE 100 mW TRANSVERTER

This module consists of three 6 x 1.5 inch (150 x 38 mm) boards, incorporating the injection oscillator chain, the receive converter and the transmit converter.

The receive converter uses a BF981 dual gate MosFET preamplifier for low noise, followed by a diode double balanced mixer. Broadband termination for the mixer is provided by a grounded gate JFET stage with a 50 ohm input impedance, a tuned circuit in the drain provides some IF selectivity. An IF change-over relay is provided on this board.

On the transmit converter board, provision is made for an IF attenuator capable of handling up to five-watts. Following this, another diode double balanced mixer is used followed by a narrow tuned circuit filter and a two stage amplifier using a BF981 and a BFR96S high gain bi-polar transistor.

The injection module consists of a third overtone crystal oscillator, a diode frequency doubler and an amplifier to generate the required levels of mixer injection. This module can be used over a wide frequency range for a variety of applications.

As a bonus, this module will be described for 50-54 MHz as well as 28-30 MHz IFs.

MODULE B — SIX-METRE 500 mW TRANSVERTER

Again the complete transverter uses three PCB modules. The receive and transmit converters are similar to the 144 MHz unit and the injection chain will be described in two versions to suit various IF frequencies.

The six-metre transverter can be used with either a 28-30 MHz or 144-148 MHz IF, so not only can it be used with a HF transceiver but why not think about getting your two-metre multi-mode transceiver on 6 metres?

MODULE C & D — 70 cm 100 mW TRANSVERTER

This module has proved to be the most difficult design problem of the whole series. The two versions will be described, the first for 50-54 MHz or 28-30 MHz IFs and the second, a more complicated dual-conversion unit for a 144-148 MHz IF This module will probably be left until late in the series to allow time to further develop some improvements to the existing prototype.

MODULE TWO — TWO-METRE 2 WATT LINEAR AMPLIFIER

This module is designed to provide a more usable power output from the transverter, provides an output change-over relay and makes provision for controlling external preamplifiers and power amplifiers.

MODULE F — SIX-METRE 5 WATT LINEAR AMPLIFIER

This module is the six-metre version of Module E, described above.

MODULE G — SIX-METRE TRANSCEIVER INJECTION CHAIN

By now some of you may be thinking of building a self-contained low power transceiver to power all of the transverters you will no doubt build! Well, this is what is required. Build the complete IF sections of the VK3AFQ building blocks, then add this variable reference synthesised VFO to make it into a 'native' 50-54 MHz transceiver for driving transverters or to catch some six-metre DX.

It is proposed to describe a similar unit for a 144-148 MHz transceiver at a later date, if interest warrants.

MODULE H — 150 WATT TWO-METRE POWER AMPLIFIER

Using the latest RF Power MosFET technology allows construction of a two- stage, two watt input/150 watt output power amplifier that will leave most bi- polar power amplifiers looking a little green and rivalling the signal quality of many good valve power amplifiers. Although the devices are not cheap at this stage they certainly represent excellent value. The first stage produces approximately 30 watts out and can be used on its own if required.

MODULE I — 150 WATT SIX-METRE POWER AMPLIFIER

This is the six-metre version of Module H.

All of the power amplifiers are fitted with detectors for power indication and to permit driving an Automatic Level Control loop. The VK3AFQ transceiver is provided with a transmit ALC input compatible with these designs. By using ALC, the amplifiers can be operated well within ratings at peak linearity and performance when properly tuned and aligned. These amplifiers are easy to align and appear to perform excellently on the air. They have been personally used on six and two-metres over several months.

Detailed descriptions of these modules will commence in the next issue of *Amateur Radio*.

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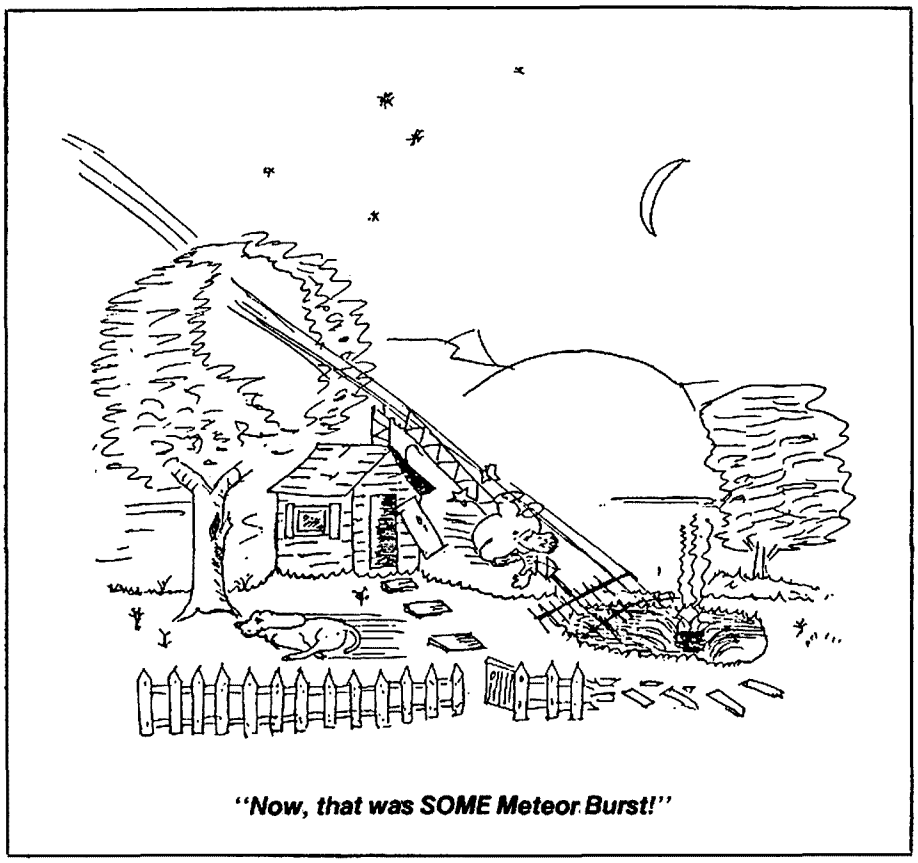
TWO METRE METEOR SCATTER

Doug McArthur VK3UM
30 Rollaway Rise, Chirnside Park, Vic, 3116

Meteor Scatter is an under-utilised mode of propagation available to the VHF and UHF operator.



"Now, that was SOME Meteor Burst!"

When using this mode the ability to complete QSOs are not only dependent upon the stations technical capability (which can be relatively modest), but depends upon rigidly followed operating procedures.

The object of this article is to promote the mode, through the establishment of a National Two Metre Meteor Scatter Calling Frequency, along with the definition of a sequencing and calling procedure.

The article provides the basis of a national scheme which will allow stations to complete QSOs via Meteor Scatter in the shortest possible time using sporadic meteors.

METEORS

The size of meteors that are of most interest for radio communications do not have to be as large as that of a 'falling star.' In fact, the numerous non-visible meteors, which range in size from 40 microns to eight centimetres in diameter, produce radio reflections.

Meteors entering the Earth's upper atmosphere can be characterised into two distinct classes.

Shower meteors are collections of particles orbiting the Sun all at the same velocity. Their relatively well-defined orbits allow for the prediction of when such showers will intersect the Earth's orbit. Their velocity and radiants, in terms of right ascension and declination (celestial latitude and longitude), have been catalogued. (*ARRL VHF Handbook*, Refer Table 1).

Meteor showers are generally named after the stellar constellations which, when viewed from Earth, form the background from which the radiant appears to originate.

As an example, the Leonid Meteor shower appears to originate from the constellation of Leo.

It is important to note that, for us in the Southern Hemisphere, this is not the case as the radiant point, although the same will, in fact, not appear from the same constellation.

Meteors vary in intensity from year to year and to predict the intensity of the shower or the exact time it will reach its peak, is not always possible. The Quanradtids (January) and Perseids (August) however show only slight variations in intensity from year to year but again to predict their peak is difficult. Unfortunately, scant information is available for the Southern Hemisphere with respect to shower meteors and the data listed is for the Northern Hemisphere.

Sporadic meteors are those that move in random orbits about the Sun and all are distributed throughout the year. They have no defined radiant nor predictable velocity. It is these sporadic meteors that the amateur can utilise daily.

True, shower meteors will provide short time excitement, but their time of arrival is difficult to define. Some showers may only last a few hours and being there at the time is a game of chance. Shower meteors can provide spectacular results on the lower VHF bands and are essential for those who wish to use this mode on 432 MHz (and higher) frequencies.

Meteors enter the upper ionosphere at a height of 80-120 kilometres and commence to burn rapidly. An ionised trail is formed as a result of the kinetic energy (of the meteor) which is converted to potential energy as the meteor is slowed by collisions with neutral molecules. The ionisation takes the form of a long thin column whose electron density is proportional to the mass of the meteor. The length of this trial is also dependent upon the mass of the meteor, its velocity and the angle of entry into the ionosphere. Additionally, the action of winds at this altitude, (which can be very strong), will deform the rapidly decaying trail. Trails can range up to 50 kilometres in length although typical lengths are about 15 kilometres. Space 'junk' re-entering the atmosphere will leave behind a similar trail.

The cone of this trail is most dense at the point of entry. As a consequence the reflected radio signal is characterised by a strong initial burst and if the trail is of a reasonable size the signal diminishes slowly. Hence the term of a meteor burst or a meteor ping. Thus the meteor's size, speed and direction of travel (dependent upon the zenith angle of entry) will primarily determine the received signal strength and duration of possible communication between specific communication sites.

The optimum frequency for the use of meteor scatter is in the 35-45 MHz region. Meteor scatter links are still used to complement forward ionospheric scatter in some remote parts of the world and provide a reliable communication mode. The signal strength is inversely proportional to the cube of the frequency and this equates to about an 8 dB reduction of signal level if the frequency is doubled. The density of the ionisation is greatest at the commencement of the meteors entry into the atmosphere and consequently if the meteor is small, only a proportion of this trail may be detected. In practical terms, a meteor burst heard on 50 MHz would be about three times the length of that received on 144 MHz. The same relationship exists between 144 and 432 MHz. A change of operating techniques is therefore required for 432 MHz and above as the challenge of making QSOs becomes quite daunting as the burst durations will be in the order of tens of milliseconds.

DISTANCE OF POSSIBLE COMMUNICATIONS

Meteors commence to burn at about the height of the 'E Layer' and consequently the distance that can be worked is similar to that of a single hop from the 'E Layer'. Multi-hop 'E Layer' communication is not practical as the amount of energy scattered from the ionised trail is too small to support a second hop. Further, the possibility of, at that very time, having two trails in the optimum place is quite remote. It is feasible, during a very dense meteor shower, that this could be possible but to my knowledge such an incident is, as yet, to be recorded. Consequently the maximum distance is approximately 2000 kilometres. Forward scatter signals can be greatly enhanced by meteor

Meteor Showers

Table I—Meteor Shower Data for V.H.F. Use

Shower and Date	Time Visible Rise	Set	Optimum Paths and Times N-S	NW-SE	E-W	SW-NE	Hourly Rate Visual	Radio	Velocity, km/sec.	Period, Years	Next Maximum
* January 3–5 Quadrantids	2300	1800	—	0300–0800 SW	0800–0900 S	0900–1400 SE	35	45	45	7	Note 1
January 17 Cygnids	0230	2130	—	0600–1100 SW	1100–1300 S	1300–1800 SE	—	—	—	—	—
February 5–10 Aurigids	1200	0330	—	1400–1730 SW	—	2130–0100 SE	—	—	—	—	—
March 10–12 Boötids	2200	0830	2330–0030 W 0530–0630 E	0330–0530 NE	0230–0330 N	0030–0230 NW	—	—	—	—	—
March 20 Coma Berenices	1600	0630	2130–2300 W 0100–0300 E	2000–2130 SW	—	0300–0430 SE	—	—	—	—	—
* April 19–23 Lyrids	2100	1100	0230 W 0530 E	2330–0100 SW	—	0700–0830 SE	8	12	51	415	Note 1
* May 1–6 Aquarids	0300	1200	—	0830–1000 NE	0630–0830 N	0500–0630 NW	12	12	66	76	Note 1
May 11–24 Herculids	1800	0630	2130–2300 W 0100–0300 E	2000–2130 SW	—	0300–0430 SE	—	—	—	—	—
May 30 Pegasids	2300	1200	0300–0430 W 0630–0800 E	0130–0300 SW	—	0800–0930 SE	—	—	—	—	—
June 2–17 Scorpiids	2000	0300	—	0100 NE	2300–2400 N	2200 NW	—	—	—	—	—
June 27–30 Pons Winnecke	Does not set; min. at 0900		—	1500–1830 SW	1830–2330 S	2330–0300 SE	—	—	—	—	—
July 14 Cygnids	1800	1000	—	2100–2330 SW	0130 S	0330–0600 SE	—	—	—	—	—
July 18–30 Capricornids	2030	0400	—	0100–0200 NE	2300–0100 N	2200–2300 NW	—	—	—	—	—
* July 26–31 Aquarids	2200	0600	—	0300–0500 NE	0100–0300 N	0000–0100 NW	10	22	50	3.6	Note 1
* July 27–August 14 Perseids	Does not set; min. at 1730		—	2330–0300 SW	0300–0800 S	0800–1130 SE	50	50	61	120	Note 1
August 10–20 Cygnids	1200	0700	—	1700–1930 SW	2130 S	2330–0200 SE	—	—	—	—	—
August 21–23 Draconids	Does not set; min. at 0900		—	1500–1830 SW	1830–2330 S	2330–0300 SE	—	—	—	—	—
August 21–31 *Draconids*	Does not set; min. at *0700*		—	1300–1630 SW	1630–2130 S	2130–0100 SE	—	—	—	—	—
September 7–15 Perseids	2130	1200	—	0030–0200 SW	—	0700–0830 SE	—	—	—	—	—
September 22 Aurigids	2100	1230	—	0030–0200 SW	—	0700–0830 SE	—	—	—	—	—
October 2 Quadrantids	0500	0000	—	0900–1400 SW	1400–1500 S	1500–2000 SE	—	—	—	—	—
October 9 Giacobinids	0600	0300	—	1100–1600 SW	1600–1700 S	1700–2200 SE	Note 2		20	6.6	1972
October 12–23 Arietids	1900	0700	2130–2330 W 0230–0430 E	—	—	—	—	—	—	—	—
* October 18–23 Orionids	2230	0930	0000–0200 W 0600–0800 E	0430–0600 NE	0330–0430 N	0200–0330 NW	15	30	68	76	Note 1
* Oct. 26–Nov. 16 Taurids	1900	0630	2100–2300 W 0300–0500 E	0130–0300 NE	0030–0130 N	2300–0030 NW	10	16	27	3.3	Note 1
* November 14–18 Leonids	0000	1230	0300–0500 W 0800–1000 E	—	—	—	12	Note 3	72	33.2	1999
November 22–30 Andromedids	1300	0600	—	1600–2000 SW	—	2300–0300 SE	Note 4		22	6.7	1977
* December 10–14 Geminids	1900	0900	0030 W 0330 E	2130–2300 SW	—	0500–0630 SE	60	70	35	1.6	Note 1
* December 22 Ursids	Does not set; min. at 2030		—	—	0130–1530 S	—	13	13 Note 5	38	13.5	1972, 1985
* May 19–21 Cetids	0530	1430	—	1100–1230 NE	0900–1100 N	0730–0900 NW	—	—	20	37	—
* June 4–6 Perseids	0500	1730	0800–1000 W 1300–1500 E	—	—	—	—	—	40	29	—
* June 8 Arietids	0330	1530	0600–0800 W 1100–1300 E	—	—	—	Note 6		70	38	—
* June 30–July 2 Taurids	0500	1700	0700–0900 W 1300–1500 E	1130–1300 NE	1030–1130 N	0900–1030 NW	—	—	30	31	—

* Major showers—Last four are daylight showers.

Times given are local standard at path midpoint

NOTES

1. These streams are evenly distributed and little year to year variation is to be expected.
2. Very concentrated stream. Peak years give up to 400 meteors per minute, but with duration of only 6 hours. 1946 peak was most concentrated shower in amateur radio experience up to that time (see December, 1946, QST, page 43) but 1959 recurrence was deflected and was hardly observable.
3. Peak years give 60/hour visual. In the peak years of the 1800s, prior to being deflected by Jupiter and Saturn, this shower gave 1200 per minute. Spectacular results in 1965 and 1966 are reported in Jan. 1966 QST, page 80, and Jan. 1967, page 83.
4. Before being deflected by Jupiter this stream gave peak year rates of 100/minute. No notable rates have been observed since, though *the stream* could return.
5. Short duration shower. Peak years the radio rate is 165/hour.
6. This intense daylight shower begins June 2 and runs to June 14 with radio rates from 25 to 70/hour.

Meteor Shower Data for VHF use.
(Courtesy of *ARRL VHF Handbook*)

scatter and, in typical high power VHF commercial circuits, the very small meteors are utilised. In amateur circles the generation of such power, coupled to very high gain antennas (low radiation angle), generally places such transmissions beyond our licensing conditions. The amateur is thus faced with using the larger meteors which, in their wake, provide a high degree of ionisation. The signal levels can be quite high but their duration can be equally as short. Daunting though this may first appear, contacts can be made quite easily (on VHF) with patience and defined operating procedures. Contacts have, in fact, been accomplished overseas (Canada) on 1296 MHz by stations using EME commensurate equipment.

The writer first became interested in this medium of communication in the early 1960s whilst living in Alice Springs (VK5KK and later VK8KK). Using a modest set-up I used to monitor the vision carriers of the various Channel 2 television transmissions and was surprised at the consistency and level of the forward scatter signals. It was rare that signals could not be detected. On top of the residual forward scatter, meteor bursts were, to say the least, impressive and the signal level, regularly exceeded S9.

These initial experiments led to tests being conducted on 50 MHz with Ray VK3ATN, Mick VK5ZDR, Col VK5RO, John VK5DJ and David VK4AK, (then at Mount Isa, but now VK3AUU). Incidentally, it was during these initial tests with Ray VK3ATN, that he tried his HF European Rhombic on 50 MHz. The dramatic results achieved with this antenna subsequently led him on to constructing a two-metre stacked Rhombic with which he achieved the first ever VK Moon Bounce QSOs. (A milestone in our amateur radio history). Later, when I moved to Darwin (1968-1975) these experiments were continued with David (who had then moved to Tennant Creek with the call of VK8AU) and Ross VK4RO, at Ayr. Countless QSOs were made via 52 MHz Meteor Scatter during this period.

Well, 50 MHz is a breeze! ! ! Bursts lasting well over a minute are common and overlapping bursts are a bonus.

As mentioned earlier, as the frequency increases the duration of the burst decreases and at 144 MHz communication starts to become more of a challenge. The burst here has shortened to about a third of the 50 MHz signal although the peak signal remains about the same.

OPTIMUM TIMES TO WORK METEOR SCATTER

The *ARRL VHF Handbook*, and other publications, list tables of the known meteor showers. Unfortunately for us in the Southern Hemisphere this data will not necessarily coincide with respect to local times, and optimum path angles. Moreover, not all showers will be visible in the Southern Hemisphere as appear in the Northern Hemisphere. The Perseids (July 27 to August 14), Geminids (December 10 to 14) and Quadrantids (January 3 to 5), seem to bear a relationship to this published data. Very little information is available for the Southern Hemisphere and accordingly, the tables, as published, should be treated as a guide to the shorter duration meteor showers. A typical dispersion of meteor shower activity is shown in Figure 1.

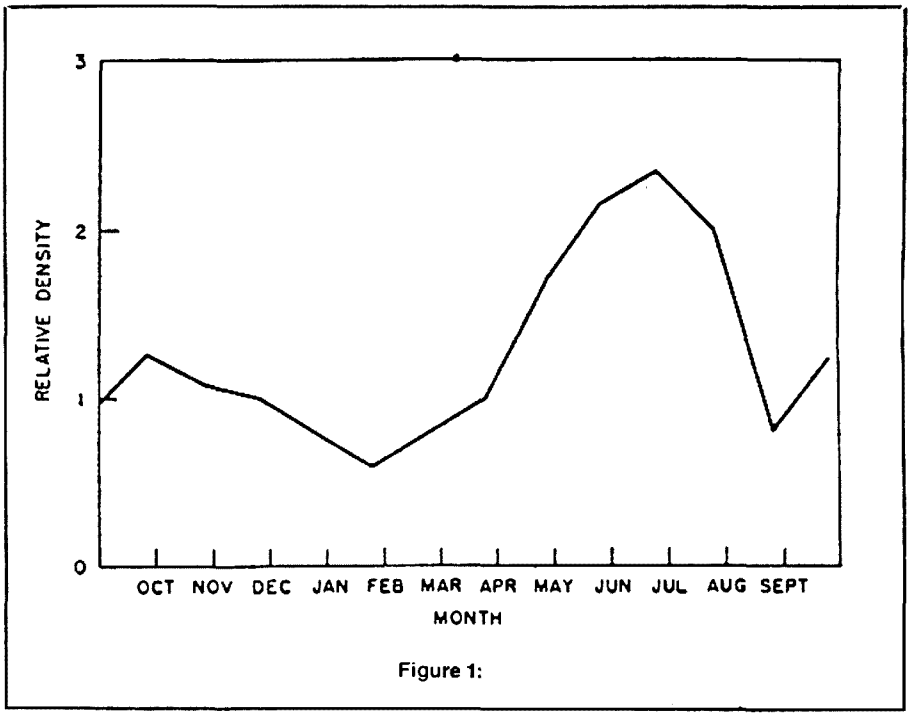


Figure 1:

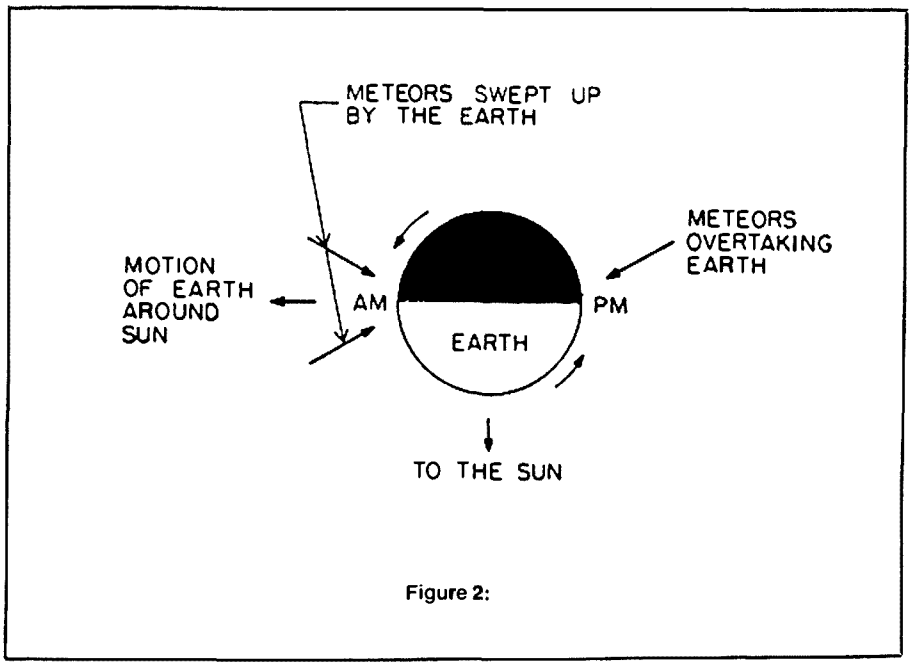


Figure 2:

Local Astronomical Yearbooks do provide information on the visual showers but, although helpful, do not provide detail of the nature contained in the *ARRL VHF Handbook*.

Fortunately it can be predicted that, for sporadic meteors, the best time is when your location is travelling at right angles to the Earth's motion. At this time you will be 'facing into space' and the number of sporadic meteors will be at their maximum. This time coincides with dawn and the best period is about one and a half hours before to about one hour after sunrise. (Refer Figure 2).

Twice a year, and for a period of several days, we intercept the remnants of Halley's Comet. These showers occur in the first week of May (Aquarids) and the third week of October (Orionids) and these days provide meteor showers of significant proportions. (Refer Figure 3).

Due to the Earth's orbit and the nature of the space debris, the intensity of such showers will vary from year to year. Notwithstanding such variations, they do provide an exciting time for the meteor scatter enthusiast. Many other meteor showers exist and, although, as mentioned earlier, they are documented for the Northern Hemisphere, it is difficult to relate them to our situation. Additionally, it would seem reasonable to assume that we may experience meteor showers of intensities greater than those located to our north. Perhaps some reader may be able to assist with such information.

You will, I hasten to add, hear sporadic meteor pings throughout the day but their frequency will be greatly diminished. Space junk returning to Earth may provide a 'space junk ping' in the same way as a meteor (not that you will be able to tell the difference!). It is worth remembering that you do not require a

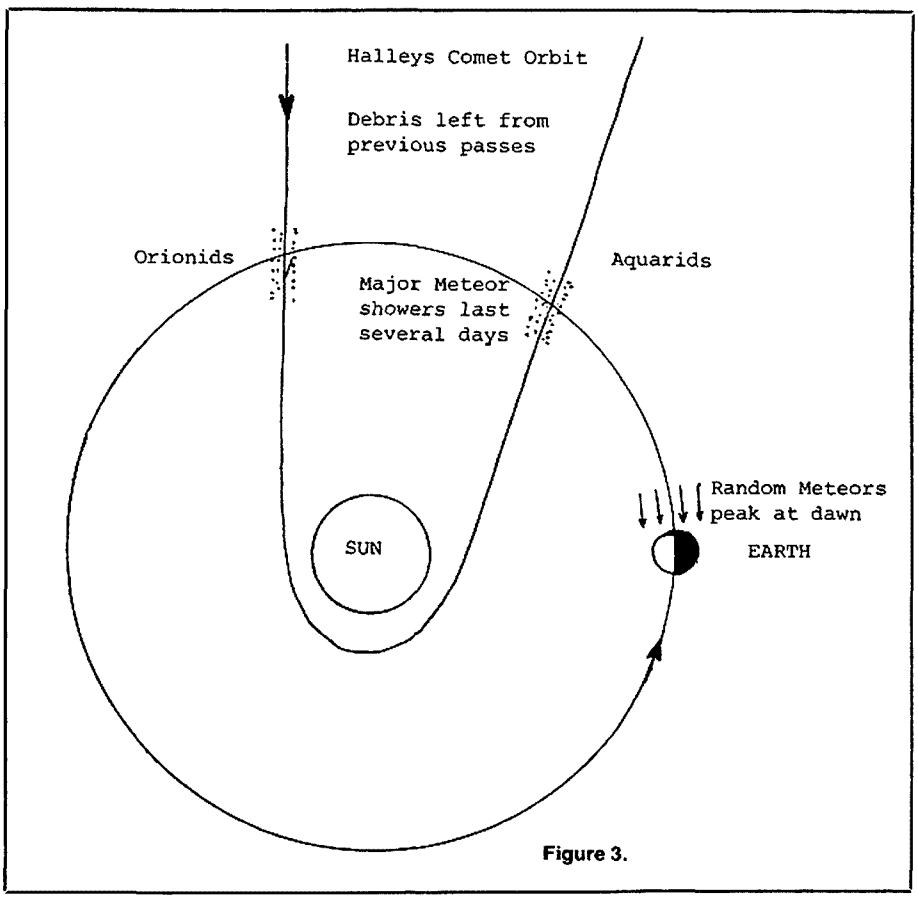


Figure 3.

meteor of the size of the visual falling-star to provide communication. Meteors of this size would provide a classic one-minute-plus burst (on 144 MHz), but the smaller ones, the size of a grain of sand (or smaller) and not visible to the naked eye, are all that is required to utilise this communication mode.

I have spent many hours standing outside the shack window peering into the darkness whilst listening to the pings from a distant station. It is rare that you see the ones that provide the signal, but when you do they are the ones that block your receiver, cause the speaker to leap off the bench and the family to come running to see what caused the noise.

EQUIPMENT REQUIREMENTS

As discussed earlier, the signal characteristics of a meteor burst is that of a strong leading edge with a tail diminishing rapidly over a variable length of time. The initial burst can be extremely strong (exceeding S9) but equally it can be very short to the extent that all you hear is half a syllable. The length of the tail is what we are interested in to provide a QSO. A listener will quickly detect short meteor pings for up to one second (on two-metres), but patience is required to make a OSO. Extending the period of the tail with increased effective radiated power (EIRP) and increasing the receiver sensitivity is essential. However, a modestly equipped two-metre station running 100 watts output to 12 dB of antenna gain and a receiving system with a 1 dB or less noise figure is adequate (with patience) to work similarly equipped stations.

Meteors entering the ionosphere do so at varying angles and, as such, it would be an advantage to aim the antenna towards the expected trail. Nevertheless, the height of the meteor trail requires a very low radiation angle to obtain the maximum usable distance of communication. Conversely, as the zenith angle of the meteor is random, knowing where to aim a high gain antenna with a low angle of radiation is a problem. What one would like to have is an antenna beam width of 60 degrees, gain of 15 dB, and a radiation angle of less than two degrees!!! In practice, noting the scant data available for the Southern Hemisphere, it is best to beam directly towards the distant station. (Great circle bearing).

The speed of the meteor, relative to each station, dictates that Doppler shift will occur on the incoming signal. On 50 and 144 MHz this is relatively small and generally will not be noticed. If you listen very carefully the Doppler is most evident at the commencement of the burst. This can, when you are attempting to net a station on very short pings, cause you to be a little off frequency.

OPERATING TECHNIQUES

Recently, a National Two Metre Meteor Scatter Calling Frequency of 144.350 MHz USB has been chosen. The choice was made to avoid spuri and such problems which are encountered from Channel 5A. Hopefully, with activity, it will become another 144.100 MHz, but devoid of 'locals' rag- chewing on the channel!!!

There are a few basic rules to observe when entering into this mode and foremost is the aspect of frequency accuracy. In Melbourne, most are fortunate to be able to receive and calibrate their equipment using VNG's harmonic on 144.000 MHz, however, this service, used by so many for various reasons, will cease on March 31, next year (or earlier), unless some dedicated government department or benevolent organisation comes to the fore. The digital displays of most transceivers are, however, accurate to within 1 kHz. If you wish to instigate a spirited debate raise the frequency accuracy question on air!

Regardless of those who may claim accuracy to the nearest 10 Hz(!) — it does not matter too much as you will be able to net the distant station given 15 minutes of patient listening. It is important that frequency stability is maintained during your operating period. It may be an advantage to leave the equipment on overnight to thermally stabilise prior to commencing a meteor scatter session. If you can disable the AGC, this too is an advantage, as the initial burst is more than likely to block the receiver and, in so doing, cause you to miss the tail of the signal.

It is also essential that the 'Master Station' does not attempt to net the 'Calling Station' otherwise it will become a 'leap-frogging' dual, with all participants finishing nowhere!

Similarly, if a partial exchange has been made, the 'Calling Station' (if they find themselves to be a little off frequency), should not net the 'Master Station' as it is reasonable to expect he already has you resolved and a further frequency shift will only add to the confusion. Net the frequency as accurately as possible and then use your receiver's incremental tuning (RIT) to resolve the other station.

The above comments are orientated towards SSB. Overseas, high speed CW has proved popular. Europeans, for example, on 432 MHz transmit very high speed CW, record the received signals and replay them at a reduced speed. Naturally this introduces a delay in responding to a calling station during this 'decoding' process but, at this frequency, the burst length is so short as to require this procedure. Providing the QSO is completed within the same day, it is quite valid!!!

This would seem to be a total 'off-put' to a prospective new Meteor Scatter operator however, it is not nearly that difficult for 50 or 144 MHz operators. Six metres is 'easy' and this article is aligned towards the 'Two Metre Band Enthusiasts' as this mode has not been greatly utilised in this country.

Overseas stations have preferred to transmit sequence periods of five, two- and-a-half, two, one or even less than one minute for CW and SSB. The communication rate is slow under such sequencing. Invariably, when a long burst (15 seconds) is received, it will fall in the middle of the distant stations sequence. It also follows that a further burst may not occur for some time and it may again occur during a transmission sequence, leaving you unheard at the distant end!

Recently, I have developed a means that uses a little hardware to overcome the obvious tedious requirement of fast sequencing. This method was chosen to allow modestly equipped SSB stations, with little experience in the mode, to become successfully involved by making QSOs without spending an exorbitant time at the rig.

The object here is to intercept the burst during the transitional period when going from transmit and receive, hopefully completing the QSO during the one burst.

Observations have shown that, during a non-meteor shower period (and around dawn), you will, on average, receive about three 10 second or longer bursts, in a one hour period. Thus you should be able to work three stations per hour! Some operators may scoff at this aspect but for the dedicated VHF/UHF operator to regularly work distances of up to 2000 kilometres is an achievement.

Time is deceptive. A great deal can be said in five seconds. Two stations, with fast footwork, or is it 'tongue-work', can complete a total exchange and confirmation in less than 10 seconds. This is not the mode to provide your name, QTH, rig and family tree details! Choose your words carefully, abbreviate where you can and success will be achieved. Plan ahead what you need to say and the order you will respond

when the time comes. Rest assured you will be caught by surprise and become confused at first. This is natural and you will improve with time and practice.

It is reasonable to ask how you can keep this short sequencing going for long periods, assuming that the calling sequence has been set at five seconds, without developing repetitive strain injury on CW, or laryngitis on SSB. In the latter case, your fate may well have been decided by your wife as calling CQ each and every 10 seconds at 0530 in the morning, can be a health hazard!

On October 28, 1985, a meteor scatter experiment took place, with some 20 participating operators who were divided into groups of two or three operators. Each group were 'allocated' selected frequencies commensurate with adjacent channel interference and compatibility. Liaison was established on 3.690 MHz to allow a check-in before the tests to ensure that their partner stations were 'on-deck' and ready to proceed. The results of the test were impressive (although predictable) as nearly all of those who participated completed their QSOs.

Contacts were made between VK1 and VK7, northern VK2 and VK3, VK3 and VK4. On this occasion all participants used 10 second SSB sequencing. Needless to say, there were many who had sore throats that morning. The enthusiasm created by the test with those unfamiliar with this aspect of operating was gratifying and most wanted to try again at a future date. Incidentally, the morning chosen was supposed to be a peak of a meteor shower but this proved elusive and all contacts were made from sporadic meteors. Somehow, we never did get around to set up another test!

An electronic aid was the obvious answer to overcome the laborious calling and reply sequences. Anyone with a computer may generate CW and it is not difficult to interface this to your transmitter to generate the sequence timing required. Nevertheless, it is the SSB mode that provides a greater communication speed and this is discussed in detail below.

DIGITAL VOICE STORE

I had been contemplating a method of sending five-second SSB sequences for some time. The endless tape method was tried and discarded because of the difficulty of accurate timing, and the inevitable RFI problems. The 30-second tapes always seemed to be 32 or 28 seconds, when run on my recorder. Obviously if you could adjust the speed of the recorder to match the tape you could overcome the problem but it was decided the effort was not worth pursuing.

Thought turned to digitally storing a message on the computer, but it was not convenient to tie up the 'big box' for long periods. Besides, it has the habit of generating spurious signals on the 144 MHz band.

What was needed was a simple stand-alone analogue-to-digital conversion store into memory, and a complementary digital to analogue back end. A design had been established when, low and behold, *Electronics Australia* in the February 1987 edition, published the basis of just what was needed and with the added bonus of a PCB layout. With the assistance of Peter VK3AZL, who quickly produced the main PCB, it was put together without any drama. Several 64k memory boards were on hand from a now unused 6809 computer system and one of these provided the memory required, in lieu of the original design.

There are several sampling rates available with the *Electronics Australia* design. The most attractive, consisted of a 9 kHz bandwidth, 4.1 seconds of voice storage using 62k of RAM was chosen, not for the bandwidth, (excessive for SSB), but for the time of 4.1 seconds. This was ideal for a five-second sequence.

The original EA design incorporated a 4 MHz crystal for timing which could be divided to provide a 10 second pulse to initiate the replay sequence. Unfortunately, in my case, it was found that the crystal was considerably low in frequency and the supposedly 10 second pulses were invariably at 10.2 second periods. This is quite significant as the time slip became a nuisance over a one-hour period. Again the answer was simply overcome by using the mains to control the timing. This has proven to be quite precise for the accuracy required. 'Resetting' the device initially to the standard VNG time, it will stay correct throughout the day.

As an added feature, it was decided to add a Morse 'K' tail to the Digital Sound Store. Again this feature is locked to the internal timing and aurally provides an indication to the distant station that the station is going to the receive mode. Another adjunct was the adding (as an alternative to the 'K'), of a CW '?'. This feature was to alert a distant station that an unidentified signal had been heard and/or more information was required. The question mark tail (. . -- . .) is sent for two minutes following the unidentified burst and the system reverts to the 'K' call. Further applications of this 'tail' will be detailed later in this article.

When an identified signal is heard (the operator should have the microphone in their hand at the ready), the PTT action disables the Sound Store and the QSO is initiated. Should the contact not be completed in that particular burst, the Sound Store is quickly changed to send the appropriate response required.

REPORTING SYSTEM

There are various schools of thought and methods being used to exchange reports when working via Meteor Scatter. Some use the Moon Bounce system (EME). Even this can be confusing because there are currently two systems in use, one being the 144 MHz method and the other as used on 432 MHz and higher frequencies. The 432 MHz and above systems use the T, M and O reporting scheme where the T is sent repeatedly during the last 30 seconds of the sequence to indicate that only bits of the signal have been received. The M indicates that only parts of the signal have been received whilst O is used for indicating full call signs have been received. Additionally, a repeated Y is used to signify that the originator has received his call sign and repeat only yours and a G is used to signify that the originating operator is requesting a Grid Square reference (particularly useful for Grid Square hunters). The R character is sent along with the letter of the report to the initial response (eg RTRTRT or RMRMRM or RORORO viz received O). This would be followed by a complete sequence or RRRRRR and final confirmation given by a 737373 sequence. A valid QSO would be recorded with an M or O report combined with the following sequences. It is rare, in my case, to have had to resort to this reporting system unless signals are so weak that a simple 32N or similar report does not succeed. I do not favour this method for Meteor Scatter Propagation.

Another reporting system favours a S1, S2, or S3 where the numeral indicates the length of the burst; (eg S2 indicates a two second burst). Again the author does not favour this method of reporting for Meteor Scatter Propagation.

For simplicity, the conventional reporting system is favoured. This system is practical and easy to use, even though the signal reaches a large value then decays rapidly. There is no time to advise the other station that they are varying from 5x9 to 4x1. One has exchanged call signs and a report, which constitutes a valid report, and hence a QSO. It is suggested that the conventional system be adopted for the 50 and 144 MHz bands. Maybe those who will attempt a 432 MHz Meteor Scatter QSO, may have to resort to adopting one of the previously described methods.

SEQUENCING

It is essential that one has an accurate time source at their disposal or one that they can adjust to a time signal prior to commencing a Meteor Scatter session.

The basis of a successful operation rests upon your, and the other station's, ability to maintain a precise time sequencing schedule.

The transmit sequences will commence at the even minute, termed zero sequence and at five seconds after the minute termed the five sequence. Thus a station transmitting the 'zero' sequence will call from 00 to 05, 10 to 15, 20 to 25, 30 to 35, 40 to 45 and 50 to 55 seconds after the minute. Conversely, a station transmitting the 'five' sequence will call from 05 to 10, 15 to 20, 25 to 30, 35 to 40, 45 to 50 and 55 to 60 seconds after the minute.

If you choose to build a Digital Sound Store along the lines previously described there is a deliberately in-built overlap for practical timing purposes. The Digital Sound Store provides 4.1 seconds of voice and the CW tail adds another 220 milliseconds. Additionally your transceiver has a finite period to change over and this brings the transmission length close to 4.5 seconds. This then provides half-a-second of extra receive time that may benefit the loss of data should both stations not be transmitting on their precise sequence.

In practice, it has been found that maintaining a half-second accuracy over a two-hour period to be readily achieved. Fundamentally, the accuracy is dependent upon the mains accuracy and your ability to release your 'set-time' button to coincide with a transmitted standard.

If you do not have an automatic sending system then listen on 144.350 MHz and after a short time you will be able to distinguish from the timing of the bursts what sequencing the distant station is using and if the following beam heading recommendation is followed, approximately where the distant station is located. You will naturally respond during the opposite sequence.

It is suggested the following sequencing criteria should be adopted. *Stations beaming north or west, transmit during the 'zero sequence."*
Stations beaming south or east, transmit during the 'five sequence.'

QSO PROCEDURE

The objective of the short sequencing procedure is to intercept a meteor burst of sufficient length to complete a QSO during the one burst. This is not too common on two-metres where shorter bursts are far more prevalent. Thus, the following call and response practice should be observed to avoid, where possible, confusion at the distant end.

The following examples will serve to explain what is required and for explanation purposes it is understood that the station calling CQ is the ***master station*** and the station responding to the call is the ***calling station.***

(a) A station calling CQ
Your CQ should be spoken clearly, and quickly avoiding phonetics. Most operators can manage three CQs in the 4.1 second period. A station responding to the CQ should, after the CW tail, respond to the CQ's call sign, give their call sign with a report. The master station would respond with the calling station's call, QSL, and the report. The calling station would respond with 73.

To emphasise the short exchanges this is all that is required.

CQ VK3UM CQ VK3UM CQ VK3UM K
(Master station 4.5 seconds)

VK3UM VK4AGO 5n4 *(Calling station)*
VK4AGO QSL yr 5n3 *(Master station)*
QSL 73 *(Calling station)*
73 *(Master station)*

Note:. . .5n4 refers to 5 and 4 or fifty four and yr relates to a quickly spoken 'your.'

A completed QSO in less than 10 seconds!

Five second sequencing is abandoned for the duration of the burst.

(b) The master station may not receive the full call sign of the calling station but as an indication to the calling station that it is being heard, the CW tail is changed from 'K' to the question mark (. . - - . .). This is run for a two-minute period following the last burst. The question mark tail serves as an indication to the calling station that unidentified pieces are being received of their transmission.

(c) The master station identifies the calling station but fails to get their report. They would then change their CQ in the Voice Store to the following:

VK4AGQ 5n4 VK4AGQ 5n4 VK4AGQ 5n4 . . -- . . (4.5 second normal sequence).

Note that the CW tail (. . -- . .) indicates to the calling station that the master station ***has not received their report*** and the calling station would then respond in the other sequence ***with only the report.*** Call signs have been confirmed so are consequently not required;
(eg *5n3 5n3 5n3 5n3 5n3 5n3)*
(Calling station 5 seconds per period).

(d) Once a contact has been initiated the combined sequencing of (a) and (c) should be employed as long as required to complete the QSO. It is essential not to jump a step otherwise you will confuse the other station. Normally the bursts are of sufficient length to partially, if not fully complete, the QSO in one or two attempts. On long bursts it is possible to work two or more stations during one burst. The very common short bursts can be utilised, with patience and application of the above procedure, providing it is rigidly followed.

FINAL COMMENTS

Meteor Scatter may not be your cup of tea, but to a serious VHF/UHF enthusiast it is a further challenge. High power and very large antennas are not essential. QSOs are available for the taking, if you wish to participate.

Aircraft Enhancement is now commonly used and hundreds of QSOs have resulted from the original articles in AR. This has been a breath of fresh air to those who thought 'that there was no way they could work out of their mine shaft.' This mode has opened up the Melbourne-Canberra and Sydney paths, as well as the Sydney-Brisbane and Western Victoria-Adelaide paths. The two-metre and 70 cm bands have come alive again and activity is still on the increase.

You too can work up to 2000 kilometres on two-metres and the band does not have to be 'open' . . . only the shacks! Don't sit back and wait for next seasons Sporadic **E**, listen to the Meteor Scatter Frequency. Chances are that you will be most surprised at what you hear. Perhaps you too will be encouraged to give Two Metre Meteor Scatter a try!

NATIONAL TWO METRE CALLING FREQUENCY

Frequency	144.350 MHz Upper Sideband
Times	0600-0800 EST (2000-2200 UTC) Weekends or evenings at random
Sequence	North or West beaming stations transmit: 00-05, 10-15, 20-25, 30-35, 40-45, 50-55 seconds South or East beaming stations transmit: 05-10, 15-20, 25-30, 35-40, 45-50, 55-00 seconds Long bursts . . . use break-in
	Liaison . . . 3.690 MHz

A further article will appear in AR describing the additional timing, control and CW generator board, (mentioned in this article), which is used in conjunction with the *Electronics Australia* Digital Sound Store. A PCB layout shall be included and the project uses easily obtained 74LS ICs.

ACKNOWLEDGMENTS

I would like to make special mention to the following amateurs that have participated in our Meteor Scatter Schedules, all of whom I have had the pleasure of working on many occasions by this type of propagation. They include Bill VK4LC, Angus VK4AGQ, Rod VK4BRP, John VK2FG and Gordon VK2ZAB.

Additionally special thanks to Ian VK1BG, who has monitored the forward scatter signal, and meteor bursts, to collect further Aircraft Enhancement data and Ross VK2DVZ, whose present QTH precludes him from making a QSO, but relentlessly sends comprehensive reports of the observed meteor scatter bursts and duration.

Finally thanks to Roger VK2ZTB, who, as always, is a wealth of information and has supplied reference material of (2) and (3) as listed below.

REFERENCES

1 *ARRL VHF Handbook*
2 DAVIES, KENNETH. *Ionospheric Radio Propagation*, National Bureau of Standards Monograph 80.
3 HARRISON, ROGER. *6 UP Magazine.*

Repeater Reverse for the Yaesu FT-730R

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The Yaesu FT-730R is a popular FM-only UHF mobile rig, and in common with its cousin the FT-290R, lacks a repeater reverse facility, and incorporates a redundant CALL button instead.

This article shows how to adapt the famous modification for the FT-290R that turns the CALL button into a repeater reverse button. It is assumed that the reader is familiar with this modification. Perhaps it is not well-known that the tone call is still operative merely by pressing the PTT at the same time.

A quick summary of the modification is in order. When the CALL button is pressed burst switch Q2018 is switched on. This in turn activates the burst oscillator Q2019 and PTT switch Q2020. Whenever the PTT line is enabled pin 4 on the microprocessor Q2001 common to all the series is grounded via diode D2006, thereby shifting frequency by the appropriate offset. The modification grounds pin 4 through the CALL switch via an extra diode and prevents the tone oscillator from enabling PTT.

Now for the practical side. Unscrew the bottom cover of the rig and disconnect the speaker wires to get them out of the way. The microprocessor is now quite visible. With the knobs facing you look for the wire coming from the pad marked B next to connector J04. Follow this to where it terminates close to the microprocessor. This wire is the CALL line. Locate the diode D2006 and solder the anode of another diode, 1N914 or similar, to the anode of D2006. The cathode is terminated on the pad of the aforementioned wire next to the microprocessor. Now, locate the connector in the top left hand corner, J01. Counting from the right there is one capacitor and three resistors just under it. Grit your teeth and cut the lead on the second resistor, R2080. Reassemble and test. Repeater reverse is now activated with the CALL button and if the tone call is desired it can be obtained by pressing PTT as well.

It is also worth mentioning that there is a simpler version of this modification if the tone call is not desired at all. Simply move that wire from where it terminates close to the microprocessor to the anode of diode D2006. This is the essence of the modification for the FT-230R that appeared In another place, but retaining the tone call is almost as easy.

Technical Editor's Note:
The technique of simulating PTT to the microprocessor to give reverse repeater on receive can be used on other brands and models. Many rigs use PTT information to cause the microprocessor to shift the PLL frequency for repeater operation.

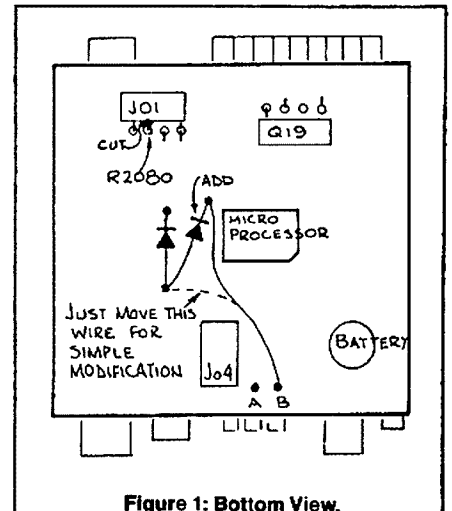

Figure 1: Bottom View.

BUILDING BLOCKS REVISITED

— Part 4

This article covers Module 2, the IF filter, and Module 9, the VFO.

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Before describing these modules in detail, some general comment on the IF crystal filter is called for.

Since the early 1960s the crystal filters used by amateurs have used the lattice configuration. The difficulties of 'home-brewing' this sort of filter were (and are) many, and the advent of commercially available units was welcomed with open arms!

The current advertised price of such filters is between $A120 and $A200. This is before import duty, sales tax and the dealers margin is added. These costs could add another $A60 to $A100 on your purchase.

With the above thoughts in mind and the prohibitive cost another type of filter configuration, known as the ladder filter, which is just as good as the lattice type, allows one to contemplate home-brewing with a minimum of trouble and expense.

The ladder type filter, so far as the writer can ascertain, surfaced during WWII where it was found in equipment used by the German armed forces. The technique fell into disuse after the war and did not reappear until the late 1970s.

At this time there appeared, in the amateur literature, references to empirical experiments carried out using crystals intended mainly for the — then burgeoning — CB service.

It was not until the February 1979 issue of the RSGB magazine *Radio Communications* that an article appeared which put ladder filter design on a firm footing. It was written by J A Hardcastle G3JIR. Those wishing to learn more about ladder filters are directed to this and subsequent articles by G3JIR.

It was not easy, even in the late 70s, to obtain bulk supplies of crystals all on the same frequency. Today the supply scene has changed and crystals, all on the same nominal frequency, can be purchased for as little as $A0.40. They come from the computer industry. The ladder filter, thus has become a very practical home-brew possibility.

Figure 14 shows a typical six-pole ladder filter and its 'tuning' capacitors. Depending on the frequency of the crystals (they should all oscillate within a range of 150 Hz for SSB filters) and the characteristics of the quartz itself, G3JIR's article shows how to calculate the value of C1 to C9 and the terminating load resistance.

Given that six crystals have been selected from a bulk supply, it may be that the capacitor sizes calculated by the Hardcastle method are non- standard. However, the writer has found that by parallelling two standard value capacitors he can always get close enough to the calculated value to produce an excellent filter. The filter board of Figure 16 has been laid out with this technique in mind.

To make the whole project even easier, it is understood that the Frankston and Mornington Peninsula Amateur Radio Club, PO Box 38, Frankston, Vic. 3199, will be making available matched sets of crystals, including matching BFO crystals and resonating capacitors.

MODULE 2 — THE CRYSTAL FILTER BOARD

Figure 15 gives the circuit diagram of the module while Figure 16 shows the parts placement on the six inch x 1.5 inch (152 mm x 38 mm) circuit board. With the exception of the diplexer (L5 and L6), the filter is used for both transmission and reception.

This diplexer ensures that the double balanced diode mixer used in the (yet to be described) mixer stage of Module 1 is properly terminated in 50 ohms at all of its output frequencies, not only at the required output of 8 MHz. This is a prime requirement of diode DBMs.

The 2N2222A buffer stage has an input impedance of close to 50 ohms and its collector load matches the crystal filter. When in the transmit mode, the input to the buffer stage is from the balanced modulator of Module 6, Figure 6 with the changeover being made with a miniature relay.

It should be noted that a mismatch occurs between the 200 ohm output impedance of the balanced modulator and the 50 ohm input impedance of the 2N2222A buffer. The consequent loss of gain is not important in this particular instance.

If, in other applications, it is necessary to provide a better match for gain reasons, then a 4:1 broadband matching transformer could be interposed between the two stages.

The filter removes one sideband and the SSB signal is amplified in a BF981 stage. This amplifier is exactly the same as that on the IF amplifier board (Module 3, Figures 12 and 13).

No values have been put on RL1/RL2 or on C1 to C9, since, as explained, they depend on the actual crystals used.

As an indication, the following values were necessary for two differently sourced batches of 8 MHz crystals used by the writer.

		Batch 1	Batch 2
RL1 = RL2	— ohms	330	180
C1 = C9	— pF	68	100
C2 = C8	— pF	56	82
C3 = C7	— pF	68	100
C4 = C5	— pF	220	470
C6	— pF	68	120
Centre Frequency	— kHz	8002	7999
3 dB bandwidth	— Hz	2682	2548
60 dB bandwidth	— Hz	4333	4210
Ripple	— dB	>1	>1

In both cases the design 3 dB bandwidth was 2700 Hz and the nearest standard capacitor/resistor value was used. Trimming to the calculated values only affected the bandwidth by a few hertz, leading to the belief, that the approach is a practical one. Varying the load resistance by one standard resistor value either way had a little more effect, with top ripple increasing to just under 2 dB.

CONSTRUCTION AND TESTING

If the module is required only for reception, the relay and its associated diode can be omitted and a link put between the appropriate points on the board.

There are no constructional hazards and the technique described in Part 3 for winding the coils will be of assistance. The leads of the BF981 need to be bent down to fit into the board, the method was also detailed in Part 3.

Before applying power, two equal value resistors should be used to terminate the AGC line. As in the case of the IF strip, one goes between the AGC pin and +12 volts, the other between the AGC pin and earth. The output pins are terminated with a 51 ohm resistor, which is monitored with an RF probe and meter. Sufficient signal at 8 MHz, acquired from a signal generator or the BFO, is injected into the input pins. It might be necessary to swing this input signal and/or vary its level, until an indication is seen on the probe meter. The tuning slugs of L5, L6 and L7 are adjusted in that order for maximum meter reading, reducing the input signal as peaking proceeds to keep the meter reading on scale.

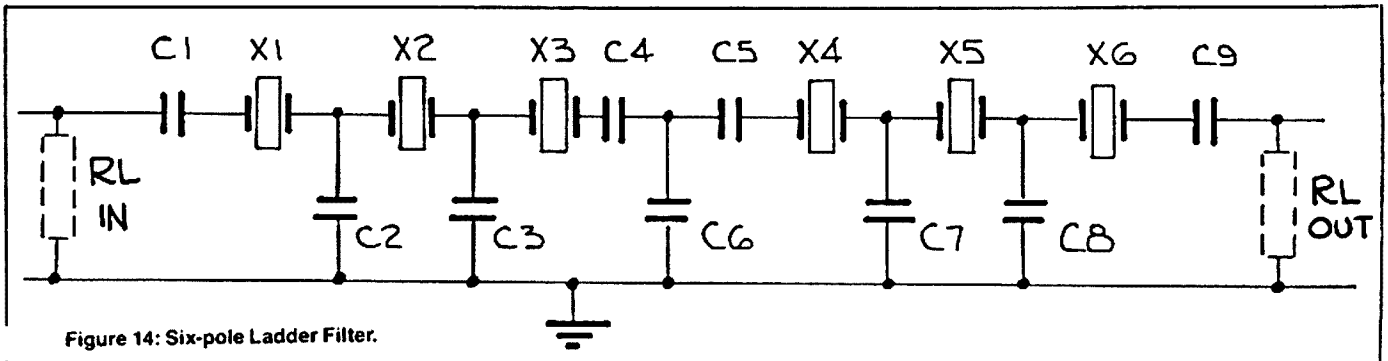


Figure 14: Six-pole Ladder Filter.

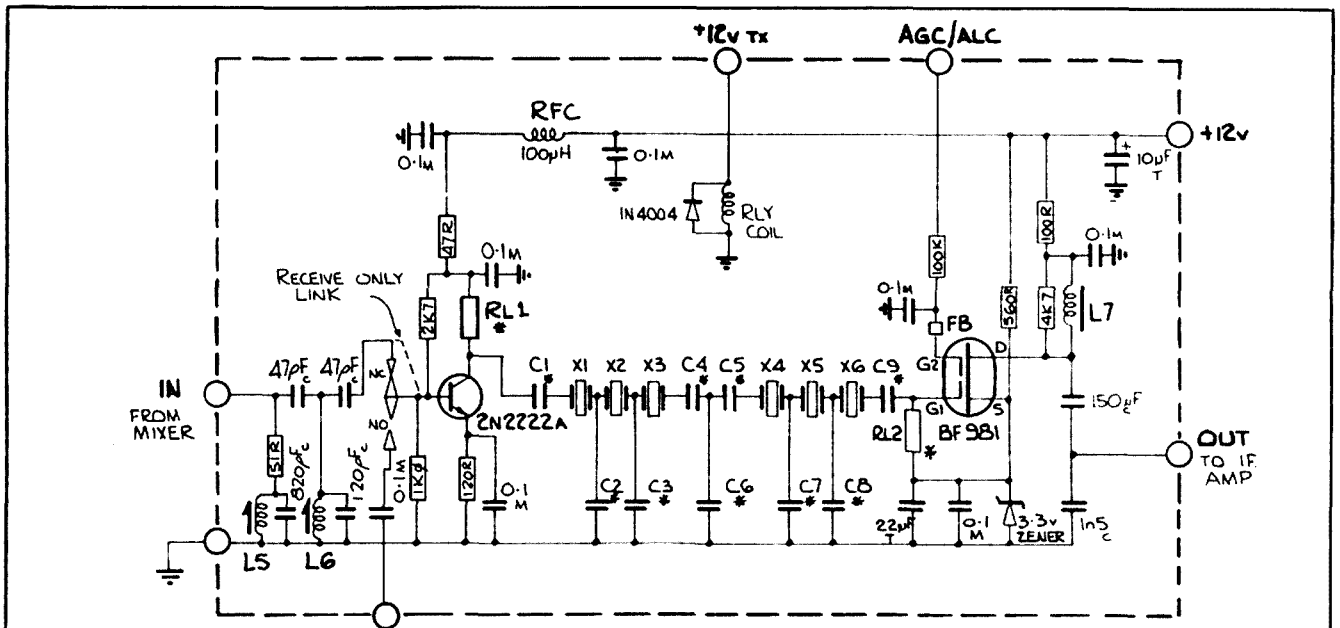


Figure 15: Module 2 — Circuit.

NOTES:

1 All resistors ¼W 5 percent
2 M = Monolithic Ceramic Capacitor
3 C = Ceramic Disc or Plate Capacitor
4 Relay is DPCO National Type HB2-DC12
5 L5 = 12 turns 26 gauge Enamel Close Wound on Neosid Type A Former — F29 Slug
6 L6 = 25 turns 32 gauge Enamel Close Wound on Neosid Type A Former — F29 Slug
7 L7 = 27 turns 32 gauge Enamel Close Wound on Neosid Type A Former — F29 Slug
* = See text for discussion of values

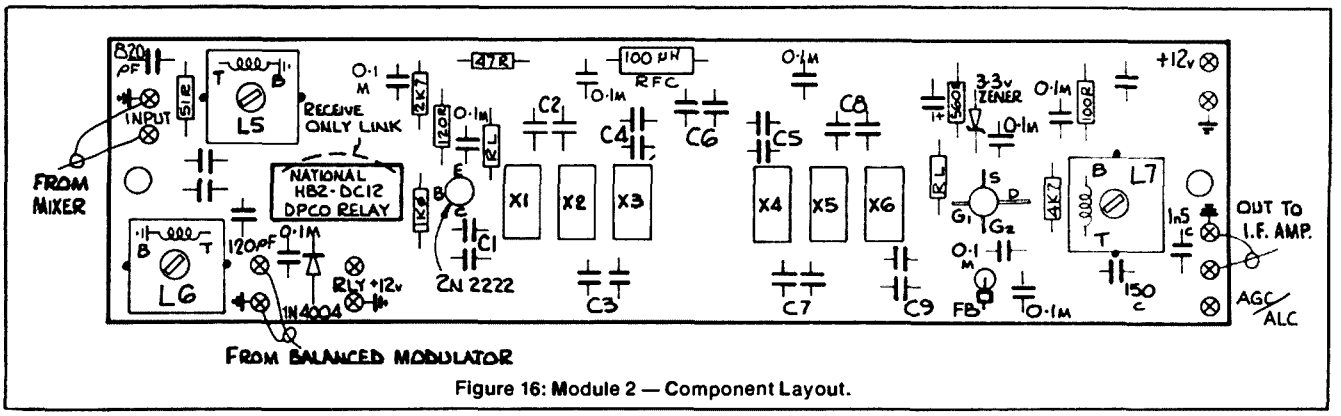


Figure 16: Module 2 — Component Layout.

It will be found that L5 is fairly broad in its tuning and the peak may be difficult to identify. Final peaking can be done only when the receiver is finished.

MODULE 9 — THE VFO

Figure 17 gives the circuit diagram of the 2.9-3.4 MHz VFO and its associated power supply. Figure 18 shows the parts placement on the two 2.5 inch x 1.8 inch (64 mm x 46 mm) PCBs used. Figure 19 is the drilling detail of the recommended Eddystone 6908P diecast box housing the units and Figure 20 shows the disposition of the boards and associated off-board components, within the box.

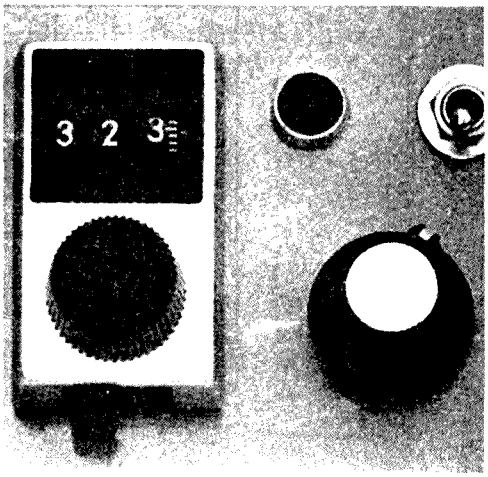
The VFO is a standard Clapp circuit but uses varactor main tuning instead of the more conventional variable capacitor. As explained in Part 1 of this series the high cost of variable capacitors and the virtual non-existence of suitable capacitor drive mechanisms has required work to produce a practical alternative.

It must be noted that if a would-be constructor already has a 220 pF swing capacitor and a suitable drive mechanism at hand, they can be used in place of the BB212 main tuning varactor diode.

In this design the goal was to produce a VFO that had a low phase noise. One of the main criticisms of current amateur commercial 'Black Boxes' is that the oscillator phase noise is high, typically around -70 dBc, which has left the receiver open to interference caused by reciprocal mixing. The VFO described in this article achieved a phase noise of -115 dBc in a 1 Hz bandwidth 3 kHz out from the carrier.

The oscillator inductor, L8, is wound on an Amidon T68/2 toroid. Its nominal inductance of 11.5 microhenries is higher than is normally suggested in order to increase the energy stored in each oscillation cycle. The frequency determining capacitors, 100 pF, 82 pF and the two 1500 pF, are styroseal types as their temperature characteristics are much better than ceramic discs or silver mica capacitors.

The oscillator proper is an MPF102, which is followed by a two stage FET/bipolar buffer. It is recommended that substitution of the active devices not be made. Since they are common stock items, their supply should present no difficulty.



Close-up view of the Multi-dial.

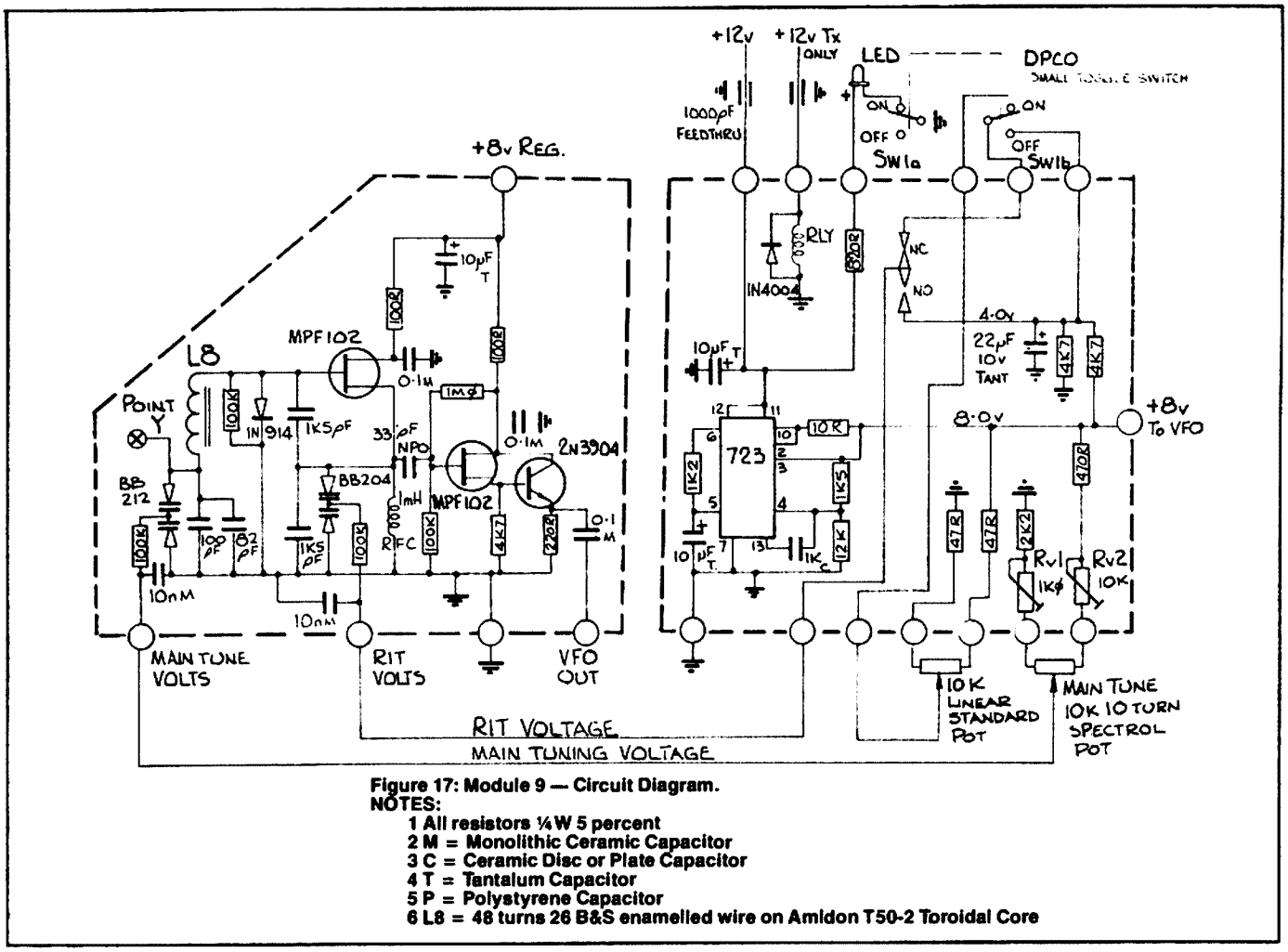


Figure 17: Module 9 — Circuit Diagram.

NOTES:

1 All resistors ¼W 5 percent
2 M = Monolithic Ceramic Capacitor
3 C = Ceramic Disc or Plate Capacitor
4 T = Tantalum Capacitor
5 P = Polystyrene Capacitor
6 L8 = 48 turns 26 B&S enamelled wire on Amidon T50-2 Toroidal Core

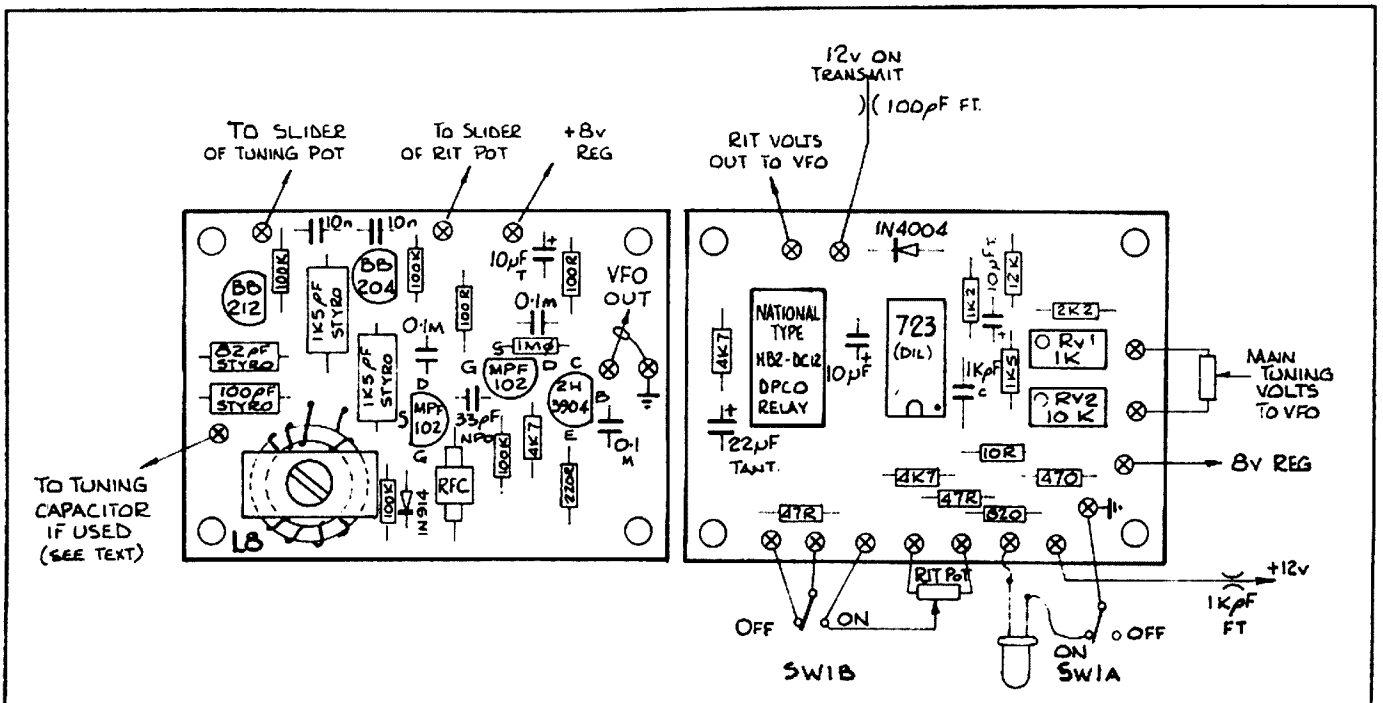


Figure 18: VFO and Power Supply — Component Layout.

The power supply for the VFO, and especially the varactor tuning voltage, must be very clean and stable. The standard three pin regulator is just not good enough. If, as in this design, a five volt change of varactor tuning voltage produces a frequency change of 500 kHz, then the 'sensitivity' is 100 kHz per volt or 0.1 Hz per microvolt. A 7808 regulator has a typical noise output of up to 90 microvolts and, if used in place of the regulator described, would produce an output that was effectively FMed by 9 Hz. The 723 regulator used in the configuration shown, has a noise output of only two microvolts and does not significantly modulate the carrier.

The 12 volt supply to the 723 is already regulated, which removes some of the strain on it. The 1k5 and 12k resistors between pins 3, 4 and ground set the output to 8.0 volts. The 1k2 resistor between pins 5 and 6 ensures maximum temperature compensation. The 10 ohm resistor out of pins 2 and 10, limits the short circuit current to about 70 milliamps. The eight volt line powers the oscillator, and buffers. It is also the source of the tuning voltage for the two varactors.

The Spectrol Type 534 10-turn 10k linear potentiometer and its Spectrol Model 18-1-11 Multidial, forms the main tuning function, while a linear 10k potentiometer provides for receiver incremental tuning or RIT.

SW1 allows the RIT to be switched on and off, with a LED to indicate status. The relay is energised only on transmit and disables the RIT irrespective of the position of SW1. This avoids the situation where stations chase each other up and down the band because their 'clarifiers' have been disabled on transmit.

One thing that is rarely stressed, or for that matter mentioned, is that even the best designed and constructed VFOs will not reach their potential for stability and cleanliness, unless they are housed in the right sort of container. Ideally this container should be of metal and have sufficient thermal capacity to iron out short term variations in ambient temperature. It should also be very stiff and non-resonant; ie the sides should not flex when the box is moved about. Such flexure will cause a slight variation in the oscillator frequency.

Luckily all these desirable features are present in the ubiquitous die-cast box. The present design uses an Eddystone Type 6908P unit. Finally, don't expect the box to do all that it should if the lid is left off. Apart from draughts causing frequency changes there can be more subtle effects. During the development of the VFO module it was found that the 50 Hz field from the equipment on the bench was of sufficient magnitude to cause severe FMing of the oscillator and, even worse, degraded the phase noise performance.

CONSTRUCTION AND TESTING

Board construction is not difficult but it is essential that all components be firmly pulled down to the board. L8 is secured to the board with a 0.75 inch x 0.5 inch (19 mm x 13 mm) piece of stiff insulating material and a NYLON nut and bolt. A suitable insulant is epoxy circuit board material with the copper removed from it. If available, the turns on L8 can be locked in place with a high quality 'Q' dope. Don't use nail varnish because it noticeably reduces the O of the coil.

Commission the regulator board first and before installing it in the die- cast box, temporarily connect in the two tuning potentiometers. When 12 volts is applied, the voltage at the output pin should be 8.0 volts with a possible variation of 0.2 volts. When the RIT potentiometer is swung through its full 270 degree travel, the voltage on the slider should vary between around 0.5 and 7.5 with respect to earth.

Similarly, the slider of the 10-turn potentiometer should vary between 1.5 and 6.5 volts as the potentiometer is wound from one end to the other. If not, adjust RV1 and or RV2 to get close to these values.

Still on the bench, connect up the VFO and apply power. Turn the RIT potentiometer to half travel and measure the VFO frequency at both ends of the travel of the 10 turn potentiometer. This is ideally done using a digital frequency meter, but, failing this, listening on a general coverage receiver will do the job. Adjust RV1 and RV2 again so that the frequency coverage is from just under 2.9 MHz to just over 3.4 MHz.

With the main tuning potentiometer at some central point, move the RIT potentiometer to one end of its travel and measure the frequency, then to the other end of its travel and again measure the frequency, the total change should be about 3 kHz. If the VFO output pins are temporarily terminated with a 50 ohm resistor, the output when measured with the RF probe as used in Part 2, should be between 0.5 and 0.6 volts.

If the die-cast box has been drilled according to Figure 19, then assembly of the two boards and the other components into it can take place. The writer recommends that the box is rubbed down with steel wool and painted before this assembly takes place. The extra time spent doing this makes the finished project look more professional.

Each of the two boards is mounted on quarter-inch (6 mm) metal standoffs tapped an eighth-inch (3 mm) or whatever else is around the shack that is about this size. The connection between the output pins on the VFO board and the output socket should be done in thin, about eighth-inch (3 mm) coaxial cable, the impedance being unimportant. All other connections are made in normal hook up wire.

Next month's article in *Amateur Radio* will cover Module 7, the heterodyne board and Module 1, the front end board.

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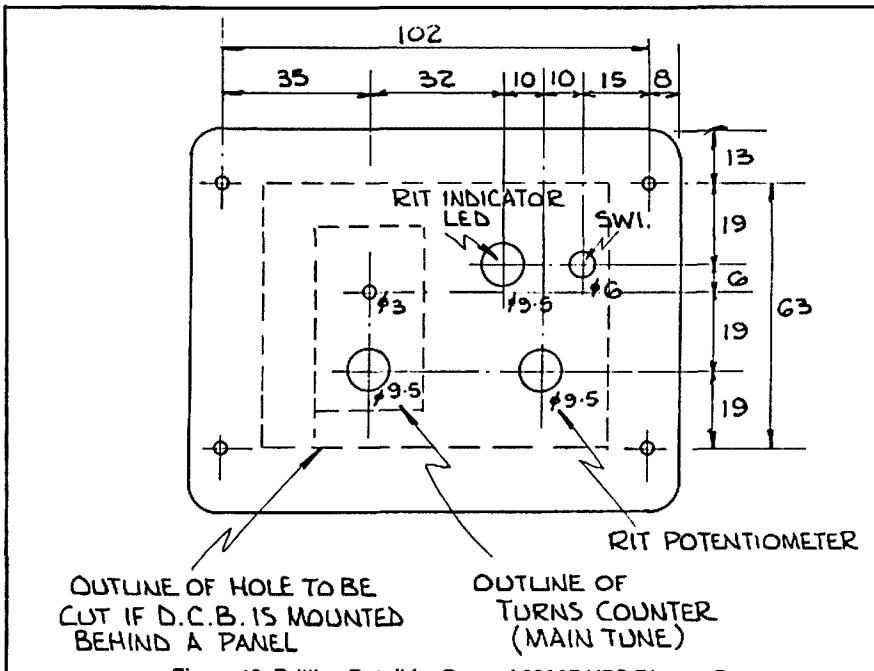

Figure 19: Drilling Detail for Base of 6908P VFO Diecast Box.

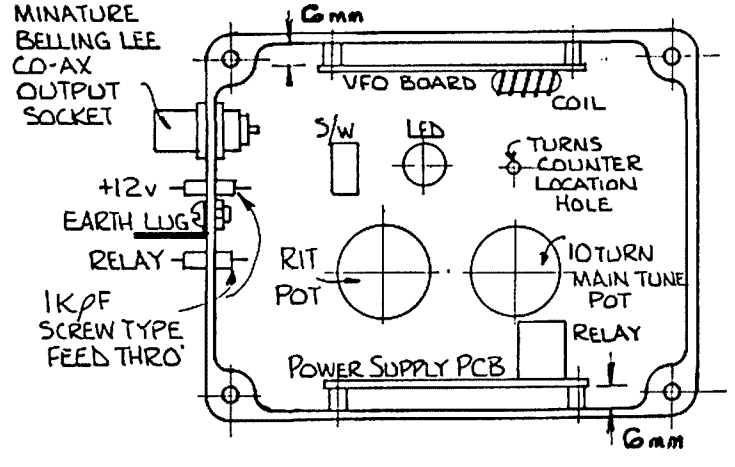

Figure 20: VFO/Power Supply.
Placement of components and PCBs in 6908P DCB.

AERIALS: SOME PRACTICAL CONSIDERATIONS — II

SELF-SUPPORTING MASTS AND TOWERS

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SO FAR WE have considered guyed masts, but what of the self-supporting types of masts and towers? They certainly look more professional and there are no problems caused by guy wires when you come to hang that ultimate beam system on top of the structure. They may take a number of forms, from the telegraph pole through to the lattice tower, and each does the job efficiently if proper attention is paid to the mechanics of it and correct design safety factors are considered.

In considering the guyed mast, all loads except the downward acting load, due to the mast's own weight and some small load due to the downward acting component of the guy wire tension, are carried by the mast base. All wind and aerial loads are taken by the guy wires and their anchors. It is a completely different ball-game when a self-supporting structure is used.

Consider a mast standing upright and just balanced on the ground. At the first puff of wind the mast would fall down in the direction the wind blows it. From this fact we can deduce several important things. Firstly, the wind exerts a force on the mast; secondly, that the mast has a resistance to the wind or a wind-loading. If we further consider the position, we find that the harder the wind blows, the quicker our mast falls down. We can further deduce that the wind-loading increases with wind speed. Furthermore, the larger the area offered to a given wind the greater the tendency for our mast to fall down.

WIND LOADING

We now have two factors tending to overturn our mast; firstly the wind velocity, the other the mast area. The wind velocity exerts a pressure on the mast area which increases as the square of the velocity. At a velocity of 50 MPH, the wind exerts a pressure of 6.4 pounds per square foot, but if the velocity is doubled to 100 MPH, the pressure is quadrupled to 25.6 pounds per square foot. If we are designing our own structure we begin by determining the wind velocity we wish to consider a safe maximum. This figure must be reached by considering the known wind patterns over a considerable time for the region where the mast will be erected, taking into consideration any local wind peculiarities.

We therefore calculate the area of the mast, and knowing the wind pressure per unit area at our designed maximum wind velocity, we can determine our total overturning force. Where a circular pipe or rod section is used there is less wind resistance due to its more streamlined shape, so a correction factor may be applied to the area calculations. If the area of a circular section is multiplied by the factor of .6, this will compensate for the circular shape. With beam aerials, the area should be calculated, as should the area of the rotator and the rotator extension pipe. The wind load of the mast will act from half the height of the mast. The aerial wind load will act from its height and the combined load for the extension and the rotator will act from halfway up the extension pipe. Thus, if we have a mast area of X square feet multiplied by .6, it will be acting as a lever from the midpoint of the mast and will exert a force of (X x .6) pounds x H/2 feet pounds, where X = area of mast in square feet and H = height of the mast in feet. Similarly, the force acting from the rotator/extension will be Xrot x H + Hrot, where Xrot = area of rotator + area of extension and Hrot = height of rotator plus height of extension/2.

Forces acting due to the aerial can be found by estimating the aerial area (square root of (side area squared + end area squared)) x Ha, where Ha = height of aerial above ground. Obviously these figures do not leave any margin for safety, so it is usual to multiply these figures by a factor known as the safety factor. The usual safety factor used varies between two and three. If the mast or tower is ready-made, all the necessary calculations of stress and wind loading have already been made by the manufacturer and it only remains to check that they are adequate for local wind conditions.

OVERCOMING WIND LOADING

As we are not guying our mast, it then becomes necessary to find a method of preventing the wind loading from overturning it. At its very simplest, as with our telegraph pole, this overturning force can be resisted by burying some of the mast in the ground and allowing the soil resistance to offer the necessary resistance to the overturning force. But, how deeply do we bury the mast?

In theory this will vary considerably with the nature of the soil in which the mast is erected but a good rule of thumb, used for generations by electric authorities, is to plant the mast for some six feet for a mast up to 30 feet high and one-sixth of its height if above 30 feet high. Thus, if we want an mast 42 feet high we must begin with a pole 50.4 feet long an bury 8.4 feet in the ground. The same rule applies for concrete light poles. These concrete poles make an attractive looking structure but are expensive and quite heavy. A 17 metre pole weighs some three to three and a half tonnes and would be about 14 metres out of the ground. This would present more than a small problem for a working bee from the club and would be best left to professional erectors, as would the erection of a wooden pole of similar size. It may be possible to do a deal and obtain a second grade concrete pole cheaper and have your electricity authority plant it in your backyard for a nominal cost.

ANOTHER APPROACH TO OVERCOMING WIND LOADING

A different approach can be made, namely, the bottom of the mast, or more realistically, a

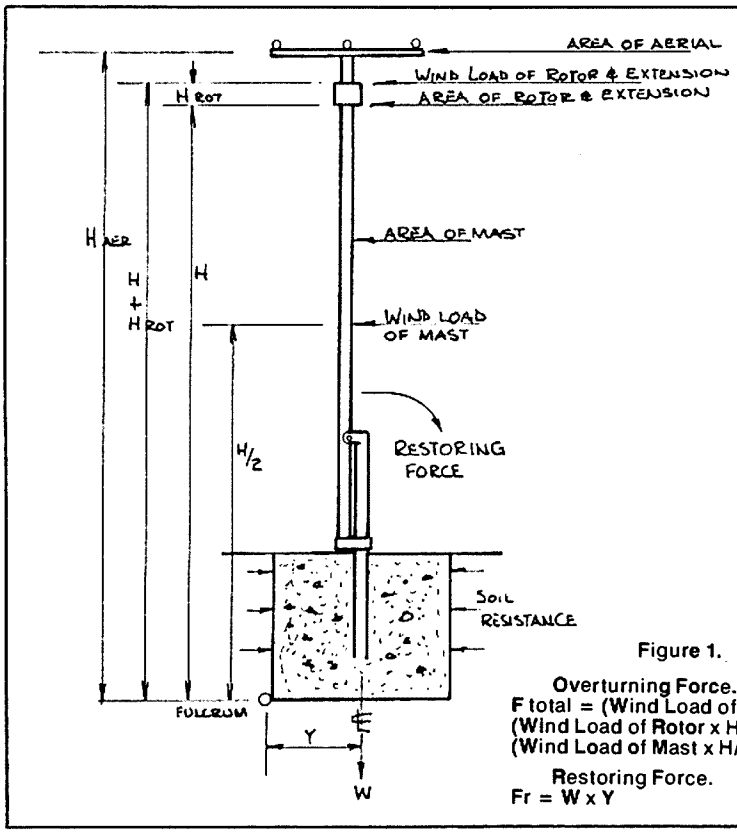

Figure 1.

Overturning Force.
F total = (Wind Load of Aerial x Haer) + (Wind Load of Rotor x H + Hrot) + (Wind Load of Mast x H/2)

Restoring Force.
Fr = W x Y

supporting post of wood or metal, can be buried in a concrete block. When the mast is raised the position is similar to novelty toys which have a counter-weight in the base and they always right themselves when tipped over. (Not that we intend going that far with our mast! ! !)

Acting on this concrete block, or counterweight, we have forces shown in Figure 1. As an overturning force, we have the wind loading of the mast acting as a lever from halfway up the mast plus the wind load of the aerial and rotator, if used, acting as a lever from halfway up the rotator/mast extension and including the wind load of the beam. Opposing this is the dead-weight of the concrete block plus the weight of the mast, rotator and aerial acting vertically through the concrete block. The overturning force acts on a pivot or fulcrum formed by the edge of the counterweight opposite the direction of the wind at any given time. The counterweight acts about the same fulcrum to restore equilibrium or maintain stability in the system and, so long as this force exceeds the overturning force, the mast will remain erect.

Do not overlook that the wind forces will also supply a bending moment to the mast and can actually bend it if construction is too light or flimsy. Therefore, we need good old-fashioned solid construction practices.

Instead of a mast construction, a triangular or square lattice type of tower can be used of course.

ERECTING THE MAST

The mast can be stood up and bolted to posts as described for the guyed mast. However, there is one big difference in the approach to the job. As this is to a a self-supporting structure, there are no guys to assist with the erection. It then becomes necessary to make up temporary ropes or wire guys and take them off where convenient during the actual erection. One convenient difference is the need to to get to the top of the mast after erection, so it is simple to remove the temporary guys when the mast is erect. If the mast is bolted in place it then becomes a fixture and, consequently, it is almost imperative to fit pole steps to make it possible to climb to the top to carry out adjustments, etc.

Allowing for the well-known propensities of the younger generation to act adventurously, it is wise to begin the steps at least two and a half metres from the ground. This will then necessitate the use of a ladder to climb to the first step. Treat it safely and do not lead the ladder for the littlies to find and use.

At the top of the mast it is suggested to place four steps at the same level with 90 degrees spacing and two steps opposite at the next level down. It is sometimes necessary to have two people at the masthead when fitting a beam to the top and it is not comfortable wearing a 15 stone pair of boots on top of your own at that height!

For comfortable climbing, treat the steps as you would the rungs of a ladder. That means, one foot per step up or each step two feet apart on each side. Once again, I emphasise the safety angle — wear hard hats and safety belts when working on or around the mast.

A lattice tower can be installed to be a rigid fixture and it will take very little thought to find a means of securing the base. For instance, a heavy base plate on the tower, a couple of heavy hinges, and a bolt inserted *into* the concrete base which is safely secured with a nut when the mast is erect.

TILTING AND TELESCOPING TOWERS AND MASTS

For sheer luxury and convenience it is hard to go past the tilting and telescoping tower or as a lesser luxury, the telescopic tower. With these towers comes some control over the forces of Mother Nature as the tower may be telescoped to a lower level when prevailing winds become menacing. In the final chapter, you can tilt the mast and support it horizontally if necessary. In cyclonic conditions don't wait for the full fury of the winds before doing this. It is almost imperative that a tilting tower or mast be telescopic also to reduce the tilting load to manageable proportions, particularly when operating the tower alone. Remember that the stress situation has altered quite a bit from the upright condition when the mast is horizontal. The short section of mast normally below the tilting pivot is now opposing the main load caused by the upper section of the mast whilst horizontal. This applies a force of weight on the upper section acting from halfway along the mast plus the weight of the rotator and the extension acting from halfway along the extension plus the weight of the aerial acting from the distance of the pivot point to the aerial. These combined forces are all acting on the tilting winch and are quite substantial. Consequently, ensure that the winch, winch cable and mounting system are heavy enough for the job at hand, are substantially mounted, and that the winch and cable are correctly aligned.

It is best to follow the manufacturers instructions when erecting these towers. Failure to do so would render void any claim for faulty materials or workmanship against the suppliers. These suggestions are for guidance only and I do not accept any responsibility for accidents arising from same.

The amateur who has sufficient engineering knowledge to design and build their own lattice tower and base system would not need my advice on how to erect it.

WINCHES AND SAFETY MEASURES

Winches have several flaws in their design and are likely to confound the poor old amateur with their completely unpredictable behaviour at the most inopportune times. Therefore, it is suggested to take suitable restraining measures with a winch to prevent any minor (or major) disasters occurring.

Winches carry the lifting and tilting loads of the mast/tower and aerial through the winch cables. For this reason it is necessary to choose a cable that is capable of carrying the load with a good safety factor and ensure that the cables are periodically inspected and lubricated. Quite obviously the winch and its mounting are also carrying this load, so the same safety factors should apply to both winch and mounting. The action of the winch pawl should be positive and the pawl system should be greased and a close check made of the pawl spring for rust and corrosion.

A broken or worn pawl on the tilting winch can cause the sudden descent of the mast and, if you are standing in the wrong place, you could be driven into the ground like a staple! The same result could be reached if unauthorised people, particularly children, attempt to operate the winch. Therefore, take the strain off the winch and cables by building-in a locking pin and plate system for both winch systems. Knowing the ability of the junior population to figure out the easiest way to get into the maximum amount of mischief, I suggest that these safety locking pins or plates be, in turn, locked securely with padlocks, keeping the key in the shack and not left hanging on the winch. The extra peace of mind you will find will enable you to concentrate on enjoying QSOs to the fullest.

EIFFEL TOWER AND OTHER AWFUL TOWERS

These classic types of towers, which have three or four upright legs and usually are of beautiful aesthetic proportions, are the ultimate in the art of tower design. If you can afford to have one installed at your QTH you are indeed fortunate and sufficiently "well-heeled" to have the constructors do all the worrying and calculations involved with laying the foundation concrete blocks, etc.

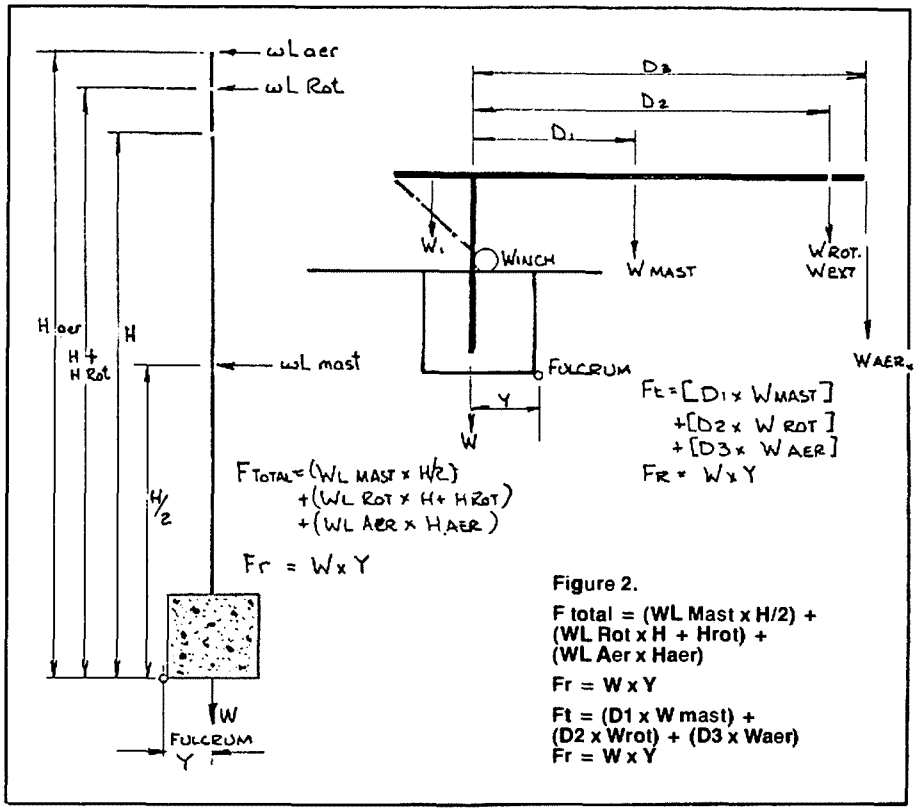

Figure 2.

F total = (WL Mast x H/2) + (WL Rot x H + Hrot) + (WL Aer x Haer)

Fr = W x Y

Ft = (D1 x W mast) + (D2 x Wrot) + (D3 x Waer)
Fr = W x Y

Windmill towers are in this category and make fine towers for all our purposes. This type of tower also has the same basic design problems as any other self-supporting tower. Wind loads have to be calculated from the area and maximum wind velocity. From these figures, the overturning forces have to be determined, as before. However, the righting force calculations are complicated by the fact that there is one concrete block at the base of each leg.

We will not go into the necessary calculations here as few will be built and the erection firm will take care of the details for those installing one.

CONCRETE SLABS AND BASES

If we study the diagram of the mast with its forces acting upon it, we see that the fulcrum *for both overturning and* righting forces is located on one edge of the concrete block. Some simple mental arithmetic will show that a deep block of a very small area will be overturned more easily than a shallow block of a wide area. If, however, the block is too shallow it does not supply a great deal of support to the base posts. It is then necessary to consider the shape of the block and a good round style is a cube or maybe a somewhat greater plan area than elevation area. As all stresses and forces are designed around the worst possible case to give ample safety margin, it can be easily seen that it is best to place the mast support in the centre of the block.

The weight necessary to overcome the overturning force at the designed wind velocity must be determined and a safety factor of at least two applied to the result; ie the weight doubled. Knowing that one cubic foot of concrete weighs approximately 140 pounds, or one cubic yard weighs some 3780 pounds, or even one cubic metre weighs some 2235 kg, we can then estimate the amount of concrete needed. The necessary size of the hole to be excavated can also be calculated.

If you are lucky you may receive assistance from family and/or friends to dig the hole while you are "planning the next step!"

Once the hole is there in all its glory, you may decide to make further use of your willing(?) assistants and decide to mix your own concrete. A suitable mix is one part cement, two parts sand, and four parts gravel. It is certainly easier on the labour side to buy the cement ready mixed.

Before the cement is poured install the base posts and hold them plumb with temporary staying timbers or wires until the concrete has set. Heavy steel reinforcing rods can be driven into the sides of the hole to transfer some of the load into the earth and so increase the safety factor. It is also a sign of good practice to build a simple box form at the top of the hole to carry some of the concrete above the ground level. Do not think the concrete is wasted as its weight will still contribute to the righting force, and make a more professional-looking job.

If the mast is to be mounted on a foot plate bolted to the concrete base, a wooden frame can be made using the foot plate as a template, with the mounting bolts fitted to the frame and the frame and bolts supported in the centre of the hole until the concrete sets. The bolts should present a large area to the concrete to prevent pulling-out under strain. This can be done by slipping a length of heavy steel (say 2 x ½ inch), drilled at the appropriate centres, over the bolts. Another method is to use heavy lag bolts or to thread lengths of steel rod and bend them at right angles well below surface level.

When the concrete has set it is only necessary to remove the nuts, wooden frame and box frame above ground level. Do not forget to allow at least a week for the concrete to cure before raising the mast.

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USSR CALL SIGNS

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Many are intrigued by Russia but few know or understand very much about it. Ken Stevens VK5QW, was fortunate enough to attend the North West Pacific DX Convention, in Seattle, Washington at the end of July 1986. Included in the many interesting subjects covered by the Convention was a lecture on Russia, Russian call signs and the way they work, and a coverage of their awards program by Jack Wichels W7YF. Jack has kindly given permission for AR to publish his lecture notes so AR readers may better understand the USSR.

USSR GENERAL INFORMATION[1]

1 The land area of the USSR is about two and a half times that of the USA.
2 The USSR makes up about one sixth of the total land area of the world.
3 The population of the USSR is about 15 percent greater than that of the USA.
4 The USSR ranges in latitude (excluding the Arctic Islands) from about 35 degrees north in the Turkmen Republic, to about 1300 km from the North Pole at Cape Chelyuskin.
5 The USSR contains more different time zones — 11 — than any other country in the world, from Zone 3 in Kaliningrad (UA2F) to Zone 13 in Chukotka (UA0K). The entire USSR is on Daylight Savings Time for the whole year round.
6 Parts of the USSR still have extremely low population density. Evenk Nationality Okrug UA0H, in Central Siberia, only has an estimated 13 000 population: 44 people per 1000 square miles. By comparison, Alaska had, in 1984, 880 people per 1000 square miles.
7 Excluding Mexico and Canada, the USSR is the closest country to the USA: 80 km across the Bering Straits, in the middle of which is Big Diomede Island (USSR), separated from Little Diomede Island (USA) by the International Date Line and only three kilometres of water.

REPUBLICS OF THE USSR

The various USSR Republics shall be listed first since the USSR call sign system is based on keying the call signs to each of the various Republics.

The USSR — Union of Soviet Socialist Republics — is made up of 15 separate Republics.

a The RSFSR — Russian Soviet Federated Socialist Republic — is by far the largest of the 15 Republics, comprising 76 percent of the USSR's land area and 54 percent of the USSR's population. The RSFSR might very loosely be described as made up of what may be called "Old Russia" in Europe and "Siberia" in Asia.
b The remaining 14 Republics are these:

1 B-T-Y Ukraine Soviet Socialist Republic, or the Ukraine
2 C Byelorussian SSR, or Byelorussia, or White Russia
3 D Azerbaijan SSR, or Azerbaijan
4 F Georgian SSR, or Georgia
5 G Armenian SSR, or Armenia
6 H Turkmen SSR, or Turkmen
7 I Uzbek SSR, or Uzbek
8 J Tadzhik SSR, or Tadzhik
9 L Kazakh SSR, or Kazakh
10 M Kirghiz SSR, or Kirghiz
11 O Moldavian SSR, or Moldavia
12 P Lithuanian SSR, or Lithuania
13 Q Latvian SSR, or Latvia
14 R Estonian SSR, or Estonia

The meaning of the capital letters is explained below.

DXCC COUNTRIES AND CONTINENTAL BOUNDARIES

Each of these 15 USSR Republics counts as a separate DXCC country. The DXCC Countries List shows *19* USSR "countries." Where are the other four?

a The RSFSR, though a single Republic, is on two continents, Europe and Asia. So the European RSFSR counts as one country and the Asiatic RSFSR counts as the second, and separate, country. We are now up to 16, instead merely 15, countries.
b Kaliningrad, UA2F, (before World War II it was Konigsberg, East Prussia, Germany), is politically part of the RSFSR, but is separated (by more than 120 km) geographically by two other USSR Republics, Lithuania and White Russia. So UA2F-land is still another separate DXCC country. Now there are 17 of them!
c Franz Josef Land, a group of USSR-owned islands in the Arctic Ocean, is more than 360 km from the USSR mainland, so FJL counts as a separate country. . . . 18 countries.
d USSR stations (4K1-) operating from scientific bases on the Antarctic Continent are counted as operating from Antarctica. There are the 19 USSR DXCC "countries."

(Note: Look at a map showing the Azerbaijan Republic. Part of this Republic — Nakhichevan ASSR, Oblast number 002, is — like Kaliningrad, geographically isolated from its parent Azerbaijan SSR by Armenia.
Oblast number 002, however, is not counted as a separate DXCC country, because the separation distance is less than 120 km (DXCC Criteria number 3).)

We may also point out that the USSR *political* boundary between European RSFSR and Asiatic RSFSR differ from the traditionally accepted *geographical* boundary between the two continents. The accepted geographical European-Asiatic continental boundary starts at the Arctic Ocean, follows the ridge line of the Ural Mountains, then the Ural River to the Caspian Sea. Politically as well as by call sign area, the USSR defines this continental boundary as being the same as the *western* boundaries of the *UA9* call sign area, which are *west* of the Urals. So for DXCC as well as for All-Asian DX Contest, *any* UA9 call sign is on the Asian continent, by definition.

Note, also, that the USSR Republics of Georgia, Azerbaijan, and Armenia are also on the continent of Asia. There can be no argument here, since the Caucasus mountains, which form the northern border of these three Republics, are also the accepted geographical boundary between Europe and Asia.

THERE ARE OBLASTS, AND THEN THERE ARE OBLASTS!

There are 184 different amateur radio regions in the USSR. Each of these, for amateur radio purposes, is called an *oblast*. These have been assigned discrete numbers, from 001 to 191, as of May 1, 1984, when the current USSR call sign assignment system became effective. There are, no longer, any oblasts with numbers 11, 32, 35, 61, 116, 171 and 172: for various reasons, these seven oblasts were deleted on or before May 1984.

There is a difference between an *oblast* for amateur radio purposes, and an *oblast* as used to define a Soviet political sub- organisation. If one looks at a map of the USSR for these oblast QTHs, it will be found that these amateur radio oblasts include not only Soviet (political) oblasts, but also USSR Republics (Moldavia, OBL No 39); Autonomous SSRs, or ASSRs (Tatar ASSR, UA4P, No 94); Krays (Primorye, UA0L, No 107); Autonomous Oblasts, or AOs (Jewish, UA0D, No 111); Nationality Okrugs, or NOs (Koryak, UA0X, No 129); and even merely cities (Moscow, UA3A, No 170). Again, for amateur radio purposes, all of these "things" are called oblasts.

There is good reason to mention the "oblasts versus oblasts" here. For example, if you QSO an amateur whose prefix is UA0X, he may tell you his QTH is in Kamchatka — or he may tell you his QTH is in Koryak. Either way, he is correct. The Koryak NO is a political subdivision of the Kamchatka Oblast. If you really pin him down he will tell you he is in OBL No 129.

When you look at an Oblast List set up in numerical order, you might well wonder how did they get in that particular order. The original list of 170 oblasts were set up in order by the name of the Republic *in the Cyrillic, or Russian, alphabet*, and then numbered sequentially.

INTERNATIONALLY ASSIGNED RADIO CALL SIGNS FOR THE USSR

International radio call sign blocks are assigned to each world country (and a few International Organisations) by the International Telecommunications Union (ITU), whose headquarters are in Geneva, Switzerland. A reasonably complete and current list of ITU call sign assignment blocks is included on page 125 of the *1986-87 Australian Radio Amateur Call Book*.

The ITU call sign block assignments for the USSR are listed below:

EKA-EKZ
EMA-EOZ
ERA-ESZ
EUA-EZZ
LYA-LYZ
RAA-RAA — or any call sign starting with the letter R
UAA-UZZ — or any call sign starting with the letter U
YLA-YLZ
4JA-4LZ

Gaps in the E-series are for call sign blocks assigned to other countries, such as Liberia, Eire, Spain, etc. Likewise, other world countries are assigned blocks beginning with L, Y, and 4.

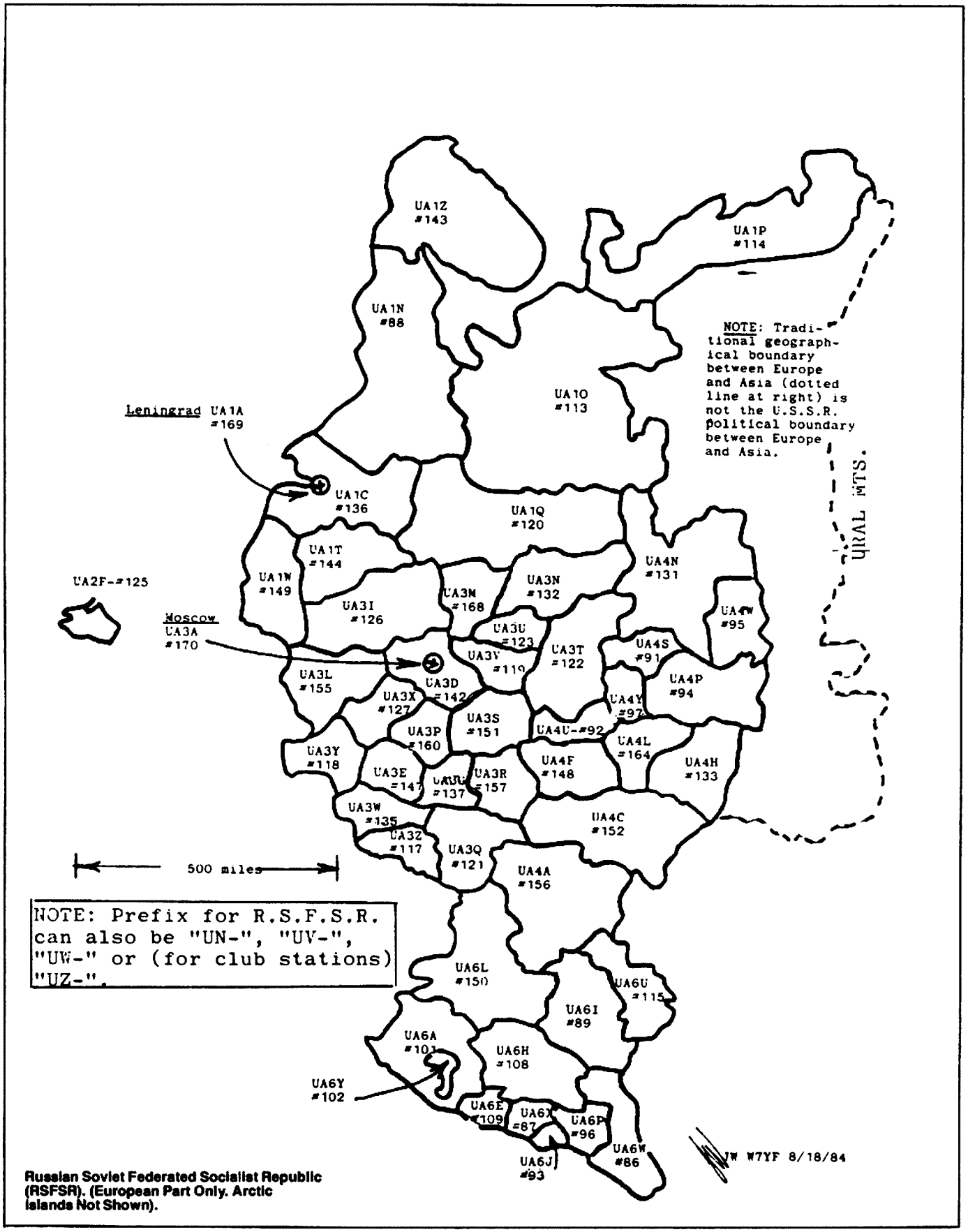
4K0 — prefixes have been used for stations on floating ice islands in the Arctic Ocean. 4K1 — prefixes are used by USSR stations operating from Antarctica. YL3M was on air from Yaroslavska, OBL No 160, a few years ago.

Several years ago, 4J0BJ was assigned to a special DXpedition on Shikikan Island, in the Kurils.

The USSR has also been a little unusual in occasionally assigning call signs made up of only four letters (no numerals) to amateur stations: ***RAEM*** was the call sign assigned to Ernst Krenkel from 1934 until his death in 1971;
UPOL has been the call sign given to Arctic ice island amateur stations, sometimes followed by a number; ie UPOL-22.

To amateurs just beginning to get their feet wet in DX, the message is clear; learn how to use that ITU List in the Call Book. It can answer a lot of questions arising when you hear an unusual call sign.

Warning! Caution! Here comes an in-house, purely arbitrary, "take it or leave it!", W7YF definition for the rest of the article to simplify



Russian Soviet Federated Socialist Republic (RSFSR). (European Part Only. Arctic Islands Not Shown).

describing the new USSR call sign assignment system, which went into effect on May 1, 1984.

1 "Russian" oblasts will mean any oblasts within the RSFSR only.
2 "Other" oblasts will mean any USSR oblasts *not within the RSFSR.*

IF YOU HEAR A USSR AMATEUR SIGNING HIS CALL, WHERE IS HE LOCATED?

Note: You will note this first description seems to ignore USSR call signs beginning with E, L, Y, and 4. This is correct. They will be discussed later under "Special Call Signs."

If you hear the call sign beginning with R or U, listen to see what the *second letter* of the call sign is.

1 *If the second letter is A, N, V, W, or Z, his QTH is in a Russian (see definition above) oblast.*
2 *If the second letter is any other letter,* he is in one of the other USSR oblasts (again, see definition above).

IF A RUSSIAN OBLAST, listen for the call sign number and the first letter to the right, or immediately following, the number. This key will tell what oblast his QTH is in, by using the Oblast List (see below).

IF IN ONE OF THE OTHER OBLASTS, listen for the two letters immediately a before and after the call sign number. Disregard the call sign number itself. These two letters will identify the QTH of this other oblast from the Oblast List.

Refer back to the list of the 14 "other" Republics above for moment. You will see some upper-case, or capital, letters preceding the name of each of the "other" Republics. One of these letters will be the second letter of the call sign — the letter immediately before the call sign number — and this letter identifies which of the "other" Republics the amateur is located in. The Ukraine is assigned more than one letter, since there are more than 26 separate oblasts making up the Ukraine.

You will also notice when you look over the Oblast List or the Oblast Maps, that there are five of the 15 USSR Republics which do not have any political subdivisions — that is, the whole Republic is a single oblast.

SECOND LETTER	REPUBLIC
G	Armenia
O	Moldavia
P	Lithuania
Q	Latvia
R	Estonia

For each part of these five Republics cited above, you can forget about any other part of the call sign to identify the oblast, since there is but one oblast in each.

Examples

1. UA*4H*P

The second letter is A, meaning it is a Russian oblast (RSFSR). The number and first letter to the right is 4H. From the Oblast List, this is Kulbishev, OBL No 133.

2. RW*0K*A

The second letter is W, again telling you it is a Russian oblast. The number and next letter is 0K. From the Oblast List, this is Chukotka, OBL No 139.

3. UL8GA

The second letter is *not* one of the Russian oblast letters, so it is in one of the other Republics. The second letter is L; disregard the number; the next letter is G. So the identifying sequence is L-G. On the Oblast List, this is shown as OBL No 190, the city of Alma Ata, in Kazakh.

And that is all there is to OTH identification of call signs under the new USSR call sign system. It is even simple and logical.

CLUB CALL SIGNS

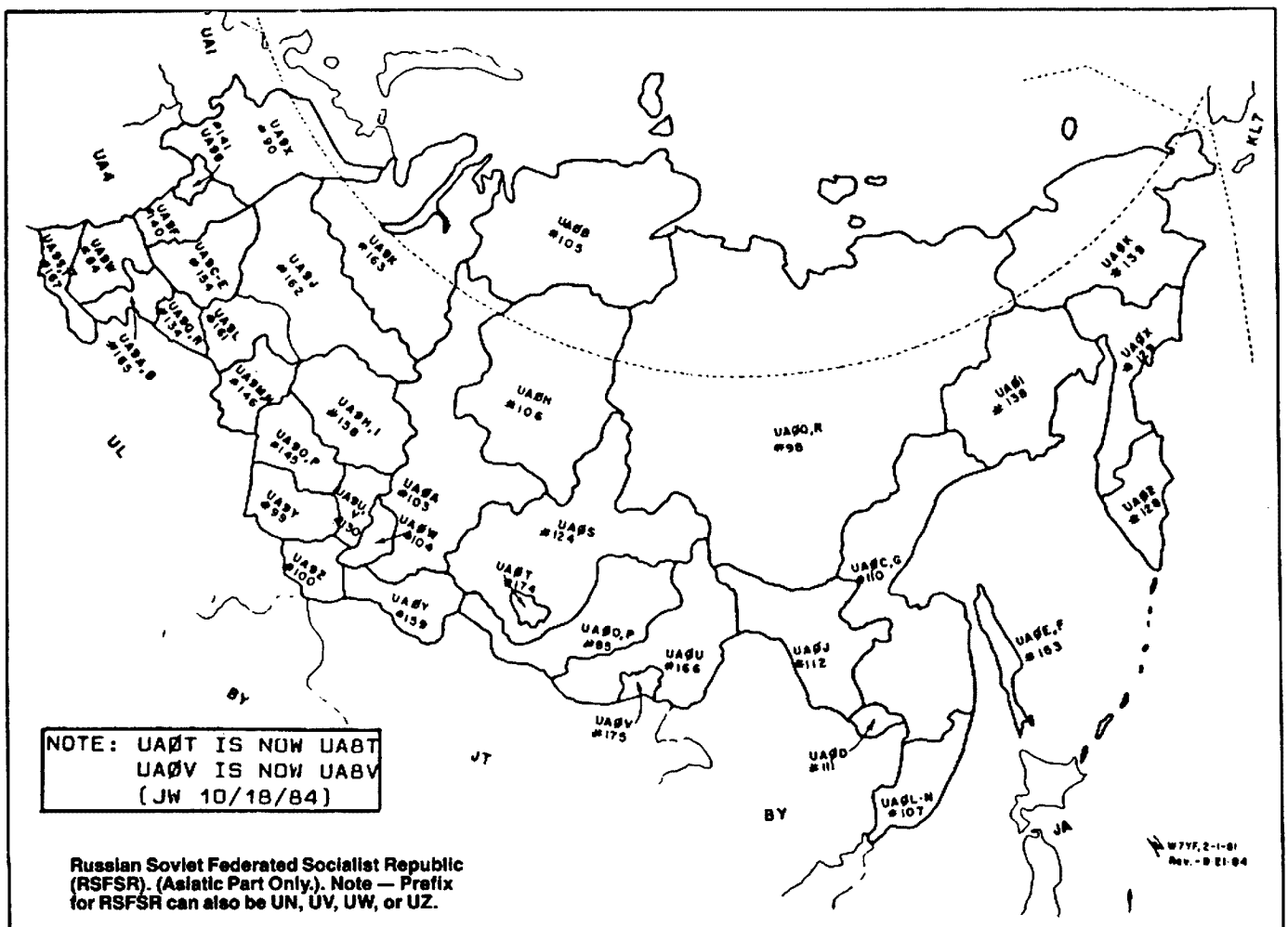
In the USSR, in addition to call signs issued to Individuals as in the US, there are special uniquely-identified call signs issued to club stations. Club station call signs in the USSR are identified in two different ways, depending on whether the QTH is in the RSFSR or in one of the other Republics.

1 IN RUSSIAN OBLASTS, club call signs are identified by the second letter of the call sign, which will always be Z.
Example:
UZ0KAA, a club station in Chukotka, OBL No 139.
2 IN OTHER OBLASTS, club call signs are identified by the second letter to the right, or second letter immediately following, the call sign number. This letter will always be either W, X, Y or Z for club stations.
Examples:
UD2DWA, a club station in Azerbaijan, OBL No 001.
RC1CZB, a club station in Minsk, OBL No 009.
The club identifying letters cannot be in the same (second letter of the call sign) location as for Russian oblasts, because this location is reserved for the Republic's ID letter.

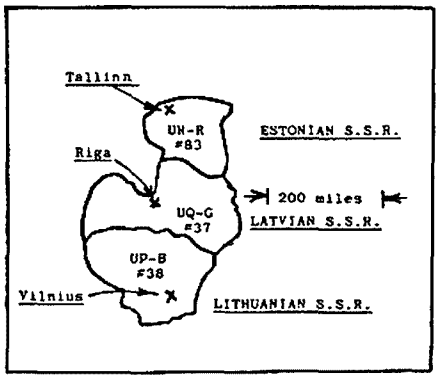
Exceptions:

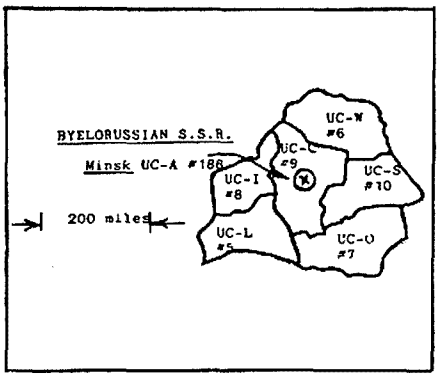
Unfortunately, there are exceptions to this otherwise logical "call sign versus QTH" system.

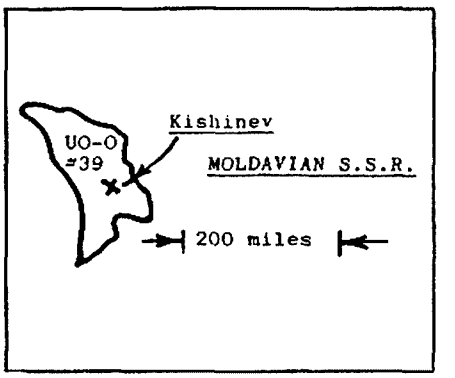
1 ***"Grandfathered" Call Signs.*** Five letter call signs which were issued prior to 1971 and

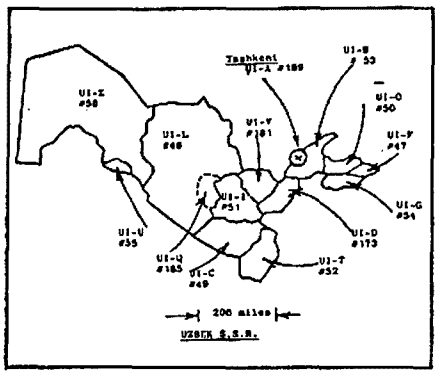


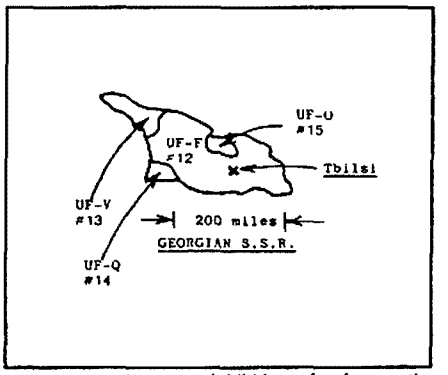
Russian Soviet Federated Socialist Republic (RSFSR). (Asiatic Part Only.). Note — Prefix for RSFSR can also be UN, UV, UW, or UZ.

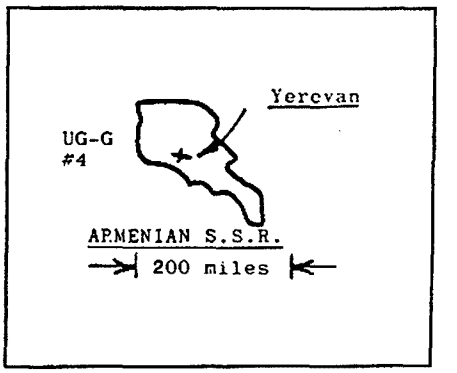


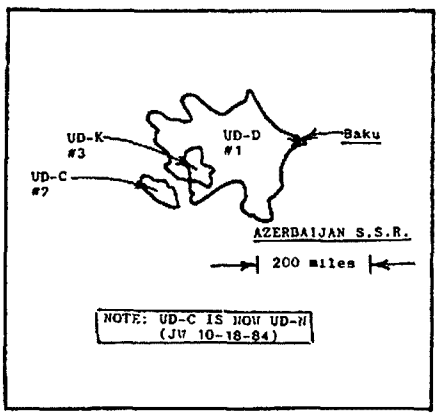












which are still in use are not necessarily changed by this new call sign system.

2 ***Commemorative, or Special Event Call Signs.*** Some of these special call signs fit into the calls beginning with E, L, Y, or 4, as mentioned previously. The Soviet Union seems to have no inhibitions for frequently assigning special call signs. Fortunately, many such times these special calls seem to more or less fit the system just described.

For example, U0Y has been used for DXpeditions to Tuva ASSR (Zone 23) — while there is no second-latter to identify this as a Russian oblast, the 0Y does fit OBL No 159, Tuva. A couple of years ago, U1ZM and U1ZZ were on air from Murmansk and vicinity — here again, still no second-letter, but otherwise the 1Z was okay for OBL No 143, Murmansk. U4W was on air some time ago from Udmurt, OBL No 095, and it fits the same pattern — no second- letter, but the 4W fits the system.

On the other hand, some special calls do not give much of a clue. U2H was on from Khatyn War Memorial in late 1984. His QSL information indicates Minsk, OBL No 009. I have not been able to pinpoint Khatyn.

The 1984 USSR call sign system appeared, at first, to "go to the dogs" during the Soviet Union's "40th Anniversary of World War II Victory," during which time special call signs came out of the woodwork from all parts of the USSR between January 1 — May 12, 1985. Even here, however, these "Victory" call signs could be tied back into the general call sign assignment system, once one figured out how to do it.

OBLAST LIST

The call sign prefixes on this list are shown beginning with the letter U, but keep in mind they can also begin with the letter R — and in some limited cases, E, L, Y or 4.

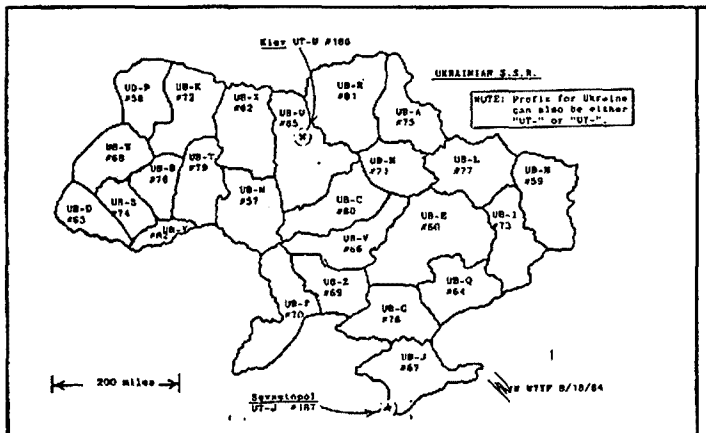
USSR OBLAST MAPS

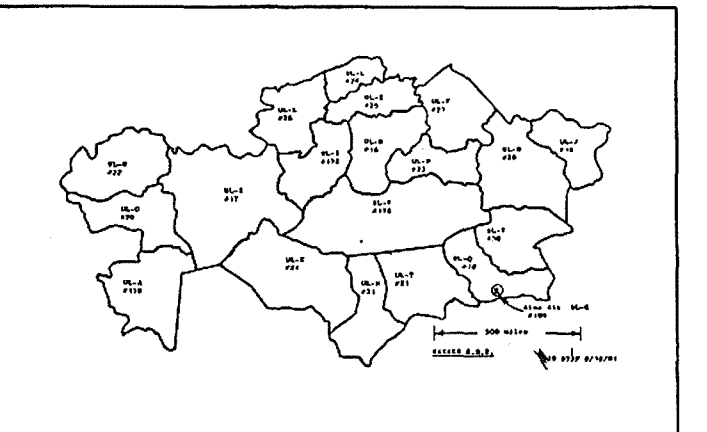
These maps identify and locate the various 184 oblasts on maps of each USSR Republic. Notice the dotted borders on maps for Tadzhik, Kirghiz and Uzbek SSR: Oblasts Nos 183, 184 and 185 are newly created oblasts, and their boundaries were not shown on my map: so I had to make a guess at these particular oblast boundaries, thus the dotted line boundaries.

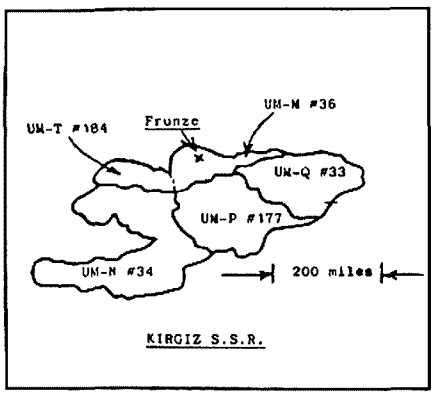
MINOR OBLAST CHANGES ON MAPS

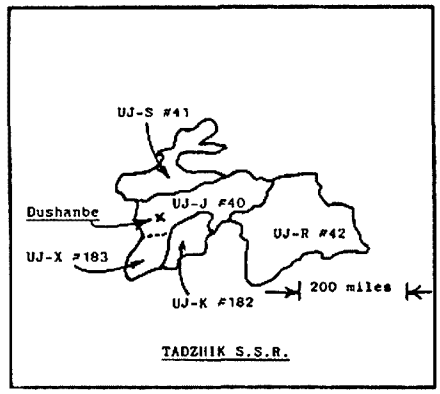
Since first preparing these maps, three oblast identifiers have been changed since May 1, 1984. These changes are noted in small boxes on the appropriate oblast maps.

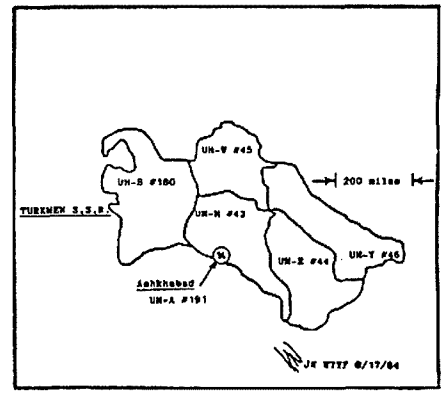
1 UD-C, OBL NO 002, has changed to UD-N
2 UA0T, OBL No 174, has changed to UA8T
3 UA0V, OBL No 175, has changed to UA8V











THE SOVIETS DO CHANGE NAMES OF CITIES

The Soviets do like to change names of cities or towns every so often, to supposedly honour a recently-deceased leader or high official. This may cause a problem sometimes when a USSR amateur tells you his QTH, and it cannot be located on a map — because the name change only took place in the last year or so! Here are a few "old" and "new" names that have taken place over the past several years:

1 Rybinsk, in UA3M, is now Andropov
2 Izhevsk, in UA4W, is now Ustinov
3 Sharypovo, in UA0A, is now Chernenko

ENGLISH-RUSSIAN MORSE CODE ALPHABET EQUIVALENTS

Table one shows these equivalents. The Russian, or Slavic, alphabet — more correctly known as the Cyrillic alphabet — has five more letters than does the English alphabet. I don't rightly know what the average amateur would do with this chart if he

ENGLISH, RUSSIAN & MORSE ALPHABETS

A	А	·—	L	Л	·—··	W	В	·——
B	Б	—···	M	М	——	X	Ь	—··—
C	Ц	—·—·	N	Н	—·	Y	Ы	—·——
D	Д	—··	O	О	———	Z	З	——··
E	Е	·	P	П	·——·	—	Ш	——————
F	Ф	··—·	Q	Щ	——·—	—	Э	··—··
G	Г	——·	R	Р	·—·	—	Ю	··——
H	Х	····	S	С	···	—	Я	·—·—
I	И	··	T	Т	—	—	Ч	———·
J	Й	·———	U	У	··—			
K	К	—·—	V	Ж	···—			

Table 1.

USSR OBLAST LIST

1	UD-D	Azerbaijan	50	UI-O	Namangan	99	UA9Y	Altai
2	UD-N	Nakhichevan	51	UI-I	Samarkandskaya	100	UA9Z	Gorno-Altai Aut
3	UD-K	Gorno-Karabakh	52	UI-T	Surkham Darinskaya	101	UA6A	Krasnodar
4	UG-G	Armenian	53	UI-B	Tashkentskaya	102	UA6Y	Adigei Aut
5	UC-L	Brestskaya	54	UI-G	Ferganskaya	103	UA0A	Krasnoyarsk
6	UC-W	Vietebskaya	55	UI-U	Khorezmskaya	104	UA0W	Khakass Aut
7	UC-O	Gomelskaya	56	UI-Z	Kara-kalpak	105	UA0B	Tajmyrsky
8	UC-I	Grodnenskaya	57	UB-N	Vinnickaya	106	UA0H	Evenkiysky
9	UC-C	Minskaya	58	UB-P	Volinskaya	107	UA0L	Primorye
10	UC-S	Mogilevskaya	59	UB-M	Voroshiiovgradskaya	108	UA6H	Stavropol
11	UC2-	Deleted 1960	60	UB-E	Dnepropetrovskaya	109	UA6E	Karachai-Cherkess
12	UF-F	Georgia	61	UB5-	Deleted 1963	110	UA0C	Khabarovsk
13	UF-V	Abkhazian	62	UB-X	Zhitomirskaya	111	UA0O	Jewish
14	UF-Q	Adjar	63	UB-D	Zakarpatskaya	112	UA0J	Amurskaya
15	UF-O	South Osselia	64	UB-Q	Zaporojskaya	113	UA1O	Arkangelskaya
16	UL-B	Celinogradskaya	65	UB-U	Kievskaya	114	UA1P	Nenetskiy
17	UL-I	Aktubinskaya	66	UB-V	Kirovgradskaya	115	UA6U	Astrakhanskaya
18	UL-Q	Alma-Stinskaya	67	UB-J	Crimskaya	116	UA4	Deleted 1962
19	UL-J	East Kazakhstanskaya	68	UB-W	Lvovskaya	117	UA3Z	Belgorodskaya
20	UL-O	Gurievskaya	69	UB-Z	Nikolaevskaya	118	UA3Y	Brianskaya
21	UL-T	Jambulskaya	70	UB-F	Odesskaya	119	UA3V	Vladimirskaya
22	UL-M	Uralskaya	71	UB-H	Poltavskaya	120	UA1Q	Vologodskaya
23	UL-P	Karagandinskaya	72	UB-K	Rovenskaya	121	UA3Q	Voronejskaya
24	UL-K	Kizil-Ordinskaya	73	UB-I	Doneckaya	122	UA3T	Gorkovskaya
25	UL-E	Kokchetavaskaya	74	UB-S	Ivano-Frankovskaya	123	UA3U	Ivanovskaya
26	UL-L	Kustanayaskaya	75	UB-A	Sumskaya	124	UA0S	Irkutskaya
27	UL-F	Pavoldarskaya	76	UB-B	Ternopoiskaya	125	UA2F	Kaliningradskaya
28	UL-C	North Kazakhstanskaya	77	UB-L	Karkovskaya	126	UA3I	Kaiininskaya
29	UL-D	Semipalatinskaya	78	UB-G	Hersonskaya	127	UA3X	Kalujskaya
30	UL-V	Taldy-Kurganskaya	79	UB-T	Hmelnickaya	128	UA0Z	Kamchatskaya
31	UL-N	Chimkentskaya	80	UB-C	Cherkasskaya	129	UA0X	Koryaksky
32	UM-	Deleted 1959	81	UB-R	Chernigovskaya	130	UA9U	Kemerovskaya
33	UM-Q	Issyk-Kul-Przhevalsk	82	UB-Y	Chernovickaya	131	UA4N	Kirovskaya
34	UM-N	Oshkaya	83	UR-R	Estonia	132	UA3N	Kostromskaya
35	UM-	Deleted 1959	84	UA9W	Bashkir	133	UA4H	Kuibishevskaya
36	UM-M	Kirghiz	85	UA0O	Buryat	134	UA9Q	Kurganskaya
37	UQ-G	Latvia	86	UA6W	Daghestan	135	UA3W	Kurskaya
38	UP-B	Lithuania	87	UA6X	Kabardino-Baikarsk	136	UA1C	Leningradskaya
39	UO-O	Moldavian	88	UA1N	Karelian	137	UA3G	Lipeckaya
40	UJ-J	Tadzhik	89	UA6I	Kaiymk	138	UA0I	Magadanskaya
41	UJ-S	Leninabad	90	UA9X	Komi	139	UA0K	Chukotskiy
42	UJ-R	Gorno-Badakhstan	91	UA4S	Mari	140	UA9F	Permskaya
43	UH-H	Turkoman	92	UA4U	Mordovian	141	UA9G	Komi Permyatsky
44	UH-E	Maryiskaya	93	UA6J	North-Ossetia	142	UA3D	Moscowskaya
45	UH-W	Tashauzskaya	94	UA4P	Tatar	143	UA1Z	Murmanskaya
46	UH-Y	Chardjouskaya	95	UA4W	Udmurt	144	UA1T	Novgorodskaya
47	UI-F	Andijanskaya	96	UA6P	Checheno-Ingush	145	UA9O	Novosibirskaya
48	UI-L	Bukharskaya	97	UA4Y	Chuvash	146	UA9M	Omskaya
49	UI-C	Kashkadarskaya	98	UA0Q	Yakut	147	UA3E	Orlovskaya
						148	UA4F	Penzenskaya
						149	UA1W	Pskovskaya
						150	UA6L	Rostovskaya
						151	UA3S	Riasanskaya
						152	UA4C	Saratovskaya
						153	UA0F	Sakhalinskaya
						154	UA9C	Sverdlovskaya
						155	UA3L	Smolenskaya
						156	UA4A	Volgradskaya
						157	UA3R	Tambovskaya
						158	UA9H	Tomskaya
						159	UA0Y	Tuva
						160	UA3P	Tulskaya
						161	UA9L	Tiumenskaya
						162	UA9J	Khanty Mensyjsky
						163	UA9K	Yamalo Nenetsky
						164	UA4L	Ulianovskaya
						165	UA9A	Cheliabinskaya
						166	UA0U	Chitinskaya
						167	UA9S	Orenburgskaya
						168	UA3M	Yaroslavskaya
						169	UA1A	Leningrad
						170	UA3A	Moscow
						171	4K0-	Deleted 1984
						172	4K1-	Deleted 1984
						173	Ui-D	Syrdarinskaya
						174	UA8T	Ust Ordynsky Buriatsky
						175	UA8V	Aginsky Buriatsky
						176	UL-Y	Turgay (1970)
						177	UM-P	Narynsky (1970)
						178	UL-R	Dzhezkazganskaya (1973)
						179	UL-A	Mangishiakskaya (1973)
						180	UH-B	Nebit Dag (1983)
						181	UI-V	Dzhizakskaya Oblast (1973)
						182	UJ-K	Kulyabskaya Oblast (1973)
						183	UJ-X	Kurgan-Tyubinskaya (1977)
						184	UM-T	Taiasskaya (1980)
						185	UI-Q	Navoyskaya (1982)
						186	UT-U	Kiev City (1984)
						187	UT-J	Sevastopol City (1984)
						188	UC-A	Minsk City (1984)
						189	UI-A	Tashkent City (1984)
						190	UL-G	Alma Ata City (1984)
						191	UH-A	Ashkhabad City (1984)

—September 18 1984 . . . K1KI

SPECIAL NOTES TO OBLAST LIST

DELETIONS: 11, 32, 35, 61, 116, 171, 172
MISCELLANIOUS: UA6A = UA6B, UP-B = UP-P, UR-R = UR-T
Call signs may begin with R or U — RI = UI, UZ = RZ, UB = RB, etc
UKRAINE — UB = UT = UY
RSFSR — UA = UN = UV = UW = UZ
Call signs issued before 1971 may not follow this pattern.
Club call signs can be identified by a W, X, Y or Z in the second letter following the number.
The Oblast can be determined by the letter following the number for all Republics, except the RSFSR where the number and following letter are needed.
Franz Josef Land stations are in Oblast 113 — UA1O.

does not already read or write in the Russian language!

Using CW when in contact with USSR amateurs, one does run into some three- letter abbreviations of Russian words quite often, and I encourage DXers to use them as appropriate:

DSW means goodbye (pronounced dah scee-DAH-neeyah)
SPB means thank you (pronounced spah-SEE-bah)

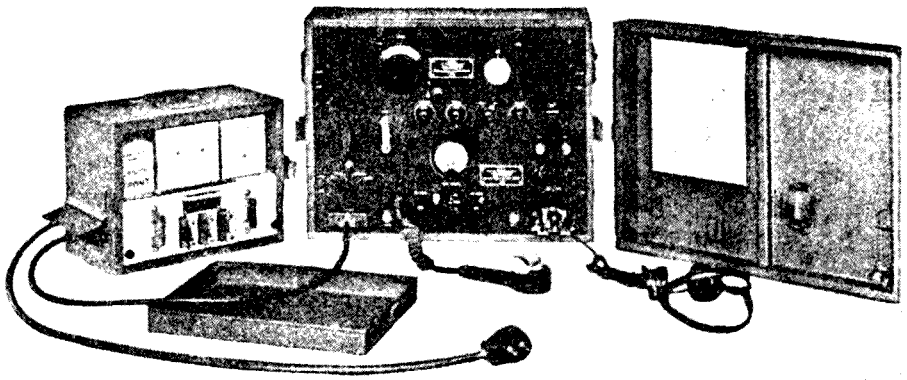
1. From the *1986 World Almanac* and *Webster's New Geographical Dictionary*

Thanks to Tom Frenaye K1KI, for his assistance with the *current* Oblast Lists. For anyone who wants to keep up-to-date on the latest USSR amateur happenings should get K1KI's *USSR Tidbits* newsletter. Write to Tom at PO Box 62, Unionville, CT, 06085, USA for more information.

ar

'ARMY WIRELESS SETS OF WORLD WAR II

Jim Payne VK3AZT
PO Box 105, Yarra Glen, Vic. 3775



Field Wireless Set, No 109, Mark II*.

Most 109 sets constructed by Standard Telephones and Cables have a three valve transmitter and a five valve receiver covering 2.5 to 5 MHz. In the transmitter, 4307-A pentodes or 807 "Red Spot" tubes were interchangeable as master oscillator (Colpitts), power amplifier and modulator. In the receiver, 6U7G tubes function as RF and IF amplifiers, 6K8G is a mixer, 6B6G combines as second detector, AVC generator (R/T only) and audio amplifier while 6J7G is beat note oscillator. In some early models the synchronous vibrator for the receiver power supply is mounted in the receiver while the HT supply for the transmitter is obtained from a synchronous split reed vibrator and filters in the power supply unit.

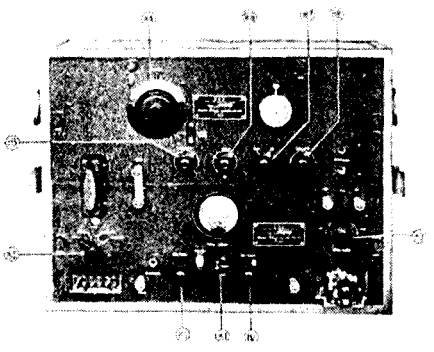
Two alternative types of power units supplying both the transmitter and receiver are provided for later models. In one type the HT supply for the transmitter is obtained from a non-synchronous vibrator operating in conjunction with a selenium rectifier, while in the second type the rectifier unit has four 6X5-GT valves. A six volt 150 AH battery is usually used as the current drain is 2.7 amps on receive and 19.5 amps on transmit.

Power input to the final stage is about 15 watts. The carrying case containing the transmitter and receiver is 650 mm, 420 mm and 255 mm (WHD) and consists of a light steel angle welded framework, to which are welded panels of sheet motor body steel. The detachable lid is drip proof and held rigidly in place by two spring snap-action locks. The power unit measuring 370 x 345 x 215 mm is similarly constructed. Both cases are bonderised and finished with a heavy coat of hard stoved defence khaki green enamel. The set weighs 35 kilograms, the power unit 20 kilograms, the six volt battery 30 kgs and the antenna bag, etc, 9.5 kgs.

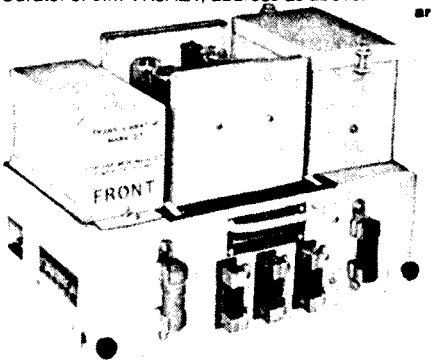
These sets issued as 109 Mark I, II, II* and II** were used by Australian Signal units in every campaign from 1940 to late 1944, when many were replaced by the 22 set. In the 109 Mark II, the power amplifier circuit was keyed and, if the neutralising was not completely effective, a weak carrier was audible at close quarters with the Morse key open when working on W/T. In the Mark II*, the master oscillator circuit is keyed directly and the back signal is completely eliminated. Certain components of the later models were modified to withstand tropical climates with operating temperatures up to 55 degrees Celsius and relative humidities up to 100 percent. The Mark II** receiver is an improved design with a second 6B6G valve providing an additional stage of audio amplification.

NOTE: The Curator, Royal Australian Corps of Signals Museum, Simpson Barracks, Watsonia, Vic. 3085, wants a 109 set for that museum. If any reader has such a set for sale, or can suggest where one might be available, kindly advise the Curator or Jim VK3AZT, address as above.

ar



Transmitter/Receiver Unit, Front View.



Power Unit, Valve Rectifier Type, Removed from Case.

WHAT IS THIS THING CALLED AMTOR?

S E Molen VK2SG
13 Pendle Way, Pendle Hill, NSW. 2145

From time to time, readers may have heard of AMTOR. What does the name indicate?

There are two versions, one is **AM**ateur **T**eleprinter **O**ver **R**adio, the other is **A**mateur **M**icroprocessor **T**eleprinter **O**ver **R**adio. It is also known in the commercial field as the ARQ (Automatic Request Query), FEC (Forward Error Correction) or TOR (Teleprinter Over Radio) system. It is interesting to note that the amateur system will marry the commercial system, as both systems are designed to follow the CCIR (International Radio Consultative Committee) recommendation 476, and therefore follow exactly the same parameters.

The AMTOR code consists of the normal 26 characters of the alphabet, plus carriage return, line feed, figure case and letter case, the same as the normal RTTY signal, plus three extra characters used as control characters, these are designated as RQ, Alpha and Beta. The RQ signal is used as the request query and also in the original calling signal. Beta is used as an idle signal (when no traffic is flowing) and the Alpha is used as part of the hand over signal. Each character in the AMTOR Code consists of three lows and four highs, or three 000 and *four* 1111, or three marks and four spaces. The various arrangements of these highs and lows are all that the AMTOR system will accept. (Refer to AMTOR Codes, Table 1). The code is not compatible with either Baudot or ASCII. The actual transmitted signal is 100 Bauds, but the printer speed remains at 45 or 50 Bauds, whichever is selected.

Basically, there are three modes of operation:

1 Mode A — which is the automatic or ARQ mode
2 Mode B — or broadcast mode called FEC
3 Mode L — or listen mode (in this mode there are no transmission facilities)

In mode A only two stations can communicate with each other. The originating station is called the Master or ISS (Information Sending Station), the called or receiving station is called the Slave or IRS (Information Receiving Station). The master station remains the master throughout the whole contact irrespective of which station is transmitting at any time, and as master, controls the timing of the whole system.

In mode A operation the ISS (Information Sending Station) transmits three characters in 210 milliseconds, then goes to receive for 240 milliseconds, during the receive period the system looks for a logic reply from the IRS to indicate that the three characters have been received correctly, if the correct reply is received the ISS then proceeds with the next three characters, but if there has been an error in the reception at either end the last three characters are repeated until such time as they are received correctly. Both stations only acknowledge receipt of the correct logic signal consisting of the 3/4 ratio, all other signals are treated as errors and are not printed. Therefore, interference, static, etc does no cause misprints but only causes a slowing down of the traffic flow between the two stations, without any loss of traffic.

NO	LETTER	FIGURES	7-UNIT CODE
1	A	-	BBBYYYB
2	B	?	YBYYBBB
3	C	:	BYBBBYY
4	D		BBYYBYB
5	E	3	YBBYBYB
6	F		BBYBBYY
7	G		BYBYBBY
8	H		BYYBYBB
9	I	8	BYBBYYB
10	J	audible	BBBYBYY
11	K	(	YBBBBYY
12	L	)	BYBYYBB
13	M	.	BYYBBBY
14	N	,	BYYBBYB
15	O	9	BYYYBBB
16	P	0	BYBBYBY
17	Q	1	YBBBYBY
18	R	4	BYBYBYB
19	S	'	BBYBYYB
20	T	5	YYBYBBB
21	U	7	YBBBYYB
22	V	=	YYBBBBY
23	W	2	BBBYYBY
24	X	/	YBYBBBY
25	Y	6	BBYBYBY
26	Z	+	BBYYYBB
27	carriage return		YYYBBBB
28	line feed		YYBBYBB
29	letter shift		YBYBBYB
30	figure shift		YBBYBBY
31	space		YYBBBYB
32	unperforated tape		YBYBYBB
-	control signal 1		BYBYYBB
-	control signal 2		YBYBYBB
-	control signal 3		BYYBBYB
-	idle signal beta		BBYYBBY
-	idle signal alpha		BBBBYYY
-	signal repetition		YBBYYBB

AMTOR Codes: Table 1.

On completion of traffic in one direction an automatic changeover takes place by the sending station (ISS) transmitting +? (plus question-mark) when this is acknowledged by the receiving station (IRS) a change of direction of traffic takes place, and the slave station is now the transmitting station (but is not the master). In the event of a loss of signal for 15 seconds, the master station will then resume command and start calling the slave station, as it did at the start of the contact. When contact is re- established, the flow of traffic will continue as though nothing had happened, so that if the slave station was the transmitting station at the time of loss of signal, then the slave station will resume sending traffic from exactly where it left off, and the master station automatically returns to the receiving situation.

With Mode A, there is the availability of complete break-in, so that if the transmitting station asks a question, the receiving station can immediately break in to reply, finishing his reply with +?, the original transmitting station carries on with his traffic as though there has been no interruption, but the reply has been printed in the middle of his outward traffic. This feature is very handy for quick question and answer, and saves a lot of time under some circumstances. A further feature of Mode A is that, on start-up (switch on) you insert your call sign, which must consist of four characters only, thus VK2SG would become VKSG and VK2RT would become VKRT, but VK2BVE would become VBVE, it is the usual practice to use the first character and the last three characters of your call sign, there are some exceptions to this, such as the countries that have figures in their call sign; eg 9M2CR who uses the call sign NMCR. On entering the four characters, your system is now on standby (selcal) and may be left in this state indefinitely, as it will not operate unless it receives your designated call sign (selcal). As soon as it detects your call sign it will start to reply to the calling station as though you were present, and will receive any message sent to it. The sending station, upon receiving the correct reply, will then be able to send traffic to you, and know that you have received it correctly, because you have given all the correct replies. There is another feature that can be used at this time, and that is the delayed copy, this is a delay of your transmitted message that is not printed at the transmitting end of the circuit until the correct reply (control character) is received, and then it is printed. In this way, you not only know that you have sent the traffic, but you can see that the receiving station has received it correctly.

While you are in stand by, any other station may operate on the frequency without disturbing your system, because your system will only activate on your call sign, and not any other. Similarly, you may call another station's equipment by inserting their call sign into the Mode A facility. As soon as the call sign is entered, your system will start calling that station, and will start looking for a reply; as soon as it receives a reply, it will then go into traffic mode, and if you have any traffic to send, you may now proceed. At this point, both the transmitting and the receiving station may start to load their buffers, or should one, say pre-load, their buffers with up to 1024 characters (16 lines) and these characters will flow out at normal rate.

Mode A does have one disadvantage, and that is distance. Because the radio waves travel at 300 km per millisecond, there is a time delay between the time the signal is sent and the time that it is received at a distant point; as we have to wait for a reply from the distant station there is a further delay on the return path. If one considers a station, say 18 000 km away, the signal and the reply has to travel 36 000 km which will take 120 milliseconds on a direct path. To this we must add the 70 millisecond reply control character which brings us up to 190 milliseconds. Unfortunately, there are several other delays to be considered. Firstly, there is the delay of the transceiver, that is the time taken to go from receive to transmit at half power. This is usually in the order of 15 to 20 milliseconds, so we now have to add another 40 milliseconds to our delay time which brings us to 230 milliseconds. The path of the radio waves is not a direct line but a trip to the ionosphere and back. This takes more time, so that in the end we see that there is not enough time in receive to receive the full correct control character before we go back to transmit; it therefore becomes apparent the path length has a great bearing on the Mode A communication.

By speeding up the switching time of the transceiver, (refer Note 1), both from receive to transmit, and from transmit to receive, and if one could get the switching speed down to about two or three milliseconds, then the long path to Europe would be possible, provided that you can find a station in Europe that can operate at the same speed. Inversely, the short path to Europe presents very little problems as far as Australia is concerned as it is short enough to be able to operate Mode A with ease. The usual way to operate the transceiver is in the break-in mode with the AGC switched off. If it is still slow, then you might have to do some work inside the transceiver to eradicate some of the delays that are in-built. In actual fact, the delays of the transceiver will only be detrimental to the long haul signals, as, in the main, local contacts would be fairly easy unless you run into a very fast transceiver. The accuracy of Mode A may be judged by the following when compared with normal RTTY.

NORMAL RTTY	AMTOR
100 percent	100 percent
90 percent	99.9 percent
80 percent	99.8 percent
70 percent	99.7 percent
60 percent	99.5 percent
50 percent	99.2 percent
40 percent	98.8 percent
30 percent	98.2 percent

On the worst case shown, the traffic transfer speed will have dropped from 60 WPM to approximately 50 WPM, but still with almost complete accuracy.

With Mode B, or broadcast mode (FEC), we have operating conditions that are similar to normal RTTY, that is, key down all the time with no breaks. In this mode, we are again using the 3/4 ratio of the digital code so the receiving station still has the same logic letters to look for, and will therefore only accept correct logic, but as there is no check-back with the sending station, and therefore no possibility of detecting an incorrect letter, each character is sent twice but spaced 350 milliseconds apart. This spacing is used to allow time for static burst, car ignition, etc, and therefore removes some of the possibility of both letters being mutilated by one burst of static, etc.

The receiving station looks at the two characters, if both are correct logic it will only print one of them, but if there is a mutilation of either character, it will delete the incorrect logic character and print the correct logic character. If both characters are mutilated, and this can happen, it will then not print either but will leave a space where the character should be, therefore you are not getting garbled print, rather correct characters with letters missing. The sending speed is again 100 Bauds and the speed of the printer is 45 or 50 Bauds, whichever you have selected. The transmitted procedure is as follows:
A B CDAEBFCGDHEIFJG etc.

If you are typing at 45 Bauds there will be times where the transmitted message is ahead of the typed message. At this point, idle signals are automatically inserted, so that the receiving station may have a look at the correct phasing of the signal and make adjustments inside the system that may be necessary. There will be times when the signal is not good enough for a perfect print and therefore errors will creep in, in Mode B; this mode is not as accurate as Mode A but is a great improvement on normal RTTY. The handover in this mode is a mechanical operation and the operator has to make the changeover. It is not an automatic function as with Mode A.

Mode L is a listen mode only and has no transmit facility. It is purely intended to look at the operation of other stations in Mode A and Mode B, with Mode L you can look at both Mode A and B. The accuracy of this mode is no better than normal RTTY; as it is not an operating mode it is of no consequence.

NOTE 1:
ANARTS (Australian National Amateur Radio Teleprinter Society) has a list of switching speed modifications for 41 transceivers. For further information, write to: Box 860, Crows Nest, NSW and please include a suitable stamped addressed return envelope.

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Parasitic Beam Program for the Microbee

Karl Saville VK5AHK
2 Wood Street, Lobethal, SA. 5241

The following program is translated from the Parasitic Beam Program for the Commodore 64 by Joseph Ortuso VK7NJO, in June 1986 issue of *Amateur Radio.*

The Microbee program is not a direct conversion to the Commodore one and, because of the difference between the two basics, I have approached the solution in a slightly different way and the *Read-out* format is arranged differently.

However, I must thank VK7NJO for presenting a very interesting program which has given me some pleasure in converting it for the Microbee.

The program has been checked out over the range of 14 to 432 MHz against data for three element beams, in the 1979 *Radio Amateur's Handbook,* and the results compare favourably.

The program requires two *Inputs:* Frequency and Spacing of the elements. The latter spacing input being common to all elements.

The *Read-out* gives the lengths of the driven, reflector and director elements, in both feet and metres and also gives the approximate radiation resistance.

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```
00100   REM:A program to calculate
        dimensions for a 3 element parasitic
        beam, for the Microbee, by H K
        Saville VK5AHK. 1986
00110   CLS:CURS 20,1:PRINT"Parasitic
        Beam Program":CURS
        20,2:PRINT[A22 61]
00120   CURS 1,4:PRINT "Use 1.5 in OD
        tubing for 14 MHz and 1 in for 21 and
        above"
00130   CURS 1,5:PRINT "The forward gain
        for various spacings is between 7.5
        and 8 dB"
00140   CURS 1,6:PRINT[A62 45]
00150   CURS 1,9:INPUT"Which frequency
        (MHz)" ;F1
00160   CURS 1,10:PRINT"Which
        spacing";:INPUT S1
00170   D1=435+((S1-0.1)*150):D2=D1/F1
00180   R1=480+((S1-0.1)*120):R2=R1/F1
00190   A1=475-((S1-0.1)*50):A2=A1/F1
00200   H1=15+((S1-0.1)*400)
00210   W1=30000/F1
00220   W2=W1*S1/100
00230   W3=W1*S1/100/.305
00240   CLS:X1=0.305:A3=A2*X1:D3=D-
        2*X1:R3=R2*X1
00250   CURS 24,1:PRINT"ELEMENT
        LENGTH":CURS 24,2:PRINT [A14
        45]
00260   CURS 10,4:PRINT "For ";F1;"MHz
        and ";S1;"of wavelength
        spacing":CURS 10,5:PRINT[A46 45]
00270   CURS 10,6:PRINT"Driven El ",[F8.2
        A2];" ft or ";[F8.2 A3]; " mt"
00280   CURS 10,7:PRINT"Director ",[F8.2
        D2];" ft or ";[F8.2 D3]; " mt"
00290   CURS 10,8:PRINT"Reflector ",[F8.2
        R2];" ft or ";[F8.2 R3]; " mt "
00300   CURS 10,9:PRINT"The spacing is
        ";[F8.2 W3];" ft or ";[F8.2 W2]; " mt "
00310   CURS 10,10:PRINT"Radiation
        resistance is approximately
        ";H1;"Ohms"
00320   CURS 10,11:PRINT[A46 45]
00330   CURS 1,15:PRINT"Would you like to
        compute again, Y or N?"
00340   Z0$=KEY$:IF Z0$=" " THEN 340
00350   IF Z0$="Y" OR Z0$="y"THEN 100
        ELSE END
```

Parasitic Beam Program

Use 1.5 in OD tubing for 14 MHz and 1 in for 21 and above
The forward gain for various spacing is between 7.5 and 8 dB

Which frequency (MHz) 28.25
Which spacing? .175

ELEMENT LENGTH

For 28.25 MHz and 0.175 of wavelength spacing

Driven El	16.68 ft	or	5.08 mt
Director	15.79 ft	or	4.81 mt
Reflector	17.30 ft	or	5.27 mt
The spacing is	6.09 ft	or	1.85 mt

Radiation resistance is approximately 45 ohms

Would you like to compute again Y or N?

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NOT A RESCUE, BUT —?

Harry Atkinson VK6WZ
5/97 Railway Parade, Mount Lawley, WA. 6050

The way some people put to sea in small craft these days you'd think they had a whole team of guardian angels looking after them.

First Low Tide — PM Saturday.

Ron Dent VK6UF, however, is not like that.

On Saturday, March 14, Ron and his 17½-year-old "first mate" set off in their 5.2 metre runabout *Arjay* for a fishing and camping weekend at Ron's favourite "barra" spot, up river from Dugong Bay.

This spot is about 45 km from Ron's home and saltmine, Koolan Island, right up at the "top end" of Western Australia. And here's what *Arjay* had on board that March morning in addition to its human cargo.

A 65 hp main engine; a 6.5 hp emergency motor; food, water, fishing tackle, red and orange flares (both smoke and parachute type) and adequate fuel. A "crocodile dissuader" (.44 calibre magnum with 100 rounds of hv hollow- nosed ammunition); TS-430S transceiver; AT-300 tuner; 27 MHz AM marine band radio with 11 foot whip; RDF beacon (water activates) four life jackets; solar panels for emergency power and a hull repair outfit.

After an initial loss of 45 minutes — due to cleaning fuel line, filter and fuel pump because of a decision — wise as it turned out — to run on the 60 litres of emergency fuel for starters, petrol which turned out to be like some wine "over the hill" — the intrepid duo set off. But not to worry. The main tanks held 120 litres and even if the remainder of the emergency 60 stayed on just for the ride as dead weight, there was 40 more litres stowed away at the campsite.

Motoring along at 25 knots, they reached the mouth of the river at 1030 hours and, while waiting for the tide to rise and fill the creek with navigable water, caught themselves a small barra (weight 4 kg). An hour or so later, they were setting up camp.

Finally the boat was moored and the tide going out at 1700 hours. They felt they were in for a good weekend of fishing in the rock pools along the river bed. With *Arjay* gently settled at her moorings, the pair went walking along the river bed and brought back to camp eventually another barramundi and a couple of rock cod — a total of 18 kg!). The evening meal and listening to the night sounds — fish jumping and crocodiles barking — filled the time to lights out with a plan to be up bright and early next morning, for more fishing on the next low tide. Ron got up during the night and, by light of the full moon, with no wind and a balmy 25 degrees Celsius temperature, satisfied himself that all was well with boat and crew.

However, at daybreak, *Arjay* was high and dry on the rocky bed with its side hard against the bank and at an angle which placed the pressure of the boat's weight not on the keel — the thickest and strongest part of the hull — but on the forward gunwale, the thinnest part. As a consequence, there was a 150 cm crack below the water line, but above the flotation tanks.

However, says Ron, no worry. Good old epoxy and five minutes work and all was 100 percent again. But would *Arjay* at that angle cope with the next incoming tide? It was then that the TS-430S came into play. Shortly before 9.30 WA-time on Sunday the 15th, VK6UF called Don VK6HK, on 14.110 MHz during the test period prior to the VK6 WIA News Relay. Would Don stand by for the next few hours while the campers waited for the noon tide to get them afloat and on their way home?

Of course he would, said Don. And so the time passed while the WIA Bulletin went to air.

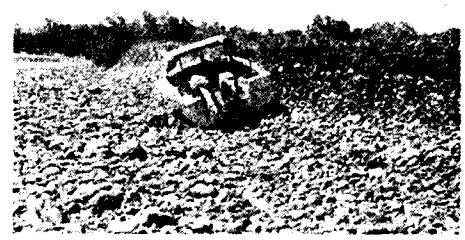
While those engaged in the call-backs on VHF and the other HF relays after the broadcast remained unaware of the possible drama going on up at Dugong River, Don and Ron were exchanging reports and arranging scheds for later in the day. Ron gave his position as 123° 51'E, 16° 37'S.

Despite a fear of leaking fuel and the onset of a period of illness, Ron and his first mate made it out from the river into the open sea and moved slowly and cautiously homeward. VK6UF expressed his heartfelt thanks to Don and others on the frequency who stood by in case rescue procedures had to be set in motion.

Recalling the incident Ron says there is no substitute for radio — particularly amateur radio — when away miles from anywhere and anyone. There is also no substitute for knowing where you are going and having on hand everything you are likely to need, no matter what the ultimate outcome.

It was not a rescue, but —? What if — no chart of the area, no hull repair outfit, *no radio?*

ar



Second Low Tide — AM Sunday, looking upstream.

SOLAR CELL

Sanyo of Japan, has developed the world's first translucent amorphous solar cell.

An exclusive cell structure and patterning technology allows natural light filtration and simultaneous generation of electric power from solar energy.

Sanyo says it can be used for a wide range of applications including home and motor vehicle windows, skylights, also outdoor and indoor artificial greenhouses.

DEVOLVEMENT OF EXAMINATIONS

SUBMISSION FROM THE WIRELESS INSTITUTE OF AUSTRALIA

1 INTRODUCTION

The Wireless Institute of Australia is the national body which represents the interests of all amateur radio operators throughout Australia. It has members in all States, in remote as well as urban areas, who have between them a vast reserve of expertise in practical, technical, educational and administrative fields and a reputation for willingness to assist the newcomers to the hobby.

The Institute is very aware of the need for present and future amateurs to have equal access to examinations whatever their location, available time or other constraints, and to have examination costs kept to a minimum.

Discussion at the Federal Convention re-emphasised these issues raised in the Institute's Interim Submission, and stressed the desirability of a uniform examination standard for candidates throughout Australia. This uniform standard has been traditionally maintained by examinations administered by a single body, the Department of Communications. It is the Institute's opinion that this single controlling body system should be retained.

2 REQUEST FOR ACCREDITATION

The Wireless Institute of Australia (WIA) requests that the Department of Communications (DOC) accredit it as the sole examining authority for Amateur Operator Certificates of Proficiency.

The Wireless Institute of Australia is the only body concerned with amateur examinations which has representatives in all States and a widespread network of willing assistants throughout the nation. Because of its close liaison with DOC over many years, the Institute has a good understanding of the problems involved in the present examination system, and the requirements of any future system.

The assumption of control over the examination system does not preclude other bodies. WIA Divisions, clubs, educational establishments or individuals, from arranging and managing examinations as required using materials prepared and supplied by the Institute's Examination Officer.

The Institute expects, as the examining body, to reserve the right to delegate or contract out the preparation of examination materials as required.

In this way, the most efficient use can be made of the vast reserve of expertise available within the membership.

3 REQUEST FOR ACCESS TO EXISTING EXAMINATION MATERIALS

The Institute requests access to the existing DOC question banks and the programs for computer generation of examination papers and Morse code examination tapes.

These items are needed as a starting point for the Institute's examination materials so that the existing standard can be maintained. The first few papers produced by the Institute should comprise at least 80 percent existing questions, and the tapes should continue to be produced from the existing program.

Review of the existing questions by the Examinations Committee will establish the pattern and level for future additions to the banks.

4 REQUEST FOR A TRANSITION PERIOD

The Institute requests that a transition period of at least 18 months be allowed so that it can fully develop the required infrastructure and procedures.

It is suggested that during this period the Institute will first assume responsibility for supervision of examinations, gradually moving into preparation and distribution of examination materials to a mutually agreed timetable.

5 THE INSTITUTE'S RESOURCES

The major resource of the Institute is the experience, expertise, equipment and enthusiasm of its members.

The membership includes theoretical and practical engineers, able to produce and criticise questions, experienced and practicing educators capable of validating and evaluating questions, computer experts to produce or maintain the necessary programs, and administrators with experience of both public and private industry.

Expert advice can be obtained from within the membership on all aspects of the establishment of an Examinations Section. Assistance will be forthcoming from experienced personnel for the production of questions and the preparation and assessment of Morse code tapes.

Nevertheless it is not intended that the Institute will rely on volunteer labour for the whole of the examination program.

(a) Physical resources

The Executive has agreed to provide the necessary office and associated equipment to enable the establishment of an efficient Examinations Section separate from the Executive.

(b) Human resources

The Institute was directed by the Federal Convention to employ an Examinations Officer once accreditation is received, so that examination procedures can be established rapidly and an effective system developed. This position is seen as handling the production and distribution of examination materials, marking papers and tapes, notifying results and maintaining records of individual candidate status.

A number of members have already indicated their interest in joining the Committee to assist the Examinations Officer by producing appropriate materials such as study guides, and multi-choice questions. The wide geographic distribution of Institute members willing to assist with examination arrangements will ensure that candidates throughout Australia have access to examinations as required.

6 THE INSTITUTE'S INTENTIONS

On being granted accreditation the Institute will proceed to carry out the directions of the Federal Convention with regard to:

a Employing an Examinations Co-ordinator;

b Establishing an Examinations Committee to:

1 Finalise approval and publication of a NAOCP Study Guide.

2 Prepare a draft AOCP Study Guide to accompany the AOCP/AOLCP Syllabus, submit it to DOC for approval and subsequently publish it.

3 Review the existing question banks and amend as required.

4 Extend the existing question question bank by adding new approved questions.

5 Enter the extended question bank into an appropriate computer.

6 Develop a suitable computer program to select questions from the bank for an examination paper as required.

7 Publish a sample question paper from the bank at each level annually.

It is also intended to:

c establish communications with groups or individuals likely to desire to conduct examinations, with a view to developing a protocol.

d appoint members in Divisions, clubs or other bodies to be responsible for the local arrangements for examinations.

e arrange publication of the procedures required for entry to WIA controlled examinations.

f when the question bank reaches approximately 1000 questions at each level, publish the bank and make provision for update and review as necessary. Similar arrangements will apply for the Regulations questions, but a bank of 300 questions should suffice.

7 OUTLINE OF PROPOSED EXAMINATIONS SYSTEM

The Institute sees two components to be requirements for establishing an examinations system:

a The "Central Office" component which deals with the preparation and distribution of examination materials, their return for marking, the distribution of results and maintenance of records.

b The "Field Staff" who assume responsibility for the local arrangements when an examination is required or scheduled in a particular area. These members would arrange a suitable time and venue and an appropriate invigilator, who would receive the papers or tapes, supervise the the examination, and return papers or tapes to the "Central Office". Responses so far received allow the Institute to be confident that sufficient volunteer "Field Staff" will be forthcoming for examinations to be conducted at the current frequency but at an increased number of centres. The necessity for proposed dates of local examinations to be advertised in advance has also been foreseen.

8 PRIORITIES

Of the intentions listed in Paragraph 6, the Institute sees the priorities as, in order:

(a) Establishing the committee
(b) Finalising the NAOCP Study Guide
(c) Preparing the AOCP/AOLCP Study Guide
(d) On receiving accreditation

i employing a suitable Examinations Officer,

ii establishing the network of Field Co-ordinators,

iii establishing a system for production of examination materials,

iv devising and publishing procedures for examination entry and conduct.

(e) On receiving access to the question bank

i reviewing it to maintain the standard,
ii collecting and reviewing new questions for addition to the bank,
iii publishing sample examination papers and tapes.

(f) Publishing the question bank

Progress so far:

Steps have already been taken to establish an Examinations Committee with the current brief to finalise the production of the NAOCP Study Guide and to proceed with producing an agreed AOCP Study Guide.

Members of this committee are those who have expressed interest and concern regarding the devolvement proposals and willingness to take an active part in the proposed activities.

All have a history of association with Novice or AOCP courses and examinations, and several have both qualifications and experience in teaching and educational administration.

This group is also anxious to review the existing question bank if the Institute is granted access to it, and to produce and validate new questions.

A computer program for selection of questions from a computerised bank according to the existing distribution formula has already been offered to the Institute.

9 PROPOSED TIME SCALE

It is expected that by the end of July 1987, the committee will be in communication and the NAOCP Study Guide should be approved and ready for publication.

Although it is not likely that the AOCP Study Guide will be completed before about March 1988, an effort will be made to have a draft available for discussion by the end of 1987.

The Institute considers that a phasing-in period of at least 18 months from the date of accreditation will be necessary to allow development of an efficient and effective system.

During that period, the Institute will organise the Field Co-ordinators, and will undertake to arrange examinations as required using materials supplied by the Department.

By the end of 1988, the Committee should have produced and approved a bank of 500 questions for use at each level.

10 SUMMARY

In its 75 years of representing the interests of radio amateurs, the Wireless Institute of Australia has consistently upheld the principle of self-regulation of the Amateur Service.

The Institute believes it is ideally equipped to further assist the development of this Service in Australia by accepting the responsibility for conducting examinations for Amateur Operator Certificates of Proficiency.

It is the Institute's considered opinion that, in view of the Department's stated intention to devolve responsibility for amateur examinations, present and future amateurs can best be served by the WIA being accredited as the sole examining authority.

June 9, 1987

Federal Executive
Wireless Institute of Australia

For further information regarding Devolvement of Examinations, see *Education Notes*, this issue.

AMATEUR RADIO IN AN EMERGENCY SITUATION — 1929

The VK3RJ Story

Maurie Milani VK3CWB
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This is a factual, historical story about one of Australia's amateur radio pioneers, the late Ray Jones VK3RJ. The article has taken 18 months to research, with Ray providing much of the information, however Ray passed away at the end of May unfortunately not seeing the labours come to fruition. It was to be a tribute to Ray but now becomes his Obituary. Vale Ray Jones VK3RJ.

During early 1986, I had the pleasure of meeting Ray Jones VK3RJ. Ray had obliged in assisting me with my research concerning the late Leo G Cohen. Most CW operators of old, ex-PMG telegraphists, and other Morse related areas will recognise the name as being the one which is on the name- plate of the *Simplex Auto*. This device was a mechanical, semi- automatic apparatus for sending Morse code manually, and was often referred to as a "bug." (After the American company called Vibroplex which made a similar device many years earlier. This company used a small red coloured bug or beetle on the name-plate as its insignia).

Some pf the Simplex Autos made were unique in that they had a pendulum positioned at a right angle to the finger paddle. There was also a model which produced automatic dashes.

Cohen, a telegraphist with Ray in the 1920s and 30s, was the designer of this type of key, many of which still remain in the shacks of radio amateurs today.

During the course of my interview, Ray spoke of the early days of amateur radio in Australia. He mentioned that his call sign, VK3RJ, was obtained in July 1928 and by December he was on the air. From about 1914 to 1960, Ray was involved with Morse code in one form or another with his occupation.

In 1914, aged 14, he began his career as a PMG "messenger in training" a position which eventually led Ray to becoming a telegraphist.

He enlisted in the Australian Imperial Forces (AIF), Wireless Unit, in 1918. After the war he returned to his position with the PMG.

In World War II, he spent five years in the Royal Australian Air Force (RAAF), wholly in signals. During this time he was stationed at RAAF Headquarters, No 2 Training Group Headquarters, Eastern Area Headquarters and North Western Area Headquarters. In 1945, he returned to the PMG where he remained until his retirement in 1960.

In passing, Ray quickly mentioned that his amateur radio station assisted the PMG in a time of crisis. His radio was used as a means of passing telegraphic traffic. (I later discovered that there were in fact five occasions when his radio station was used). What happened was when normal telegraphic links could not pass the traffic Ray made his amateur station available to the PMG in order to have the traffic passed to the required destination.

The story goes something like this . . . in April 1929, torrential rains for several days caused intense flooding in central Tasmania. As a result, all rail, road and communication links (including telephone) between the north and south of the State were cut off for at least four days. Ray was working at the Melbourne CTO as a telegraphist when the news came to hand. All lines between Launceston and Hobart had been swept away by the floods with nhe north and south of the State basically being isolated. The real problem lay with Hobart which was totally cut off from the mainland — Launceston still had these links.

Ray stated; "I immediately approached the Assistant Superintendent of Telegraphs, Mr Jim Allen. With the confidence of comparative youth, and zeal for amateur radio, I told him I could provide him with a radio link to Hobart." Ray remembered Mr Allen as being a man with an iron fist who was brought to the CTO for the express purpose of upgrading the then existing poor service as well as the poor discipline and morale. Mr Allen exercised his power ruthlessly and was renowned for punishments for any slight misdemeanor or failure.

The need for communications to Hobart was becoming desperate, but Ray's radio scheme received great opposition the Superintendent, as well as the more powerful ranks of the hierarchy. Eventually, Jim Allen took a gamble with Ray's proposal, but, in so doing, he clearly indicated to Ray that his future was on his shoulders. (In retrospect, one should have said that his future lay in his hands — the ones that sent the Morse).

Amalgamated Wireless of Australia (AWA), who then ran the ship to shore radio service, were also contacted to see if they could render any assistance. Ray explained; "They replied that they were unable to assist as their own traffic demands could not be abrogated to release VIM and/or VIH for PMG traffic." Thus, it seemed Ray's plan was the only viable alternative to normal telegraphic links.

Jim Allen asked Ray to nominate an amateur operator in Hobart who Ray deemed capable enough for the task at hand. Ray immediately thought of Trevor Watkins, then VK7DX. Having spoken with Trevor on many occasions, Ray was conversant with his fine Morse ability. The "powers" in the Telegraph Branch then requested VIM to send a message to VIH, directed to Mr Andrews, the Superintendent of Telegraphs, Hobart. The message was to inform him of what was to take place until normal communications could be restored. It also informed Trevor VK7DX, to meet VK3RJ on 7 MHz.

Ray was sent home immediately in order to prepare.

At the scheduled time, Trevor appeared and contact was made immediately. Ray spoke to the Superintendent, Mr Andrews, through Trevor, and told him he had traffic to pass. (Ray had brought a bundle of about 30 Telegrams home with him. This was only a small portion of the many hundreds which had begun to accumulate in the Melbourne CTO). He then commenced transmitting them to VK7DX. Mr Andrews, listening in Trevor's shack, was so impressed that he immediately gave the operation his blessing.

Hence, on April 5, 1929, the operation commenced just after mid-day and continued until well after 6.30 pm when they were instructed by the administration to close down. On the second day of operation, the PMG installed a Morse line between Ray's home in Box Hill (where he resided until his death), and the CTO, Melbourne. A telegraphist was positioned at Ray's home to pass traffic from the radio link to the CTO and vice-versa. The second day of operation again commenced about mid-day. This worked smoothly and efficiently until about 9.30 pm when conditions on 40 metres were no longer favourable for propagation between VK3 and VK7. After a quick meal-break, the two operators had agreed to OSY to 80 metres. On this band they worked until well after 2 am.

By modern standards, this band change seems quite simple, however at the time it posed a problem for Ray. His equipment consisted of a Tuned Plate, Tuned Grid (TPTG) self-excited oscillator, with no external or extra amplification. The transmitting valve was a UX112A and power out was about four and a half watts (250 volts at 20 mA). The power supply was made up of a Philips B Battery Eliminator transformer, the output of

which was rectified by a Raytheon tube. Antenna was an end fed Zepp (halfwave at 7 MHz) with open wire tuned feeders.

Being relatively new to the amateur bands, Ray's equipment was not set up for the 80 metre band and at the time of the operation he had no materials to construct the required inductances for this band. Ray had to resort to compressing the 7 MHz inductance with a piece of string. The variable capacitors in the TPTG, combined with the compressed inductor, sufficed for Ray to obtain a steady signal on what eventuated as the 82 metre band. The late Max Howden VK3BQ, lived close by and rendered invaluable assistance in getting Ray on-air in the 80 metre band.

Trevor reported that, whilst Ray's signals on this band were weak, but readable, he was suffering from a power leakage. Still the two operators carried on until after 2 am — the third day of activity. Both operators, needless to say, were physically and mentally exhausted after the long hours of continual sending and receiving.

According to Ray, the way in which Trevor put his messages over made him assume he was having no troubles, when in fact Trevor was working under great difficulties. Max Howden's article in the *Listener In* for April 24, 1929, stated that rain had completely wet Trevor's radio apparatus. After having realised this Trevor took great care to ensure the crystal he was using was bone-dry. He then switched on the apparatus, but was unaware at this stage that water had entered the filament transformer which was used to heat the filaments of his UX281 rectifying valves. Max went on to explain that the plates of these rectifying valves are connected directly to the high potential side of the power transformer. The filaments then become the centre of the positive HT supply, and are connected directly to the plates of the transmitting valves, and consequently must be very well insulated from any earth connection. One side of the AC mains which feeds this transformer is always earthed so the effect of water in this particular transformer can be realised.

After initial turn-on, and many fizzes, pops and other strange sounds, understood and recognisable only by a radio experimenter, Trevor immediately switched the apparatus off. Luckily no great damage was done. At this stage he was still not on the air, and the sched time with VK3RJ was fast approaching. Trevor set to work drying out the filament transformer. He wiped and shook it well then placed it in a hot oven for a few minutes. When he finally got on the air troubles still plagued him. The aerial feeder condensers started to smoke due to their insulating strips being saturated, but VK7DX could wait no longer and let them burn as he transmitted.

Max Howden *further commented*; "Had he used anything but crystal control, it would have rendered his signals unreadable!" The crystal had prohibited any wave change even though the capacitors spoiled. Trevor was of the opinion that his signal, as a consequence, was only slightly down to usual. At the end of the entire operation, Trevor swore that he would encase his entire apparatus in plywood so as to avoid the same sort of mishap in future.

April 7, marked the last day of the operation. It began at approximately 8.45 am and concluded at 8 pm. Transmission was entirely on 40 metres. Just prior to the day's commencement of transmissions the two operators were informed that a temporary cable had been placed across the flooded area which restored normal communication circuits. Thus the stint came to an end. Ray had sent 226 telegrams and received 174 from Trevor. Also, about 25 000 press-words were sent to and fro for the major newspapers in each city.

Transmission was all on CW with both parties using "bugs." Ray suggests that his may have been a Simplex Auto. To quote his words; "So concluded an operation which I feel helped to put amateur radio in enhanced public and administrative esteem, and to demonstrate its efficiency in times of emergency for the first time in Australia."

Ray also commented; "I got no recompense (nor did I expect any), other than that I proved my optimism was well founded. All the kudos seemed to go to Jim Allen, for shortly after he was promoted to Superintendent of Telegraphs, Brisbane. Such is life!"

COMMONWEALTH OF AUSTRALIA.

POSTMASTER-GENERAL'S DEPARTMENT.

GENERAL POST OFFICE.

MELBOURNE., C.1.
6th May, 1929.

Dear Mr. Jones,

It has come to my notice that in the recent emergency created by the disastrous floods in Tasmania, when normal telegraphic communication between Hobart and Launceston was interrupted, you voluntarily placed your radio station at this Department's disposal for the exchange of telegraph business between Tasmania and the Mainland. It is further shown that you worked considerable overtime in disposing of traffic under difficult conditions and in addition incurred expenditure in the purchase of material essential to the working of your station. Approval has of course been given to the cost in the latter connection being refunded to you but quite apart from that aspect of the matter I wish to express my warm appreciation of your unselfish action in coming forward at a time of great emergency. The facility which you afforded for the transaction of telegraph business materially assisted in allaying public anxiety as to the position in Tasmania and your conduct exemplifies the true spirit of public service. The circumstances have been made the subject of an appropriate entry upon your Departmental record and I may add have also been brought under the notice of the Secretary of this Department.

Yours faithfully,

R. E. Jones,
Telegraphist,
Telegraph Branch,
Melbourne.

It would be remiss not to mention some other amateurs in the two States which, as the records of the time show, played a part. Their involvement is uncertain however research seems to show their role was probably that of standby stations in case VK3RJ and/or VK7DX ran into difficulties. These stations were Len Crooks VK7BQ, Crosby Walch VK7CW, Hubert Lovett VK7HL, L Jensen VK7LJ, E Simms VK3KS and B Hardie VK3YX. (VK3YX was then secretary of the Victorian Division of the WIA). Evidence suggests that VK3YX made contact with VK7CW and sent him outstanding news items of the day for publication in the *Hobart Mercury*. This was apparently done after permission was granted by the then Director of Postal Services, Mr H P Brown. A Melbourne newspaper obliged and the items were transmitted to Hobart. This initiative, although short-lived, was successful and effective.

Ray assisted the Telegraph Branch on a further four occasions, however the operator at the other end was no longer VK7DX as Trevor Watkins became a Silent Key on August 25, 1931. At a guess from those who knew him, they placed his age at somewhere between 45 and 55. His obituary in the *Hobart Mercury* August 28, 1931, suggests he was inflicted with the illness, which eventually claimed his life, even during the above-mentioned flood situation.

For the VK7 Division of the WIA, as well as many others world-wide, "Watties" death hall-marked the end of an era. In brief, he served as a VK7 WIA Councillor from 1926 to 1930. He also took an active part in the guard station of the Airforce Wireless Reserve in 1928 and 1929. Bill VK7TE, (today) suggests that "Wattie" was given Life WIA Membership in 1930.

In late December 1931, Ray again assisted the PMG but details are sketchy. After examination of Ray's logs for that time, it seems that the operator in Tasmania was Crosby Walch VK7CW. The message load handled and exact dates are unrecorded. Official departmental acknowledgment confirms that the operation took place during the pre- Christmas week. Ray stated; "Mr Lawrence did not confer plaudits lightly!" There is no doubt to the validity of this operation.

Next operation was from July 1 to July 3, 1932 when the Bass Strait cable suffered a break-down. At this time it is impossible to ascertain who the Tasmanian connection was, but possible candidates are VK7CW and VK7JB. However, it does seem unlikely that it would be VK7JB, as he was only licensed on June 12, 1932, and, at the time of the operation, would have been a relative newcomer to the bands and unaccustomed to the traffic load involved. The actual operation lasted for three days, and Ray recalled some hundreds of messages being handled. Unfortunately no official departmental records exist of this exercise and Ray could find no reference to it in his log book. The evidence however lays within a few personal notes referring to dates, times, etc written during and shortly after the event. Ray was unable to account for the lack of documentation.

Ray was again involved in another cable break-down between Tasmania and the mainland from September 29 to October 1, 1934. The Tasmanian connection was Jack ("Buck") Batchler VK7JB. Jack was a proficient CW operator by this time and someone Ray had many contacts with on-air. Jack's home-brew equipment consisted of a transmitter using a pair of 800s (in push-pull) in the final. (Permission to use increased power was given by the authorities so the transmitter could be used during this PMG emergency). The antenna was a full 7 MHz Zepp and the receiver a five-valve superhet. The Commonwealth Archives in Hobart recorded that the power input at the time for VK7JB was 70 watts. The frequency designated by the PMG was 7.195 MHz, however the reason why this was chosen is unknown.

The Archives material also revealed the following for the day's operation of October 1, 1934. It states:

"On Monday, 1st October, following request from Super of Telegraphs, station VK7JB was again used with a departmental telegraphist, (Mr Haine) in attendance. Mr Batchler was standing by for making engineering adjustments."

This last comment is quite interesting in that it signifies that Jack did not do the operating on this day, but rather ensured that the equipment was working satisfactorily. Initial thoughts were that a departmental telegraphist, who made a living from listening to a sounder, would have great difficulty listening to Morse tones over the wireless, however, after further examination of archival material, and by talking to amateurs of that era, it seems many telegraphists did in fact attach a buzzer unit to their circuit rather than the standard sounder. Also, the PMG did have its own wireless service. Thus, one could assume many telegraphists would have also been proficient wireless

COMMONWEALTH OF AUSTRALIA. P.M.G. 3

ALL COMMUNICATIONS TO BE ADDRESSED TO THE SECRETARY.

POSTMASTER-GENERAL'S DEPARTMENT.
TREASURY GARDENS, MELBOURNE, C.2. TELEPHONE: CENTRAL 5551

IN REPLY PLEASE QUOTE NO. R.29/2541.

24 APR 1929

Dear Mr. Jones,

In connection with the recent serious interruption to telegraph communication in Tasmania, I desire to express my appreciation of your public spirited conduct in placing your radio station at the disposal of this Department for the transaction of public business. The willingness with which you volunteered to assist the Department in its difficulties proved of invaluable aid in organising emergency services and thus materially assisted in relieving public anxiety regarding the disaster which had befallen Tasmania.

Will you please accept my very sincere thanks for your valuable assistance.

Yours faithfully,

Director-General.

R.Jones, Esq.,
Telegraphist,
Chief Telegraph Office,
MELBOURNE, C.1.

WATTIES OBITUARY

OBITUARY

THE LATE MR TREVOR WATKINS, AMATEUR WIRELESS EXPERIMENTER.

With the passing of Mr Trevor Watkins, whose death occurred on Tuesday last (*25.8.1931*), after a long illness, Tasmania lost her foremost amateur wireless experimenter. He was the first person in this State to broadcast music by wireless, from his private transmitting station in Hobart, and for several years devoted himself to the study of radio and the development of radio ideas, many of which have been adopted by fellow experimenters who were in communication with him here and from other parts of the world. His special branch of study was wireless telegraphy, and as an amateur operator his familiar call sign, "7DX" was known in every part of the world where radio amateurs are established. Many of the formal acknowledgments of receipt of his transmissions (of which he possessed hundreds) testified to the excellence of his work at the Morse key. It was quite a usual thing for him to have chats almost daily with fellow experimenters in several continents, his opinion on the adjustment of transmitting apparatus being much sought after. In a number of successful tests his work was highly appreciated by the signalling section of the Royal Australian Air Force, his station in Hobart being the section guard station for this State. In 1925, in competition with a large number of others in Australia and New Zealand, he had the honour of winning the trans-Pacific tests for amateur radio operators. During the severe floods in 1929, when departmental telegraph lines were out of action between Hobart and Launceston, his private station was on the air almost continuously for two days and two nights and for the greater part of the time Mr Watkins, though a sick man, stuck to his instruments with very short intervals for sleep, receiving and dispatching many thousands of words of press news. A most unassuming man, with a very genial disposition, ever ready to pass on his knowledge to fellow experimenters, "Watty" as he was called by radio friends here and in different parts of the world, will be much missed.

Telegrams of sympathy from the divisions of wireless institutes on the mainland received by his relatives all bear testimony to his sterling worth. Young men of his type can ill be spared.

At the graveside at Cornelian Bay yesterday, where the funeral service was conducted by the Rev J W Barrow, a large gathering of representatives of departmental, commercial, and amateur wireless bodies paid their last respects to the deceased, the pall-bearers being well-known amateur wireless operators.

—From *The Hobart Mercury* August 28, 1931

TELEPHONE NO. C.132.
SWITCH NO. 465.

COMMONWEALTH OF AUSTRALIA.
EON/HDF.

IN REPLY PLEASE QUOTE
No. MT.31/5175. POSTMASTER-GENERAL'S DEPARTMENT.
Telegraph Branch,

Sub. 0.705.—7/1931.

MEMORANDUM.

MELBOURNE. C1 4th January, 1932.

Mr. R. Jones,
Telegraphist.

Interruption to Tasmanian CABLE Working, December, 1931; Use of Radio as Auxiliary Service.

With reference to the above, the interruption to the Tasmanian Cables at the peak period of the year, and including the Christmas week, occasioned considerable apprehension and difficulty as to the disposal of the load.

Your service therefore in undertaking the transmission of surplus traffic by radio is very much appreciated, and I have to express the thanks of the Department for your valuable assistance. The technical knowledge and telegraphic skill, as well as the use of your plant, were of material assistance in the disposal of the public traffic handled and relieved the Department of much anxiety as to the safety of the business. I shall be glad to learn if you were involved in any out of pocket expenses in connection with the operation of your station on behalf of the Department.

A/G. SUPERINTENDENT TELEGRAPHS.

Letter of appreciation from Mr Lawrence, A/G Superintendent Telegraphs, 1932.

Jack VK7JB, and his station c 1930.

Mr J Batchler dies in Hobart

Mr Jack Copeland Batchler (68), well-known throughout the State in military, sporting, educational and wireless circles, died suddenly at his home in Willowdene Ave, Sandy Bay.

Son of the late John Alexander and Esther May Batchler, he was born in Hobart, and educated at the Lansdowne Crescent School and Hobart Technical College.

He first worked in the Tasmanian Railways, and before World War Two, joined the AMF specialising in signals.

He served in the South-West Pacific, and was mentioned in despatches in Tarakan, with the occupation forces in Japan for two years, and later in Korea.

He reached the rank of major.

On his retirement from the Army, he joined the Tasmanian Education Department as an electronics officer in the Media Centre.

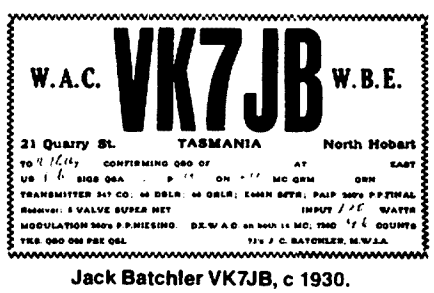
In his younger days, Mr Batchler played senior football with both Cananore and Lefroy, and he was a member of the winning Mercantile senior rowing eights in 1929-30.

He was a life member of the Wireless Institute of Australia, and participated in annual remembrance day competitions when Australian amateur radio enthusiasts sought to make contact with radio "hams" throughout the world.

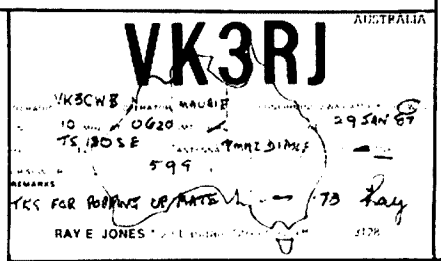
Mr Batchler also was an associate member of the Institute of Radio Engineers of Australia, and a member of the Old Hobartians' Masonic Lodge.

He leaves a wife and daughter, Jennifer.

—From *The Mercury* May 26, 1979



Jack Batchler VK7JB, c 1930.



operators. The archives note; "On October 2, the Super of Telegraphs requested the use of Mr Batchler's station. However, this afternoon (Tuesday) the Department Wireless Services were operating satisfactorily and Mr Batchler was able to return to his civil duties."

Lastly, on December 24, 1934, VK3RJ and VK7JB were used as an ancillary circuit to discharge the heavy load of Christmas greetings. About 60 messages were handled, and more were expected, but the expected traffic load did not materialise.

COMMONWEALTH OF AUSTRALIA.

TELEPHONE NO. Cent. 132
SWITCH NO. 465

IN REPLY PLEASE QUOTE
No.

POSTMASTER-GENERAL'S DEPARTMENT.
Telegraph Branch,
MELBOURNE, C.1. 30th October, 1934

DKB/HDF

Sub. C.966—5 1933

MEMORANDUM to

Mr. Ray Jones,
Telegraphist,
MELBOURNE

Interruption Tasmanian cable - utilisation of radio

With reference to the recent breakdown in the Tasmanian cable, I have to express appreciation of the assistance given in maintaining communication by radio with Tasmania.

The ready and efficient manner in which you came to the assistance of the Branch materially conduced to the successful handling of the load.

Please accept the best thanks of this Branch for the assistance rendered.

(C. McLauchlan)
SUPERINTENDENT TELEGRAPHS

Memorandum to Ray VK3RJ, from the Superintendent Telegraphs for Ray's service during the Cable Breakdown of 1934.

Trevor Watkins, Jack Batchler, Crosby Walch and Ray Jones are all now Silent Keys. Ray Jones was frequently on air until his death and particularly enjoyed the new 30 metre band . . . CW, of course. In many ways Ray was a forerunner to modern day WICEN operators. He proved beyond doubt that amateur radio communications were, and are still today, a viable, reliable and efficient means of passing messages of importance.

Ray was possibly one of the first people, if not the first person in Australian amateur radio history, to use amateur radio in an emergency situation. VK7DX should also be placed in this same category. The Tasmanian Floods were some 10 years prior to the 1939 bushfires of Victoria and South Australia, which the WIA documents as the first time amateurs took part in an emergency. Ray notified the WIA Historian of these operations after the publication of the *WIA Book, Volume 1.*

The *Ray Jones Story* is by no means complete and to delve into his multi-faceted amateur career would require many volumes. Ray was involved with QSL management from 1931 to 1978 for the WIA and in 1968, the Victorian Division conferred Honorary Life Membership to him for his services to the Division. Ray estimated that he had handled well over three million QSL cards during those years. In 1981, the Federal Executive awarded Ray the *Ron Wilkinson Achievement Award* for services rendered to the QSL Bureaus.

ACKNOWLEDGMENTS

The writer would like to express his gratitude for the patience and volition Ray gave to assist with this article. As a relative newcomer to the ranks of amateurs, this saga and Ray Jones gave both education and inspiration. Above all, Ray was a good friend.

Thanks also to Chas "Snow" Harrisson VK7CH, Bill Tanner VK7TE, Ron Cannon VK3BRC (ex-VK7RC), and Joy Batchler VK7YL, for their assistance and time in cross-checking the information of that era.

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‡ *The Hobart Mercury,* May 26, 1979.

* Supplied by VK3RJ
‡ Supplied by VK7CH and VK7TE
Commonwealth Archive Material supplied by VK7YL

See also Obituary to VK3RJ, this issue.

ar

NEW VK AMATEUR

Frank VK2EKY, in his VK shack.

On Niue Island.

I have been a radio amateur since 1971. My first call sign was SP5EKY. I was active with this call sign in Poland until December 1981, and I still retain the call.

I arrived in Australia in July 1985 and have been operational on the bands with VK2EKY since December 1985.

Prior to ceasing operation in Poland I was a member of the SPDX Club and had worked over 250 countries and had about 15 000 contacts — many of these were with VK amateurs. I have since worked many of these stations with the VK2EKY call sign and it has been a great surprise for them.

Now, as an active Australian station, I have made about 8000 QSO with over 200 countries. I love Australia and amateur radio. I have met many great Australians on the air and I was thrilled to win my section in the last VK/ZL/Oceania Contest — this was a first for me.

From April 18 to May 15, 1987, I operated from Niue Island as ZK2EKY (a DXpedition/holiday by myself) and worked 9000 stations, almost 200 countries, and 39 Zones (except 34), all-bands CW and SSB!

I am planning another DX trip to Manihiki Island (North Cook) probably with the same call sign. All QSLs for my call signs to VK2EKY, PO Box E450, Sydney, NSW. 2000.

I became a member of the WIA upon arriving in Australia and read AR magazine.

I have found amateur radio a great help in learning the English language.

—Contributed by Zbigniew (Zbig or Frank) Murdzia VK2EKY

WICEN News

BUNGONIA (NSW) RESCUE 87

WICEN operators provided communications assistance during the Rescue Exercise, an annual Sydney based Cave Rescue Group event was held at Bungonia, on March 14, 1987.

—Contributed by Greg Baker

Jeff VK2BYY, operating with Steve VK2DNN, observing.

Jim VK2BZD.

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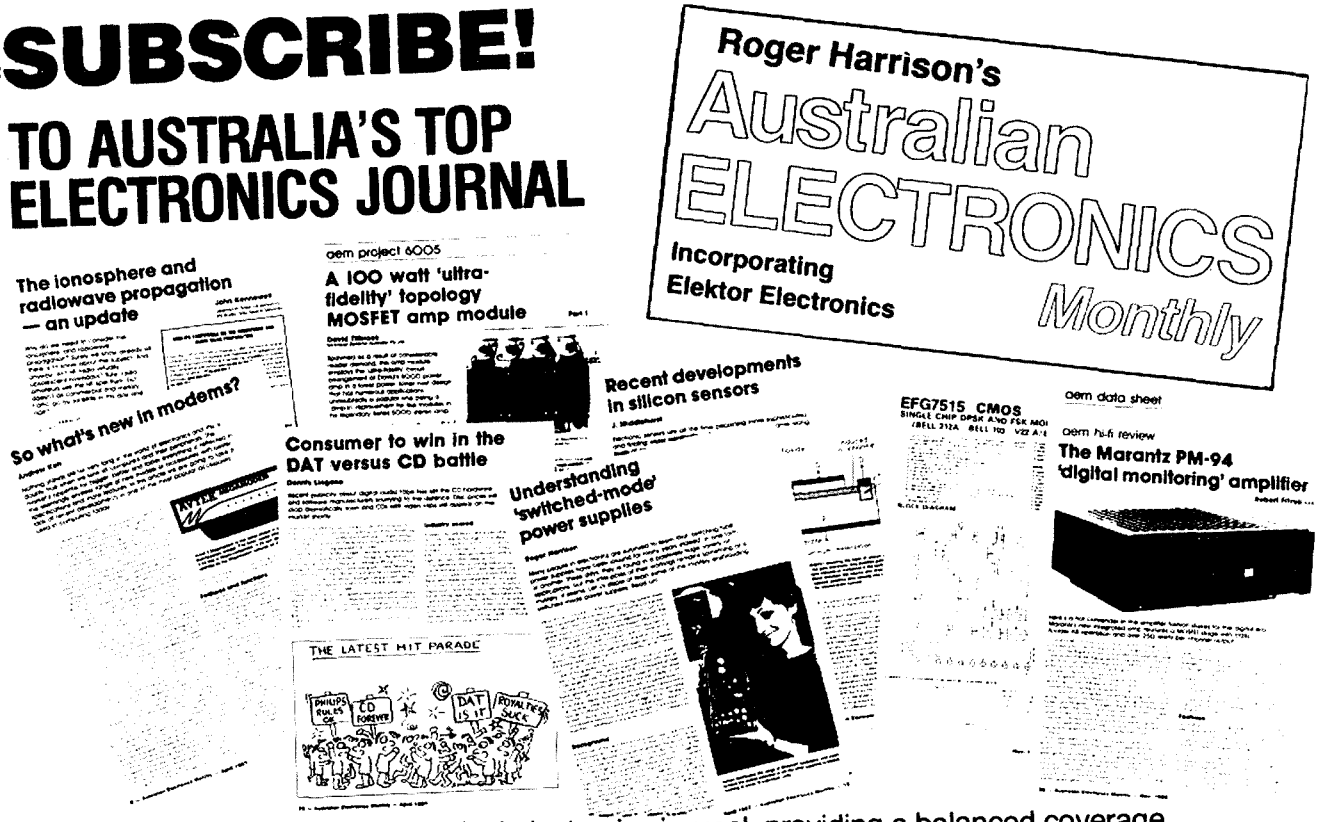

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Happy Birthday INTRUDER WATCH!

This year celebrates the 20th Anniversary of Intruder Watch.

Bill Martin VK2COP
FEDERAL INTRUDER WATCH CO-ORDINATOR
33 Sommerville Road, Hornsby Heights, NSW. 2077

Yes! 1987 is indeed the birthday (or anniversary if you like) of the founding of the Australian Intruder Watch.

In 1967, with Max Hull VK3ZS, in the WIA Federal President's chair, the Federal Council met, and the formation of the Intruder Watch was one of the results of that meeting.

WHY AN INTRUDER WATCH?

It was said at the above meeting that "Generally speaking, anyone may use any frequency until someone objects, (the 60-day rule). This means that intruders who use the amateur frequencies illegally may claim that they have the right to the frequencies because no one has objected. . ." and . . ." this is vital at the international level; unless amateurs can prove that they have objected to the presence of intruders on their bands, they have no case before an international tribunal. . ."

This premise still holds good today. So it is still vital that we have documented evidence of our objections to each new intruder.

David Wardlaw VK3ADW, was appointed as first Federal Co-ordinator, and initiated the formation of the State groups.

HOW DOES THE INTRUDER WATCH OPERATE?

The amateur or SWL hears what he suspects is an intruder transmission on an amateur band. He makes a note, detailing frequency, time (UTC), mode, signal strength, date, and sends the report off to his Divisional Co-ordinator.

The Divisional Co-ordinator receives the reports and edits them. He is looking for spurious signals, receiver IW products, etc, and is trying to establish that the reported signal is, in fact, an intrusion.

Having done this, he sends his reports along to the Federal Co-ordinator, who does much the same thing. The reports are going through a kind of 'filter process'. When the Federal Co-ordinator is satisfied he has more or less a list of bona fide intruders, he collates them all into a monthly summary which is set out in ascending order of frequency. He also keeps records of all intruders reported, in order of frequency and alphabetically. By doing this, he can keep tabs on intruders, and see which ones are intruding on a regular basis, rather that wasting time on the signal which appears once only.

The Federal Co-ordinator files a copy of the summary, sends one to the Department of Communications, and forwards one to the International Amateur Radio Union Association Region 3 Monitoring System Co-ordinator. The IARU 3 Co-ordinator collates all National Society Intruder Watch summaries into a grand summary, which goes to:

1. The IARU Region 1 and 2 Monitoring System Co-ordinators, so they can compare activities of intruders
2. The Secretary of IARU Region 3, who sends copies to all member Amateur Radio Societies in Region 3

and

3. To the IARU Monitoring System International Co-ordinator. He has access, through the IARU Council, to the International Frequency Registration Board (IFRB).

So you can see that comparisons are made, world-wide, of intruder activity, and the respective Regional Co-ordinators look at the other summaries to see if any intrusions complained of are originating in their own region. The Intruder Watch is concerned with transmissions originating from Governmental, commercial and military sources. Central and Northern Europe and Asia figure prominently in the list of originating locations.

DOES THE SYSTEM WORK?

Yes. Successes have been documented ranging from the removal of Australian Defence Forces stations using obsolete transmitters and causing harmonic radiation; the removal of French Polynesian R/T services using the 40 metre band; the removal of Chinese RTTY stations; the removal of licensed amateurs working maritime mobile and passing commercial traffic on behalf of a commercial interest, and so on. ***However,*** every victory is hard-won, and requires hours and weeks and months of persistent monitoring and reporting by all concerned. So, if you report an intruder and you hear the same signal again next week or next month, don't think that nothing is being done. It is a very slow business, and is plagued by the demands of diplomacy and political considerations.

THE IW CERTIFICATE OF MERIT

Whilst not an amateur radio award in the true sense of the word, there is a *Certificate of Merit* available, issued annually to that person, amateur or SWL, in each WIA Division, who best demonstrates support for the Intruder Watch. These certificates are issued on a once-only basis, and are a small tangible token of thanks from the Intruder Watch to its supporters. 1985 saw the first of these issued.

WHAT'S HAPPENING ELSEWHERE?

The RSGB has its Intruder Watch; the DARC has its Bandwacht; the ARRL has its AIRS (Amateur Interference Reporting System); New Zealand, Japan, Netherlands, Switzerland, and many other radio societies sponsor a similar system. Of course, what is heard in some of these places is not heard in others — that is why its is important to do comparison checks, and have the various co-ordinators exchange information.

MEET THE CO-ORDINATORS

FEDERAL CO-ORDINATOR — *Bill Martin VK2COP.* I was first licensed in 1980, as VK2PFH, after a brief period of SWLing. I then upgraded to VK2EBM, and changed to my present call in December 1984. The presence of intruder stations captured my attention from the outset of my interest in radio, and I was appointed VK2 Co-ordinator in May 1981. It seemed a natural progression to accept the Federal position in July 1982, when the position became vacant.

When the position of co-ordinator for the IARU Region 3 Monitoring System became vacant in February 1986, it seemed to be the only thing to do to undertake the job. I am a band-hopper, and keen award chaser. I have been a NSW State Police Officer for 27 years, and a part-time musician for 30 years, playing the clarinet and saxophone. I have also taught music for several years. I am also interested in gardening. In spite of its inherent frustrations, I am very happy to be involved in the Intruder Watch.

Federal Intruder Watch Co-Ordinator, Bill Martin VK2COP.

Alan Hawes VK1WX. Alan has been handling the ACT post since March 1986, as well as being heavily involved in other WIA matters. He has been licensed for seven years, and his main interest in the hobby is HF DXing and antennas. Alan is an electronics technician by occupation, and enjoys 10 pin bowling when he is away from the radio scene. He resides in Evatt, ACT.

Philip Pavey VK3BHN. Philip has recently joined us as Co- ordinator for the Victorian Division. He was first licensed in 1982 as VK3PMJ, and attained his present call sign in 1985. Philip is actively engaged in getting young people into amateur radio, and is currently Vice- President of the Frankston and Mornington Peninsula ARC. He manages to fit this all in whilst undergoing an apprenticeship with Telecom at Ballarat.

Gordon Loveday VK4KAL. Gordon has been on the air since first licenced as VK4ZBI in July 1957. He is a storage battery assembler by occupation and lives in the wilds of Rubyvale, in central Queensland. Gordon enjoys home-brewing and rag-chewing on VHF/UHF His other interests include listening to a fine collection of classical recordings. Although somewhat isolated geographically, this does not hinder his active participation in the Intruder Watch. Gordon has been involved in the IW since 1979.

Lindsay Collins VK5GZ. Lindsay was first on air as VK5NLC in September 1976. He is retired, and is a former 7th Division AIF Signals Radio

Operator. He is resident in Rosslyn Park, and enjoys experimenting with all kinds of antennas. His main interest is CW, and he was co-author of an article in AR on a programmable memory keyer, which he uses to great advantage. Lindsay was appointed IW Co-ordinator for VK5 in 1984.

Bruce Hunt VK6XZ. Bruce lives at Thornlie, and has been licensed for four years. His interests in the hobby include DXing on HF, satellite communications and data transmissions. Bruce nominates computing as another hobby, which is not surprising, as his occupation is that of a Computer Systems Consultant. Bruce holds the view that emphasis should be placed on encouraging and educating our regular contributors, where needed, and an effort made to recruit more helpers for the IW.

Robin Harwood VK7RH. Robin was licensed on Christmas Eve 1971, and is a resident of Launceston, who is interested mainly in SWL-ing. You will no doubt have read Robin's monthly SWL column in AR. He is also active with the Australian Traffic Net, and enjoys reading, writing letters and music appreciation. He is retired and has been IW Co-ordinator since 1984. He is quick to say that the number of intruders is increasing, so we must urge more people to swell the ranks of intruder watches, to keep abreast of the problem.

Henry Andersson VK8HA. Henry lives in Stuart Park, about one kilometre from the business centre of Darwin. When I asked Henry his main interest in the hobby I realised I had made my first mistake. . .I should have asked him "is there any aspect you are *not* interested in!" Morse lessons; the VK8 RTTY Broadcast; the Darwin ARC; the VK8 QSL Bureau; award-hunting; contesting; home-brewing. . .you name it, Henry does it! Also, like many of us, he is continually trying to exercise mastery over a computer. Henry has been the IW Co-ordinator in VK8 since 1975, but had been involved long before that. Possibly he was the first VK8 to be involved in intruder watching. Henry has been licensed since 1945.

So, that is the crew who look after the co-ordination of reports around Australia. Many thanks for your efforts, fellas, and we can all thank them in the future by sending in reports of any intrusions we hear on the amateur bands of frequencies.

So, once again, *Happy Birthday* Australian Intruder Watch, and we look forward to continuing support from those who have assisted in the past; we look for their support in the future, as well as the support of those who have yet to lend a hand. Remember — the intruder problem is a ***continuing*** problem.

WIA INTRUDER WATCH CO-ORDINATORS PAST AND PRESENT

FEDERAL

1967-1971	David Wardlaw VK3ADW
1971-1980	Alf Chandler VK3LC assisted by Ivor Stafford VK3XB
1980-1981	Graeme Fuller VK3NXI
1981	Bob McKernan VK4LG
1982-1987	Bill Martin VK2EBM/VK2COP

VK1

1974-1978	Ted Pearce VK1AOP
-1984	Fred Robertson-Mudie VK1MM
1984	Grahame Parsons VK1GP
1985	Ray Roche VK1ZJR
1986-1987	Alan Hawes VK1WX

VK2

1970-1974	Bill Jenvey VK2ZO
1974-1977	Les Weldon VK2AFG
1981-1987	Bill Martin VK2COP

VK3

1968-1969	Morton Davis VK3ANG
1969-1971	Alf Chandler VK3LC
1971-1975	Albert Cash SWL
1975-1981	Ivor Stafford VK3XB
1981	R J Hose VK3KAH
1982	Frank Gardiner VK3VAV
1983-1986	Steve Phillips VK3JY
1986	Bill Wilson VK3DXE
1987	Philip Pavey VK3BHN

VK4

1970-1979	Murray McGregor VK4KX
1979-1987	Gordon Loveday VK4KAL

VK5

1971-1972	Bill Franzi VK5FR
1972-1982	Leith Cotton VK5LG
1982-1984	Colin Ralph VK5KCR
1984-1987	Lindsay Collins VK5GZ

VK6

1973-1975	Ross Greenaway VK6DA
1976	Albert Cash SWL
1976-1982	David Couch VK6WT
1982-1983	John Farnell VK6ZJF/NBP
1983-1987	Bruce Hunt VK6XZ

VK7

1971-1972	Ian Pearson VK7KB
1972	Max Ives VK7MX
1981	Frank Beech VK7BC
1982-1983	Jim Davis VK7OW
1984-1987	Robin Harwood VK7RH

VK8

1975-1987	Henry Andersson VK8HA

So, these people have started, and kept the Intruder Watch going in Australia, for 20 years, and are to be congratulated, along with hundreds of amateurs and SWLs who are the people who hear the intruders in the first place, and without whom the Intruder Watch could not function. Let us hope that they, or people like them, can do the job for a further 20 years, because it will, unfortunately, always be necessary to keep watch on our frequencies.

Happy Birthday, Intruder Watch!

ar

Wireless Video Transmitter Standard

Recently a number of electronic devices have been marketed in Australia intended to distribute within the home, television programs from VCRs, etc. Most of these devices have proved to have high signal output and have the potential to cause interference to other services at VHF and UHF The WIA has pressed DOC for action to restrict the sale of such devices and to minimise the possibility of interference by the issue of an appropriate performance standard which would then enable action to be taken under the Radiocommunications Act.

Following is a recent DOC Press Release detailing steps being taken in respect to these devices, referred to as Wireless Video Transmitters. This was accompanied by a draft standard which should reduce their adverse effects on normal television reception and on other nearby services such as amateur.

The Standard:

- Limits operation to the UHF Television Band.
- Limits radiated field strength to 76 dB μV/m at a distance of three metres.
- Sets limits on bandwidth and spurious emissions.
- Requires the equipment to be capable of operation over a minimum frequency range of 70 MHz.

Where a wireless video transmitter does not comply with this Standard, (after proclamation) its importation and/or sale may be prohibited under the Radiocommunications Act.

We propose to advise the Minister that it is noted that operation of woreless video transmitters may occur in the band, 576-585 MHz, which is also allocated to the Amateur Service under footnote AUS30 to the Australian Table of Frequency Allocations. The field strength limit of 76 dBμV/m at three metres, as proposed in the draft standard is insufficient to obviate interference to amateur services in all circumstances and it is assumed that DOC assistance will be provided where necessary to any amateur suffering harmful interference. This could include the identification of an interference source and adjustment of frequency where other direct approaches have failed to resolve a problem. Detailed procedures would, no doubt, be negotiable through the normal WIA/DOC co-ordinating meetings.

Allan Foxcroft
Federal Standards Co-Ordinator

WIRELESS VIDEO TRANSMITTER STANDARD RELEASED

A draft standard, which aims to protect television reception against possible interference from wireless video transmitters, was released for public comment yesterday (May 20, 1987), by the Department of Communications.

A spokesperson for the Department said the need to protect television reception against improper use of these devices meant a standard had to be introduced as quickly as possible.

(Video transmitters provide 'wire free' connection between video recorders and television receivers. The radio signals from the transmitters allow video recorders to operate some distance from one or a number of television receivers).

"Any video transmitter connected to a power supply can cause interference to television and other types of radiocommunications receivers operating nearby," the spokesperson said.

"In the case of a video transmitter with an excessive power level, the 'wire free' link between a video recorder and a television receiver could be up to 100 metres.

"Such signals could interferes with a neighbour's television reception, particularly where video transmitters are operated in blocks of flats or other high density housing," the spokesperson said.

The standard would specify the performance and effective range for video transmitters. Details of the standard, in its draft form, would be available from the Department to suppliers, users and interested members of the public.

Once the standard came into force, the Department became aware of the use of video transmitters, either through complaints of interference or the transmission of anti-social material, the user could be subject to prosecution under the relevant provisions of the *Radiocommunications Act 1983.*

In these circumstances, the video transmitter could also be confiscated.

The spokesperson said video transmitters imported or made in Australia after the standard came into force would have to comply with its requirements.

Copies of the draft standard may be obtained by writing to the Assistant Secretary, Operations Branch, Department of Communications, Canberra, or by ringing (062) 48 3800.

May 21, 1987

VISIT TO CHINA

Wally Watkins VK4DO
Box 941, Aitkenvale, Qld. 4814

From left: Wang Xun, Qin Du Xun (Secretary-General), Wally VK4DO, Dorothy (wife of VK4DO), Huang Yongliang and Tong.

During a two week stay in Beijing I was able to operate BY1PK, on May 5, 1987. Stations worked were 4S7EA, UL7NW, VK2CBL, VK2KAE/9 (Cocos) and VK3SP.

Meaningful discussions took place with the Secretary-General Qin Du Xin, Wang Xun and Huang Yongliang, regarding WIA assistance with amateur radio in China.

At that date, there were 17 stations in China, with three new ones to start within three months. One of these, BY1CKJ, in the Chongwnemwn district of SE Beijing was visited. It came on air on June 1. The operator, Zhang, is very keen to work Australian stations. (More about this in a later article). Our CRSA friends escorted my wife, Dorothy, and I, to several places of interest in Beijing, including Radio Beijing studios and the Summer Palace.

BY1PK is situated at the south-east corner of the Tian Tan (Temple of Heaven) complex, access being from the road on the east of this park.

The station is located on the top floor of a building complex with a magnificent antenna farm just above. They have a triband beam for 14. 21 and 28 MHz; a caged dipole for 7 MHz; Yagis for the satellites; five elements on six-metres; plus antennas for 30, 80 and 160 metres.

Amateurs visiting Beijing are most welcome to visit the station and also operate it. Arrangements should be made well in advance before leaving Australia. A telephone call to the Secretary, Huang, when in Beijing is all that is then necessary to receive a warm welcome.

Dorothy and I were feted at a special banquet as guests of Qin Du Xun and our other CRSA friends.

ar

Wally VK4DO, operates BY1PK.

QSP

PRECISE CLOCK

REMEMBER THE THRILL of owning your first digital watch, knowing it would keep the correct time within a minute a month and not require winding? Now there is a super-high-tech clock that keeps time within one second over 150 000 years. If you are one of the first 150 to order — at over US$20 000 each — you may be able to get delivery by the end of this century.

It may be just as well to wait. This new solar-powered clock picks up standard time signal broadcasts from West Germany's Physical-Technical Institute in Braunschweig. Unless you live within 1200 miles (1900 km) of the transmitter in Mainflingen, near Frankfurt, you may have to wait for similar signals to be available by satellite. The accuracy of the clock comes from the accuracy of the cesium-beam atomic clock at the Institute, and from a microprocessor that makes the clock so smart you will never have to set or reset it, even when you "spring forward" or "fall back" for Daylight Savings Time.

The face of the clock is a bank of solar cells — enough to both power the clock and to store enough charge to keep it running when the sun isn't out. If the solar angle harks back to sundials, remember, they weren't much good at night.

The company behind this new clock — the 125-year-old Junghans Uhren GmbH — thinks it can someday build a wristwatch based on the same principles. And they think they may be able to reduce the price.

Let us hope so. For about the same money you could buy a cheap LCD watch every day until the turn of the century. It may not be as accurate, but at least you could use it on this side of the world!

—Adapted from *Gernsback's Outlook*, February 1987

FUTURE OF AMATEUR RADIO

Ron Henderson VK1RH
171 Kingsford Smith Drive, Melba, ACT. 2615

The April 1987 issue of this magazine contained an article about the future of amateur radio. It was forwarded as an agenda item for the recent 1987 Federal Convention where input came from all Divisions. Incidentally, one member wrote to Executive through his Federal Councillor with his views on the topic.

The ACT Division aired the topic at a Divisional meeting to determine members views. NSW held a forum, sadly, less than 10 members attended. Queensland circulated their clubs and presented a well considered paper which is part of the Convention minutes. South Australia discussed the topic at a conference of clubs and the West Australian Division's presentation to the Convention was based upon a report to their council. In summary all Divisions considered and spoke on the matter. The minute secretary took down the key points from this discussion and later read back a combined statement to ensure it conveyed the feeling and intent of the Federal Council. Those points included:

Age profiles of potential members
Component supplies
Recruitment
Entry points to amateur radio service
Amateur examinations
Practical experience
Equipment complexity
Helping others
Syllabus changes
Advanced class licence
Common band
Courses
Public relations
Administration
Regulations

The key points with supporting arguments become the Guidelines to the Executive for the Future of Amateur Radio. They were adopted unanimously by the Federal Council. The Guidelines appear below. Members are invited to comment on these Guidelines, desirably through their Federal Councillors as they will form the basis of the WIA's attitude to the future of our service.

87.09.17
APPENDIX G

FUTURE OF AMATEUR RADIO GUIDELINES TO EXECUTIVE

1 Presentations and discussions at the 1987 Federal Convention have given rise to the following guidelines to the Executive.

Age Profiles
2 It is necessary to tap all age groups, sowing the seeds of amateur radio in the young through schools, JOTA and like means.
3 The target age group is the 40s to 60s where family commitments have eased, more disposable income is available and a new hobby or interest is being sought.
4 Senior citizens and retired persons should not be neglected when seeking new members.

Component Supplies
5 The difficulty in obtaining components for home construction has been identified as a potential field for WIA involvement.

Recruitment
6 It is necessary to exploit advantages; eg the sun spot cycle increase and two metre novice privileges. Commercial pressures are not a great influence on recruiting because of the small sales volume possible.
7 We must identify what we can offer and promote it, using all available advertising means, paid and unpaid, visual, aural and print media.
8 Two fields worthy of exploiting are digital electronics and the CB community, especially UHF CB. Liaison and news broadcasts, bulletin board items are obvious first actions.

Entry Points
9 A range of entry points must be offered to accommodate differing technical levels, Morse skills and desired operating modes. A "mix and match" examination system, both with and without Morse based upon one, regulations, and two, levels of complexity for theory and Morse, will accommodate most needs. Clear power levels and operating privileges must be associated with each level. There is a case for a Morse-less novice VHF licence. These proposals generally mirror the Bracewell model (AR, August 1986).
10 We should provide the opportunity for data modes within the licence structure.
11 An easier entry to novice as the minimum standard is recommended.
12 Considerations should be given to a student or supervised operating permit or other authority as a prelude to the novice examination.

Examinations
13 A system based upon one regulations examination, plus two levels of complexity for theory and Morse will satisfy our needs.
14 The novice examination is a basic "entry to the hobby" test of skills. Marking must not be based upon admitting a fixed percentage of applicants, rather everyone who meets the basic required skills should pass.
15 It has been observed novice examination pass standards have crept up over the years since the introduction of the licence and should be restored to the earlier levels.
16 Regardless of the above this novice entry test must remain an achievement calling for a degree of study and preparation.

Practical Experience
17 Practical experience is highly desirable, yet little if any is given in most amateur radio licence courses. The student permit mooted above could be a means of enhancing this neglected aspect.
18 True amateur experimentation is still alive, although it principally applies to areas outside the transceiver proper; ie antennas, accessories, peripherals, modems, computers and the like.

Equipment Complexity
19 Amateur equipment is becoming more complex and capable, fortunately increased reliability has accompanied those changes and todays amateur is rarely required to open his "black box." This rise in complexity is in keeping with changes in our technology influenced electronic age.
20 Amateur radio as a consequence has lost its impact magic and excitement hence new avenues and applications must be found to retain interest.
21 Computers are the current fad but are rapidly being integrated into amateur radio as peripherals rather than remaining in a stand-alone state.
22 Digital signal processing using VLSI is following upon the heels of digital data handling by computer, it offers new prospects for amateur radio.

Helping Others
23 The "Elmer" approach of the USA is not well understood in Australia, perhaps because their novice examination is amateur administered. Teaching in mass has become the educational norm and this is a further contributing factor.
24 The Australian amateur, whilst able to communicate over the air, is seen as remote or impersonal in face-to-face situations. Encouragement of the Elmer or elder-pupil approach, call it what you will, must enhance the personal image of the amateur.

Syllabus Changes
25 Some attention to examination syllabuses is needed. The early novice level must be restored and question banks purified and expanded to permit public release.

Advanced Licence Class
26 The method of determining how to qualify for an advanced class licence raises problems. Demonstrated experience may be a means however the issue raises more problems than it solves and has been rejected as a retrograde step.

Common Band
27 There is much supporting argument for a common band and the case made is for 144-148 MHz FM voice. 50-54 MHz is rejected because of band usage constraints. The 420 MHz band, whilst favoured by some does not facilitate a high common band occupancy.

Courses
28 The rising novice examination standards have led to courses of excessive duration. ALso, these courses are generally without practical experience content. A course length tailored to the school term, semester, or even the winter season, followed immediately by the examination, has much to commend it.

Public Relations
29 Amateur radio presently has a low profile with some antagonism evidenced, especially at local government level. Planning permission is a key problem area to be worked upon.
30 It is essential to remove the technical awe from our public image. Amateurs must project an improved image in face-to-face situations.

Administration
31 Whilst administrative matters will generally be dealt with separately in the review of the corporate structure of the WIA, two major issues are highlighted here. Firstly, we need better representation to and from the total amateur body. Secondly, we must employ all the skills we possess in that amateur body and break down the face-to-face barriers.

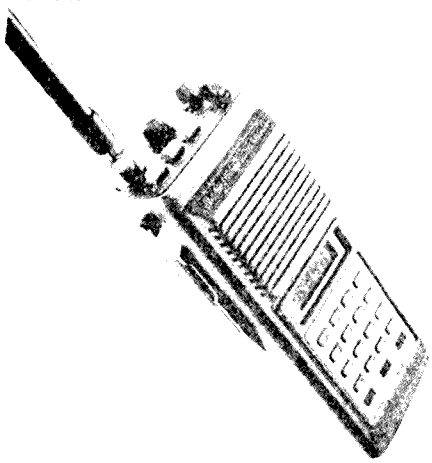
Regulations
32 The requirement is for enough standards to achieve ordered conduct.

Know your Second-hand Equipment

Ron Fisher VK3OM
3 Fairview Avenue, Glen Waverley, Vic. 3150

KENWOOD VHF EQUIPMENT continued

Continuing on from last month, we will look at a few more of the early Kenwood pieces of VHF equipment. It is interesting to note that the *Trio* has now disappeared, except in the UK where the Kenwood name has never been used. However, I have heard that the UK will soon change from Trio to Kenwood and so come into line with the rest of the world.

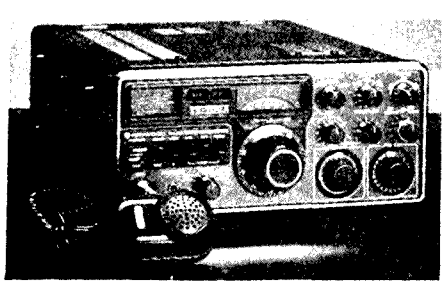


KENWOOD TR-2400 TWO-METRE FM HAND-HELD TRANSCEIVER

This was the first two-metre hand-held produced by Kenwood and for the time was a very advanced transceiver. Released in 1979, at a price of $345, it featured a LCD frequency readout, keyboard frequency entry and 10 programmable memories.

A memory scan facility could be programmed to stop on either a busy or open channel. Memory back-up was provided from the included nicad battery pack. There was one small problem with the 2400, as the drain of the memory circuit, although small, would flatten the battery after a few weeks of non- use. It was therefore necessary to ensure that the battery was placed on the charger every three weeks or so, even if it had not been used.

Somewhat larger than the hand-helds we are used to seeing today, but in most respects they were able to keep up in performance and features. Dimensions are 71 x 192 x 47 mm (WHD), weight was 740 grams. Transmitter power output rated at 1.5 watts with no low power option. They were normally supplied with a nicad battery pack and flexi-antenna. An AC operated base battery charger was available as an option, but a normal wall plug charger was supplied. Secondhand value today would be about $200.



KENWOOD TS-600/TS-700 TRANSCEIVERS

These were six and two metre, full-featured SSB, FM, CW and AM rigs, complete with in-built AC power supply. The two-metre band was tuned in four 1 MHz segments. In addition to the normal VFO tuning systems there was provision for 11 crystal controlled frequencies. With the four 'bands' this gave 44 fixed channels, but they were in the same relative place on each band.

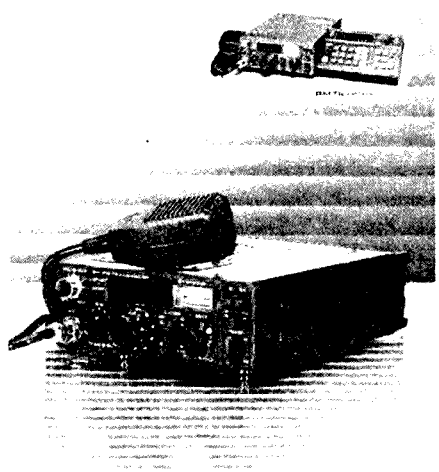
Few amateurs took advantage of this facility with most relying on the VFO. On-air performance was quite good with excellent quality on both FM and SSB. AM receive quality was poor however, due to the lack of a suitable bandwidth; the SSB filter was used for AM reception.

Transmitter power output power was about 10 watts. The TS-700, two-metre version, was reviewed in the March 1977 issue of AR. Price at this time was $575. Secondhand value today would be about $350.

The TS-600 was the six-metre version and was identical in all respects except the frequency coverage. This was from 50 to 54 MHz, again in four bands. Price both new and secondhand would be the same as the TS-700.

The TS-700 was superseded with the TS-700SP. This was upgraded to include a digital frequency readout, a receiver preamplifier and also provision for an optional external VFO.

Apparently not many of these were sold in Australia, however, if you happen to come across one I would assume the secondhand value to be about $425.



KENWOOD TR-7600/TR7625 TWO-METRE FM TRANSCEIVERS

These models were updated versions of the TR-7400 previously reviewed in this column.

The 7600 is the 10 watt output version whilst the 7625 is the 25 watt output model. Frequency selection was similar to the earlier 7400 but with the 100 and 10 kHz selector knobs now ganged and the 5 kHz point selected by a push button.

A four segment digital display indicated the operating frequency. A new feature was a memory — yes, one only — but at least an indication that we were on the way to bigger and better things. However, as an option, the micro-processor controlled RM-76 could be plugged in to do all sorts of wonderful things. This unit contained its own digital readout and had six memory channels plus scanning of the whole two-metre band or the six memory channels. Both the TR-7600/7625 and the RM-76 are rather rare items. When released in 1978, the 25 watt version sold for $450, but I cannot find a price on the remote control unit.

Secondhand value today would be about $300. If you find one with an RM-76 attached you might pay another $25. Most of these early Kenwood two-metre rigs had excellent performance and reliability characteristics and are therefore recommended at the right price.

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RADIODES

CHEWING THE RAG

Hello — CQ, CQ, CQ,
Station here is VK2.
The band sounds very good to me,
I hope that someone will agree —
And quickly send an answer through.

Hello — hello there VK2,
Here's a pal 'tis very true,
Its good to hear you on again,
Your signal's strong, your speech is plain,
So now — how copy VK2?

Oh — splendid, Pal, as I'm alive
I hear you perfectly Q five,
And as our contacts have been few,
Let's settle down the rag to chew.
For RCC we now can strive.

Hey — VK2. Hey VK2!
I want a quick report from you.
I'm working for DXCC,
Your OSL is good for me.
So now, how copy VK2?

I'm sorry pal, we had a breaker.
True, I swear it by my maker.
Not a word of yours came through,
Though ears were strained by VK2.
We also had some QS-Baker.

So let us now go QSY,
Another frequency to try.
If our position this we vary
We may escape the QR-Mary.
I'll meet you by and by.

Vee Kay Two — Oh — Vee Kay Two,
I say good eefenings to you.
I haff not heard you on before.
Ziss make my contrees list von more.
Giff QSL from you.

Hello, Hello, Pal; where are you?
Here again is VK2.
I hope conditions have not changed,
I've lost you, though the band I've ranged,
And I long the rag to chew.

VK2, now here's your Pal,
And I can tell you — name is Hal.
cq, CQ, CQ, C.Q. —
C!QI, CEE.QI, CEE KEW!
— And everything is normal.

Oh Hal, Oh Hal, my spirits sag,
My thoughts to bed I'll have to drag.
It's QRT I now must go,
To beat the QR-Mexico —
And I did want to chew the rag.

—"Hambard" (Originally printed in the Nigerian ARS Newsletter 1970s)

Coaxial Cable Specials

Low Loss VHF/UHF Cables

Description	Trade & U.L. Type Number	AWG (Stranding) Dia. in In. Nom. D.C.R.	Insulation & Nominal Core O.D. Inch	mm	No. of Shields & Material Nom. D.C.R.	Nom. Imp. Ω	Nom. Vel. of Prop.	Nominal Capacitance pF/ft.	pF/m	Nominal Attenuation MHz	db/100 ft.	db/100 m
	**9913** 80C	9½ (Solid) .108 bare copper .90Ω/M' 2.95Ω/km	Semi-solid Poly-ethylene .285	7.24	Duobond II* · 88% tinned copper braid 1.8 Ω/M' 6.0Ω/km 100% shield coverage	50	84%	24	78.7	50 100 200 400 700 900 1000 4000	0.9 1.4 1.8 2.6 3.6 4.2 4.5 11.0	3.0 4.6 5.9 8.5 11.8 13.8 14.8 36.1
						Black PVC jacket						

BELDEN 9913 low-loss VHF/UHF coaxial cable is designed to fill the gap between RG-8 to RG-213 coaxial cables and half-inch semi-rigid coaxial cable. Although it has the same O.D. as RG8/U coaxial, it has substantially lower loss, therefore providing a low-cost alternative to hard-line coaxial cable. Your special price from ACME Electronics is only $4.84 per metre.

BELDEN Broadcast Cable RG-213/U MIL-C-17D is only $5.23 per metre, or BELDEN 22385 YR Commercial Version RG213, the same specification as 8267, for only $2.14 per metre. *Prices do not include Sales Tax.

For more information about the above, or any other BELDEN cable, simply contact our resident amateur radio operator, Colin Middleton (VK3LO) or our sales department.

Coaxial Cables

Description	Trade & U.L. Type Number	AWG (Stranding) Dia. in In. Nom. D.C.R.	Insulation & Nominal Core O.D. Inch	mm	No. of Shields & Material Nom. D.C.R.	Nom. Imp. Ω	Nom. Vel. of Prop.	Nominal Capacitance pF/ft.	pF/m	Nominal Attenuation MHz	db/100 ft.	db/100 m
	**8267**† UL 1354 60C	13 (7x21) .089 bare copper 1.87Ω/M' 6.1Ω/km	Poly-ethylene .285	7.24	Bare copper 1.2Ω/M' 3.9Ω/km 97% shield coverage	50	66%	30.8	101.0	50 100 200 400 700 900 1000 4000	1.6 2.2 3.2 4.7 6.9 8.0 8.9 21.5	5.2 7.2 10.5 15.4 22.6 26.3 29.2 70.5
						Black non-contaminating PVC jacket.						

RG-213/U
MIL-C-17D

ACME

ACME Electronics

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BRISBANE: (07) 854 1911
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DARWIN: (089) 81 5411
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HOBART: (002) 34 2811

ACME 709

VHF UHF — an expanding world

Eric Jamieson VK5LP
1 Quinns Road, Forreston, SA. 5233

All times are Universal Co-ordinated Time and indicated as UTC

AMATEUR BANDS BEACONS

FREQUENCY	CALL SIGN	LOCATION
50.010	JA2IGY	*Mie (Near Nagoya)*
50.075	VS6SIX	*Hong Kong*
50.090	KH6EQI	*Honolulu*[1]
52.013	P29BPL	*Loloata Island*
52.020	FK8AB	*Nouméa*
52.100	ZK2SIX	*Niue*
52.200	VK8VF	*Darwin*
52.250	ZL2VHM	*Manawatu*
52.310	ZL3MHF	*Hornby*
52.320	VK6RTT	*Wickham*
52.325	VK2RHV	*Newcastle*
52.345	VK4ABP	*Longreach*
52.350	VK6RTU	*Kalgoorlie*
52.370	VK7RST	*Hobart*
52.418	VK0MA	*Mawson*[2]
52.420	VK2RSY	*Sydney*
52.425	VK2RGB	*Gunnedah*
52.435	VK3RMV	*Hamilton*
52.440	VK4RTL	*Townsville*
52.450	VK5VF	*Mount Lofty*
52.460	VK6RPH	*Perth*
52.465	VK6RTW	*Albany*
52.470	VK7RNT	*Launceston*
52.485	VK8RAS	*Alice Springs*
144.019	VK6RBS	*Busselton*
144.400	VK4RTT	*Mount Mowbullan*
144.410	VK1RCC	*Canberra*
144.420	VK2RSY	*Sydney*
144.430	VK3RTG	*Glen Waverley*
144.465	VK6RTW	*Albany*
144.470	VK7RMC	*Launceston*
144.480	VK8VF	*Darwin*
144.485	VK8RAS	*Alice Springs*
144.550	VK5RSE	*Mount Gambier*
144.565	VK6RPB	*Port Hedland*
144.600	VK6RTT	*Wickham*
144.800	VK5VF	*Mount Lofty*
144.950	VK2RCW	*Sydney*
145.000	VK6RPH	*Perth*
432.057	VK6RBS	*Busselton*
432.160	VK6RPR	*Nedlands*
432.410	VK6RTT	*Wickham*
432.420	VK2RSY	*Sydney*
432.440	VK4RBB	*Brisbane*
432.445	VK4RIK	*Cairns*[3]
432.445	VK4RTL	*Townsville*[4]
432.450	VK3RAI	*MacLeod*
432 535	VK3RMB	*Mount Buninyong*
432.540	VK4RAR	*Rockhampton*
1296.171	VK6RBS	*Busselton*
1296.420	VK2RSY	*Sydney*
1296.480	VK6RPR	*Nedlands*
10300.000	VK6RVF	*Roleystone*

1. A note from JA1VOK, advises KH6EQI has now shifted to 50.090 from 50.060 MHz, since our autumn months; also, that JD1YAA, being listed on 50.110, has ceased operation.
2. Mark VK0AQ, advises the present frequency of VK0MA is 52.418. He has problems stabilising the frequency, which is only a very slow drift, due to the excessively cold conditions in the unheated building in which it operates. With an outside temperature of around minus 25 degrees Celsius at the moment, one can understand there could be problems!
3 and 4. Note that these two beacons are on the same frequency! Please take note of the next paragraph.

BEACONS AND FREQUENCIES

For years I have been trying to establish the accuracy of the beacon list and have repeatedly implored beacon custodians to advise me of the status of their beacons, frequencies and any changes attached to the various beacons under their control. These requests, in most cases, have been ignored, so inevitably we find beacons listed which are no longer operating. My beacon list is published in many other publications, and mostly without acknowledgment, I might add, and, as a result, the errors are then compounded, particularly where the list is further lifted out into additional magazines, etc.

Eventually, the inevitable had to happen. We now have two 70 cm beacons in close proximity on the same frequency! VK4RIK, in Cairns, and VK4RTL, in Townsville, both on 432.445 MHz. A letter from Roger VK4CD, of the Townsville Amateur Radio Club arrived this month which says, in part, "VK4RTL has been operating in Townsville for some years on 432.445 MHz and approval has also been given by DOC and the WIA for a two metre beacon on 144.445 MHz. In fact, our VK4RTL licence shows this endorsement." I certainly never knew the beacon was operating, otherwise it would have been listed, and I can only presume the Cairns people also did not know when requesting permission to erect a beacon.

The letter also goes on "I am surprised that the WIA Beacon Co-ordinator has not provided you with these details following a survey done of beacons last year. In the interests of harmony among VHF and UHF amateurs, I hope that the co-ordinator can sort out the mess that has been created by the allocation of similar frequencies." Certainly someone has erred in this case, either the Beacon Co-ordinator or DOC or both. I have replied to Roger VK4CD, suggesting dialogue be commenced between the Townsville and Cairns Groups, with the intention of amicably resolving the matter.

Nevertheless, Roger enclosed a copy of a report on Australian beacons issued in March 1986, by Tim Mills VK2ZTM, the FTAC Beacon Co-ordinator (a copy of which I also received from Tim at the time), but as this contained so many errors, I did not use it as a basis for any adjustment to my listings; eg VK3RMB, at Ballarat, is shown as operating on 432.425, 432.451 and 432.535 MHz! That is only one set of errors. It is apparent the list is showing beacons for which permission has been granted to erect, but which, in fact, are not operating, but the list does not say this. I can only assume the FTAC Co-ordinator has not been supplied with the appropriate information in the same way as I have been treated over the years.

TO ALL BEACON CO-ORDINATORS

Now that a major problem has surfaced, let this be a lesson to everyone as to how bungling can be experienced largely due to inadequate communication from the various groups around the country. I have played my part for many years in giving your beacons adequate monthly publicity with update as I find them, and I know of no other publication which has continuous listings of beacons. May I once again implore the various Beacon Co-ordinators around the country to sit down for 10 minutes (and that is all it would take) and set out details of your beacons *which are operating,* the call signs, frequencies, power output, antenna and location. For reference, you could enclose information on proposed beacons not yet operating. Send a copy of this report to the FTAC Beacon Co-ordinator at PO Box 300, Caulfield South, Vic. 3162, and a copy to me for my listings. That is all we are asking you to do, but do it! And, please be prepared to advise any changes in status which may subsequently occur. This request is directed to ***all*** co-ordinators; those whose beacons are listed correctly are please asked to confirm that this is so, thus we will then, at last, have some accurate listings.

I would like to have this information on my desk no later that October 1987. After that date I will try and establish who has not replied and follow the matter up! Whilst I believe the present listing is fairly accurate, I want to be sure of this in the light of the problem which has presently arisen. Why not put pen to paper immediately you have finished reading these columns, that way you will not forget! Past experience has shown most of you do forget!

After that tirade, it seems appropriate to move on to other matters.

Incidentally, a letter from Steve VK4KHQ, indicates he has built a six metre keyer for use as a beacon from Mount Isa, and after using it for 23 days in May, he got his first contact through its use by working Mick VK5ZDR, on 4/5 at 0455. Signals were 5x9 with QSB. It consists of a 10 WPM CW device, generated by a TRS80C colour *computer* driving an external relay on the FT707 keying circuit. This feeds an FTV707R transverter which gives about 10 watts into a halfwave dipole at about eight metres above ground (370 metres above sea level). The keyer runs at 78 percent duty cycle with an 85 second CW message and 25 second receive break.

Steve asked whether the keyer should operate on 52.050, but I advised against this but made some other suggestions. I will await further information from him before listing the keyer in the beacon list.

SIX METRES

Pleased to receive a number of upgradings for the Six Metre Standings Table and the current listings with corrections is shown elsewhere.

Barry VK2KAY, at *Gunnedah*, said he worked most of the stations on his list using 10 watts, but recently increased power to 80 watts. Present line up to a five element Yagi is a TS660 to an FT680R and HL86V amplifier. Previously it had been a home-brew transverter.

Barry has been unable to obtain QSLs from ZM8OY and A35GW. For the former the address I gave in AR sometime ago resulted in confirmation of my contact, but I know there have been many problems with A35GW. Some have got their QSLs, many others are still trying. If anyone is able to help under present conditions please let me know.

Hatsuo Yoshida JA1VOK, advises he has worked a new DX country (number 67) on June 5, being BV0AE, on 51.010 MHz (BV transmission) and 50.110 MHz (JA1VOK answer). This was a special BV DXpedition to Taipei, on Taiwan by JA1UT. The team worked 110 JAs on 5/6.

David VK2BA, in upgrading his six metre standings advises a pleasant time spent with Gary W6XJ and his wife Janet, when they visited Sydney briefly on March 20. They showed the couple the sights of Sydney during the day, and in the evening joined with Neville VK2QF for a barbeque at the VK2BA household. He said there was plenty of VHF talk and OSL card inspections!

NEWS FROM SOUTH AFRICA

An interesting letter has come from Hal Lund ZS6WB, and the following extracts are taken from it for your reading.

"I ran across your report on VK Sporadic-E propagation in the VHF column of June 1986 *QST.* As this is a mode of propagation in which I a particularly interested, I thought perhaps we should compare notes as our Es seasons and conditions should be quite similar.

"We have a tremendous problem in getting meaningful data in this country due to the limited VHF amateur population and the small size of the country. The bulk of the VHF operators are in the major cities; Johannesburg, Pretoria, Cape Town, Durban, Port Elizabeth and East London. The short distances between many of these centres make openings very rare indeed.

"During the past Es season, we had only one very good opening into Port Elizabeth and later Cape Town. The opening lasted over two hours and only five ZS6s, one ZS2 and two ZS1s took part. Other than that, I have heard reports of only two other brief openings this season, one ZS1-ZS6 and the other ZS1-ZS5. I am sure there have been other openings *to uninhabited areas,* but obviously there have been no reports.

"Along the western coast there is virtually no

VHF activity except for two metre repeater operations in isolated places, like Windhoek. Six metres out there is completely deserted at the moment.

"I plan to install a six metre beacon system, near Pretoria, in the next six months which will have four antennas, one horizontal omni-directional (halo) and three Yagis beaming to Europe, Australia and the US. Tentative plans are for CW keying and the omni-antenna to transmit the first two minutes of each five minute period followed by one minute periods on each of the three beams in turn. Power should be in the region of 75 watts input. I am trying to get some antennas donated from one of the US manufacturers for the project and am hoping for three to six elements on each Yagi.

"At the same time and with the co-operation of one of the local radio clubs, we plan to install 12-15 low power beacons for Es research. These will be placed mainly in the areas where there is currently no six metre activity and will use omni-directional antennas.

"I would appreciate any information I could get from your end regarding your chain of beacons, especially regarding power output and whether directional antennas are being used. This would be very helpful to us here in determining which beacon frequencies would produce the best signals in this direction when F2 opens up.

"I would also be interested in contacting one or more keen six metre operators in the area of Perth who would monitor for my beacon throughout the coming Es season. The distance involved is very similar to US/Europe and there have been several contacts made via Es over the past couple of years on that path. As the beacon will be situated well away from my home station, I will be able to monitor a fixed frequency for any calls from VK with an automatic alerting signal here at work. It normally takes me six minutes from home to work, but I have made it back home in three and a half minutes when alerted of a six metre opening.

"VHF activity has dropped to virtually nothing in the past several years, the decline mainly caused by repeaters. I would guess this problem is almost universal. Although a lot of good multi-mode VHF equipment is floating around, very few go to the trouble to put up really good antenna systems and many of the ones that get properly installed are vertically polarised for use on distant repeaters. A number of the operators here are equipped for satellite operation, but very seldom use the equipment for other contacts. I have been trying to stir up some activity and over the past several months, have been publishing a VHF newsletter that now goes to about 130 ZS amateurs."

I had never given thought to the distances in South Africa, but on looking at my atlas I see it is about 1300 km from Cape Town to Johannesburg and another 50 km further to Pretoria, these being the longest distances between populated VHF areas and approximately the distance between Adelaide and Port Macquarie or Melbourne to Toowoomba/Ipswich area. This distance should be available quite often providing there are operators to come on the air. The other distances are around 600 to 700 km and are quite short for general Es working and would be like Adelaide to Melbourne.

The distance from Perth to Pretoria, according to my very poor map, is somewhere around 10 000 km, which would not be impossible by any means under F2 conditions, in fact, during the peak of Cycle 21, ZS6 signals were actually heard here in South Australia on 50 MHz. Any Perth stations sufficiently interested to take up the challenge might like to contact ZS6WB direct. The address is — Hal Lund, PO Box 27746, Sunnyside, Pretoria 0132, Republic of South Africa. I will be writing to Hal in any case.

FROM THE UNITED STATES

Bill Tynan of *The World Above 50 MHz*, in *QST* for June discussed the matter of band plans, particularly as it affects the six metre band in their country and Canada. Their current six metre band plan includes a few frequencies which are of interest to us and I extract from his list: 50.000-50.100 CW and Beacons; 50.060-50.080 Automatically Controlled Beacons; 50.100-50.600 SSB and AM; 50.110 SSB DX Calling Frequency; 50.200 SSB National Calling Frequency; 50.400 AM Calling Frequency; 51.000-51.100 Pacific DX Window; 52.000-52.050 Pacific DX Window. Bill points out that band plans, even when sanctioned by the ARRL Board of Directors, are not binding and they should not be taken as the ARRL dictating to amateurs. They are intended to act as guidelines to help amateurs gain the most from operation on the VHF and UHF bands.

As these notes are being prepared for AR, the Northern Hemisphere is entering the summer Es season. It will be very interesting to see if they fare as well as we in Australia did, particularly on two metres. Bill Tynan reproduced my map of the two metre coverage in *QST* to show the US amateurs the extent of our contacts. If they do not (and last year they did not) it will be interesting to look for any reasons. It was common knowledge during the peak of Cycle 21 that the Northern Hemisphere fared better on six metres than we did, but it seems the situation may be reversed during the minimal part of the cycles. I am sure both Bill and I will be monitoring their results very closely. Lead time for publication will probably mean we may not know much of their happenings before the September issue of *QST*.

EME WORK ON 3456 MHZ

From June *QST* comes news that the first successful two-way contact by a team consisting of W7CNK, WA5TNY and KA5JPD occurred on 3456 MHz on April 5, 1987 when W7CNK/5, in Oklahoma City, contacted WA5TNY and KD5RO, in Dallas. Congratulations! The distance is not stated being EME, but is around 300 km terrestrial.

Also mentioned is that DL9KR is the first non-North American station to qualify for a 70 cm WAS when W5RCI, in Mississippi, provided the final State back in January. This advice from March *432 and Above EME News.*

THE ROSS HULL CONTEST

The publication of my reply to the comments on the contest made by Gordon VK2ZAB, in June issue brought a swift reply from Gordon. I weighed the pros and cons of publishing further comments from Gordon in lieu of writing direct and decided to do both! I feel now, as always, that any comment Gordon makes has to be respected and, although we may beg to differ at times, I am sure we still remain very good friends!

The following will refer to salient points made in Gordon's original letter and a comment on my reply in June AR. It is all very interesting reading.

"1. A mid-May or early August 24-hour contest would favour those who live on elevated sites? Sure it would and so what? Isn't the choice of an elevated site the same as the choice of higher power and/or a bigger antenna?

"Really, you and other planners have got to make up your minds about what you want. Is the Ross Hull to be a prestige event?, a scratch event?, a handicap event?, an event for the handicapped?, a lottery?, a marathon?, or what?

"This is exactly what the problem is now. The Ross Hull tries to be everything to everybody and that is not possible as we have clearly seen by the lack of participation in it.

"2. The winter 24-hour event would favour those who live in cities? Not quite. It would also favour those who live within VHF/UHF range of the cities and that means about 90 percent of the population. I can't see how you could hope to do better than that. Again, this is the problem now. In attempting to suit everybody, you finish up satisfying no one. VK8ZLX happens to be one of the 10 percent. Tough luck! He would have the same problem if he wanted to be a sailor, wouldn't he!?

"3. I don't think Adelaide to Albany contacts have ever occurred in mid- May or early August, but if they have or if there are any other specific paths that are liable to see anomalous propagation at those times, the answer is simple — Ban those paths from the contest.

"4. Your comment that people would not have the incentive to go portable for a 24 hour contest does not hold up at all. People go portable for the John Moyle, don't they?

"Also, the incentive is born of the prestige and/or the prize. I do not think a $1000 trophy each year would be too hard to arrange, do you?

"Therefore, people will go portable if you make it worthwhile one way or the other and I do not envisage any time limit on setting up either. They can set up a week or a month before the event if they like.

"Finally, I think that a 48 hour contest at the height of the anomalous propagation season is doomed to failure. It merely makes the bad aspects of the current Ross Hull arrangement even worse; eg the chances of a two metre, 70 cm and even 23 cm opening to ZL from VK2 is quite high at that time. Imagine the screams from VK6 if that occurred during the contest! No way, Eric. You must eliminate the bias of anomalous propagation one way or the other, otherwise the event is a no contest, a farcial lottery! 73. Gordon VK2ZAB."

Well, there you have it. At least I have not backed off despite some very direct comments at me. I have to say that I do see a very small chink of light appearing in my armour which means I might be seeing more wisdom in the above approach than I first acknowledged. If something was to be done for the winter period, then perhaps it could be worth a try in 1988 which is the Bi-Centenary year. If the new Federal Contest Manager, in Tasmania, agrees, it may be possible to then drop the Ross Hull from December 1987 and try it in June/July 1988 (not the holiday weekend in June though), in this way we can gauge what support is forthcoming for a non-anomalous propagation period; additionally, we should have an indication of whether general activity drops off in the summer Es period when compared to the contest running — however, this may be difficult to judge in just one year.

Okay. The subject has been hammered pretty well for the past two years. Can we have some positive/constructive comment from the multitudes perhaps covering the following points in order to get specific answers to specific questions.

1 Do you favour a Ross Hull Contest in June or July? If so, when?
2 If not, when do you favour the contest being held?
3 Are you in favour of a 24 hour contest, say a UTC day?
4 If not, how long do you want the contest?
5 What bands should be used?
6 How do you decide the winners? Points score similar to present? Maidenhead grid squares? Or what?
7 Should there be some bonus for portable operation? If so, what?
8 Would you support a June/July Ross Hull Contest?
9 Would you enter a log?
10 If you still want a contest in December will you support it?
11 Would you enter a log?
12 Have you any other constructive comments to make?

It would be pleasing to have several hundred replies to these questions arrive on my desk by the end of August. That will mean you will have to settle down and think about the contest and pen your reply right away. If you are given more time you will only forget as so any have done in the past! Go on, please write now.

WESTERN AUSTRALIA

Wally Howse VK6KZ, has also written in response to my stirring on the Ross Hull. I had to weigh whether to include his letter this month in view of the already large coverage or use it next month, but I decided it was necessary this month when I have already asked for feedback by the end of August.

Wally has also included some views on the 2304 MHz band and higher which I will deal with next month. This band has been the subject of considerable correspondence between VK6KZ, the WIA, DOC and others and merits further comment later.

From Wally VK8KZ: "Dear Eric. Well your column in AR for June has stirred me to write to you regarding the Ross Hull Contest! ! !

"I agree totally with Gordon VK2ZAB, that the present rules mean that 'being there' is all important if winning is the objective. I would add

'living in a big city' as a second need — again if winning is the objective.

"However, winning is not the objective of everyone!

"Many people, me included, get a lot of pleasure out of participating in a period of high activity and getting satisfaction at exchanging numbers which is a little more challenging than the 59 report one hears so often with HF contests and DXpeditions.

"I know of no boycott of the Ross Hull in WA under the present, or previous rules. My log shows my participation in the Ross Hull Contest in all years over the last decade with the exception of 1985/86, when I was on holidays with my daughter in Canberra. Last year, I gave 55 numbers. However, I have not sent my log in to the Contest Manager every year. Anyway, why would I want to when I know that the score represented is by no means a 'winning' one? I know I was in the contest. Those who worked my station know I was in the contest. Why is it important for the Contest Manager to know that I was in the contest? The fewer logs the Manager has to process the easier the job.

"The exchange of numbers gives one a very good assessment of the likely scores of other competitors, at least under more recent rules, and is a very good guide as to whether a log entry for the purpose of 'winning' is likely to be worthwhile.

"To me, the Ross Hull Contest is very much like golf in that it is a type of activity in which one can participate, at one's own level of performance, and gain a lot of satisfaction by competing against oneself without having to publicise the performance via the entering of the scorecard to the Golf Club or a log to the Contest Manager.

"The most important function of the Ross Hull Contest is to increase activity and provide a challenge for participants to test their

- operating skills
- equipment
- understanding of propagation conditions (depending on the rules); and
- ability to give a lot of time to operating during the contest periods (depending on the rules).

"In so doing, the Ross Hull Contest has contributed much to our record of propagation on the VHF/UHF/SHF bands from the uniquely widely dispersed amateur radio service operators. From this record, some researchers may be able to improve their understanding of what is anomalous and what is not in VHF/UHF/SHF propagation — providing those records are kept in an appropriate form. That keeping of the data is probably the most compelling argument for the submission and retention of logs. However, does the WIA keep the logs and are they in a form which could help the researchers? I doubt whether either of these things happen. Could, or should, they?

"So much for my philosophy regarding the contest. What of the future?

"I agree with your analysis of Gordon's alternative of a mid-winter contest. The contest is best held in the summer months if the six metre band is to be included. If that band is not included, then the contest will almost certainly favour operators in areas of high population density, or at an appropriate distance from such an area or those operating on the maximum number of bands (depending on the rules).

"In my view, the Ross Hull Contest should be based on rules which provide a points score for each contact which reflects the probability of it being achieved and all contacts with the same probability given the same points. Hence those points tables which, in past years, have reflected a relationship between frequency and distance have been in the right direction as they have required some consideration of the propagation characteristics of each frequency band and probability of contacts over the distance (as currently understood!). Hence, this links to my earlier comment of the real significance of the Ross Hull Contest (and one which Ross Hull himself might have wanted to encourage) namely that of increasing our understanding of propagation of the VHF and higher bands. The real scientific analysis may not have been done but the logs of contestants have influenced the establishment of the points table. If my arguments are followed, then the Contest Manager, or at least the person responsible for the rules, should be an ardent VHF/UHF/SHF operator with an interest in propagation and not necessarily be linked with other contests.

"I now turn to the question of the bands above 52 and 144 MHz. Those two bands and 432 MHz have now advanced to the stage where activity is high, propagation characteristics are reasonably well-known to most operators and equipment for them is usually purchased rather than home constructed (the black box bands). In due course, one might expect 1296 MHz to join this black box group. However, for the higher bands, commercial equipment is still fairly rare and the spread of stations operating on those frequencies very limited. If we want to learn, as amateurs, more about those bands then activity needs to be encouraged and the Ross Hull Contest certainly did that when band multipliers were included in the rules. Your column suggested, correctly, that Reg Galle VK5QR and Wally Green VK6WG, did not have the incentive of the contest to become active on the SHF bands — the propagation path was enough. You did not refer to me, to Don Graham VK6HK, to Les Jenkins VK3ZBJ, and others in WA (such as Bob Pine VK6ZFY, Phil Casper VK6ZKO, and Barry Grey VK6ZSB) and in Victoria, who built their gear for the higher bands because the Ross Hull rules, at that time, encouraged such construction and activity on those frequencies.

"My view is that the rules should continue to encourage people to operate on all bands for which we are licensed to operate and, in particular, those bands which are in greatest danger as evidenced by the actions of the DOC with respect to the 432 and 2304 MHz bands in recent times.

"To maintain the interest of those who are limited to the lower frequency bands, I would wish to encourage the Ross Hull Contest being run in at least two sections. The first section would comprise the lower bands 52, 144 and 432 MHz (with 1296 MHz being added in about three years time). The second section would comprise all banos higher than those in Section A. In both cases, I would wish to see band multipliers to provide an incentive for operation on as many bands as possible and points allocated on the probability concept described earlier. I would not see any merit in loading points for different call areas (not because I am very distant from most of them!) since these are artifacts of history and politics and there is no scientific relationship between them. Section A might be seen as the primary contest with Section B as secondary.

"As for the length of the contest, I see merit in it being a month in length in exploring propagation and encouraging activity for that period. However, such a length is very demanding and my lowered level of activity in recent contests reflected my inability to 'be there' all the time. The concept of a seven day period may be worth testing and if it is tried, I would encourage it to start on December 26, so as to allow serious operators to enjoy Christmas Day with families and friends without worrying about the contest!

"Well, you did stir me to write! Thanks for the stirring!!"

50-54 MHZ DX STANDINGS

DXCC Countries based on information received up to May 31, 1987. Cross-band totals are those not duplicated by six metre two-way contacts. Credit has not been given for contacts made with stations when 50 MHz was not authorised.

Column 1: Six metres two-way confirmed
Column 2: Six metres two-way worked
Column 3: Cross-band (6 to 10) confirmed
Column 4: Cross-band (6 to 10) worked
Column 5: Countries heard on 50 MHz
Column 6: Countries heard on 52 MHz

CALL SIGN	1	2	3	4	5	6
VK8GB	42	42			13	
VK2BA	30	30				
VK4ZJB	30	30				4
VK2QF	26	26				
VK2VC	26	26				
VK2DDG	25	26		2	12	3
VK3OT	25	26			10	
VK3AWY	22	22				
VK2KAY	21	23				
VK2BNN	20	21				
VK5LP	20	22			6	3
VK4ALM	20	20				
VK3XQ	19	20			1	1
VK7JG	18	20			2	
VK3AMK	17	17				
VK4TL	17	17				
VK9XT	17	21				
VK3AUI	17	21				
VK4ZAL	17	17				
VK3NM	16	17				
VK4ZSH	15	16				
VK2ZRU	15	16			1	3
VK3ZZX	12	13				
VK9YT	12	14				
VK6OX	10	10	1	1		
VK6RO	9	9	3	3	2	3
VK4KHZ	8	10				
VK6HK	8	13		3	2	
OVERSEAS						
JA2TTO	48	48			6	

The minimum number of countries confirmed for an operator to commence being listed is five, including VK.

The position on the list is determined by the number of confirmed contacts. Where two or more operators have the same total, those first date listed with that total can only be displaced by someone having a greater number of confirmed contacts.

The next list will appear in February 1988, and entries will need to be on my desk no later than December 15, 1987. Claimants are reminded that full details of all contacts are required; viz date of contact, time in UTC, call sign of station worked, country, mode, report sent and received, QSL sent and whether received, split frequency contacts should be indicated. Please add your own call sign, signature and date of claim.

I reserve the right to ask any claimant for QSL cards for perusal to support verification if considered necessary.

WINTER TIME SPORADIC E

I recently received an excited phone call from Peter VK8ZLX, in Alice Springs, who reported that on June 3 around 0700 VK8ZMA had monitored a VK5 working a VK3 or two metres! So far I have been unable to trace the stations concerned, but if correct, I think it is probably the first recorded instance of two metre Es during winter months. Apparently Channel 4 television was reasonable copy at the time, and this could have been the station at Port Pirie which would tend to support the fact that the MUF must have been very high at the time. Very interesting. At the same time, six metres was open from Alice Springs to VK2, VK3 and VK5.

It is becoming more obvious that operators are still alert for the occasional odd openings because more of them are being reported. These, coupled with the 70 cm possible Es report from Roger VK5NY, and the station in Brisbane last summer, tends to make the rethinking of old ideas necessary.

No reports have come in of anything else of a spectacular nature, so it appears the bands are reasonably quiet. I observed a VK4 on six metres on 4/6 around 0630, but had to catch the mail so could not stay long enough to make a contact.

CLOSURE

It may come as a shock to most of you, but I am seriously considering moving away from Forreston to live at Meningie, 148 km by road from here on the shores of Lake Albert and south east of Adelaide. The move is for health reasons as I am sure the milder climate will suit my back problems. This is only a preliminary announcement to warn correspondents to keep their eyes on my address, but I should be able to say definitely next month. Naturally the area should be a good VHF site with a water path almost all the way to Albany! And Melbourne should be in range too.

Closing with the thoughts for the month: "It is easy to distinguish between a wholesale price increase and a wholesale price decrease — one of them gets passed on to us" and "You really find out who your friends are when your cat has kittens!"

73. *The Voice in the Hills.*

Contests

Ian Hunt VK5QX
FEDERAL CONTEST MANAGER
Box 1234, GPO, Adelaide, SA. 5001

CONTEST CALENDAR

AUGUST

1		YLRL YL-QM SSB Sprint (Rules this issue)
8	— 9	European CW Contest
15	— 16	**Remembrance Day Contest** (Rules July AR)
15	— 16	SEANET SSB Contest (Unconfirmed)
22	— 23	All Asian CW Contest (Rules July AR)
1	— 31	40th Anniversary Pakistan Award (See notes July AR)

SEPTEMBER

19	— 20	Scandinavian CW Contest
26	— 27	Scandinavian SSB Contest
26	— 27	CQ WW RTTY Contest

OCTOBER

3	— 4	VK/ZL/Oceania SSB Contest (Rules this issue)
10	— 11	VK/ZL/Oceania CW Contest (Rules this issue)
24	— 25	CQ WW DX Phone Contest

NOVEMBER

14		**Australian Ladies' Amateur Radio Association Contest**
14	— 15	European RTTY Contest
28	— 29	CW WW DX CW Contest

Contests listed in **bold** type are WIA sponsored contest.

I wish to advise a correction in the mailing deadlines for logs in the All Asian Contest. Logs must be postmarked no later than July 30, for the phone section and September 30, for the CW section. (Not the arrival dates published in last month's issue).

NZART MEMORIAL CONTEST

Well, the lines were crossed as far as the timing of the NZART Memorial Contest was concerned. Instead of being held at the same time as our Remembrance Day Contest it was conducted on July 11 and 13. Obviously a misunderstanding which I am not able to explain at this stage. I would hope that our new incoming FCM might be able to sort this out as I believe that it could be in the best interests of all concerned for both contests to coincide.

You will note that it appears the SEANET SSB Contest is again set to clash with our annual Remembrance Day Contest. This is most unfortunate, however it is completely out of my control. I do not receive any correspondence from the SEANET officers advising me as to their contest. I would wish to point out that, from long before the advent of the South East Asia Net (SEANET), the WIA was holding the annual Remembrance Day Contest on the weekend closest to the August 15, the date on which hostilities ceased in the south-west Pacific area. I would hope that, in some way, this clash of contests in the same general geographic area may be resolved. Perhaps some of you have regular contact with SEANET and might be able to suggest that the matter be looked at by that organisation.

FEDERAL CONTEST MANAGER'S REVIEW

Nearly three and a half years ago I was approached on the subject of taking on the assignment of Federal Contest Manager. I agreed to carry out this task and as far as possible, occupy the position for the recognised term of three years. I have managed to do what I agreed to and I can also state that the time period involved seems to have passed very quickly. (Maybe that is because I'm growing older). I would like to briefly review this period of tenure now and make some comment which I hope will be of interest and also be constructive and helpful.

The position was undertaken without very much information being available to rather *green* Contest Manager. I had been interested in contesting for quite a few years and thus had followed the writings of such forerunners as Peter VK4PJ, Wally VK2DEW and Reg VK1BR, etc. No comprehensive set of guidelines or terms of reference existed for the position, thus there was not too much to go on. One was left very much to ones own devices. Such material as was passed along by my predecessor mainly comprised copies of routine correspondence or records of doubtful historical value.

I had several ideas in mind to try to clear up the contest scene and had some of my suggestions adopted by previous FCMs.

One of the first approaches was to attempt to make the Contest Column more interesting and provide more useful information for both contesters and others who are perhaps not so interested. To this end I began a series of articles regarding contest techniques, log-keeping, station layout, etc. I also provided advice regarding Field Day operation.

Amongst other things I asked for information from Divisions and members. From the former, not much, if anything, was forthcoming. However, some individual members responded.

I wished to see some changes to contests and yet, at the same time,desired to achieve stability of rules. I feel that these objectives were achieved, with the noted exception of the Ross Hull Memorial Contest, the lack of support for same having, for many years, been most disappointing. Changes which were made included shifting the timing of the VK Novice Contest to the month of June, which was designed to help with operation on the "main" Novice band of 80 metres. (It is certainly a winter-time band) and moving the Field Day Contest to late March rather than have this contest held during the high fire danger month of February. It would appear that these changes have paid off.

I also believed, and still maintain the opinion, that there are too many contests (count up the Contest Calendar for a year sometime if you don't believe me!), and I fought quite a battle to have the CW-only contest disbanded following its inception as an initial anniversary contest. Fortunately, Federal Council eventually saw the commonsense in what I was trying to convey. I did find some difficulty in having matters dealt with and agreed to by Federal Council. There always seemed to be an inordinate delay in having matters dealt with. Guidelines, whilst now available, need to be just that. Flexibility is really necessary if a good job is to be done. There is also a need for Federal Council to take proper notice of recommendations from the Federal Contest Manager. His advice should be probed and tested but taken seriously. I have attended quite a number of Federal Conventions and have never ceased to be amazed at the number of people who become "instant experts" on all aspects of amateur radio. Background material should be carefully considered and, if necessary, matters should be referred back for further advice before any decision is made where any doubt exists. Along with this approach comes the need for the system to be made more streamlined to allow greater flexibility and speed in decision-making. In this way we may be able to shake off some of the taint of "old fogeyness" of which the WIA is sometimes accused. I might add the point that, where Federal Officers as employees, albeit voluntary, of the Institute are involved and listening to their advice is concerned, you "should not keep a dog and bark yourself."

Amongst other matters I have tried to implement have been printed log sheets specifically for contests, provision of additional prizes and trophies, and separate trophies for Phone and CW in the Contest Championship. These latter are, I believe, on the way, whilst the other matters will be left to my successor to deal with along with the problems concerning the Ross Hull Contest and having the Field Day Contest broken down into two further contests.

Now, the above comments might sound like a gripe and perhaps they are is some small way. Rather than have you believe that I leave the position with a bad case of sour grapes, I would explain that I am a realist. I never did expect that everything I though was right had to be accepted by others as such. I mention that matters concerned merely to try and provide some basis for yet further discussion where interest exists in working towards further improvement for the betterment of our hobby generally and not only contesting to the exclusion of all else. In some small way, what I have written may serve as a record of some use to later historians.

I have enjoyed the task of Federal Contest Manager and have had the value of experience from doing what I have been able to do.

I would also like to acknowledge help that I have received from some individual members. In doing so, I wish also to express my thanks generally to all who have written or telephoned with ideas and questions. Specifically I refer to Bill Rice VK3ABP, our Editor, for whom I have great admiration and respect, both for his wide general knowledge, as well as his high ability in his professional field. I must also thank Ken VK3AH and his wife Bett, who have done a great deal which is unknown to many in keeping our magazine going. Ken has always provided me with useful advice as to the preparation of material for typesetting. Reg Macey, our ex-Secretary/Manager and Earl Russell VK3BER, have always been of great help. I must acknowledge that constant contribution of Frank Anzalone W1WY, and the useful advice and discussions available from my contacts with Jock While ZL2GX. My relations with Federal Executive have always been excellent and I thank those members who have been so co-operative as well as commend them for their mighty efforts put in on behalf of us all. Throughout all of my term I have been able to have access to our VK5 Divisional Federal Councillor and our Divisional President. Their encouragement and advice has been wonderful.

Certain individual members I would mention are Jim VK2BQS, who has been on of my most loyal supporters. Les VK3ZBJ, has always been prepared to submit useful comment on VHF/UHF matters. Les, in fact, went to the effort of paying me a personal visit last year to discuss contest matters.

I could not let the opportunity pass to express my thanks to Eric Jamieson VK5LP, for all his help in trying to sort out rules, etc, and endeavour to make some sense of the Ross Hull Contest. I trust that our efforts will not have been in vain and that some good may eventually come out of the work that has been done.

I have made many friends on the air and might say that I have never experienced any form of unpleasant comment on the bands. Rather, I have continually met with kindness, interest and encouragement. The same can be said of most comments provided with logs and other letters received by me.

I have not always replied to letters direct, but again I can assure you that, where you have not received an answer via this column, your letter has not been ignored. Many of you have provided a resource which has been used to try and improve our hobby. For your help and support I am indeed grateful.

As stated elsewhere, I am not dropping the position into the lap of my successor without providing some support. I have been conducting regular schedules with him and I am sure that a smooth changeover will result. As part of this "tailing off" I will be completing the handling of the VK Novice Contest and the production of all certificates up to, and including, this contest. Should you have may queries involving contests to this stage you can still make contact with me and I will do my best to sort matters out.

I will naturally be involving myself in other activities with perhaps a little respite from deadlines, etc, and I will certainly be continuing with contesting, albeit with a limited amount of time available for such events.

As from next month, the September issue, the new Federal Contest Manager will be able to introduce himself to you. I am sure that he will be able to improve further the contest scene here is Australia. I am also sure that he will have many more good ideas to put into practice and that a new approach to the task will indeed be most beneficial.

I commend to you the value of providing support and trust that you will continue to provide the kind of support that I have received over the past three-plus years.

I would like to finish this contribution to the column by providing you with a portion of the text from my Annual Federal Contest Manager's Report to the 1987 Federal Convention, as follows:

"FINAL COMMENT

"At this time my term of office as Federal Contest Manager is almost concluded. I would expect that my final contribution to *Amateur Radio* magazine in this office will be for the August 1987 issue.

"I will, as intimated in an earlier portion of this report, ensure that any loose ends are tidied up and that the new incumbent will be able to commence his duties with a clean slate. I will also continue to be available to provide any advice and counsel should it be requested.

"I wish the new FCM, whoever he/she may be, all the very best in the position.

"I have enjoyed the privilege and experience which has been made available to me by virtue of having held the post of FCM for the last three years. There have been times when some strain has been evident, however this has been compensated for by the remarks of encouragement and appreciation received from time to time from individual members. Such cases have far outweighed in quality and number any complaints received.

"I have tried, as FCM, to bring an era of rationalisation and improvement and feel that I have achieved many of the goals which I set. I have also attempted to make the contesting scene interesting for all concerned including readers who are not primarily interested in contesting. I am rather glad though, that the Australian contest scene does not have the "rat race" characteristics which I have observed in some countries, both during my various trips abroad and in my on-air contest experiences.

"I have been happy to be able to serve my fellow amateurs in some way and must indeed admit to some slight sadness of though due to my term having concluded. I do have many other commitments which carry a very great priority over anything else and I do look forward to some possible relaxation of the load upon my shoulders.

"Last, but not least, I would wish to claim that I have attempted to bring to my own small sphere of amateur radio a level of balance and also of the higher values and ethics which I believe we should put into practice as a normal part of our daily lives. I do not hesitate to state my beliefs that these standards of values and ethics are based on Christian principles.

"I wish the Federal Council, our Federal President and all members of the Executive the very best for the future and express my wish that your deliberations will always result in the best possible outcome for the benefit of amateur radio in both this country and on a world-wide basis.

Signed: Ian J Hunt VK5QX
FEDERAL CONTEST MANAGER"

FINAL, FINAL

I would like to wish each and every one of our members and all amateur radio operators generally, the very best in their efforts associated with our hobby. I would like to think that, for you, amateur radio will always be a rich and rewarding experience and also that you do not allow it to cause difficulty between yourself and your family or neglect of any other responsibilities. I would hope that our hobby will become a shining light to the rest of our community as an example of co-operation and service.

To each of you, my warmest greetings.

73 de Ian VK5QX

YL/OM SUMMER SSB SPRINT

Time period from 1800 to 2200 UTC, Saturday August 1.

As the name implies, this is a four-hour "shorty" organised by the YLRL. Only contacts between YLs and OMs count, on all HF bands, no nets or repeaters and a power limit of 1500 watts PEP. (A little more than VK stations are allowed, anyway).

EXCHANGE: Call, RS, name and state, province or country.

SCORING: (A) One point per QSO. Same station may be worked once on each band. (B) Alphanumeric multiplier. Using the last number and the first letter following that number of the call; ie W1XZ is 1X, W2GLB/7 is 2G, 9Y4A is 4A, etc. (An unusual method for multipliers and somewhat of a novelty, I feel — FCM). (C) Low power bonus of 1.5 for stations using 200 watts PEP or less at all times. (D) Final Score — total QSO points (A) times the multiplier (B) times low power bonus (C) if applicable.

FREQUENCIES: 3.955, 7.255, 14.265, 21.395, 28.595 MHz, plus or minus 15 kHz.

AWARDS: Certificates to the three highest scoring YLs and OMs, and to the highest scoring YL and OM in each US district, VE Province and DX Country. (Minimum of 10 valid contacts). Print or type logs and show scoring. Operators signature is requested. All entries must be received by September 1, 1987, and should be sent to Mary Lou Brown NM7N, 504 Channel View Drive, Anacortes, WA. USA. 98221.

Whilst speaking of YL organised contest, I would like to add a little advertisement for the ALARA Contest to be held in November. I would suggest that you keep this well in mind. The rules should appear in the October issue of *Amateur Radio*. This is a really good contest and it deserves your utmost support (FCM).

CONTEST DISQUALIFICATION CRITERIA

A standardised approach is taken to the disqualification of logs entered in all of the contests which come under the direct control of the Federal Contest Manager appointed by the Federal Executive.

A perusal of these criteria will show them to be quite fair and well thought out. They are based on those used by the ARRL in administering their contests. It is suggested that you take note of this particular issue of the magazine for reference to these general rules in the case of all contests for the ensuing year. Details are as follows:

DISQUALIFICATION — An entry in WIA conducted contests may be disqualified if, upon checking of logs, it is necessary that the overall score be reduced by more than two percent. Score reduction does not include correction of arithmetic errors. Reductions may be made of unconfirmed QSOs or multipliers, duplicate QSOs or other scoring discrepancies. An entry will be disqualified if more than two percent duplicate QSOs are detected as being claimed for credit. For each duplicate or mis-copied call sign removed from the log by the Contest Manager, a penalty of the deletion of three additional QSOs of equivalent value to the offending claim may be applied. The penalty will not be considered as part of the two percent disqualification criterion. If a participant is disqualified *under* these afore-mentioned provisions that operator will be barred from entering the contest for that particular mode in the ensuing year; eg disqualification from the 1987 RD Contest, Phone Section will prohibit an entry for the 1988 RD Contest, Phone Section. However, participation in the 1988 RD Contest's CW Section would be allowed.

Logs which are very untidy, illegible or incorrect in layout to a major degree may also be disqualified. The call signs of disqualified participants may be listed in *Amateur Radio* magazine, together with the contest results.

THE 11TH WEST AUSTRALIAN ANNUAL 3.5 MHz CW and SSB CONTESTS Transmitting and Receiving

DURATION:

CW — Saturday and Sunday, August 15 and 16.

SSB — Saturday and Sunday, September 19 and 20.

On both days between the hours of 1100 and 1330 UTC; ie five operating hours in all for each contest.

FREQUENCIES:

All contacts to be made in the 3.5/3.7 MHz band using frequency allocation applicable to your licence conditions.

CALLING:

Stations will call CQ WAA using the three times three technique, infringement of this rule by the use of long CQ calls may entail disqualification as will prearranging of a QSO.

SCORING:

Points for contacts are as follows:

Within Western Australia — five points per contact
WA to all Mainland Eastern States — two points per contact
WA to VK7 — four points per contact
WA to VK0 and Overseas — eight points per contact

Three points per contact with WA stations only.

MULTIPLIERS:

A multiplier of two per Western Australian Shire worked will apply to the final score. For Western Australian stations north of the 26th Parallel a multiplier of 1.3 per contact confirmed.

CONTACTS:

Stations may be worked twice on each night; ie once between 1100 and 1300 UTC and again between 1300 and 1330 UTC. These contacts will count for points. Each time the contact for WA stations will take the form of an exchange of five characters comprising RS/T and Shire letters; eg a station in *Northam* sends 579NM or if in *Harvey* 579HY, this helps towards the Worked All Shires Award. Eastern states and overseas stations will send RS/T plus a running number start at 001.

LOGS:

Contest logs are to be set out on one side of a quarto or foolscap sheet with columns headed as below.

DATE:			CALL:		OPERATOR:
TIME UTC	CAL-L WK-D	RST OUT RST IN	SHIRE LETTERS	SHIRE MULTIPLIER	POINTS CLAIMED

Column seven to be totalled at the foot of the each page and the running totals brought forward. The last page to contain the following summary: Total number of points scored, Input power, Equipment and Antennas used, along with comments on the contest in general.

SWL participants score as above using the outgoing transmit score.

All logs to be addressed to WAA Contest Committee, 42 Kennedy Street, Melville, WA. 6156 and posted so as to reach the destination not later than October 16, for both contests. The results for both contests will be published in December's issue of *Amateur Radio*.

SHIRE LETTERS

1. Albany Town	AT	70. Leonora	LA
2. Albany	AL	71. Mandurah	MB
3. Armadale	AK	72. Manjimup	MP
4. Augusta Margaret River	AM	73. Meekatharra	MK
5. Bassendean	BA	74. Melville	MV
6. Bayswater	BW	75. Menzies	MZ
7. Beverley	BV	76. Merredin	MD
8. Boddington	BD	77. Mingenew	MW
9. Boulder	BO	78. Moora	MA
10. Boyup Brook	BB	79. Morowa	MR
11. Bridgetown Greenbushes	BG	80. Mosman	MS
12. Brookton	BK	81. Mukinbudin	MU
13. Broome	BE	82. Mullewa	ME
14. Broomehill	BH	83. Mundaring	MB
15. Belmont	BL	84. Murchison	MH
16. Bruce Rock	BR	85. Murray	MY
17. Bunbury	BY	86. MI Magnet	MM
18. Busselton	BN	87. MI Marshall	ML
19. Canning	CA	88. Nannup	NP

20. Capel	CL	89. Narembeen	NN
21. Carnamah	CH	90. Narrogin	NG
22. Carnarvon	CN	91. Narrogin Town	NT
23. Chapman Valley	CV	92. Nedlands	NL
24. Chittering	CI	93. Northam	NM
25. Claremont	CT	94. Northam Town	NO
26. Cockburn	CR	95. Northampton	NH
27. Collie	CE	96. Nungadin	NG
28. Coolgardie	CG	97. Peppermint Grove	PG
29. Coorow	CW	98. Perenjori	PJ
30. Corrigin	CS	99. Perth	PH
31. Cottesloe	CO	100. Pingelly	PY
32. Cranbrook	CK	101. Plantagenet	PT
33. Cuballing	CB	102. Port Hedland	PD
34. Cue	CU	103. Qualrading	QG
35. Cunderin	CD	104. Ravensthorpe	RT
36. Dalwallinu	DU	105. Rockingham	RM
37. Dandaragan	DN	106. Roebourne	RB
38. Dardanup	DP	107. Sandstone	SS
39. Denmark	DK	106. Serpentina Jarrahdale	SJ
40. Donnybrook Balingup	DB	109. Shark Bay	SB
41. Dowerin	DR	110. South Perth	SP
42. Dumbleyung	DG	111. Stirling	ST
43. Dundas	DS	112. Subiaco	SU
44. East Fremantle	EE	113. Swan	SW
45. East Pilbara	EP	114. Tambellup	TP
46. Esperence	ES	115. Tammin	TM
47. Exmouth	EH	116. Three Springs	TS
48. Fremantle	FM	117. Toodyay	TY
49. Gingin	GG	118. Trayaing	TY
50. Gnowangerup	GP	119. Upper Gascoyne	UG
51. Geraldton	GN	120. Victoria Plains	VP
52. Goomalling	GM	121. Wagin	WN
53. Gosnells	GS	122. Wandering	WO
54. Greenough	GR	123. Wanneroo	WO
55. Halls Creek	HC	124. Waroona	WR
56. Harvey	HY	125. West Arthur	WA
57. Irwin	IN	126. Westonia	WS
58. Kalamunda	KA	127. West Pilbara	WP
59. Kalgoorlie	KL	128. Wickepin	WI
60 Katanning	KG	129. Wiluna	WU
61. Kellerberrin	KN	130. Williams	WL
62. Kent	KT	131. Wongan Ballidu	WB
63. Kojonup	KP	132. Woodanilling	WG
64. Kondinin	KD	133. Wyalkatchem	WY
65. Koorda	KO	134. Wyndbsm East Kimberley	WE
66. Kulin	KU	135. West Kimberley	WE
67. Kwinana	KW	136. Yalgoo	YO
68. Lake Grace	LG	137. Yilgarn	YN
69. Laverton	LV	138. York	YK

VK/ZL/OCEANIA DX CONTEST 1987

It is almost that time of the year again — the VK/ZL/Oceania DX Contest. Here are this year's rules. It would be appreciated if you would not only take an active part yourself, but also encourage all other amateurs and shortwave listeners is your area to do so.

Please advise all societies, clubs and individuals where and whenever possible of this year's Contest. It would also be greatly appreciated if you could advise any technical, amateur, radio, electronic or shortwave listener magazines of this contest.

Should you have any Packet, AMTOR, or RTTY Bulletin Boards in your area, would you kindly place the contest rules on there as well.

If there is any way I can help or assist anyone with this contest or in fact any other amateur related matter, please do leave a message on the VK4BBS Packet Bulletin Board Station on 14.107 MHz. A reply will be sent as promptly as band conditions allow.

Looking forward to receiving a log from you and many more from your area. Do enjoy the contest and make many new friends.

Brian Beamish VK4AHD/VK4BBS (Packet BBS M/Box)
1987 VK/ZL/Oceania Contest Manager
PO Box 254
Stones Corner, Qld. 4120

FOR OVERSEAS ENTRANTS

1. SSB

Within 24-hour period from 1000 UTC Saturday, October 3 to 1000 Sunday, October 4, 1987, during which time a **maximum** of 12-hours operating time will be done — in one hour blocks based on "even hour to even hour" in UTC; eg 1000 to 1100 UTC or 1300 to 1400 UTC with **minimum** periods of one hour.

1a. CW

Within 24-hour period from 1000 UTC Saturday, October 10 to 1000 Sunday, October 11, 1987, during which time a **maximum** of 12-hours operating time will be done — in one hour blocks based on "even hour to even hour" in UTC; eg 1000 to 1100 UTC or 1300 to 1400 UTC with **minimum** periods of one hour.

Receiving SSB and CW Combined in the above times (**maximum** total 24- hours).

2. **Only** one contact per mode per band is permitted and **all** bands **except** WARC bands may be used.

3. SCORING

** For stations operating outside the Oceania, score two points for each contact with VK/ZL or Oceania stations.

** Oceania stations score two points for all contacts.

4. FINAL SCORE

Multiply total QSO points by the sum of all VK/ZL/Oceania prefixes worked on all bands. (The same VK/ZL/Oceania prefix worked on a different band counts as a different unit).

NB. Oceania stations are those which qualify as Oceania for WAC.

5. CIPHERS

Five or six digit numbers composed of RS/T report plus a three digit sequence number beginning at 001 and increasing by one for each QSO on that band.

6. LOGS

a) Separate logs for each band please and for SSB and CW.

b) Show date, time UTC, call sign of each station contacted, ciphers sent and received.

c) Underline each new VK/ZL/Oceania prefix.

d) State QSO points for each band.

e) State VK/ZL/Oceania prefix claimed on each band.

f) Summary sheet to show:

** Call sign, Name Address

** Total QSO points claimed on all bands.

** Total VK/ZL/O prefixes contacted on ALL bands.

** Total points claimed.

** Declaration that rules were observed.

Post logs to: WIA VK/ZL/Oceania Contest Manager, VK4AHD/VK4BBS (Packet), PO Box 254, Stones Corner, Qld. 4120, Australia. Logs must arrive no later than February 15, 1988.

7. SWLs

A VK/ZL/Oceania station must be heard in a QSO — logs to be set out as for the transmitting section.

8. AWARDS

Separate awards for SSB and CW.

a) Special coloured certificate to the top scorer in each continental area.

b) Special coloured certificate to the tope scorers in each country.

c) Participation certificates to all others on request (One IRC for postage please).

**Copy or relevant results available on request (One IRC please).

FOR VK/ZL STATIONS

Check with overseas rules

Rules 1, 2, 5, 6 as for Overseas stations except . . . in Rule 6.

3. VK/ZL stations are permitted to contact each other **only** on **160** and **80 metres**. VK/VK, ZL/ZL and ZL/VK contacts are all permitted on these two bands.

4. SCORING

Different points for contacts on different bands as follows:

160 metres — 20 points
80 metres — 10 points
40 metres — 5 points
20 metres — 1 point
15 metres — 2 points
10 metres — 3 points

Total score will be the total QSO points multiplied by the total number of prefixes worked. The same prefix worked on a different band is counted.

NOTE: K1, W1, AA1, N1, etc, are all different prefixes. W1AAA/6 would count as W6 not W1.

6. CHANGE

Logs to arrive no later than December 5, 1987.

7. SWL SECTION

As for overseas but. . .

* VKs must hear and log ZL or other stations (no VK stations)

* ZLs must hear and log VK or other stations (no ZL stations)

* ZL/VKs do not log each other

8. AWARDS

Separate awards for SSB and for CW.

a) Special coloured certificates to top scorers in each prefix area and to top scorers on each band.

b) Participation certificates to all others on request. (One IRC or $1 for postage, etc, please).

ar

Awards

Ken Hall VK5AKH
FEDERAL AWARDS MANAGER
St George's Rectory, Alberton, SA. 5014

ROARS 15TH ANNIVERSARY 1972-1987

The Royal Omani Amateur Radio Society, which was formed under the gracious patronage of His Majesty Sultan Qaboos Bin Said A4XAA, is happy to announce a special program for their anniversary.

To celebrate the event, the Society will operate a four-day non-stop special event station from 0200 UTC, Thursday November 5, 1987 to 2000 UTC, Sunday November 8, 1987, using the special call sign A4XXV.

Operation will be on the 160, 80, 40, 20, 15 and 10 metre bands using SSB, CW, RTTY and AMTOR. A special and exclusively designed award will be available for all operators who can satisfy the following conditions.

i	Work or hear A4XXV on two different bands or two different modes.
ii	Claim by certified log extract.
iii	Award Fee of 10 IRCs or equivalent.
iv	Award deadline: June 20, 1988.
v	Claims to: The Awards Manager, ROARS, PO Box 981, Muscat, Sultanate of Oman.

ROARS will be looking for radio amateurs in all countries.

—Contributed by A Razak Al Shahwarzi A4XJT, Chairman

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TECHNICAL MAILBOX

A letter from VK2DDL poses the following question.

I wonder if you can enlighten me on the following matter.

I find that some manufacturers of receivers and transceivers, particularly those for VHF or UHF operation, specify their receive sensitivity in terms of the signal voltage at the input (usually in the order of one microvolt or less) required to produce a signal plus noise/noise ratio of 10 or 12 dB, while others quote a noise figure in dB, which may be anything from 0.8 to 4 or 5.

However, I have not been able to discover any text or formula explaining how to convert from one form to the other, so that comparisons become difficult. I have attempted to convert the former to the latter by calculating the equivalent noise voltage in a particular specification, converting this to a noise power value at the relevant input impedance and inserting this value in the formula for determining noise figures. The resultant noise figure based on this calculation has been below that quoted for the input transistor in data books, so I am obviously in error.

I have also noted that the SINAD figure has been quoted for FM equipment as 'PD,' which I assume means at peak deviation, but I would be interested to know if this means at a bandwidth capable of containing the maximum peak-to- peak deviation or simply one half of that bandwidth. (eg does a deviation of ± 7.5 kHz imply a bandwidth of 15 kHz or one of 7.5 kHz?)

I look forward to seeing the answers to this inquiry in a future issue of *Amateur Radio.*

S V Ellis VK2**DDL**

VK2DDL has opened up a real can of worms!

Basically what you wish is a direct comparison of performance between one piece of equipment to another. Manufacturers seem to delight in publishing specification figures which can confuse, or in some cases, obscure the issue.

Commercial equipment (eg Land Mobile, Personal Portable, Marine, CB, etc) in this country is required to meet Department of Communications (DOC) Standards. Equipment is then approved to the relevant Standard and issued with an approval number. The reason for such a system is complex. In simple terms it provides a means whereby frequency allocations can be derived from the knowledge of known minimum technical equipment standards. In this way compatibility between services and efficient spectrum management may be achieved. In fact, frequency allocations can be made by computer when based upon defined minimum equipment standards.

Amateur equipment has traditionally been exempt from such requirements due, in the main, to the fact that amateurs traditionally built their own equipment. Such is not always the case today.

It has become apparent over the last decade that commercial manufacturers of amateur equipment have pressed for deregulation of commercial specifications, thus enabling them to sell their lines to the commercial market.

Unfortunately for the amateur, most of the equipment manufactured has not seen technical advancements aimed towards 'commercial specifications.' There has been an attempt to convince authorities to reduce their requirements. These, we hasten to add, are minimum requirements based upon internationally recommended standards (IEC) aimed towards efficient spectrum management. One would think that as technology advances, specifications would be tightened to reflect the greater use of the spectrum. Alas, the mighty dollar and deregulation pressures are seemingly causing a reverse effect!

Why do we mention such matters in responding to VK2DDL's letter? Well, it goes back to the opening paragraph — "Manufacturers seem to delight in publishing specification figures which can confuse or in some cases obscure the issue." The cold hard facts are that most amateur equipment does not come within a 'bull's roar' of such minimum specifications. Considering todays amateur population and the band crowding that exists, this appears to be an anomaly. Manufacturers most likely would try to defend themselves on the cost of such improvements, but this is really not a defensible issue! Such improvements should not increase the cost of equipment to the extent most claim.

We, as amateurs, suffer! As black-box buyers, in a limited production market, there is little choice of what to buy, that is if an individual can afford the expenditure these days! Are you attracted to and make your choice purely on the ever increasing options, which are rarely used, that predominate the sales pitch?

Take the general coverage receiver options offered in most HF transceivers. Great! If you analyse how this is achieved it will be found that it is not the receiver aspect of the design that a manufacturer has foremost in mind but the broadband transmit option deliberately built into the equipment! To satisfy Australian authorities and qualify for reduced import duty this option must be deleted by techniques which it is uneconomic to reverse. Such a requirement does not apply to many other markets for which the manufacturer caters.

It is important to note that In any specification, a method of test should form part of the specification, otherwise considerable confusion will arise from the interpretation of the results.

In amateur circles many people would first consider, as a receiver comparison, the ability to detect weak signals (receiver sensitivity). If you choose your receiver by such a comparison alone you will most likely not get what you want. The ability of a receiver to handle strong signals (blocking and cross modulation), adjacent channel signal rejection, spurious responses and selectivity are some of the basic factors one should consider.

You may have the most sensitive receiver in your area but find it useless when your local amateur or commercial operator hits the ether and it does not have to be on the same band! There are more poor receivers around than transmitters! Receiver design is a science where short cut cost compromises will greatly affect the end result. It is annoying to see manufacturers promoting the gimmick features instead of producing a high performance receiver.

Do you, as an amateur or SWL, select your equipment purchase on the number of memory channels alone?

Possibly, because most of the relevant comparison specifications are not published. Manufacturers cannot be blamed for not publishing their third order intercept figures for example, as sales may plummet. As such, the purchaser wears it and then blames the other station for splattering or the local Paging Service for wiping out the two-metre band!

Now, after climbing down off the 'soap box,' back to VK2DDL's letter.

The questions raised in this letter were discussed with others and particularly with an amateur who is an acclaimed expert in such fields and was most gracious to provide a concise explanation on the matters raised, as follows.

In order to answer fully the question on receiver sensitivity specifications, it is necessary to determine the input signal level required to produce a 10 dB signal to noise ratio from a two-metre SSB receiver with a bandwidth of 2.5 kHz and a noise figure of 3 dB. Firstly, it is necessary to consider some aspects of noise figure (NF) concepts.

Noise Figure is a measure of the degradation in signal to noise ratio between the input and output ports of a two port network, such as our receiver.

Noise Figure Is essentially a ratio, so in order to compare it with an absolute value measurement, it is necessary to define an absolute value of input signal at which the noise figure is measured.

This absolute value of input level is given in the IRE (later the IEEE) definition of noise figure and is the level of the noise available due to thermal agitation at a standard temperature of 290 degrees Kelvin. This is close to the temperature seen by our receiving antenna when it is directed at the horizon and it is also close to room temperature, at least in the colder climes of the Northern Hemisphere.

We can thus place a value on this noise power (Np). It is equal to KTs Watts per Hertz

where K = Boltzmanns Constant
= 1.38×10^{-23} Joules/Kelvin
and Ts = Temperature (290 degrees Kelvin)

For convenience this is expressed here in decibels below one milliwatt (dBm).

$$Np = 10 \log 1.38 \times 10^{-23} \times 290 \times 10^{3}$$
$$= -174 \text{ dBm/Hertz}$$

This is a useful figure to commit to memory.

The example receiver has a bandwidth of 2.5 kHz, so the total amount of noise getting through it will be 2500 times -174 dBm. In dBm this is:

$$N \text{ total} = -174 + 10 \log 2500$$
$$= -140 \text{ dBm}$$

Since NF is a measure of the degradation in Signal to Noise ratio (S/N) and since the method of degradation is the addition of noise by the receiver, the NF is added to the above to arrive at the 'noise floor' of the receiver.

From the above example:

$$\text{Noise floor} = -140 + 3$$
$$= -137 \text{ dBm}$$

The example receiver specification called for a 10 dB S/N, so a further 10 dB signal must be added to the noise floor as determined above.

$$-137 + 10 = -127 \text{ dBm}$$

This can be converted to microvolts to compare it to other receiver specifications if the input resistance is known. Generally this is 50 ohms.

From Ohms Law:

$$E = \sqrt{PR}$$

and it follows:

$$E \text{ (microvolts)} = \sqrt{50 \times \log^{-1}(-157/10)} \times 10^{6}$$
$$= 0.1 \text{ microvolts (approximately)}$$

To summarise, add 10 times the log of the bandwidth, the signal to noise ratio in dB, the noise figure in dB and -174 dBm to arrive at the signal level required to obtain that S/N. Then convert to microvolts if required.

The sample receiver in this case requires 0.1 microvolts for a 10 dB Signal to Noise ratio.

A few points worth bearing in mind:

1 S/N = (S+N/N) - 1 as ratios. To find the input level required for a 10 dB S+N/N add 10 log (10 - 1) to the noise floor (9.54 dB). This is not very important in most cases.
2 An improvement of 1 dB in noise figure is equivalent to increasing the transmitted power by 1 dB in the case of systems with a receive antenna temperature of 290 degrees Kelvin; ie systems where the antenna looks at the horizon.
3 Noise figure is not concerned with modulation systems, unlike SINAD for example.

The Technical Mailbox group express their sincere thanks for the expert, concise and easily understood answer which should interest all readers.

Finally, VK2DDL asks about PD. The answer here could be twofold, as an example is not given to clearly define the question.

It could mean, as you say, peak deviation. In this case it would mean that a ± 7.5 kHz would imply a bandwidth of 15 kHz. The implications of such a specification are quite profound for it

introduces the characteristics of receiver performance with respect to a modulated signal. In this way a 'dynamic comparison' may be achieved by such a technique. This is an excellent method of defining the true performance of a receiver in the real world. It is also briefly mentioned in three above.

Another explanation of PD could be potential difference. That is the voltage level when measured across the terminated input impedance of the receiver.

All this proves is that specifications are only as good as the method used to arrive at a figure and this 'figure' must be derived from a meaningful baseline.

It is thought prudent to expand a little further on point two of the answer to the first question.

The noise floor is the absolute limit one faces when trying to detect weak signals, without going into sophisticated techniques where one can go below this limit. In practical terms one can reach a point where lowering the the receiver noise figure will not provide an increase in usable receiver sensitivity whilst one's antenna is pointing at the horizon. This however is not true when the antenna is elevated above the ground, where, providing it is not 'staring' at a stellar noise source, the usable noise figure then becomes the actual noise figure of the system. EME operators are most concerned with such matters. When dealing with weak signals and marginal communication, the ground noise may be greater than the wanted signal. However, once the antenna is raised, as the Moon rises, a signal of sufficient amplitude will become readable.

The Earth is one big ball of noise, be it at 290 degrees Kelvin! ! !

Please Note: Technical Mailbox requires more questions to keep the group on their toes. Readers please submit your queries.

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MORSEWORD 5

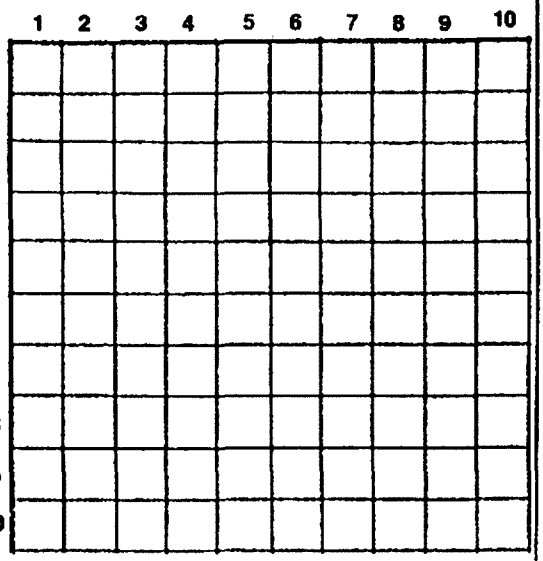
Compiled by **Audrey Ryan**
30 Starling Street, Montmorency, Vic. 3094

ACROSS

1. Exclamation of surprise
2. Be afraid of
3. Informer
4. Strong wind
5. Arab Republic
6. Immense
7. Dr.
8. Stalks
9. Brief records
10. Spigots

DOWN

1. Standard
2. Part of the eye
3. Increased
4. Thick mist
5. Neat
6. Murmur of doves
7. Skin disease
8. Relieves
9. Hybrid animal
10. Festivals



Solution page 63

Magazine Review

Roy Hartkopf VK3AOH
34 Toolangi Road, Aiphington, Vic. 3087

G General
C Constructional
P Practical without detailed constructional information
T Theoretical
N Of particular interest to the novice
X Computer program.

BREAK IN — May 1987. Conference Report (G). QRP Articles (G).

CQ AMATEUR RADIO — April 1987. Special Antenna Issue (G & N).

QST — April 1987. Home-brew Hardline Connectors (P). New American Examination Questions (G & N). Home-brew Antenna Hardware (P & N). Messy Shack Photographic Contest (AF).

RADIO ELECTRONICS — May 1987. Electronics in the Next Century (G). Loran (G). Soldering — New Technology (P & N).

SHORT WAVE MAGAZINE — March 1987. One Valve Shortwave Radio (C). Annual Index (G). Compact Helical Antennas (P & N).

SHORT WAVE MAGAZINE — April 1987. Now a magazine for the Shortwave Listener. Some columnists gone to *Practical Wireless*.

VHF COMMUNICATIONS — 4/1986. Satellite Receiving System (C). Wideband VCOs (C).

WORLDRADIO — April 1987. American Novices get more (G). World Amateur Radio News. General Information on Amateur Happenings (G).

73 MAGAZINE — March 1987. 7 MHz QRP Pocket Transceiver (C).

73 MAGAZINE — April 1987. Special Antenna Issue (G). Tower Hazer Unit (P).

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Intruder Watch

Bill Martin VK2COP
FEDERAL INTRUDER WATCH CO-ORDINATOR
33 Somerville Road, Hornsby Heights, NSW 2077

Many reports were received during April 1987, regarding the activities of intruder stations on 28 MHz, originating in Asia. This problem will continue to escalate and we have taken some steps to try to do something about it. However, if we do not receive reports on these activities we certainly have nothing to complain about to other administrations.

Reports received for the month were from: VK1WX; VK2s DEJ, PS, Arthur Bradford; VK4s AKX, BFO, BG, BHJ, BTW, DA, KHQ, OD; VK5s GZ, TL; VK6RO; VK7RH; VK8s JF and HA.

There were 171 intruders reported using AM mode (A3E), 194 using CW (A1A), 50 using RTTY (F1B), 11 using different modes and 33 intruders gave their call signs on-air. This announcing of call signs on-air by the intruders is a fair indication of the measure of respect they give to the frequencies of services other than their own. In other words, they blatantly use the amateur bands, give their call signs, and tacitly state "Well, here we are on your bands, what are you going to do about it?" I can assure you that the Intruder Watch does something about it, but the Australian Administration leaves a little to be desired at their end. We keep hoping that this situation will change.

OH2BLU reports that Radio Tirana "seems to have reduced transmissions on 7.065 and 7.090 MHz" as heard at his QTH. DJ9KR confirms this as heard in West Germany. His summary of activity for April also nominates the call sign of RCQ 45 as belonging to the "V" beacon station on 7.002 MHz. Does it really surprise anyone to note that the call sign commences with an "R"?

So, we continue to monitor the bands, and hope that the amateur population will keep us informed of what they hear. See you next month; good DX and 73.

Bill VK2COP

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QSP

NOVICE ENHANCEMENT

THE FEDERAL COMMUNICATIONS Commission (FCC) has announced that it will enhance the Novice licence grade in the United States of America.

New bands and new privileges for Novices will include SSB and Digital privileges in a portion of 10 metres, and access to all authorised modes (including use, but not licensing, of repeaters) in portions of the 220 and 1270 MHz bands.

The full specifics of the enhancement were to be released soon by the FCC.

The ARRL had sought the enhancement to make the Novice licence more attractive to a wider range of people and relevant to today's technology.

In its supporting new privileges and modes for Novices, the ARRL pointed out that it believed this grade of licence should be permitted to hook up computers to amateur station equipment.

The US Novice will be permitted to operate RTTY, ASCII, Packet Radio and other digital modes, and the enhancement also means all grades of US licence now share common bands.

Electro-Magnetic Compatibility Report

Hans Ruckert VK2AOU
EMC REPORTER
25 Berrille Road, Beverly Hills, NSW. 2209

RFI IN GREAT BRITAIN — WHERE DO WE STAND (IN DL)?

by Hans Kreuzer DL1AN, CQ-DL 3/87 p 168
(Translated by VK2AOU)

Since January, radio amateurs in Great Britain have received a standard letter from the authorities (DTI), when their neighbours equipment was affected by their transmitter. The letter contains recommendations on how to overcome the RFI, and the amateur is asked to report within one month that the problem has been overcome to the satisfaction of the neighbour! Otherwise the Radio Investigation Service (RIS) will inspect the station (not the neighbours equipment for susceptibility, or his/her willingness to co-operate?) and decide which measures have to be taken. A change of licence could be considered!

And worst, the complaining neighbour receives a copy of this letter. It must be feared therefore, that a non co-operative neighbour would see no need to do anything themselves, because the letter seems to imply that it is the amateur's fault which is causing the interference.

The regulation which determines the procedure, appears to be the equivalent to paragraph 9 of our administration regulation DV-AFuG. It was issued without consultation with the RSGB and was apparently not published. Only on the 20-2-1986 did the RSGB receive a copy during a meeting 'handed across the table'. The RSGB stated then to DTI that the new guidelines were hopelessly against reality, and demanded their withdrawal. This DTI refused to do. Only a revision of the standard letter may be considered.

The RSGB now asks all members to send a copy of the DTI letter to its own investigation service. Counter measures, perhaps involving a legal process (court of law), are considered as necessary to avoid a drastic restriction of radio amateur activities.

The RSGB is of the opinion with regard to radiation immunity (of the equipment chassis), that the 1.8 V/m CEELC-Standard, which is being planned by the European Common Market countries, is exceeded by most transmitters (compare EMC Report AR January 1987, p 51-54). As stated by G3OUF 'The Amateur and the Government' News Bulletin of Radio Communication 4/86, (3V/m TEM cell test, Jacky in DL), there are signs of a European vendetta against amateur radio. Similar reports have come from Belgium.

Where do we st ! In (DL)?

When I look at the dubious paragraph 9 of our regulation VwAnw DV-A FuG and the letter from FTZ (=DOC in DL) published in CQ-DL 2-86, I see little difference in the aims of the authority; Single-sided preference towards manufacturers, dealers and promoters of 'electronic devices for everyone'. The Post Office belongs to this group too.

DJ2NL Interprets these rulings in *CQ-DL* 4/86, to mean that the radio amateur is not and cannot be responsible for RFI from his fundamental frequency radiation (which complies with the law). If this was so, I could transmit freely using all the permitted 750 watts, because most RFI comes from fundamental radiation picked up by the equipment's chassis (PC boards and wiring). The transmitter harmonics can easily be suppressed. I doubt that I can rely on the DL2NL Interpretation? In any case, the legal professionals involved are not likely to earn any laurels, if the law can be so differently interpreted. DL1AN

(See also AR January 1987 p61, RIS Problem)

BCI AND TVI FROM A TV TRANSMITTER

Members of my family live in Riverview Street, Lane Cove. (A Sydney suburb). They complained that they could not receive the 2MBS-FM radio and SBS Channel 28 television. Investigation showed that the location was in a deeply cut valley into which the antenna from the Channel 10 television station looked down from about 2.5 km distance. Several neighbours had their television antenna pointing away from the television station, receiving reflected signals and ghosts from the opposite valley wall. The serviceman had installed the Hi Fi 'Hitachi' FM tuner to the television antenna installed above the roof. Several ghost FM stations were heard between ABC-FM (92.9 MHz) and 2MBS-FM on 102.5 MHz, where none was actually transmitting. 2MBS was usually covered by interference. The problem was solved with a portable FM receiver, by gradually reducing the length of the telescoping antenna from 100 to 20 cm, until the FM receiver front end was no longer overloaded by the strong television signal.

The ghost stations had disappeared and 2MBS could now be clearly received. A series-tuned LC shunt wave-trap tuned to channel 10 would have helped too, if a longer antenna had been needed to receive the desired station with a good enough signal for stereo.

The SBS channel 28 television signal gave more or less unsatisfactory pictures (snow and ghosts) on two television sets (National and Sharp) in spite of the professional UHF beam installed above the roof of the two storey house. I made a 12 element long Yagi beam especially tuned for channel 28 using NBS-USA design methods. This worked much better than the other antennas. Three different locations were tried. This 12 element beam gave a good picture free of snow and ghosts only if placed in a critical position on a veranda. Installed above the roof near the other channel 2-10 Yagi the results were not good enough. After the experience with the FM-BC receiver, we tried in desperation a 'rabbit-ear' indoor antenna on top of the television set. It is still there, giving excellent reception with both television sets on channel 28! Who says that one must have a high gain beam above the roof? Perhaps one could save money.

We did not complain to DOC about Channel 10 causing TVI and BCI, nor was a court case started for nuisance or damages, as happened to VE3SP ('AR' Feb 1987 and 'QST'). Could one of us suffer like VE3SP in spite of DOC support?

Many frustrating cases would not occur, if radio and television manufacturers adopted the RF front end design methods of their colleagues who produce the modern amateur receivers/transceivers (Yaesu, Icom, Kenwood etc). Their designs result in very good dynamic range and intercept point values. They had to do it to overcome severe interference problems, and the same need applies to BC and television receivers too. How much longer will we have to wait for adequate and effectively policed EMC Standards combined with the necessary education of the public?

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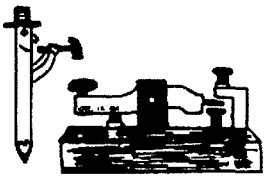


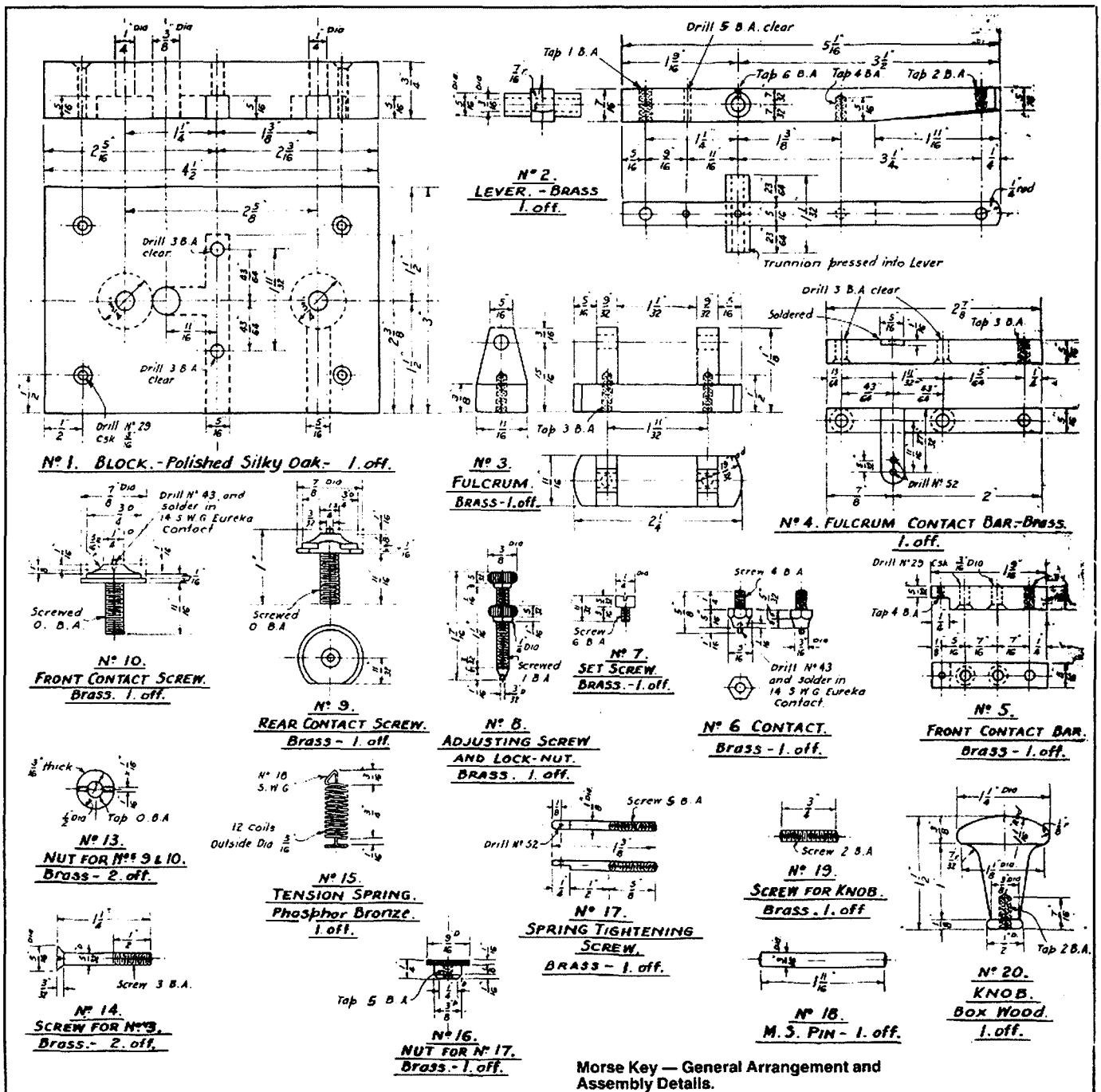
Pounding Brass

Gilbert Griffith VK3CGG
7 Church Street, Bright, Vic. 3741.

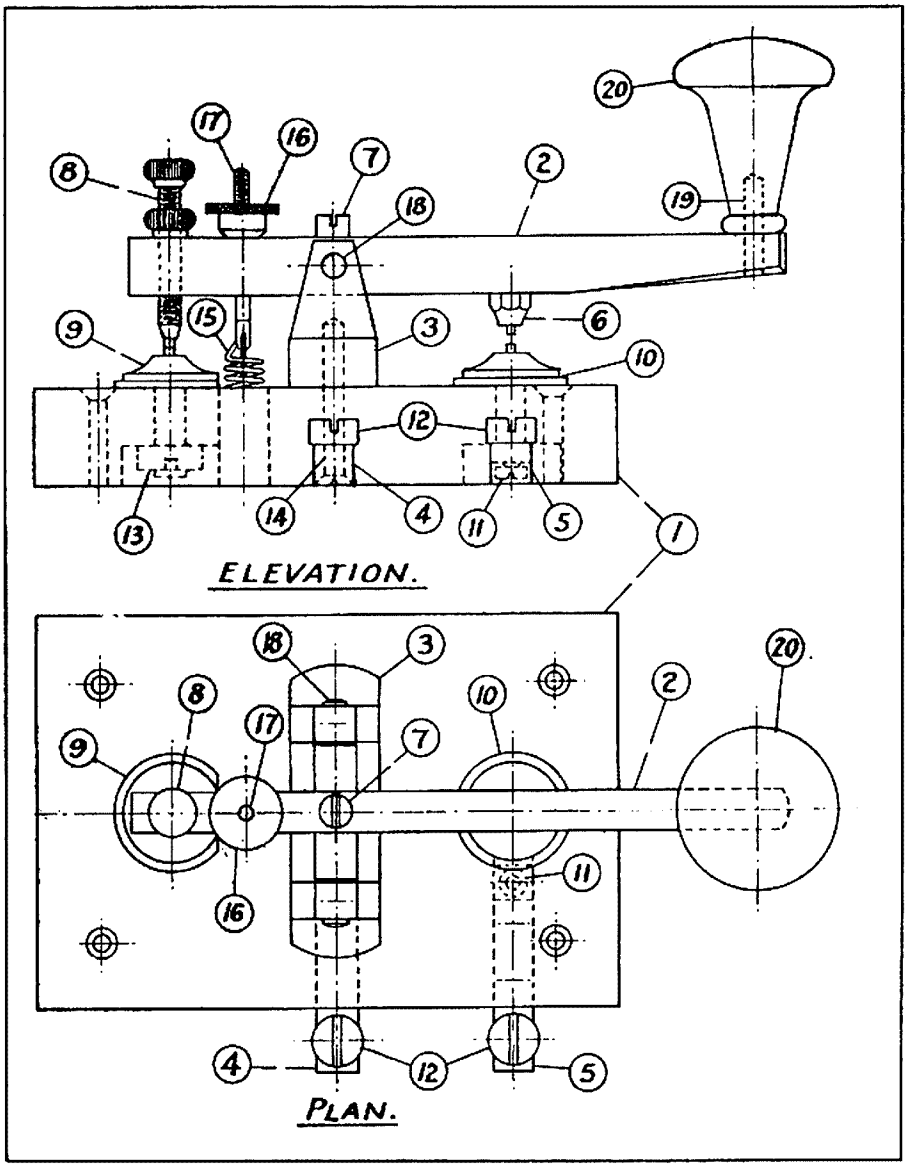
GM, GA es GE everyone. Yesterday I received a letter from Michael VK4BMD, on behalf of the Brisbane North Radio Club. They have a number of active Morse enthusiasts and meet on 3.530 MHz at 0930 UTC each Tuesday. Regulars include, VK4APZ, VK4CAY, VK4NCM, VK4MWZ, VK4FTJ, VK2CHW and VK4BIL, as well as some listeners. Visitors to the net are welcome and they will QRS on request. There is also an award available for contacts with five members (VK) or three members (elsewhere). Write to their Awards Manager for more details at PO Box 78, Chermside, Qld. 4032.

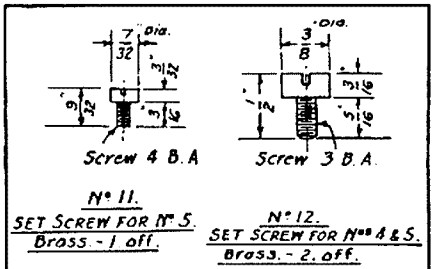
Michael also sent me a production drawing for a brass Morse key which we include here for interested readers. His original is full size but it has unfortunately had to be reduced here. Thanks Michael and the North Brisbane Radio Club.

A few evenings ago I was having a chat with Phil VK3CDU, on 3.520 MHz, a frequency where we can usually be found! These chats are becoming few and far between. We were having a little laugh over some things heard during the recent contest, the CQ WW WPX CW Test. One particular station was calling frantically at about 35 WPM on 80 metres. Now, both Phil and I feel we are "pretty hot stuff" at receiving fast Morse, even with the computer switched off, but we commented that we had to listen to many repeats just to decipher the call sign. Admittedly, it did begin with a "K" so it was difficult to decipher the beginning from the end. Apart from the fact that, when someone finally answered at half his speed,



Morse Key — General Arrangement and Assembly Details.





he did not QRS. We wondered at his operating strategy. We gathered that, assuming only 40 percent of amateurs could copy him, is he only going to score 40 percent of his possible score in the test? Or, is he assuming that 60 percent of operators will not be in the test anyway? I will consider this further in the Novice contest and the RD this month.

Contesting is one thing, but when you are rag-chewing, you never know who is listening. Maybe someone out there wants to talk to you. How many of us send our call sign like we write our signatures — illegibly? How many times do we have to listen to a repeated call sign before we can unravel it enough to call the station? How often do we hear the interestingly long code 'characters' such as dahdahdahdididahdit?

The secret of the telegraph code is timing. Each element — dit, dah and space must be proportioned reasonably well in order to be intelligible. And, unless the letters are separated by the proper space, how can we tell for sure what letters they are? Words run together put a heavy burden on the writer in ordertodecipherthem, don't they? By contrast, the well sent, properly proportioned signals stand out like landmarks of clarity. Alf VK4OL, and Clive VK3CQL, to name a couple of superb senders.

Let us look at the problem of distorted code a little more fully, and from the intelligibility aspect. Most of us can read sending where the dits are too fast for the dahs — that is, the dahs are disproportionately long. They are a little distracting but not incomprehensible. On the other hand, there are those who make their dahs so short that, at times, they sound like dits — and that is troublesome. We can misunderstand.

Whilst it can be annoying, the occasional misspelled word or abbreviation can usually be understood — and all of us slip up this way at times. It is no major stumbling block. And we sometimes send too many dits for characters like S, H and 5, also B and 6, etc. These are forgivable slips and, in most cases, can be understood rightly!

But it is lack of spacing of letters within words (and calls!) and between words that cause most of our problems. Leave out the space between TT and it become M, similarly spacing errors can make ST sound like V (and vice- versa), G like ME, C like NN — and so the long list goes on. Does this happen because of wrong initial learning of each character as a distinct unit in itself? Or is it misplaced haste that leads to running letters together? Haste that leads to this only leads to unintelligibility.

Perhaps the commonest fault with spacing concerns the need to keep words separate. I sense, at times, that this is due to undue hurry to get the thought across. But, in so doing, the receiver is deprived of the key element in his reading and understanding — where each word begins. English is not an easy language to decipher when its word-beginnings are not marked.

Maybe, we can all profit from some drills (including new learners) in sending. Many years ago, Walter Candler recommended the following to help us develop a good timing sense.

Drill 1 — Send the letter S, counting the dits as you send it, then keep counting up to say 12 and without hesitation send a second S, and so on until you have sent 20 to 25 of them. Gradually speed this up by dropping out one count, until normal letter spacing is reached (the length of one dah). Try it with the letter O, etc. Both drills may be sped up as you send faster, keeping the same spacing proportions.

DRILL 2 — Take a simple sentence, sending it first with wider than normal spacing between the letters and words, and then gradually shorten these spaces to the normal length, being careful to keep the letters and words distinct. Eg, if a single dash represents longer spacing between letters and a double dash a longer spacing between words, it would go like this; g-o-o- d--s-p-a-c-i-n-g--i-s--e-a-s-y--t-o--r-e-a-d, etc. Then gradually bring it to normal.

A keyboard and an iambic keyer will always make perfect characters with proper proportions between and among the internal parts. What is sent may be wrong, but it will "properly made" wrongness! But with an ordinary hand key or semi-automatic key there will always be some evidence of one's individuality. Let us not let it get out of hand. After all, the purpose of the code is to convey intelligence not to present the listener with a puzzle.

Let us not burden the listener with more than the QRM and QRN he is probably struggling with, by making our message garbled! As someone noted, well-sent code comes through interference much better than poorly sent code.

Reference: Wm G Pierpont N0HFF and MM

Finally, from Tony G4FAI, "There is a movement to obtain a no-age limit Novice licence in the UK which would permit Morse-only operation on the 10 metre band with a transmitter output of five watts, preferably using inexpensive home-brew equipment. It is suggested that an eight week study course, covering theory and technical matters, at an appropriate level, could be followed by a two hour examination set by the RSGB, and Morse test at five word-per-minute, conducted by local amateurs. The secretary of the campaign is Ian Abel G3ZHI, who says, "The idea has the support of the G-QRP Club, the Scouts, Sea Cadets, the RSGB and a number of radio amateurs. Further information is available from Ian at 52 Hollytree Ave, Maltby, Rotherham, S66 8DY, England.

73, Gil VK3CQ

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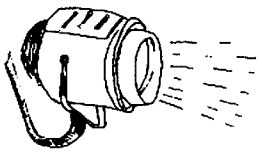


Spotlight on SWLing

Robin Harwood VK7RH
52 Connaught Crescent, West Launceston, Tas. 7250

Well, almost three-quarters of the year has passed and it certainly has been different this year from last time around. Conditions seemingly improved and it has been officially confirmed that we have turned the corner and are into a new sunspot cycle. In mid-May, the sunspot count rose to 50 on one occasion, before dropping back to 14, early in June.

Incidentally, Radio Australia now has a daily propagation report and forecast at 0425 UTC, which is repeated every four hours until 2025 UTC, except Sundays. A weekly propagation summary is included in *Talkback*. The report is presented by Mike Bird, in co-operation with the IPS and Space Services in Sydney. It includes the solar flux, the A index and the geomagnetic indicator — the K index for the previous 24-hours and also the predictions for the next day. This service has helped me to keep track with daily propagational conditions and RA is to be congratulated on extending this daily service to professionals and amateurs alike.

Winter-time conditions have been particularly fascinating this year, compared to 1986, although I have moved QTH, which probably has made the difference. The 41 and 49 metre broadcasting allocations have been especially interesting around our local lunchtime; ie 0200 UTC. Many European signals are being easily heard and logged. Yet, the surprising signal has come from an unexpected area in Bolivia, in central South America. *Radio Panamericana* is a low powered station on 6.105 MHz, from La Paz. It has been observed at 0250 UTC with typical Latin music and there was full identification frequently given on the hour, during a news bulletin. The station was on a split channel, but fortunately no other European signals were co-channel this day. I hastily wish to add that this station was not present every day, yet it is unusual as Latin Americans do not come in normally until much later. For example, around 0500 UTC, which is about sign-off time. There are some who operate 24-hours, such as *Radio Union* in Lima, Peru. It is on 6.115 MHz and is well heard when Europeans fade-out at sunset and before *Radio Tanpa* in Tokyo comes up.

And, while we are on domestic shortwave relays, an era in Australian broadcasting history came to an end on June 12, when VLR and VLH, in Melbourne, closed down for the final time. These stations relayed the ABC domestic programming to the Inland and the Pacific. They have been on-air since at least 1934. These became redundant with the introduction of AUSSAT relays of domestic radio networks to the same service areas.

Also, the Lyndhurst site was being phased out. So a familiar voice on 9.680 and 6.150 MHz, in this part of the world, closed down. Only VNG, at Lyndhurst, remains and this is also in doubt.

There has been no word yet about the other ABC shortwave relays of domestic programming from either Perth or Brisbane. I would not be surprised if the Western Australian relays went the same way as VLH/VLR. The Brisbane relay services tropical areas, where long distance MW reception is impossible due to high static levels at times.

Also, my spies reliably inform me that the ABC Metropolitan Network (2BL, 3LO, 4QR, 5AN, and 7ZR) will likely be permanently operational for 24 hours from August 1. This will make it more difficult to obtain any worthwhile MW DX, without resorting to MW loops. Is it a question of time before the Regionals follow suit?

Some of you may not be aware that the BBC World Service has been recently relayed through the RA Shepparton site. The target is Fiji and has been on 15.393 MHz from 2200 to 0030 UTC. This may be only a temporary arrangement. Unfortunately, reception of this service was not good in Northern Tasmania, due to the presence of a VOA relay from the Philippines, in Chinese, being co-channel. The back-radiation effectively masks the signal, although I am only a few hundred kilometres from Shepparton.

I also believe that the Spanish Foreign Radio has recently signed an agreement with Costa Rica, to construct and equip a shortwave station, which will, reportedly, be jointly shared by REE and a Costa Rican external service. Also, new relay bases for International broadcasters should be shortly on-air. One in Arava, Israel, is to be jointly shared by Kol Israel and the VOA/Radio Free Europe. It is not hard to guess where the target area is. Another BBC relay base should be fully operational next month. This is in Hong Kong and will relay World Service programs to north and east Asia, as well as Asian language services. The two senders should put good back- radiation to this region. Keep an ear on 15.280 MHz, in our daytime and 7.185 MHz in the evening.

There is a new compere on the RA *Talkback* program, on Sundays. He is Roger Broadbent, ex-Radio Netherlands *Media Network*. He replaces Brendan Telfer. *Talkback* is heard at 0310, 0710, 0910, 1230, 1610, or 2040 UTC, on Sundays.

This month, the Remembrance Day Contest is also held. The rules were published last month so I am not going to duplicate the information. Many SWLs and DXers become involved in this annual contest which is held in memory of those amateurs who paid the Supreme Sacrifice in World War II. All the very best of luck and good listening!

—Robin VK7RH
ar

Education Notes

Brenda Edmonds VK3KT
FEDERAL EDUCATION OFFICER
PO Box 883, Frankston, Vic. 3199

The final WIA submission to DOC about Amateur Operator Certificate of Proficiency examinations is published in this magazine, and copies also have been circulated to those that had input to the decision making. Once again, thanks to all who assisted.

It is of course not possible to please everyone in a situation such as this. The stand the Institute took was based on the firm belief that the system suggested would be the most efficient and effective for members and for the future of the hobby as a whole.

Whether or not the Institute is granted sole accreditation, there are a number of steps which must be taken as soon as possible.

We see the completion of the Study Guide at both levels, and the preparation of a Question Bank for producing sample examination papers as tasks that will be of great benefit both to students and to those who are assisting them.

In addition, liaison with DOC with regard to these items should further stabilise the standards of examinations in the approach to the devolvement.

The NAOCP Study Guide requires only some minor negotiation with DOC before it can be published. It has been in use in a few classes this year for trialling. But the AOCP/AOLCP Guide is a long way from completion. It is my intention, however, to prepare a first draft from the syllabus myself and then circulate this for comment to those who have expressed interest in it.

I already have names of some members who are prepared to be part of the Education Committee decreed by the Convention. I would be very pleased to hear from any others who are willing to write, criticise or amend questions, or to criticise or amend sections of the Study Guide. I am sure there are many members with experience in the technical or educational fields or in helping newcomers into the hobby. All I am asking is some time to read and make comments on material posted to you, and sufficient enthusiasm to return the comments to me by mail. I do not see any need for meeting in person.

If you are interested please drop me a note to the above address.

Recent discussions have raised the possibility of changes to licensing procedures and privileges for various grades of licence. A number of proposals have been aired, all with the common aims of increasing recruitment into the hobby or maximising use of permitted bands. It was pointed out by a DOC representative at the Convention that amateurs accept as a right their access to a considerable amount of spectrum for which commercial users would be prepared to pay thousands of dollars in licence fees.

How do we justify our continued occupation of our allotted bands? It is, perhaps, time for a bout of introspection to decide where the hobby should be going over the next few decades.

Whatever happens with the devolvement proposals, most amateurs accept and uphold the idea of entry by examination, although there are perennial complaints about standards of the examinations.

Most also accept that the examination content should be related to the privileges of each class of licence, if privileges are extended, the syllabus must be extended to take this into account.

IMPLICATIONS

If Novice licensees are to be permitted to operate on the two- metre band, they should be examined on FM, repeaters, VHF propagation and antennas, etc.

But what do we have to add to the AOCP syllabus to cover the vast proliferation of modes such as packet, digital and computer generated transmissions?

Should holders of existing licences be examined on new modes or techniques, before being allowed to use them on air?

Hands up all those Old Timers who are operating Solid State equipment but who were not examined on transistors or FETs let alone ICs or logic gates.

The DOC will maintain surveillance over examinations for a long time yet, and changes to procedures or privileges will only come about by negotiation between the Institute and DOC. But there is room for discussion and consideration of the new ideas which are appearing from time to time. It is to be hoped that the debate will consider long term effects, and the over-all good of present and future amateurs.

The Institute has established a Committee to consider "The Future of Amateur Radio," intending it to discuss the range of possible options and the implications thereof on both a national and international scale. The committee cannot predict future scientific breakthroughs, or changes in international relations, but will be expected to investigate some of the recent proposals for change, and recommend directions along which developments should proceed. The committee has a very broad brief, but it could well play a very Important part in shaping Institute policy and action.

My best wishes to those sitting for the August examinations. Remember, ***READ THE QUESTION,*** and ***ALL*** the answers.

73, Brenda VK3KT
ar

AMSAT Australia

Colin Hurst VK5HI
8 Arndell Road, Salisbury Park, SA. 5109

NATIONAL CO-ORDINATOR
Graham Ratcliff VK5AGR
INFORMATION NETS
AMSAT AUSTRALIA
Control: VK5AGR
Amateur Check-In: 0945 UTC Sunday
Bulletin Commences: 1000 UTC
Primary Frequency: 3.685 MHz
Secondary Frequency: 7.064 MHz
AMSAT SOUTH WEST PACIFIC
2200 UTC Saturday
14.282 MHz

Participating stations and listeners are able to obtain basic orbital data, including Keplerian Elements from the AMSAT Australia Net. *This information is also included in some WIA Divisional Broadcasts.*

ACKNOWLEDGMENTS
Contributions this month are from UoSAT Bulletin Board, VK5AGR BBS and Bob VK3ZBB.

OSCAR-10 TRANSPONDER SCHEDULE CHANGE (June 1, 1987)

Until further notice — OSCAR-10 will be available for communication at the following times (Mean Anomaly in MA/256):

May/June	MA30. . .MA220
June 8 to July 20	MA20. . .MA250
July/August	MA40. . .MA220

In the period of June 8 to July 20, the transponder of OSCAR-10 could be used between MA20 and MA250. Beyond these MA-times the satellite is in an eclipse and use of the transponder is absolutely forbidden. Users are strongly requested to use minimum necessary Uplink Power, especially when the satellite is around perigee. Best sun- angle (100 percent illumination) is to be expected around June 29.

After previous observations of the beacon and transponder signals, we conclude that now the OMNI-Antennas are switched ON instead of the HIGH GAIN Antennas, which were present for a long time before. The schedule expansion above will allow users to communicate via OSCAR-10 under the presence of extremely good signals. Due to the OMNI-Antenna, the signals around apogee and best MA-Squint are currently somewhat low.

The switch-over was caused by one of the computer crashes, which sometimes occurred when entering/leaving the eclipse with total loss of power due to a BCR/battery problem. The last seems to be fixed recently.

Good DX and 73 de Peter DB2OS, OSCAR-10 Command Station and Co- ordinator.

UOSAT-OSCAR-11 BULLETIN-090 (June 11, 1987)
UOSAT MISSION CONTROL CENTRE
University of Surrey, Guildford, Surrey, England

UOSAT OPERATIONS
UOSAT-1:
(de G3YJO)
UoSAT-1 was returned to normal operations on 060687 following an operator error that occurred in April. The resolution of the problem required six weeks of concerted effort using the UHF uplink. A new version of the 'Diary' for UO-9 has been written by Steve Holder at UoS, which should both avoid this problem in the future and considerably enhance spacecraft operations. Whilst this new 'Diary' was being checked out, CCD image data was transmitted continuously on 090687 and 100687, interspersed with 'standard' telemetry. UO-9 should resume normal scheduled operations by 120687 under the control of Chris Payne G1VRL.

UO-9 HF BEACONS
Following reports since Christmas that the 21 MHz beacon on UO-9 was no longer being heard by stations, diagnostics on the experiment were carried out this week. These showed the beacon to be operating normally. Subsequently, the beacon was tracked (transmitting CW telemetry at 10 and 20 WPM interspersed with a steady carrier) on several passes on 090687 by G4VRC, at UoSAT. Reports on reception of this beacon would be most welcome.

UoSAT-2
CCD — several new images have been collected from the UO-121 CCD imager and are under analysis by Jacky Radbone at UoS.
RADIATION — surveys are planned for July to explore transatlantic propagation anomalies at 50 MHz.

FO-12 TELEMETRY NEEDED
The JARL needs FO-12 PSK telemetry data of the satellite when it is in eclipse. If you obtain telemetry frames where channel No 1 indicates 000, please relay the data to any official AMSAT Net station for relay to JARL. (de ANS).

AMSAT TECHNICAL JOURNAL AVAILABLE
AMSAT Technical Journal Editor, Bob Diersing N5AHD, has completed work on the first edition of the AMSAT Technical Journal. The Journal contains a collection of first-rate technical papers from AMSAT experimenters world-wide. It should provide the advanced satellite user with new data and ideas, as well as giving the "normal" user a look at the state-of-the-art engineering which makes the Amateur Satellite Program important and possible. (de ANS).

Journals must be ordered directly from AMSAT-NA Headquarters, addressed to AMSAT-NA, PO Box 27, Washington, DC 20044, USA.

RS NEWS
Russian sources say the launch will not occur in June and that additional modifications of the RS-9

SATELLITE ACTIVITY FOR THE MONTH OF APRIL 1987

1. LAUNCHES
The following launching announcements have been received:

INTL NO — 1987	SATELLITE	DATE	NATION	PERIOD mis	APG km	PRG km	INCL deg
030A	Mrant 1	Mar 31	USSR	89.2	320	177	51.6
031A	Cosmos 1834	Apr 08	USSR	92.8	443	413	65.0
032A	Cosmos 1835	Apr 09	USSR	89.7	387	180	65.0
033A	Cosmos 1836	Apr 16	USSR	89.2	313	188	65.0
034A	Progress 28	Apr 21	USSR	88.7	255	198	51.6
035A	Cosmos 1837	Apr 22	USSR	88.7	255	198	62.0

2. RETURNS
During the period 30 objects decayed including the following satellites:

1982-007A	Cosmos 1335	Apr 05
1987-023A	Progress 26	Mar 26
1987-025A	Cosmos 1826	Mar 25

3. NOTES
1987-028A — Raduga 20:
Orbital parameters are period 14365.6 min, apogee 35827 km, perigee 35766 km, inclination 1.2 degrees.
1987-029A Palapa B-2P:
Orbital parameters are period 1449.1 min, apogee 36952 km, perigee 35129 km, inclination 0.1 degree.
1987-030A Kavant 1:
The astrophysical module spacecraft (quantum) successfully docked with the orbiting manned space complex MIR on April 12, 1987. Experiments in the field of extra-atmospheric astronomy will be carried out on board by means of the orbiting observatory "Rentgen" and the ultra-violet telescope "Glazar" and also to obtain batches of superpure biologically active substances in weightlessness. Research will be conducted on X-Ray radiation sources over a wide range wavelength, stars of various spectral classes, and galaxies in the ultra-violet part of the spectrum.
1983-041A GOES 6:
1987-022A GOES 7:
GOES 6 and GOES 7 will be known as GOES West and GOES East respectively once they have been maneuvered into their permanent positions. GOES East orbited at 75 degrees west and reached its permanent station on March 24, 1987. GOES West will orbit at 135 degrees west and will arrive on station on or about April 28, 1987.

—Contributed by Bob Arnold VK3ZBB

OSCAR-10 APOGEES — AUGUST 1987

DAY AUG 1987	DAY NO	ORBIT NO	UTC HHMM:SS	APOGEE LAT DEG	APOGEE LON DEG	SYDNEY AZ DEG	SYDNEY EL DEG	ADELAIDE AZ DEG	ADELAIDE EL DEG	PERTH AZ DEG	PERTH EL DEG
1	213	3107	0103:14	20	270	303	2	312	10	330	24
2	214	3109	0022:08	20	261	309	8	319	15	340	28
	214	3111	2341:01	20	252	316	14	328	20	351	30
3	215	3113	2259:54	20	242	324	19	337	24	2	30
4	216	3115	2218:46	20	233	334	23	347	26	13	29
5	217	3117	2137:40	20	223	334	26	358	27	24	26
6	218	3119	2056:33	20	214	354	28	9	27	33	22
7	219	3121	2015:26	21	204	5	28	19	24	41	17
8	220	3123	1934:16	21	195	16	26	28	21	49	11
9	221	3125	1653:12	21	186	26	23	37	17	55	4
10	222	3127	1812:05	21	176	35	19	45	11	61	-2
11	223	3129	1730:56	21	167	43	14	52	5		
12	224	3131	1649:50	21	157	50	8	58	-1		
13	225	3133	1608:44	21	148	56	1				
14	226										
15	227										
16	228	3136	0225:57	21	304					304	3
17	229	3140	0144:50	21	295					311	9
18	230	3142	0103:43	21	285			302	-1	318	15
19	231	3144	0022:35	21	276			309	5	326	20
	231	3146	2341:29	21	267	306	3	316	11	335	24
20	232	3148	2300:22	22	257	313	9	323	16	345	27
21	233	3150	2219:15	22	248	320	15	332	20	356	29
22	234	3152	2138:07	22	238	329	19	342	23	7	28
23	235	3154	2057:01	22	229	338	23	352	25	17	26
24	236	3156	2015:54	22	219	348	25	2	26	27	23
25	237	3158	1934:47	22	210	359	26	13	24	36	19
26	238	3160	1853:39	22	201	9	26	22	22	44	13
27	239	3162	1812:33	22	191	19	24	31	18	50	7
28	240	3164	1731:26	22	182	29	20	40	13	56	1
29	241	3166	1650:19	22	172	37	16	47	8		
30	242	3168	1609:12	22	163	45	10	53	2		
31	243	3170	1528:05	22	153	51	4				

systems are under way. These could affect the modes of operation as well as the frequencies.

RS5 and RS7 will be available for use on the 10th orbit of each day, except Wednesday, through to June 30, says PA0DLO. Then, from July 1 to July 25, both will be available for use on the ninth orbit of each day, except Wednesday. Both satellites are in poor condition with their batteries virtually useless after six and a half years in orbit.

G3IOR reports that the Mir Amatfur Radio Experiment is not imminent. Reports to the contrary have been unduly optimistic. The most recent achievement has been the completion of the transceiver to be used. This may have sparked recent speculation that MAREX activity was at hand.

ar

Australian Ladies Amateur Radio Association

Joy Collis VK2EBX
PUBLICITY OFFICER, ALARA
Box 22, Yeoval, NSW. 2868

ALARA-MEET

For those wishing to attend the ALARA Get-Together in Adelaide, and have not registered yet — ***time is running out!***

Do not delay any longer, get your registration to Maria VK3BMT.

SURPRISE FOR MARILYN

As everyone is probably aware, our President, Marilyn VK3DMS, is a very hardworking lady, so when her 50th birthday arrived, OM Geoff sent her off to Melbourne for a week to enjoy a well deserved holiday.

Marilyn had a great time shopping, touring stamp shops (philately is one of Marilyn's hobbies), and visiting friends, including Mavis VK3KS and Bron VK3DYF. More was to come.

On the Friday, Marilyn arrived, with her brother, at her sister-in-law's house, and was very surprised and delighted to find about 20 people (including OM Geoff), who had been sitting patiently in the dark awaiting her arrival. Her surprise party was enjoyed by one and all, especially Marilyn.

Marilyn's interest in radio began in 1971, when she became Official Communications Officer for the Cockatoo Bushfire Brigade. In 1974, she moved to Pooncarie, where Marilyn and Geoff ran the local Post Office and Telephone Exchange. In 1975, when bushfires caused havoc in the area, they became involved with SES radio, teaching and establishing a network in the field. They ran the SES radio as a base station until they left in 1978.

Geoff achieved his amateur licence in 1977, and Marilyn began to join the LARA nets with Geoff at her side.

When they moved to Mildura, she found herself quite lost without radio, and determined to do something about it. She joined the 1979 class, and gained her novice licence in May 1980, followed by the limited in September, and a full licence in December of that year. Certainly a busy year for Marilyn.

Since than she has made more good friends than she ever had before, and enjoys amateur radio very much.

Last year, she became President of ALARA, a position she fills with flair and aplomb.

We wish you many more years enjoyment of amateur radio Marilyn.

YL ACTIVITY DAY

YL Activity Day was formulated by Diana G4EZI, some years ago as a "Let's get together on air" idea.

Recently, due mainly to poor propagation, fewer YLs have been heard, but with the beginning of the next solar cycle we may soon be able to catch up with some of our DX friends, renew old acquaintances and make new ones. YL Activity Day is a good place to begin.

YL Activity Day — sixth of each month.
Listen on the hour UTC (ie after 2400 UTC during our winter, for 24 hours).
Phone: 3.588, 14.288, 21.188, 21.388, 28.588, and 28.688 MHz.
CW: 3.530, 14.058, 21.058, 21.133, 28.088, and 28.133 MHz.

KEN MCLACHLAN VK3AH

After several years as DX Editor for *Amateur Radio*, Ken VK3AH, has decided to call it a day, (see July AR).

If you are wondering what you are doing in the ALARA Column, Ken, you are here because we would like to wish you well for the future, and thank you for your support of, and assistance to, ALARA on so many occasions.

NEW MEMBERS

A warm welcome to Rose SM5HYL and Jeanette VK4BZL, ex-P29ZL. Great to "have you aboard."

REGARDING RADIO SHACKS

And, of course, every ALARA member has one, whether it be a spacious room filed with all the latest gadgetry or a modest transceiver on the end of the kitchen bench.

Sometimes the shack is shared with the OM or other family members, sometimes not.

This is my radio shack:

I have a little radio shack beside the attic stair,
There's a curtain on the window, there's a comfortable chair.
Certificates and QSLs adorn the white brick wall,
And I am running out of space in which to put them all.

My HF rig is on the bench, with log books strewn around,
And a box of bits and pieces 'neath the cupboard, on the ground;
Odds and ends that may be useful in some future great home-brew,
When I have the time to so the things I've always wanted to.

There are coils and resistors, (some are old and rather bent),
And a Morse code oscillator, (Well! I wondered where that went)
There are diodes and condensers and an ancient valve or two,
Insulation tape, and solder, and half a tube of glue.

Shelves bulge with books and magazines, catalogues by the score,
A large world map is hanging on the wall beside the door.
Pens and pencils in a box, (the writing I don't shirk),
But the pen I grab is always the pen that simply will not work.
My little Morse key is ready to transmit each dit and dah.
There are meters, filters, tin-foil and some thumb tacks in a jar.
I've a floppy cushion at my back, a cat upon my knee,
Yes, this tiny room is really such a pleasant place to be.

And in my little radio shack the world is close at hand,
So many different accents as I tune around each band;
But — shock and horror! The OMs voice drifts through the open door
"I think we'll clean this room right out and use it for a store!"

'Bye now, 73/33, Joy VK2EBX
ar

Club Corner

PORT AUGUSTA AMATEUR RADIO CLUB AWARD

The Port Augusta Amateur Radio Club is launching a new award to celebrate their first birthday.

On the weekend of August 8 and 9, the club will be celebrating its first birthday. Amateur who contact the club station, VK5AUG, from 0930 UTC on the 7th to 0730 on the 8th, will be eligible to obtain the award. On application for the award, which only requires a log extract and $5, the award will be posted. As a birthday present for this occasion, the recipient will be eligible to win a power supply transformer rated at 18 volts, 10 amps continuous or 16 amps peak. The winner will be announced at the monthly meeting on September 11.

Shortwave listeners can also qualify for the award by logging the club station.

Those who qualify for the award during the birthday weekend will receive a multi-coloured certificate.

The award will still be available after the birthday weekend but it will be necessary to work the club station, plus four member stations. Shortwave listeners will qualify by logging the club station and four member stations. Application details will remain the same, however the award will only be monotone.

For applications for the award or further information contact the Awards Manager, C W McEachern VK5KDK, PO Box 360, Port Augusta, SA. 5700.

—Contributed by C W McEachern VK5KDK, Awards Manager, PAARC

ar

VICTORIAN WIA WESTERN ZONE

A meeting of the above Zone will be held on Saturday, August 22, 1987, at the Lake Bolac Hotel, from 1.30 pm.

The following notice of motion has been received and will be discussed at this meeting. "Unless funds are received prior to the August meeting to allow the Zone to operate satisfactorily, all activities of the Victorian Western Zone will be suspended."

—Contributed by Jim Wright VK3CFB, Secretary, WIAWZ

ar

VK4 DISABLED PERSONS RADIO CLUB

To celebrate the fourth anniversary of the opening of the VK4 Disabled Persons Radio Club, an activities day will be held at the residence of Roley Norgaard VK4AOR, on Sunday August 30.

The club station, VK4BTB, will be on the air from 0001 to 0600 UTC (10 pm to 4 pm local time). This period is likely to be extended according to the availability of willing operators.

Intended frequencies for use on the day are 3.590, 7.090, 14.190, 21.190 MHz as dictated by time and conditions.

The station will be off-air from about 4000 to 4300 UTC as the formal part of the day will take place at this time.

Paul Bell VK2VJR, has offered to help promote the day by making a donation in the form of a prize. All people participating, including those making radio contact, will be eligible to win this prize and it is anticipated to announce the winner on 3.590 MHz at about 0600 UTC.

Further inquiries can be made by contacting the club on their regular Friday Net, which commences at 0900 UTC, on 3.590 MHz, or by contacting Roley VK4AOR, on (076) 96 7587 or Graeme VK4NYE, (076) 30 8323. Both are QTHR.

All members of the club look forward to making your acquaintance on the day.

—Contributed by Roley Norgaard VK4AOR, Station Manager for VK4BTB

ar

WAGGA CONVENTION 1986

How better could one spend a spring weekend out amongst the birds and bees in the country, than by attending the 1986 Wagga Convention, last October.

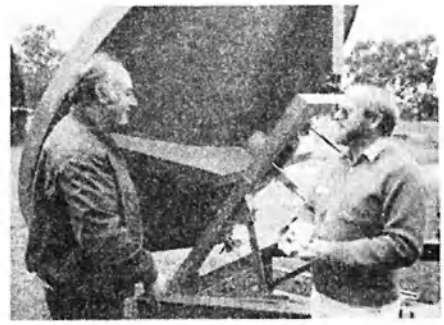
A large "roll-up", similar to past years, began gathering in Wagga on the Friday night with an almost certain guarantee of perfect Riverina weather. Fortunately for all, the guarantee came good and almost perfect weather prevailed for the whole weekend. So much so in fact, that this year's organisers of the annual event are almost ready to come up with the same guarantee for Wagga 1987, in October.

Back to 1986, visitors were treated to a wide range of displays and general activities that kept everyone involved over the weekend. Apart from the usual field event contests, etc, there was a

Stan VK3BSR, from Bail Electronic Services, shows Kevin VK2ZKV, the latest in Morse keys.

Sid VK2SW (left) and Tony VK2ACV, check the old components table.

Peter VK2DOL, with his ATV display.



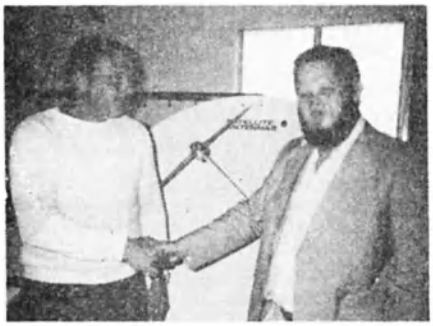
Doug VK2ZMP enjoys a chat with Phil VK1YS.

From left: Peter VK2KZZ congratulates joint winners of the 70 cm Yagi (donated by ZZV Antenna Farm), Graham VK2HI and Peter VK2DOL.

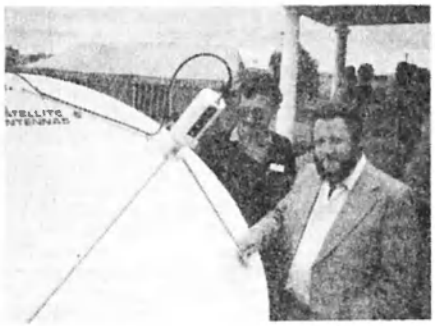
Russ VK2AZR, with a proper "wireless set."

Dave VK2ZYE, loading his dishes after the convention.

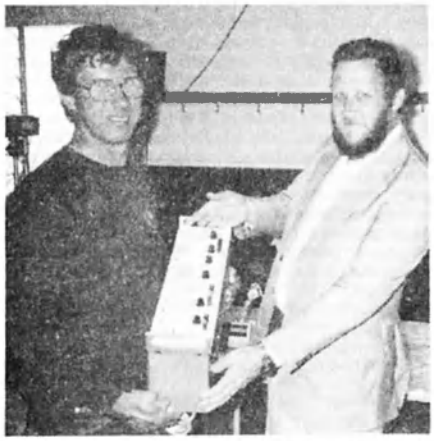
Enjoying a chat, from left, John VK2AQ. Russ VK2AZR, Harry VK2AEC and Rex VK2YA.



Jeff VK2KCL, receives his prize of a satellite dish (donated by Satellite Antennas Pty Ltd), from Roger VK2ZTB.



Wagga Club President, Peter VK2KZZ, and Roger VK2ZTB, inspect the working satellite television display.



Jeff Pages VK2BYY, receives his prize, a laboratory power supply (donated by Scientific Devices), from Roger Harrison VK2ZTB.

good variety of trade displays coupled with many working demonstrations of very interesting amateur and commercial activities. Among the working displays were such items as 70 cm ATV complete with a special "outside Broadcast" of one of the field contests. There was also displays of actual, working slow-scan television. Intelsat showing American television, and AUSSAT was well represented with actual off-air pictures.

A Wagga Convention would not be the same without a vintage radio display giving visitors the opportunity to travel back in time to the days of valves, large resistors, mammoth inductors, heavy relays and plenty of brass things — no plastic or multi-legged fuses — always a popular exhibit.

The Saturday Night Official Dinner also proved a great event at the local Australian Rules Club. A capacity house enjoyed a variety of entertainment including an address by the convention guest, Roger Harrison VK2ZTB.

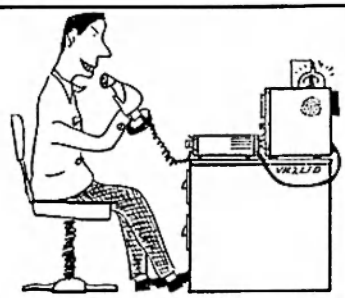
In all, a very good weekend for amateurs and their families who had, collectively, travelled thousands of kilometres from SA, Vic, Qld and NSW.

This years event is also shaping up to be one not to be missed. Club members hope to see all the old friends and new ones in Wagga this October.

—Contributed by Jeff Lange VK2EJJ

ar

"I've got the rig upside-down — I think all the DX has sunk to the bottom! ! !" —VK2COP



"I'm putting 1 kW into a — whoops — I mean I'm running 400 watts into a three-element Yagi!" —VK2COP

TAKING TWO METRES BY STORM

Icom (Australia) Pty Ltd has announced the arrival in Australia of a transceiver destined to take the two metre band by storm. With the imminent granting of two metre FM privileges to Australian Novice operators, with a subsequent major increase in activity on that band, specifications for two metre transceivers will become even more critical than at present. The IC-275A two metre transceiver is well positioned to becomes the 'bench- mark' for two metre base/mobiles under these new, more crowded conditions.

Until now, the only truly 'top-spec' two metre all-mode transceiver available in Australia was the IC-271A. For all its superb specifications and features, it has one minor drawback. It cannot be used away from the 240 volt mains supply. In the IC-275A, Icom has overcome that 'shortfall' providing comparable features and specifications in a transceiver that is as flexible as the active amateur who uses it — the unit runs on 13.8 volts DC and can be fitted with an internal 100 percent duty cycle power supply (IC0OS25) for mains operation.

In some ways, the IC-275A is superior to its highly-rated predecessor. The inclusion of Icom's most recent engineering development, the Direct Digital Synthesiser (DDS), makes the IC-275A unique. DDS is the logical successor to the (aging) Phase Locked Loop (PLL) frequency synthesis system and completely replaces all PLL circuitry with an advanced computer-designed, digital synthesis circuit that provides extremely fast (five mS) lock-on to selected frequency, fast PTT switching for packet radio and AMTOR modes, and superb frequency stability through the mixing of DDS-generated source frequencies in an advanced double phase-locked loop system.

And, that's not all that's new — the HD64B180 ROP central processor unit (CPU) in the IC-275A provides 99 user-programmable memory channels storing frequency, mode, duplex direction and offset, and, where used, subaudible tone information. The CPU also provides advanced remote control functions via a rear-mounted RS-232C jack operating at 1200 baud, allowing computer control of VFO, frequency and mode selection, and memory data via an appropriate interface.

Four separate scanning functions provide easy automatic monitoring of selected band segments or the entire two metre band. *Memory Scan* automatically cycles through each of the 99 memories, with stop on busy or stop on clear. *Mode-Selectivity* memory scan allows selective scanning of only those memories containing the same mode as the VFO in use. *Programmed Scan* repeatedly scans a user programmed segment of the band. *Skip Scan* allows automatic scanning of only selected memory channels, regardless of mode.

The newly designed liquid crystal display (LCD) uses a soft orange illumination for maximum display visibility, even in a bright environment. The display unit provides constant monitoring of the VFO in use, selected mode, split or offset, scan data, memory channel, RIT offset, subaudible tone data and operating frequency.

User enhancements include IF passband tuning (PBT), deep notch filtering, noise blanking, selectable AGC and speech compression. Optional add-on modules include the AG-25 mast-mounted preamplifier (with front-panel control), UT-36 voice synthesiser for mobile or sight-impaired use, UT-34 tone squelch unit for 'quiet base' type operation, CT-16 satellite interface for common control of the IC-275A/H and its 70 cm companion, the IC-475A/H, CT-15 AQS adaptor for full access to the 'Amateur Quinmatic System', FL-

83 CW narrow filter providing 500 Hz selectivity at -6 dB, and the CR-64 high- stability crystal unit providing stability of 0.5 ppm within the operating temperature range of the transceiver (normal stability is 5 ppm).

For advanced mode applications, the IC-275A is provided with an easily accessible rear-panel AFSK jack for RTTY, Packet or AMTOR use and a Data switch to reduce transmit/receive switching time to an incredible 0.005 seconds.

The IC-275A/H is on display now at authorised Icom dealers. For more information and specifications, contact your local dealer or Icom (Australia) Pty Ltd, 7 Duke Street, Windsor, Vic. 3121.

ar

TEST RIG FOR CELLULAR MOBILE TELEPHONE INSTALLERS

If it was necessary to test an installation of one of the newer Cellular Mobile Telephones, you may have had trouble — until now! *Call Me Communications* of Parramatta are selling a completely Australian built and designed SWR/Power meter that accurately measures power and SWR in the 800-900 MHz region where these exotic radios transmit.

Designated model 03-801, the meter is designed for installers who need a rugged instrument to check antennas and cabling. A very detailed instruction manual is included, which takes the operator step by step through the various procedures and checks, and even diagnoses likely reasons for various difficulties.

For further information and specifications of the 03-801 SWR meter contact *Call Me* Communications, 28 Parkes Street, Parramatta, NSW. 2150. Phone (02) 633 3545.

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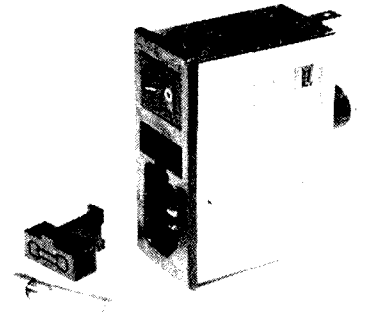


EMI FILTERS

Most EMI filters fitted to electronic equipment are normally an integral part of the socket, the power switch being located elsewhere.

A new product recently introduced by J A Severn is a composite power line socket module that includes both filter and switch. The socket is a standard three-pin IEC connector suitable for 250 volts AC and the switch is capable of switching six amps. Common mode insertion loss at 10 MHz is claimed to be greater than 40 dB and, in normal mode (line-to-line) greater than 60 dB. The module is designed for panel mounting and standard connection is by 6.3 mm Quick-Connect terminals.

Details of the EMI 7103 series power line socket module is available from J A Severn Pty Ltd, PO Box 129, St Leonards, NSW. 2065. Ph: (02) 957 6455.

ar

HALCYON DAYS

Do not miss the latest work by Alan Shawsmith VK4SS, the WIA Qld Division Historian. This book is a condensed story of VK4 history up to WWII and runs into 178 pages and approximately 45 000 words. It contains over 100 photographs, illustrations and early documents. There are 200 thumbnail biographies of pioneers and experimenters, revealing all kinds of facts abou' them which are mostly forgotten.

Read about the near fate of the WIA in 1929 – will history repeat itself in a few years? What v as the QRTL and who were the men who took over the displaced WIAQ and became its presidents? When was the first Australian VHF record achieved in VK4? Who were the HF DXers who broke QRP world records and what was the state of the ionosphere during this period? Also, what were the developments that began tc turn the world into a global village? Why did the many flourishing private clubs suffer an almost total demise by WWII? Why was the Observatory Tower the most significant amateur shack in Queensland, possibly Australia? Did you know there were over 250 radio magazines and journals available in Australia pre-WWII? Could you pass a 1930s AOCP examination and what do you know of the modusoperandi of the period? . . . All these and 1000 more facts can be read in *Halcyon Days*.

Only one print run is possible and a sell out anticipated — so don't miss put! ! ! Advance mail orders, personally autographed by Al VK4SS, can be obtained at a specially reduced price.

Halcyon Days is a full-sized quality product, professionally presented, ideally priced to suit the amateur's pocket and the *first* of its kind in Australia. It is no heavy, dull tome but is written in an easy-to-=read, light style an sprinkled with humourous anecdotes — guaranteed to raise a laugh and inform at the same time. A book not to be missed and a perfect gift for a radio friend.

It is expected to be available, straight from the presses, by September.

Order now from the WIA Qld Division Bookshop, GPO Box 638, Brisbane, Qld. 4001, or contact Anne VK4KZX on (07) 349 7768.

Pre-production price ending August 21, 1987. $9.25.

Post-production price after August 31, 1987. $12.00.

ar

VK3 WIA Notes

NEW MEMBERS

The following applicants are welcomed to membership of the WIA, VK3 Division.

Ronald Adams, Ian Bevan, Gary Carlson VK3KBL, A G Knee VK3PKU, Dominic McLoughlin, Andrew Monkhouse VK3YAU.

ar

VK2 Mini-Bulletin

Tim Mills VK2ZTM
VK2 MINI BULLETIN EDITOR
Box 1066, Parramatta, NSW, 2150

THE RD CONTEST — 1987

Have you marked your calendar for the weekend of August 15/16? The rules were in last month's AR. If you are able to spend a couple of hours, or the full weekend, in the contest it will help VK2.

A reminder — the broadcast for this weekend changes. Instead of the usual morning session, it is replaced by a transmission at 5.30 pm on Saturday, August 15, which concludes with the opening address for the RD at 6 pm. The usual Sunday evening session is at 7.30 pm. After taking part, do not forget to send in your log. Have a good weekend, conditions permitting.

NOVICE DEBATE

As these notes were being prepared the discussion was still occurring on the possible extension of Novice privileges to include aspects of the two-metre band. The thanks of Divisional Council to the various clubs and members who have written with their respective thoughts. Because of the time delay in these notes, you are requested to keep in touch via the broadcasts or should you not hear these, then via the telephone news report on (02) 651 1489. The outcome of the discussions should have been conveyed to you by now, via the broadcasts or elsewhere within *Amateur Radio*.

While there has been a considerable response to this subject, and many amateurs have taken the trouble to indicate their point of view, which is most helpful in decision-making, it is disappointing that prior to the Federal Convention, only seven people attended a forum at Amateur Radio House, to discuss the agenda items. This topic is just one of many which requires input and ideas from every amateur at regular intervals.

WICEN

The WICEN Net conducted on the Sydney Repeater, VK2RWS, was scheduled to change the starting time to 9 pm early in July.

Coming events for WICEN include the Sun City to Surf on Sunday morning, August 9. The event is being co-ordinated by Brian VK2ZZB, and is open to any amateur to assist. it is an exercise to enable non-WICEN personal to have a look at what goes on. The next major event close to Sydney is the Hawkesbury canoes over the weekend of October 10/11. Most local WICEN groups have exercises within their regions.

MAY *AMATEUR RADIO*

A problem occurred somewhere within the mailing distribution system which resulted in a large number of the May issue taking from 10 to 20 days to reach their destinations. Many members advised the office of the non-receipt of the magazine. In some cases, replacement copies were arranged, only to have the original arrive at the same time. Some members, when advising that their copy had not arrived, voiced levels of concern about the magazine and its content. This was balanced by others saying how pleased they were with the improving quality of it in recent times. While the magazine has to cover and include a wide range of subjects, similar to a daily newspaper, not every subject will interest every reader.

Technical articles are important to any (technical) publication and should, where ever practical, come from within the membership. While there are many good articles in other magazines, they are not the same as your own. So, if you are working on something and would like to share the experience with others, why not send something along.

The other important function that a membership magazine like *Amateur Radio* provides is the written notification of changes and news to member. Whilst we are perhaps lucky (or different) in being a communications hobby where some information can be passed by the medium of radio, it is the printed word which is the only lasting record that can be referred back to as required.

Perhaps the halfway point in this is the mode of packet radio. Work is proceeding within the packet groups to link country regions. Recently, the Oxley Region installed their digi-repeater, VK2RPM 7575, which has extended the northern coverage from Newcastle. Work is proceeding to the south with systems being established to connect Sydney into the Riverina, via installations at Mittagong and Goulburn. These will link up with the VK3 systems to provide a circuit to Melbourne.

The Division is working towards having a packet bulletin board which can be accessed from this network. It will provide an information and reference source, including most items of the Sunday broadcasts, which are prepared on the word processor and read live from Dural. Further details when the system is on-line.

HOME-BREW

Are you currently building a project? Do not forget the annual home-brew contest. Entry forms available from the Divisional Office. You may collect one during the open hours of 11 am to 2 pm, Monday to Friday, or 7 to 9 pm, Wednesday nights. Alternatively, write to the PO address above or telephone (02) 689 2417, during these hours.

LICENSE RENEWALS

A reminder. It is almost a year since the NSW DOC placed their records on the SMIS computer. Make sure that you have your licence renewed by its due date. Ever so often we are finding a duplicated call sign in our records so the respective holders and the Department are advised. Between all concerned, the problem is sorted out.

The next Conference of Clubs will be held in November. Clubs are reminded that agenda items have to be lodged at the office by September 11.

Have you been looking for 810 triodes? The need still exists with the HF AM transmitters at Dural. On the subject of Dural, the fireworks evening in late May was an excellent night with an attendance of over 100. Do not forget the monthly BBQ, usually the first Sunday of the month — August 2 and September 6.

DECEASED ESTATE

The Division has been asked to offer the following for sale by tender on behalf of a Deceased Estate. Interested persons should submit their offer, in writing, to be received at the Divisional Office by August 21, 1987.

Item 1. Kenwood TS520 with DG5 display unit
Item 2. Info-Tech M-300C. RTTY/ASCII/Morse keyboard unit
Item 3. Info-Tech M-200F Converter to drive above keyboard (and video display).

NEW MEMBERS — FOR JUNE

A warm welcome is extended to this large intake of new members during June.

R E Barrie Assoc	Eastwood
C W Belton Assoc	Wheelers Heights
P Borrell VK2YBP	Randwick
B Bowler VK2XFS	Richmond
K J Burton Assoc	Wauchope
M R Cheeseman VK2XGK	Springwood
A M Ellsmore VK2FCO	Carlton
V Ficarra Assoc	Coniston
C Gooch VK2XCG	Baulkham Hills
J G Griffith VK2BGG	Wauchope
A N Herring VK2FVK	Manly
V Huzevka VK2AEA	Parramatta
M G Johnstone Assoc	Metford
P V Kelly VK2MCD	Ourimbah
G C Levitt	Valley Heights
G W McLennan VK2MBV	Kurri Kurri
G B O'Keefe Assoc	Mudgee
W R Phillips VK2MWP	Kooringal
J S Sharpe Assoc	Forresters Beach
J Siqueira VK2MCF	Harris Park
C A Smith Assoc	Jenolan Caves
E J Smith VK2EBY	Kiama
M W Smith (Mrs) VK2BAK	Kiama
T Vu-Dinh VK2XGZ	Kingsford
N J Wadds VK2FFE	Port Macquarie
M J Wallace VK2ZWJ	Wauchope
G P A Worrall VK2GPA	Gordon

SLOW MORSE OPERATORS

This nightly session is provided by a group of operators on VK2BWI. Vince Roberts VK2CVR, is the co-ordinator who is on the look-out for additional operators. If you can assist would you call in after the session on 3.550 MHz.

ar

Five-Eighth Wave

Jennifer Warrington VK5ANW
59 Albert Street, Clarence Gardens, SA. 5039

The questionnaire which you should have received in your July insert into AR will hopefully be collated by the time you are reading this. As soon as we have the results we will put them on the Sunday morning broadcast. However, they probably will not get into this column until the October issue, due to our lead times. Rest assured that we will publish them eventually.

At our May meeting, we were pleased to welcome Ron Henderson VK1RH, and Bob Roper VK5PU. Although Bob is a member of this Division, he is normally resident in the USA.

Also at that meeting it was my sad duty to announce the passing of Cam Patterson VK5XR, suddenly at Peterborough. The usual period of silence was observed and we extend our sympathies to his wife and nine children.

I would like to thank John Anderson VK5ZFO, who has kindly agreed to take over the job of Program Organiser. John knows a lot of people in a variety of technical areas and I am sure that from these he will be able to find us some very interesting speakers. However, if you have a suggestion for a speaker or topic I am sure that John would be very pleased to hear from you.

DIARY DATES

Tuesday, August 25 — Ross Forbes WB6GFJ, "An Amateur Radio/Tourist Guide to San Francisco" (illustrated with 35 mm slides).

(We have been very lucky in obtaining Ross as a speaker as he will only be in Adelaide a few days — our thanks to Graham VK5AGR, for this 'coup' — don't miss out on this rare opportunity to hear Ross).

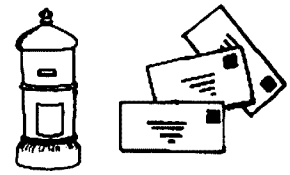
September 22 — Will be our popular Display of Members' Equipment night at which the usual prizes and vouchers will be awarded, so start thinking now which piece of home-brew equipment, which you have built recently, would interest other members and perhaps win you a prize into the bargain!

JUBILEE 150 AWARDS

1393	YB3EUO
1394	C53FH
1395	YC0EFC
1396	YD2DGO (as SWL)
1397	YD2HZZ (as SWL)
1398	VK3YH

ar

Over to You!



Any opinion expressed under this heading is the individual opinion of the writer and does not necessarily coincide with that of the publisher.

A POINT TO PONDER

With regard to the recently mooted allocation of band space on two metres for Novice operators, I would like to put forward this point to the discussion. If a decision is made to grant such privileges, after suitable resolution of any problems which may arise, perhaps the 70 cm band would prove to be in much more need of the increase in activity which would result from an influx of new operators. This seems to be borne out by the call for increased use of the UHF spectrum allocation much coveted by the ever expanding commercial segment, as was indicated by DOC at the Federal Convention. Let us hear more on this one!

Allstair G Elrick VK4FTL,
c/- Base Radio Station,
RAAF,
Amberley, Qld. 4305.
ar

FURTHER TO. . .

I refer to my letter concerning the "Amateur Radio Discussion Paper" and the reply by Andrew Keir VK2AAK, printed on page 59, of March AR.

I have delayed penning a reply in order, calmly and concisely to appraise Andrew's letter. The only opinion I can offer is that he went for his gun so quickly he has shot himself in the foot.

In my letter I went to great pains not to single out any individual as I am of the opinion that too much space is taken up in AR with unproductive personal criticism. In spite of this, Andrew saw fit to use my correspondence as a catalyst to launch a frenzied attack on my character, reminiscent of a rabid ferret!

I wish to make it known that I have never met or corresponded with Andrew in any way and, unless he is privy to information of which I am unaware, Andrew is manifestly unqualified to comment on my credibility.

In one paragraph he states that obtaining a full call is no great achievement, but in the next paragraph goes to great pains to inform us that he has recently upgraded. If it is no great achievement, why did he bother? (How's your foot, Andrew?)

Andrew states that his circle of friends has forgotten more about radio than I will ever know. Whilst I admit my knowledge is limited I hope what Andrew states is correct as this country is sorely in need of a new breed of technical wizard. Perhaps when Andrew's full potential is realised we can expect advances unprecedented since the days of Tesla and Edison. Look out Silicon Valley, here comes Seven Hills!

Yours sincerely,

R Cummin VK2CRJ,
39 Hague Street,
Rutherford, NSW. 2320.
ar

TRAILING ANTENNA

I am amazed at the article published on page 26, AR, June 1987, re VI5JSA Aeronautical Mobile. Hopefully the Department of Aviation did not read this page.

Jeffrey Thornton's father should think before he lowers half a house brick out of any aircraft. This is completely unacceptable by DOA. Has he ever thought what would happen under negative "G" conditions — ruptured fuel tank, damaged flight and control surfaces, etc. The only trailing antennas used on an aircraft must be approved by DOA and exit the rear of the aircraft by the use of a drag device.

Yours faithfully,

Geoff Campbell,
279A Victoria Place,
Drummoyne, NSW. 2047.
ar

PLI COMMENT

The article on Power Line Interference in the June issue of AR was excellent and informative. We still however have the situation where amateurs, legal users of the electromagnetic spectrum, suffer gross interference from outdated power distribution systems.

In many cases, where amateurs suffer S9 plus (wipe-out) PLI, the television signals are so strong that no PLI shows on any channel except Channel 2. Too bad if you do not have a low frequency television channel in your area, or the Channel 2 signal is very strong. What happens when all the television stations are moved out of the low frequency band, as has happened in the UK?

I put the questions to the Department of Communications.

1. "Would you tell a television viewer in a weak signal area that nothing can be done because the television signal is low level?"
2. "Would you tell a commercial/business radio user that nothing could be done about his PLI problem?"

Amateurs can be closed down for causing interference. In this age of equal opportunity, how about the power generating and distribution authority being made responsible for their interference problems!

Most power line interference problems can be eliminated with good engineering practice. Relying on unbonded mechanical joints and non-linear leakage paths is not good engineering practice when dealing with high voltages.

The same theory applies to power distribution as does to digital circuits — "Never have a floating situation". Like good antenna engineering practice — ensure that all potentials are well separated and all mechanical joints are well bonded.

Power line interference is incidental radiation: Incidental Radiation is radiation which is not required for the correct operation of the equipment or service (see the Radiocommunications Act).

Spark transmissions are banned by the Department of Communications, yet power distribution authorities appear to be exempt!

Yours sincerely,

A D Tregale VK3QQ,
73 Nepean Street,
Watsonia, Vic. 3087.
ar

BANDS, LICENCE GRADES

After much thought on the subject of new allocations for Novice, Limited and Combined Novice/Limited Licensees, I have compiled the following suggestions for consideration by readers. Similar correspondence has been forwarded to the DOC, the WIA and ARA magazine to stimulate discussion and comment. Many amateur radio operators hopefully are now stirring from their apathy due to the many opinions, concerns and, as some feel, threats, generated by the proposals, and the possibility of further input to DOC and the WIA is eminent.

My suggestions are as follows:

(A) Proposed new allocation — NAOCP Novice Licence

1. 29.525-29.700 MHz — Mode FM (simplex and duplex operation, repeater use permitted).
2. 145.200-145.700 MHz — Mode FM (simplex operation only).
3. 439.000-440-000 MHz — Mode FM (simplex operation only).

Power — 10 watts DC (output from PA) maximum.

(B) Proposed new allocation — LAOCP Limited Licence

1. 29.525-29.700 MHz — Mode FM (simplex and duplex operation, repeater use permitted).

Power — 10 watts DC (output from PA) maximum.

(C) Proposed new allocations — L/NAOCP Limited Licence plus Five WPM Morse

1. 1.835-1.875 MHz — Modes CW, SSB, RTTY, SSTV and Packet.
2. 7.025-7.300 MHz — Modes CW, SSB, RTTY, SSTV and Packet.
3. 24.925-24.950 MHz — Modes CW, SSB, RTTY, SSTV and Packet.
4. 29.525-29.700 MHz — Mode FM (simplex and duplex operation, repeater use permitted).

Power — 10 watts DC, 30 watts PEP (output from PA) maximum.

(D) Proposed new allocation — AOCP Full Call

1. 95-100 kHz — secondary service — Modes CW and SSB.

Power 25 watts DC, 100 watts PEP (output from PA) maximum.

The above allocations are designed to spread amateur activity in an attempt to ease the congestion in some of the bands which are frequented by both Novice, Limited, Limited/Novice and Full Call alike. They also give these licensees more common ground which I feel will promote more study and create the need for the upgrading of licences to Full Call standard. By gaining a taste of VHF and UHF operation, novices may understand the usefulness of this part of the spectrum and wish to gain full privileges, even if only for the frequencies above 52 MHz and into the bargain gain further access to the HF spectrum.

By the same token, the Limited and the Limited/Novice licensee may gain further incentive to upgrade to Full Call through using the proposed new segments. I would also propose that the Limited licensee who is qualified at sending and receiving Morse at five words-per-minute should not be classed as a Novice on HF in view of his/her higher theory standard. It then follows that they be permitted to use some of the modes already in use above 52 MHz on these proposed segments where they will not clutter the Novice licensee's band space. I would also suggest that a new designation given to the combined call forming a new class of licence.

While the segment 95-100 kHz would not be used by all Full Calls, I believe a lot of interest could be generated in this area. I understand that, on rare occasions, permission has been granted to a few amateurs to conduct experiments in this region. No doubt the challenge of building equipment for this band could make it the last bastion of the home-brewer which, in itself, is enough to interest many amateurs. Of course, the theory examinations would have to reflect the above proposals in content to ensure that problems did not develop during operations in these new areas, but I feel confident that this matter could be handled easily.

Above all, these proposals are designed to provide spectrum access for a larger number of amateurs and hence more efficient amateur band usage. It may be as well to plan these moves now as the commercial needs of spectrum space increase so that amateur radio as we know it, can survive into the next decade.

I will now end this rather long-winded "over" and confidently leave this matter for your consideration.

73, de,

Peter McAdam VK2EVB,
PO Box 433,
Coffs Harbour, NSW. 2450.
ar

EXAMINATIONS

I beg to offer some comments on Brenda's Education Notes in the June issue. It was pleasing to read that a great deal of suggestion and discussion was presented relating to proposed changes in the amateur examination system. Any improvements in this area of amateur radio must be based on widespread opinion, especially from persons engaged in the training of future operators.

However, I noted that Brenda suggested that we "old hands" who took essay-type questions "had it fairly easy." As one of those ancient types I must take issue on this point. The standard required was adequate for the pre-high-tech approach to amateur radio. Far from swotting 10 past ques-

tions, we improved our chances by preparing — and thoroughly — at least 20 or 25 — complete with full circuit diagrams and detailed explanations. Anyone preparing only 10 to 15 model answers was taking a real risk of missing out. Having conducted AOCP courses for many years, I might be pardoned for expressing this opinion. Also, wherever possible, instruction in theory — even with essay-type questions — had to be related to actual pieces of equipment — receivers, transmitters, power supplies, etc. Yes, we had no syllabus in those far-off days and this was for decades a weakness in the Departmental testing arrangements. It was only after considerable pressure from the WIA that Novice and AOCP syllabuses were produced by the authorities. Admittedly, marking had to be conducted by technically competent Departmental officers, but that presented no problem, as the people concerned were technical types in the Examinations Branch of the Department, handling not only amateur examinations, but Commercial and Broadcast Operator's Certificates. There is nothing new in having examinations marked by persons who may vary in their assessments. A competent examiner's practice should be to make up model answers to his theory paper and then evaluate each candidate's efforts against the model.

I agree that multi-choice questions are easy to mark, but is that the most important criterion? I point out that it is just as easy to set *direct questions* such as "What is the length in feet of a halfwave dipole antenna to be used on the 3.5 MHz band?" instead of offering a range of four options. I would be possible to increase the sampling of a candidate's radio knowledge considerably by increasing the number of questions that should be answered in the allotted time. Also, there are candidates who have difficulty with reading and comprehending the various alternatives in the multi-choice format. They are at a disadvantage in the multi-choice situation. Some people will complain that they find problems with writing essay-type answers. Their fears can be allayed by pointing out that amateur examinations are *not* designed to test English Expression, but Radio Knowledge. An essay-type question can be answered by listing points from one to 10 (for example) with each point being followed by short notes to explain the sequence of operations. If the WIA accepts the challenge and takes on the examining function, we should be able to look forward to experimenting with other forms of questioning than just multi-choice. We do not want to find the "dead hand" of DOC on our shoulders to inhibit trail of alternative methods. There are plenty of people in the WIA capable of framing variations and assessing whether new formats are more useful than the clumsy and unwieldly types used at present. There are many other question formats available, but these have been ignored by the existing examiners.

At least there should be an option for candidates to "take" theory papers based on the existing Question Bank, but State Division examiners and radio club examiners should be given the chance to "try out" other formats. If the examining task is distributed to Divisions and radio clubs on an accreditation basis, there will not be the same pressure to have "easy marking" as the principal objective. The notion of a monolithic WIA examination system based on a Melbourne WIA central system is most unacceptable. The State Divisions should be responsible for examining candidates within their own State boundaries. Further, the idea of using the proposed examination system to perform a revenue-raising function is quite contrary to the notions and principles of *amateur* radio. The stress should be on (i) *Voluntary* Morse Examiners; (ii) *Voluntary* Examination Committees at State Level; (iii) *Voluntary* Examination Supervisors and so on. Surely we should be able to find people who have benefitted from amateur radio to the extent that they are willing to "put something back" into our grand hobby.

Yours truly,

Rex Black VK2YA,
562 Kooringal Road,
Wagga Wagga, NSW. 2650.

ar

LICENCING

I am getting sick and tired of all the so-called discussion about classes of licences and their introduction.

I though, at first, that the idea of an easy-to-get CW-only licence was appropriate at the time. I envisaged a one to two year, non-renewable simple licence with home-brew equipment, a small portion of 160 or 80 metres, low power (five watts or less), and low licence fees.

After much discussion and consideration I have changed my mind. Now, I feel that one class of licence is enough for all and that it should be AOCP level or higher. Why such a change of heart?

Consider, novice was supposed to be a non-renewable licence and only an incentive to upgrade to AOCP. But what happened when the time came to take it away? Although it was before my time, it seems they lobbied and decided to let them have it instead.

That was the first lowering of the standard.

The same could happen if any large group decided they wanted more of our bands. Novices can easily get together and claim as much of the bands as they like. It is easier than studying for the AOCP, and they have the numbers.

It is perilously close to that now with LAOCP operators pushing to drop Morse code. They cannot be bothered to study either and they have the numbers, too.

Are AOCP holders soft? Do you sit back and blame the WIA? Just because you have your full call does not mean that these issues do not affect you any more. Unless you make your voice heard, through the WIA if necessary, you can expect anyone at all to literally buy your spectrum space.

If you cannot take the trouble to answer surveys, vote on issues, or help in some other way, then you do not deserve the title "ham". You may as well throw your equipment away and take up watching television.

There are many Silent Keys, better men than you, who you have to live up to now. Paying $23 a year for a licence is not supporting your hobby. Merely double that for the WIA membership will help, not only will you get the magazine, QSL bureau, repeaters, etc, you will get to vote.

$40 a year is nothing these days, so, absolutely no arguments will be entered into.

Aaaah, what the heck. . .73,

Gil Griffith VK3CQ,
7 Church Street,
Bright, Vic. 3741.

ar

Technical Correspondence

In reference to your *Equipment Review* article on p32 of the June issue of *Amateur Radio,* Emtron EAT-300A Antenna Tuner. I would like to make the following comments.

1 The EAT-300A is electrically identical to the EAT-300. Although it is a new unit with many more features, it does not supersede the EAT-300.

2 It is customary to rate al antenna tuners in PEP values instead of average and the reviewer should have been aware of it. There is a very good reason for this condition. Also the power rating is valid only when the tuner is correctly adjusted. A simple mathematical exercise shows that at a power level of 300 watts and a load range of 5 to over 2000 ohms a power level of less than 1000 volts appears across the terminals. The variable capacitors in our 300 series tuners are rated at 1000 volts; consequently when correctly adjusted they can easily handle their rated power and thus any transceiver on the market today.

3 There are two reasons for the use of a 200 watt FSD power meter in this tuner:

(a) since the meter does not indicate PEP but average power, there is no reason for a 300 watt meter

(b) the second reason is practical. All Emtron cross needle meters are custom made, and the manufacturer only accepts orders of a thousand or more. It would be difficult to use a different meter for each Emtron product. The same meter is used in the EAT-300A, EAT-1000A, EAT-2000A, EP200 and some other equipment still on the drawing board.

4 The built in dummy load in the EAT-300A is rated 100 watts at 50 percent duty cycle (or 300 watts at 20 percent duty cycle). Since all practical power measurements and tuning of older-type transceivers is done within a minute this has been set as a limit. This has nothing to do with the power rating of the tuner.

The dummy load is an additional useful feature but has nothing to do with the tuner and its power rating. The reviewer has confused these aspects.

5 Re the air-wound inductor over heating. Several tests have been conducted in our laboratory with a continuous power of 200 watts of 80 metres RF being applied for periods of 30 minutes. The inductor did warm up, which is only natural, but the temperature level assessed by touching it with a sensitive part of the hand was not unpleasant. These tests were performed on a balanced load with impedances ranging from 200 to 800 ohms. Therefore the claim is rejected. The 200 watts continuous power was generated with a transceiver driving a TL922 linear amplifier.

The reviewer is correct in suggesting that tuning with 125 watts caused capacitors to spark. But note that is precisely what every tuner manual, no matter how poorly written, tries to prevent the user from doing. What the reviewer should have done, was to adjust the tuner first at low power as suggested in the manual and then apply full power.

6 Finally, criticism of the manual is fully justified. Too much has been taken for granted. These days when most amateurs are 'appliance operators', we at Emtron should have known and produced a more detailed operators manual, presently in preparation.

Yours faithfully,

Rudi Breznik VK2AOT,
Emtron Industries.

ar

I was very interested in Ron Fisher VK3OMs excellent review of the Emtron EAT-300A Antenna Tuner, as appeared on p32 of the June issue of *Amateur Radio.*

I agree with Ron that this is a very good unit, as I had purchased one a short while before publication of the article. Ron rightly comments that 'tuning on most of the bands was extremely critical'.

All tuners of this type are critical to tune, a movement of one degree makes a big difference on either capacitor.

Within the first couple of hours of operation of my unit, I had removed all the nice looking small knobs with the wide markings and replaced them with old pointed knobs from the 'junk box.'

These knobs are easier to manipulate and make it easier to locate a previous setting, after changing frequencies.

I commend this change to other users of a similar unit.

73,

Allan Doble VK3AMD,
206 Poath Road,
Hughsdale, Vic. 3166

ar

Silent Keys

It is with deep regret we record the passing of —

MR M F POTTS	VK2EK
MR VAN DER VEN	VK3AZN

Obituaries

VERN EVERITT VK2LR

Vern was born at Marrickville, Sydney, on December 23, 1908. One of his great joys and life-long interests was his radio. Unfortunately, specific details of his early activities with radio are not available. However, his sister recalls that when he was about eight or 10 years of age, well before he went to high school, he made a crystal set for which he bought ear phones. As he had no form of amplification, he put the ear phones in his mother's mixing bowl and the volume and clarity of sound that resulted was amazing. Vern's daughter recalls being told that at about the same age, he used to carry a heavy car battery around to operate his radio.

The source of Vern's early interest in radio is not clear. It is thought that someone connected with the Boy Scouts or the Dulwich Hill Holy Trinity Anglican Church Boys Choir, to which he belonged, assisted him. Vern made several crystal sets for neighbours and friends. He later made several valve sets when he was in his early 20s. A boyhood friend recalls that the four valve radio made for him by Vern around 1929 operated well until after the war and was still operating well when it was replaced. When Vern was about 12 years old he subscribed to some early wireless magazine. Later in the 1930s and 40s he subscribed to *Wireless Weekly*.

In the 1920s, Vern belonged to the Lakemba Radio Club. Recently, when the LR call sign became available Vern changed his call sign from VK2BQO to VK2LR, in memory of his early Lakemba Radio days.

Vern looked forward to the journal *Amateur Radio*. He particularly enjoyed the diagrams of circuits and board layouts and was working on several of these up to his passing. As cataracts had resulted in his having very poor, almost negligible eyesight, this was surprising and gives some indication of his great love and interest in radio.

Vern's many radio friends well remember and miss his daily scheds with his son, Kevin, and with them. Vern was active on the air right up to the day of his passing, having made contact with Kevin VK4BKE, that very morning.

Vern was a man who was "larger than life". He had a wide spectrum of interests and abilities. He had a keen and inquiring mind. He occasionally commented that there was not enough time to pursue all his interests. Professionally he was a lawyer. He had the distinction of being the youngest person admitted to the Bar. He had an outstanding career in the Crown Law Office and Public Works Department before his resignation to commence his own legal practice in 1949.

Vern was a brilliant musician and was proficient in playing the violin, clarinet, range of saxophones, piano and organ. While in his third year at Fort Street Boys High School, Sydney, (where his name is on the Academic Honour Roll) Vern formed a four man jazz band. His band was engaged to play for school dances and other functions in the district. Music, particularly jazz, proved along with his radio, to be a lifelong interest for Vern.

Vern passed away suddenly from a heart attack on the evening of August 8, 1986.

He was a Christian gentleman, and left the world a better place. He was dearly loved, and is sadly missed by his wife Lorraine, children Shirley and Kevin (VK4BKE), eight grandchildren and nine great-grandchildren.

Vern's XYL, Lorraine Everitt
ar

RAYMOND EDWARD JONES VK3RJ

The death on Friday, May 22, 1987, of Ray Jones VK3RJ, marked the loss of one of the best-known and respected members of amateur radio in VK and overseas, and also a friend we have known for many years.

Born in January 1900 at Maryborough, Victoria, as one of six children, Ray lost his father at a very young age. The family found the going extremely hard, but with Ray's assistance and support, were able to cope.

At the age of 14 years, Ray joined the Postmaster General's Department, as a Telegraph Messenger, at Maryborough. Four years later he enlisted in the Army, but did not see any overseas service because of the cessation of hostilities shortly afterwards.

After being discharged from the Army, he returned to the Post Office and was promoted to a Telegraphist at Central Telegraph Office, Melbourne. He continued in this position until the outbreak of World War II, in 1940, when he again enlisted and saw service as LAC and rose to the rank of Squadron Leader.

At the end of the war he resumed in his former position of a telegraphist in Melbourne and was subsequently promoted as Supervisor. He retired in 1960, when he and his wife, Lilian, travelled on an overseas trip to Europe and the USA. Here they met many amateurs with whom Ray had contact with since receiving his amateur licence in 1928, under the call sign VK3RJ.

With 59 years of activity under his original call sign, Ray was a tireless supporter of the Wireless Institute and managed the Inwards and Outwards Sections of the OSL Bureau for many years. He was rewarded with Life Membership of the Institute for his work in this area. He was a foundation member of the RAOTC and served on the committee in its early years of formation. He was also a member of the First Class Operators Club and many other clubs associated with DX and CW. The walls of his shack were covered with certificates and awards of all types which indicated his remarkable prowess in contest working, including DXCC.

Ray was an expert CW operator and his sending was a real pleasure to copy as the rhythm and clarity of his signals was outstanding.

Although in failing health for sometime, Ray maintained his interest in amateur radio almost to the day of his becoming a Silent Key.

Ray's wife pre-deceased him four years ago. He is survived by two daughters and four sons and their families, to whom we extend our sincere and deepest sympathy.

He will be greatly missed by all who knew him. Vale Ray.

Wall Matters VK3MJ, Ivor Stafford VK3XB & Mavis Stafford VK3KS
Sea also a tribute to Ray, this issue.
ar

CAMPBELL (BANJO) PATTERSON VK5XR

"Banjo" lived in Naracoorte, South Australia, 600 metres from my home, when I was just a baby. Our late fathers John Patterson and Roy Crawford, were great friends.

Around the age of nine years, I walked into Banjo's shack and was astounded by the bank of accumulators — a crystal oscillator, Morse key feeding an "end-fed Zepp" with power out of four watts on the 7 MHz band.

Banjo's first entry in his log book was on May 5, 1933 when he contacted Jack Lester VK5LR. (Jack is now residing at Inman Valley and is still active at the age of 85 years.) On May 5, 1983, VK5LR and VK5XR again made contact on 7 MHz with SSB to commemorate "50 years of amateur radio" for VK5XR.

Banjo was a keen rifle shooter and, despite having lost the sight of one eye at an early age, won many trophies on the rifle range. His brother, Murray, was one of the members of Jim Kelly's "Bullocky Drive" from Naracoorte to Port Adelaide.

After leaving Naracoorte, Banjo started a radio and electrical business at Peterborough, South Australia. At a later date he became manager of the Peterborough Power Station, a position he held until his retirement.

Banjo was 75 years of age when he passed away. I have many fond memories of the Patterson family and extend deep sympathy to his wife, Cecele and family.

Bill Crawford VK5XB
ar

QSP

RADIO DETECTION EQUIPMENT — A NEW USE!

The Federal Department of Communications has recently helped the Police Department of New South Wales, track down some $30 000 of stolen property, including transmitters, stolen from the State Rail Authority, which were used to direct trains.

A state-of-the-art Radio Detection Finder, urgently recalled by DOC from Perth, was pressed into service on receipt, to trace the source of illegal transmissions, presumably from the stolen radios.

A spokesperson for the DOC said that with the information gained the police were able to simultaneously raid six premises and subsequently charge three people.

The spokesperson said that the stolen transmitters had apparently been illegally used to disrupt radio traffic on the train 'working frequency,' including an attempt to make a train run against a red stop light.

DOC officers had worked closely with state police and railway officers by using direction finders and other radio monitoring equipment in two vehicles which traced the source of the illegal transmissions giving evidence enabling the police to obtain search warrants and execute them in a dawn raid.

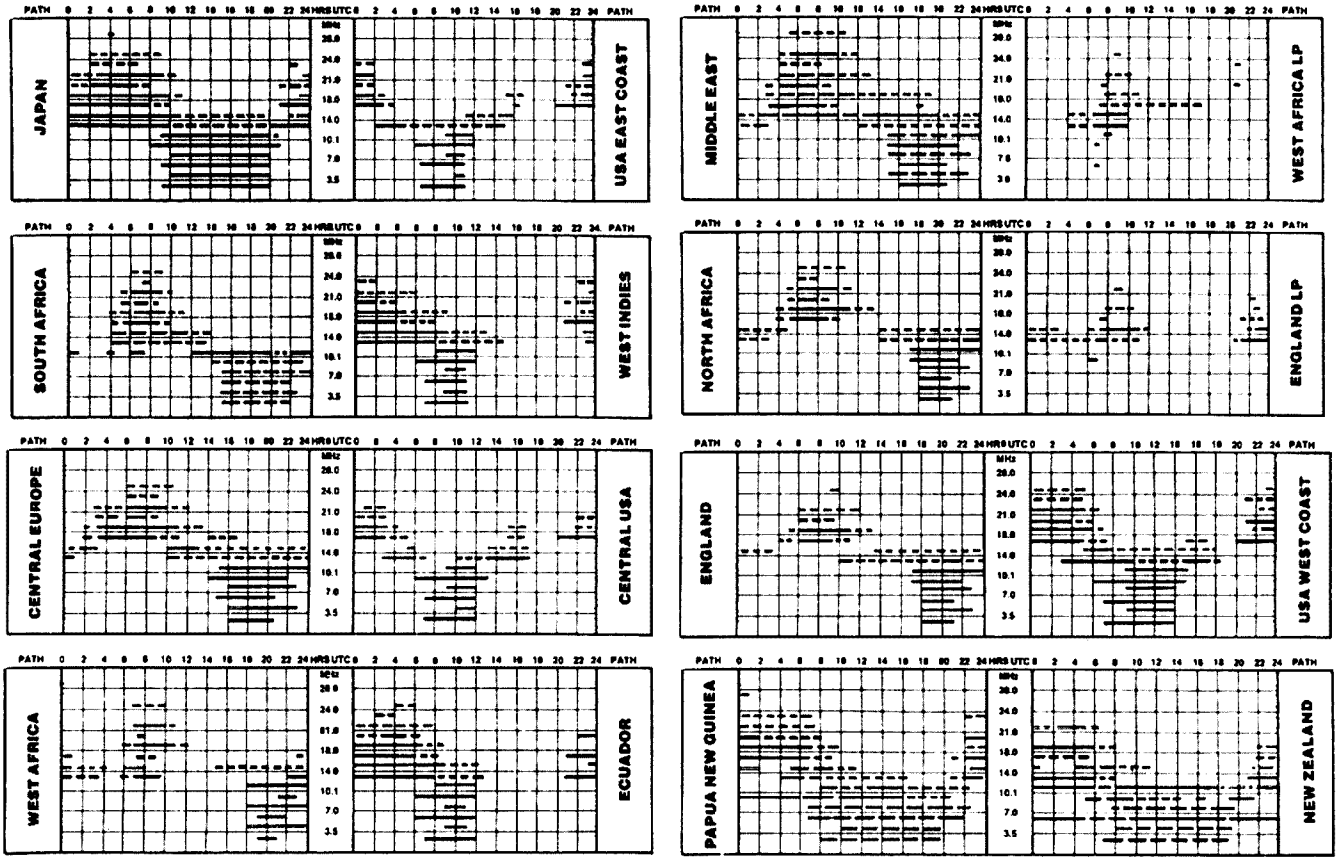
The operation was spearheaded by the NSW Tactical Response Group and included teams from the Dog Squad, Anti-Theft Squad, the State Railways Authority Investigation Branch and officers of the Sydney Regional Office of the DOC.

The spokesperson said it was the first time a search warrant had been obtained under the Radiocommunications Act 1983, where Departmental officers, instructed by the police, searched the premises for illegal transmitters and conducted records of interview which allowed charges under the Act to be made on-the-spot for suspected breaches. Previous to the proclamation of the Act, proceedings would have had to carried out by summons.

From DOC Press Release Number 35/87 9th June 1987

Ionospheric Predictions

Len Poynter VK3BYE
14 Esther Court, Fawkner, Vic. 3060



LEGEND
From Western Australia (Perth)
Prom Eastern Australia (Canberra)

Mixed mode dependent on angle of radiation (long broken lines).

Better than 50% of the month, but not every day (continuous lines)

All paths unless otherwise indicated; (ie LP = Long Path) are Short Path.

Less than 50% of the month (short broken lines).

Predictions are presented courtesy of the Department of Science, IPS Radio and Space Services, Sydney.

Solar Geophysical Summary

— APRIL 1987

Solar activity was mostly low in April with two M1 flares being reported on the 8th and 16th. Despite the low solar activity there were a number of reasonably sized regions visible on the solar disc after the 4th. At times these promised significant solar activity but little eventuated.

These solar regions pushed the 10 cm solar flux up to levels not seen for a considerable period of lime. They ranged from a low of 72 on the 2nd and 3rd, up to a high of 105 on the 16th. This value was the highest observed on any day since June 1984.

Most of these regions seen during the month were 'new cycle' regions. The high monthly averaged sunspot number (39.3) for this month has caused the yearly smoothed value for October to be greater than the September figure. This raises the possibility that September 1986 is the data of the solar minimum.

Sunspot monthly average for April 1987	39.3
Yearly average	9.86
	12.4
A index average for April	7.4

GEOMAGNETIC ACTIVITY

April was a very quiet month with just two days with A15 or over. H = A16, 7 = A15.

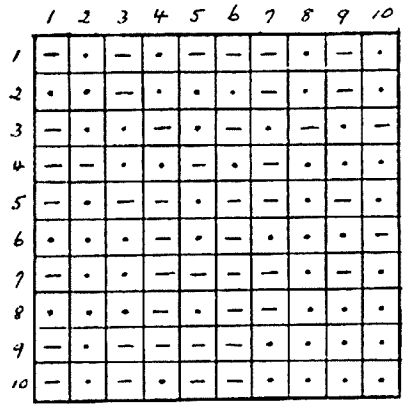
—From data supplied by the Department of Science IPS Radio and Space Services, April 1987

ar

Solution to Morseword 5

Across: 1 cor 2 fear 3 nark 4 gale 5 Yemen 6 vast 7 doc. 8 stems 9 notes 10 taps

Down: 1 norm 2 iris 3 grew 4 fog 5 tidy 6 coo 7 mange 8 eases 9 mule 10 fetes



This space is reserved for your business card.

DEADLINE

All copy for inclusion in the October 1987 issue of *Amateur Radio*, including regular columns and Hamads, must arrive at PO **Box 300, Caulfield South, Vic. 3162,** at the latest, by **9 am, August 20, 1987.**

Hamads

PLEASE NOTE: If you are advertising items FOR SALE and WANTED please write ***each*** on a separate sheet of paper, and include all details; eg Name, Address, Telephone Number, on both sheets. Please write copy for your Hamad as clearly as possible. ***Please do not use scraps of paper.***

- Please remember your STD code with telephone numbers
- Eight lines free to all WIA members. $9.00 per 10 words minimum for non-members
- Copy in typescript, or block letters — double-spaced to *Box 300, Caulfield South, Vic. 3162*
- Repeats may be charged at full rates
- QTHR means address is correct as set out in the WIA current Call Book

Ordinary Hamads submitted from members who are deemed to be in the general electronics retail and wholesale distributive trades should be certified as referring only to private articles not being re-sold for merchandising purposes.

Conditions for commercial advertising are as follows: **$22.50 for four lines, plus $2.00 per line (or part thereof)**

Minimum charge — $22.50 pre-payable

Copy is required by the Deadline as indicated on page 1 of each issue.

TRADE ADS

AMIDON FERROMAGNETIC CORES: Large range for all receiver and Transmitting Applications. For data and price list send 105 x 220 mm SASE to: **RJ & US IMPORTS,** Box 157, Mortdale, NSW. 2223. (No inquiries at office . . . 11 Macken Street, Oakley). Agencies at: Geoff Wood Electronics, Lane Cove, NSW. Webb Electronics, Albury, NSW. Truscott Electronics, Croydon, Vic. Willis Trading Co, Perth, WA. Electronic Components, Fishwick, Plaza. ACT.

WANTED — NSW

CW FILTER: YG-3395C to suit Kenwood TS-520S. Ken VK2YRL, QTHR. Ph: (066) 24 2433 (BH) or (066) 24 3197 (AH).

WANTED — VIC

GALAXY 5 HF TRANSCEIVER: Ext VFO & mic. Must be A1. Also TS-620 or similar. Also TR-7200 desk/mobile or similar. All band HF ant tuner. 14 AVQ vert ant or similar. Jock VK3UB, QTHR. Ph: (03) 49 2973.

PHOTOCOPY OF CIRCUIT BOOK: of Marconi VHF/UHF signal generator TF1064. Wanted known if anyone has a video machine which plays Sanyo tape VT20G & is sideloading. For copying of tape transfer. VK3YNB, QTHR.

POWER SUPPLY: or circuit diagram for Geloso unit 4/104 comprising +600V/200 mA, +300V/60 mA, -85V/9.2 mA. 6.3V/1.4A & 6.3V/750 mA. Please state condition & price to Manuel VK3DRQ, QTHR. Ph: (03) 420 7385/399 (BH).

ROTATOR: suitable for 6 element beam in good condition. VK3WL, QTHR. Ph: (03) 741 7654 (AH).

WANTED — QLD

CIRCUIT DIAGRAM: for Yaesu FRG-7. Will pay costs. VK4NPK. Ph: (075) 53 2832.

KENWOOD PS-20 or PS-30 POWER SUPPLY: or Icom equivalent. VGC. Ph: (079) 84 9201.

RF SIGNAL GENERATOR: to 500 MHz. AM & FM by VK4ADY, QTHR. Ph: (071) 86 4492.

WANTED FOR GYMPIE AMATEUR RADIO CLUB MUSEUM: Amateur commercial domestic military & home-brew radio & electronic gear. Alan VK4BWG, QTHR. Ph: (071) 83 1127.

WANTED — SA

SANWA "SEEC" T.1200 2 METRE FM TRANSCEIVER: (model AS) operating manual or photocopy thereof. Marlene VK5QO, QTHR. Ph: (08) 339 2329.

WANTED — TAS

FTV-107R: Harry VK7HH, QTHR. Ph: (003) 56 1578.

FOR SALE — ACT

ICOM IC-02AT HAND—HELD VHF TRANSCEIVER: HM9 speaker-mic, BP3 nicad BC25E charger. $375. Werner Wulf duo band 10/15 $100. Hustler 4BTV allband vertical $60. Buyer collects. VK1BZ. Ph: (062) 80 1264.

FOR SALE — NSW

ALINCO 2 M LINEAR AMP: New, never used. 10-30, .5-3W, cost $89. XD/S best offer. Leo VK2QB, QTHR. Ph: (049) 43 3392.

DECEASED ESTATE: TS520/DG5; Info-tech M-300C; Info-tech M- 200F. See VK2 Mini-Bulletin notes for tender details.

FT-107M TRANSCEIVER & FP-107P POWER SUPPLY/SPEAKER: $900. TR-7400A 2 metre mobile transceiver with heavy duty power supply $300. Bud lowpass filter $40. Sanwa CX505 50 kohm per volt multimeter. $50. Drake W4 wattmeter $50. B&W antenna switch $30. Qcraft SWR & power meter $20. Geoff. Ph: (02) 489 4318.

ICOM 720A: dual VFO & general coverage receiver. $750. Yaesu FP-707 power supply $250. Frank. Ph: (02) 326 2398 (BH) or (02) 621 4149 AH.

YAESU FT-707 TRANSCEIVER: FP-707 power supply, FC-707 antenna tuner, FV-707DM digital VFO, 18 AVT Hi-Gain vertical antenna. Will sell as one lot only. Offers to David. Ph: (02) 29 1768 (BH) or (02) 498 2259 (AH).

FOR SALE — VIC

2C39A UHF/SHF TRANSMITTING TUBES: New $30 ea. 2m converter FET VK3AFQ design $40. RTTY gear, 64k TRS80 colour computer, MFJ- 1229 deluxe RTTY-CW interface, B/W monitor, software for RTTY & CW, data cassette recorder. $500 the lot. Brand new Tektronics 5" display unit ideal for RTTY monitorscope. $100. Dick VK3AHT, QTHR. Ph: (03) 874 4967.

COLLINS 51S-1 COMMUNICATIONS RX: As new $650. Kenwood digital display DG-5 as new. $120. Ph: (052) 48 1410 after 7 pm.

ICOM 2M TRANSCEIVER: IC-22A. Repeaters 3, 4 & 8. Channel 37, 40, 50 & 51. VGC with manual. $150. Andrew VK3BJW. Ph: (03) 878 8593.

ROTATOR: Emotator model 502SAX. New & unused in carton. $500. Dummy load. Oil filled. 1 kW to 30 MHz. MFJ (USA) Model Versaload 250. $50. Allan VK3AMD, QTHR. Ph: (03) 570 4610 or Ed VK3EM, QTHR. Ph: (03) 578 7745.

SIGNAL GENERATOR: F995.B5 200 kHz to 220 MHz. CW/FM/AM variable deviation. Output 1 uV to 100 mV in 1 dB steps. Very stable, in condition as new. Full set of spares, complete operating and service manuals. All leads & termination unit. Calibrated for 50 ohm output. $550 ONO. Mark. Ph: (03) 509 6845 9 am to 9 pm.

SOUTHERN STAR POWER SUPPLIES: 2 only. 240V in, 13.8V DC out, 4A peak, 1.5A continuous. Suit units up to 25W. Perf cond. $45 each. Mobile rack for Kenwood 130S transceiver. Perf cond. $35. A&R transformer PR1V 180/250, VA 1000 50, Sec V115, Sec A 8 int. Enclosed W handle $100. Ex cond. Ph: (055) 62 6016.

TOWER: Nally radio lower. 13.7m. Extensible. Rated 40 MPS wind velocity. In prefect condition. $690. Ph: (03) 589 5378 after 4 pm.

FOR SALE — QLD

DIGITAL FREQUENCY METER: 7 digits, frequency & period, "EA," Dec 81/Feb 82. 50 MHz with 500 MHz prescaler & dec'l pt mod'n. Assembled Altronics kits, all instructions. At ½ new price, posted anywhere in VK for $102. VK4ADY, QTHR. Ph: (071) 86 4492.

DRAKE C-LINE (R4C & T4XC): Full coverage capability receiver & amateur bands transmitter. Very reliable rig in good condition, with many features found on more modern sets, including twin VFOs, notch filter, manuals, etc. Spare finals included. $550. Wanted IC-740 or similar compact mobile rig in top condition. Details to John VK4SZ, QTHR. Ph: (070) 61 3286.

DRAKE TR-7 HF TRANSCEIVER: All solid state, instruction manual, service manual & extender boards, plus original power supply. VK4KCF, QTHR. Ph: (07) 284 7739.

TWO ELECTRONIC MORSE KEYERS: Recently home-brewed. RF protected in attractive metal case. Both have cathode & grid keying. Look good & work well. Been tested on air. Speed about 5-40 WPM. One has red/green LEDs to indicate cathode or grid keying. Separate paddle or Iambic key needed with both. $110 lor one, $105 for the other. Ron Johnson VK4FTJ, QTHR. Ph: (079) 6532 Yeppoon.

FL2100Z LINEAR: In mint condition. $750 plus freight. Steve VK4KHQ, QTHR. Ph: (077) 43 4508 (BH), (077) 44 3100 (AH).

ICOM INTERNAL PS-35: 20A supply for 751 etc. Little used, warranty still $300. Home-brew 14V 8A reg PS. GC. $35. HF Linear, 6146s, 1W- 100+W. Compact incl PS. Well made $190. Yaesu 9 MHz xtal filters. 1xSSB, 1xCW. $20 ea. VK4AIZ, QTHR. Ph: (07) 391 5526, (07) 227 7224 (BH).

YAESU YO-100 MONITORSCOPE: Brand new & had no use. $200 ONO. Yaesu FL2100B, never been used. Less valves, best offer over $220. Unit was checked over by Mitchell Radio & is in good condition. Eric VK4NJC, QTHR. Ph: (071) 86 7255.

FOR SALE — SA

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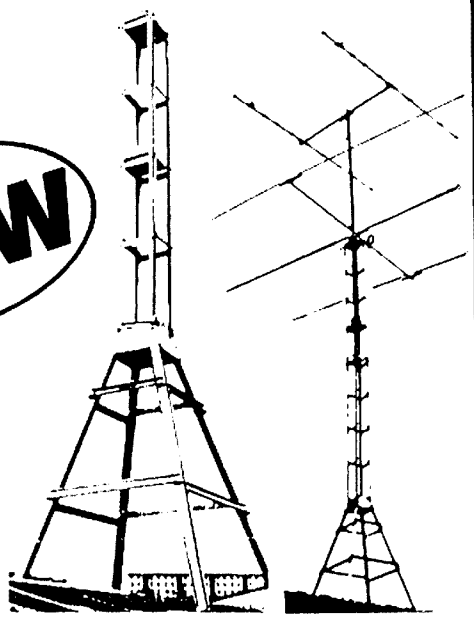

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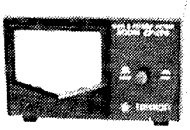

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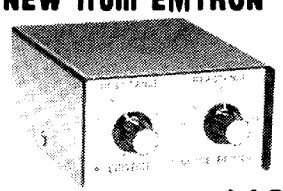

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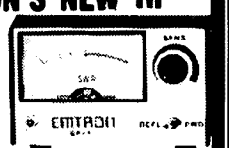

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NOVICES ON THE TWO METRE BAND

A Review of the History and the Issues

by Ron Henderson and Peter Gamble

Ever since the introduction of the Novice Licence in 1977 there has been a desire for a "common" band so that all amateurs could communicate with each other. This was first raised at the 1977 Federal Convention. However, it was concluded at that time that there was insufficient support for a common band.

At succesive conventions motions were raised with the intent of finding a common band for all licencees. As an example, at the 1982 Convention, VK6 proposed without success that novices be allowed to use approved, channelised, low power FM equipment on the seventy centimetre band. There was concern that this might also lead to "type approved" equipment which is contrary to WIA policy and indeed the reason for the existance of amateur radio. Coupled with this, there have been other attempts to extend existing novice sub-bands and privileges. None of these proposals received sufficient support at the various conventions to be passed. Nevertheless, there was a great deal of interest and discussion on these issues.

Insert in Aug A.R. 1987.

At the 1982 Convention, a policy statement on novices was produced which stated that the Novice Licence was considered to be an "entrance grade". This was reviewed at the 1986 Convention, where a further motion recommending that there be no extension to novice priviledges at this stage was passed.

The 1986 Federal Convention also took a different approach. A motion was proposed which extended the novice priviledges to the six metre band. Rather than decide on this matter in isolation, it was referred to a newly formed committee - one charged with looking at the future of amateur radio. The fact that this proposal for novice use of six metres was referred to this committee was considered to be an expression of support for the idea. However, there was some difficulty in getting this committee off the ground during 1986/87 and so no report on this matter came to the 1987 Convention.

At the 1987 Federal Convention, the VK3 Division sought to separate the novice use of six metres from the greater issue of the future of amateur radio and achieve a decision in isolation. At the same Convention, the VK3 Division proposed a novice allocation on a small two metre band segment for CW and SSB use only. These matters were debated at length. Separation of the novice use of six metres from the future of amateur radio was lost on the vote (4 to 2) but the debate disclosed very strong support amongst all divisions for a common band for all classes of licence holders.

Coupled with the knowledge that the Department of Communications intended to authorise a reciprocal agreement with Japan, which would permit their telephony licence holders (a grade technically lower than our novice) to operate on VHF and UHF bands using ten watts and telephony mode, the Council saw merit in seeking two metre priviledges for the Australian Novice.

Whilst the initial VK3 proposal was for a band segment for CW and SSB only, the Council conceded that true common band operations could only be achieved by the inclusion of the FM mode. The extra priviledeges proposed were qualified in that the existing novice power levels and emissions were to be retained with the addition of FM voice. This motion was carried almost unanimously, with the VK1 Division

dissenting only on the choice of band.

There was no intention of making the Novice Theory exam paper harder by the inclusion of FM or VHF techniques, for the Federal Council has given clear directions that there is to be no lower grade than the Novice (1976) and the Novice exam level is to be restored to its early standard.

In debating the matter, the Council was mindful of the gap between novice and full licencees and sought to achieve greater unity. Instances were cited of novice operators being formally constrained from actively participating in WICEN, divisional broadcasts, club stations and other similar activities. There was also a desire to be innovative rather than reactive, and not wishing to be criticised yet again for slow deliberations. Finally, there was the hope that this would raise the visibility and involvement of novices in amateur radio activities and end any possible discrimination.

The mood of the Council, as expressed in the motion, was to take immediate action. Consequently a request, based on the motion passed, was delivered to the DOC on the following Monday. It was adjudged the feeling of the council this apparent unearned gain by the novice was highly desirable to lift flagging interest and declining growth in amateur radio as a hobby. Subsequently this matter was discussed at a joint DOC / WIA meeting in Canberra on 19th May 1987. At this meeting the Manager, Regulatory Operations Branch, Mr David Hunt, advised that the DOC had received a number of direct submissions both supporting and decrying the request. He further advised that the DOC would seek additional information from the WIA in support of its submission. This request has since been confirmed in writing.

The Federal Executive, at its May 1987 meeting resolved:

> "That in the light of comments received from the amateur community, and with recent discussions with DOC, the issue of extended novice privileges in the two metre band be referred to the Committee for the Future of Amateur Radio; that this committee be asked to produce a number of discussion papers coupled with a general review of licensing grades and operating privileges existing in the amateur service."

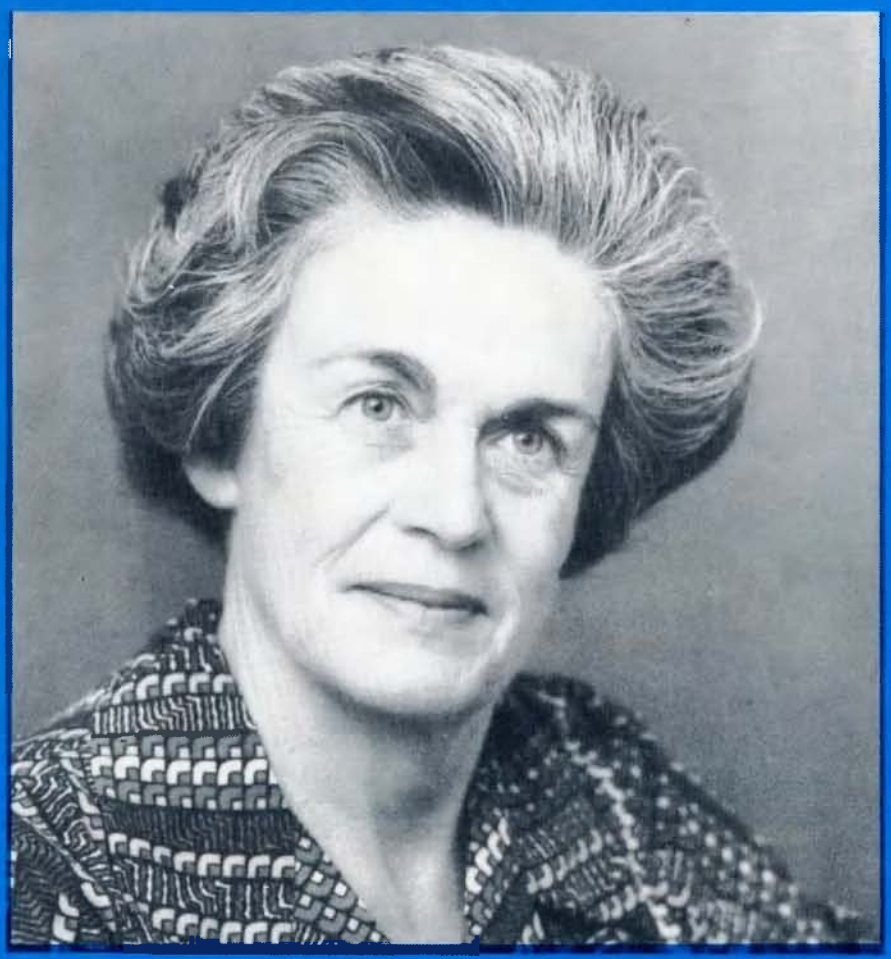
The Future of Amateur Radio Working Party is now active and is preparing a series of five papers which address various issues, including the broader issues relating examination requirements and morse code proficiency to operating priviledges. The comments made by many amateurs on this and other related issues have been forwarded to this Working Party.

We hope that this report has brought you up to date on the issues relating to the "Novices on Two Metres" proposal. Further, the papers prepared by the FARWP will be circulated to the Federal Councillors (and thus to the Divisions) for comment and input on the issues raised therein.

For the Federal Executive,
Ron Henderson, VK1RH and Peter Gamble, VK3YRP.
19th July 1987.

Amateur Radio

JOURNAL OF THE WIRELESS INSTITUTE OF AUSTRALIA
VOL 55, No 9, SEPTEMBER 1987



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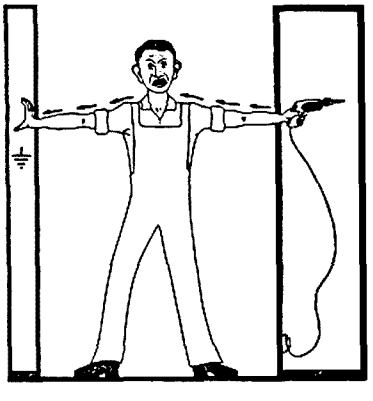
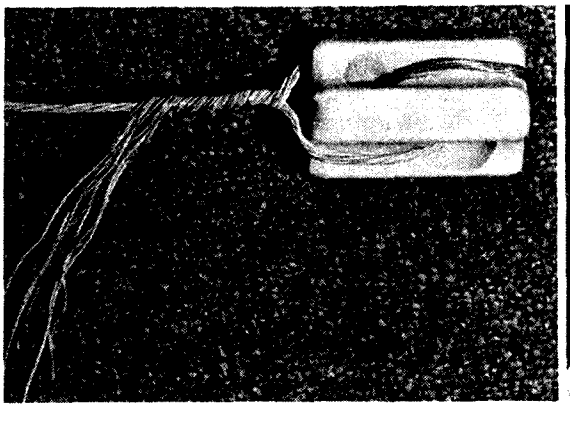
Amateur Radio

FRONT COVER: Dame Beryl Beaurepaire, DBE, Chairman of the Australian War Memorial, delivered the Opening Address for the 1987 WIA Remembrance Day Contest.

Special Features

Technical Features





Regular Features

DEADLINE

All copy for inclusion in the November 1987 issue of Amateur Radio, including regular columns and Hamads, must arrive at PO Box 300, Caulfield South, Vic. 3162, at the latest, by 9 am, September 21, 1987.

Amateur Radio

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Inquiries and material to:
The Editor,
PO Box 300,
Caulfield South, Vic. 3162.

Material should be sent direct to PO Box 300, Caulfield South, Vic. 3162, by the 20th day of the second month preceding publication. Note: Some months are a few days earlier due to the way the days fall. Check page 1 for deadline dates. Phone: (03) 528 5962.

HAMADS should be sent direct to the same address, by the same date.

Acknowledgment may not be made unless specifically requested. All important items should be sent by Certified Mail. The Editor reserves the right to edit all material, including Letters to the Editor and Hamads, and reserves the right to refuse acceptance of any material, without specifying a reason.

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Editor's Comment

"ALL I GET IS THE MAGAZINE!"

We have all heard this complaint many times, often from those who ought to know better;

"All I get for my WIA subscription is the magazine!"

Particularly from country members, whose variation is;

"It's OK for you city blokes who can go to meetings (etc, etc), but all we get in the country for our sub is the magazine!"

At the last Federal Convention a list of WIA services was exhibited. Largely, it was put together by one member of Executive (Ron Henderson VK1RH). How many different items do you think it shows? Three? Five? Ten? Would you believe, THIRTY FIVE? Actually the original list showed 33. Without having to think too hard, I've added two more!

I mentioned this list at the last Publications meeting. I was the only one present who had been at the Federal Convention. Even the Committee, keen and hard-working members as they are, could not imagine that many services! Obviously we are hiding our light under the proverbial bushel. This list needs to be impressed on every member, and even more on every non- member.

Actually, many of these services, unlikely to exist without the Institute, are to the benefit of all amateurs, members or not, city or country. Some of them are only provided by one or two Divisions. Some are free in some States but cost extra in others. Three are still being planned, either to provide a new type of service, renew an old one, or because the system is being changed. Most of the benefits are free in all States.

"Come on", you say, "What are these services? Don't keep us in suspense!" So here is the list, in alphabetical sequence. An asterisk (*) means it costs you something, membership subscription at least, maybe extra.

Advisory Committees DOC/WIA (possibility)
AMATEUR RADIO (The magazine!) *
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Contests
Conventions
Disposals Sales * (some Divisions)
EMC Advice
Equipment Insurance * (some Divisions)
Examinations * (probability)
Exam Classes *
Exhibits/rallies/meetings
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Special news bulletin boards (planning)
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Videotape Library *
WICEN

May I leave you with one last comment. Our President (VK3ADW) and Executive Vice President (VK3YRP) were the guests of NZART at its recent annual management conference. They thoroughly enjoyed the proceedings, learnt much from the ZLs, and were able to help with advice from VK now and then. But they were staggered to find (even in Kiwi dollars, which don't buy quite as much as ours!) that a licence over there costs $60, and membership of the NZART is $55 (including 10 percent general services tax). What are some VKs complaining about?

Bill Rice VK3ABP
Editor

SILENT KEY

It is with the greatest regret that we announce the death, on July 28, of Max Hull VK3ZS.

Max, an Honorary Life Member of the Institute, had been Federal Historian for many years up to the time of his death, and was Federal President from 1958-1961 and again from 1965-1967.

THE FUTURE OF AMATEUR RADIO

Ron Henderson VK1RH
and
Steve Phillips VK3JY

A Paper by the "Future Amateur Radio Working Party" Established under the authority of the Federal Council of the Wireless Institute of Australia

It is trite to observe that "change for changes sake" is often mistaken for progress.

The 1986 Federal Convention set up "The Future of Amateur Radio Working Party" to report on stated terms of reference to the 1987 Federal Convention.

The Working Party was unable to meet that time scale and it is timely that members of the Institute be given an opportunity to review some of the important aspects considered by the Working Party to date.

The purpose of this paper is to establish given data known to the Working Party, together with a review of the immutable limitations and constraints surrounding amateur radio at present and the future.

It is trite to observe that "change for changes sake" is often mistaken for progress. However, it is realistic to acknowledge that changes in technology and modes of communication over recent years will inevitably have significant impact on our world of amateur radio.

In making changes, we must ensure that movement toward such change is co- ordinated, as piecemeal changes are never satisfying.

Recent discussions surrounding proposals to broaden privileges for novice operators demonstrate that there is a need for a comprehensive review of licence levels, amateur qualifications and their associated operating privileges. Any review undertaken must be logical with recommendations which are simple, easy to understand, administer and regulate.

The Future of Amateur Radio Working Party sees its role to examine all feasible options, but to limit the final selection of recommendations to a robust complimentary set acceptable to the majority of members of the Institute. It is obvious that not all recommendations are going to meet with total agreement amongst all Institute members and amateur operators in Australia.

The Institute must also take into account the policies and attitudes of our licensing authority, the Department of Communications, which has the responsibility of ensuring the administration of the Amateur Radio Service within Australia operates within international agreements. Further, DOC constraints relating to pressing demands for spectrum space, examination and licensing costs, and limited resources to devote to what is fundamentally a "hobby service," dictates a departmental management approach based on simplicity and ease of administration.

MEMBERSHIP AND BAND USAGE

Some of the comparatively few letters on the future of amateur radio received by the Institute have expressed concern at the falling off of new entrants to the Amateur Radio Service following the burst of the CB "bubble." These comments are reflected at times in contacts heard over the air.

The implication immediately drawn is that such a reduction in the number of amateur operators will mean a consequent reduction in membership of the Wireless Institute of Australia.

The increases in numbers of amateur licences since 1976 issued by DOC can be seen in Graph 1.

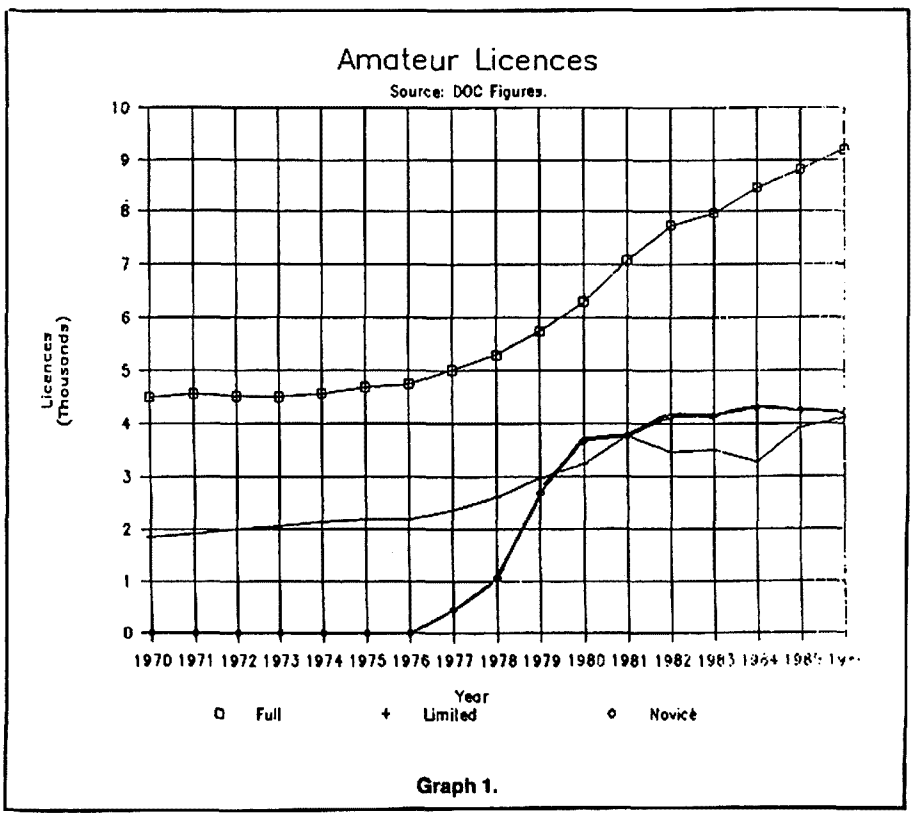
Interest in the Amateur Radio Service obviously continues at a relatively high level; perhaps what is more an issue is the pressure due to spectrum demands by other users than the Amateur Radio Service and the unknown factor as to what percentage of licenced amateur radio operators regularly use their licence in some, most, or all allocated bands.

EXAMINATION LEVELS AND ENTRY POINTS TO THE HOBBY

It is a simple fact which must be faced that devolution of amateur examinations will happen in the near future and all new examining bodies (with DOC involvement or not) will demand full cost recovery in some shape or form. It is reasonable to assume that the cost of conducting examinations will remain relatively costly, and it is in the interests of the Amateur radio Service that entry points to the Amateur Service be kept small in an effect to keep costs down.

On the other hand, increased operating modes and licence privileges can be logically associated with increased technical knowledge. In accepting this, it must not be forgotten that all modes in the Amateur Radio Service have a common basic theoretical background at a hobby skill level rather than a professional communications skill level. Many comments are heard on the lack of practical operating experiences for new licensees. The Institute must address itself to this problem by examination of methods of introducing practical experience in training courses, the use of club and other stations, and perhaps the adoption of the "Elmer" approach from North America.

Concern has been expressed about entry points to the hobby. There appears to be some evidence that Novice examination levels have risen since



Graph 1.

the introduction of this licence in 1976. The world and circumstances have changed since then, and there has been a distinct change in emphasis from "how and why" with some home construction being to the fore to the current operation and use of "black boxes" capable of a wide range of transmission modes of data.

There is often confusion between realising that utilisation of amateur bands is simply a reflection of occupied bandwidth, however the skill level in any graded system of licensing assumes varying levels of technical ability in translating intelligence to a modulating signal being sent over the air.

An ideal solution in an ideal world seem to support multiple entry points to the hobby with a few examination subjects, together with motivations and desire from those once licenced to use their full operating privileges at whatever licence level on a regular basis.

It is claimed that Novice theory examination levels have risen beyond the basic theoretical background originally envisaged, and the Novice examination may have changed from a relatively simple entrance test to a quota pass test to regulate numbers entering the Amateur Radio Service. There is a strong sentiment of support for the concept of restoring the original novice examination level of difficulty rather than as a quota mechanism.

The current Wireless Institute of Australia policy is to support a licence grade no lower than novice with that level of entry establishing (in the theory examination), a basic technical hobby understanding of communications. In contrast to this, there has been a need expressed for a "student permit" for supervised novice-like operations by radio class students in club and Institute courses. Is this necessary, given the relatively broad "second operator" provisions currently in vogue?

It would seem that our efforts would be better oriented towards re- establishing a basic novice theory level of examination rather than focusing on a sub-novice level which is implied by "student permits."

RETENTION OF THE MORSE CODE REQUIREMENT FOR FULL NOVICE LICENSES

Long, animated and sometimes heated debate continues on the need for retention of Morse by amateur operators.

The present facts are that the International Telecommunication Union (ITU) Radio Regulations, require the Amateur Radio Service to hold a simple skill level in the use of Morse for licensees below 30 MHz. This has to be acknowledged at least for the issuing of reciprocal licenses. Whether this state of affairs will continue in the future is beyond the competence and control of the WIA as it is a DOC and government matter, however it is acknowledged that each and every amateur operator will form his own opinion on this matter.

The Australian Government subscribes to the International Telecommunication Union Radio Regulations and international agreements, particularly those relating to reciprocal licensing, are extremely difficult to alter and any desire to change this aspect of the Amateur Radio Service must be seen from an international viewpoint rather than our own backyard.

RECIPROCAL LICENSES AND THE SURPRISING PRESSURES THEY BRING

The recently negotiated reciprocal agreement with Japan is, at least in the short term, irreversible with VK novices currently being disadvantaged — this is a simple fact which we must, for the present, accept for better or worse.

Whist some may argue otherwise, there has developed support in recent years for a common band for all amateur grades of licence. The single most logical argument for such an approach is the element of unification of amateur operators which would develop if such a plan was adopted.

What cannot be agreed on as yet, is which band is the appropriate one for such activity — suggestions have included six-metres, two-metres or 70 centimetres and one proponent has even suggested UHF CB!

In another vein, there is a case to seek to have our full licence equated with similar overseas licenses with slightly differing Morse speed requirements.

CONCLUSION

Over the next few months, the Future of Amateur Radio Working Party will examine various factors including frequency bands and emissions, together with licence restructuring.

The Working Party would be pleased to receive input from members of the Institute through their Federal Councillors in regard to the factors detailed in this paper together with any comments on other matters they consider of importance.

Members are reminded that the WIA is managed by the Federal Council and the Future of Amateur Radio Working Party is established under the authority of that Council. It is, therefore, appropriate that comments be passed through each Federal Councillor rather than directing your remarks straight to the Federal Executive.

To assist you in communicating with your Federal Councillor, their names and addresses are reproduced below:

VK1 — George Brzostowski VK1GB
PO Box 600, GPO, Canberra, ACT. 2601

VK2 — Jeff Pages VK2BYY
C/- PO Box 1066, Parramatta, NSW. 2150

VK3 — Danny Vits VK3XDV
PO Box 336, Kyneton, Vic. 3444

VK4 — John Aarsse VK4QA
PO Box 211, Nambour, Old. 4560.

VK5 — Rowland Bruce VK5OU
33 Sunhaven Road, Redwood Park, SA. 5097

VK6 — Neil Penfold VK6NE
2 Moss Court, Kingsley, WA. 6026

VK7 — Joe Gelston VK7JG
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FUTURE OF AMATEUR RADIO

Ron Henderson VK1RH
and
Steve Phillips VK3JY

Is amateur radio really at the crossroads?

It has been suggested that our hobby is far less exciting today to the general public than it was 30 years ago. Today, via ISD, anyone can communicate almost anywhere in the world with the greatest of ease and at reasonable cost. An overseas telephone call was difficult, noisy and expensive 30 years ago. Is it reasonable to argue that the DX magic of amateur radio is today not as exciting and mysterious as it was 30 years ago?

There have been many discussions on these and related matters amongst amateurs in recent years, together with valuable contributions in discussion papers "Amateur Radio — Future Direction" by Jim Linton VK3PC and Roger Harrison VK2ZTB, and "Novice Licensing into the 21st Century" by Gordon Bracewell VK3XX, printed in February and August 1986 editions respectively of this magazine. In April 1987, Ron Henderson VK1RH, published a Federal Convention Agenda item on the issue of the Future of Amateur Radio.

These discussions have set the scene for the Federal Council of the WIA to encourage the future of Amateur Radio Working Party to promote discussion in this area.

In preparation for the 1987 Federal Convention, VK1 Division aired the topic at a Divisional meeting to determine members views, VK2 Division held a forum with sadly less than 10 members in attendance, VK4 Division circulated their clubs and presented a well considered paper at the Federal Convention which was included in the Convention Minutes. VK5 Division discussed the topic at a Conference of Clubs and the VK6 Division's presentation to the Federal Convention was based upon a report to their Council. In summary, all Divisions considered and spoke in depth on the matter at the Convention.

The "Future of Amateur Radio" was an important Federal Convention discussion and action item and the key points raised with supporting arguments became the Guidelines to the Executive with the future of amateur radio and were adopted unanimously by Federal Council. These Guidelines were published in last month's magazine, page 39, and you are invited to comment on them through your Division's Federal Councillor, whose names appear below. All correspondence should be directed via your Divisional Office.

VK1 — George Brzostowski VK1GB

VK2 — Jeff Pages VK2BYY

VK3 — Danny Vits VK3XDV

VK4 — John Aarse VK4QA

VK5 — Rowland Bruce VK5OU

VK6 — Neil Penfold VK6NE

VK7 —Joe Gelston VK7JG

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AERIALS: SOME PRACTICAL CONSIDERATIONS — III

'ATTACHING THE 'AERIAL 'SYSTEM

Ted Roberts VK4QI
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QUITE OBVIOUSLY THE aerial must be insulated and a number of insulators have been used through the years. The most popular type has always been the "egg" insulator and there must still be quite a few of these old-fashioned porcelain receiving eggs available.

They are not the ideal type to use for a transmitting aerial however, unless they are used in a string of three or more. There were larger types of egg insulators made for transmitting use, but even these types are advisedly used in pairs. (If you doubt this check the SWR of an aerial at its resonant frequency with one insulator at each end and then again after a second insulator has been added at each end). It pays to remember that the end of an aerial or ends of a dipole are at a very high impedance and the dielectric losses can be quite high from the ends of the aerial. Quite large egg insulators are used in the power transmission industry but these are impracticable because of their weight.

These egg insulators are used in the compression mode and the aerial will not fall down if they are broken. Another type of transmitting insulator which operated under tension was the rod or tension type. Again, commonly made of porcelain, they would let the aerial down if they became broken, but they had the advantage of being fairly long. Consequently, dielectric losses were much lower. A large number of these were made from glass with eyes moulded at each end and a series of corrugated ridges moulded throughout the length of the insulator to increase the surface path, and so the insulation resistance. The average WWII or marine version of these are sometimes still available but they are fairly heavy.

When an aerial is pulled tight between two masts any excess weight contributes largely to the sag in the aerial. It is theoretically impossible to strain an aerial so tight that there is no sag at all between the ends of the aerial. This sag is known as the "catenary" sag of the aerial and it will be found that the tension on the halyards increases greatly as you attempt to raise the centre of the aerial another 30 centimetres or so. This bending moment, or load, is transferred to the guy wires or to the mast structure and can be very high if used to the extreme. The stiffer the structure the less the catenary sag but the costs of the stiffer structure rise almost as fast as the extra tension desired. It is something like trying to catch up with galloping inflation! For this reason, it is desirable to keep the weight in the centre of the aerial as low as possible as this increases the amount of sag, more so than the weight at the ends of the aerial.

Since WWII, the miracle of plastics has entered our lives and we can use plenty of alternatives to porcelain for insulators. One of the most common alternative insulators is the well-known PVC electrical conduit or plumber's pipe. This makes a very satisfactory substitute and the length can be made reasonably ling to increase the insulation resistance. Be sure to drill the holes for the wire at least half an inch from the ends for sufficient strength when it is hauled up on the halyard. Another type of plastic insulator (used personally) is three or four links of heavy plastic chain. This is very effective but suffers from two drawbacks. If a large strain is placed on the chain one of the links breaks after a short time. The same thing happens when very cold nights cause the aerial to shrink and the stress resistance of the plastic is reduced in low temperatures also.

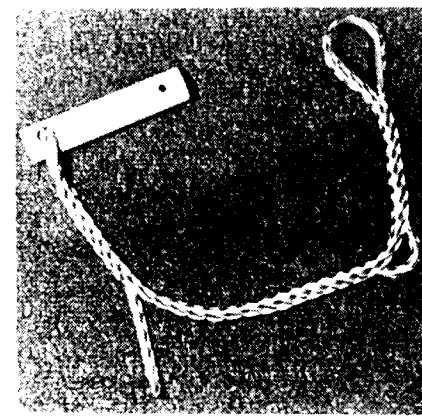
However, these plastic links make good light insulators for that standby HF dipole carried in the boot of the car for portable use. Centre insulators for dipoles can be made from PVC sheet with holes drilled for aerial wires and feeders, or to support a ferrite balun and coaxial feeder.

Another good substitute is a block cut from the family nylon cutting board. (For your own peace of mind, and health, do not let your wife catch you! You could always blame it on rats or white ants, hopefully).

Because the previously mentioned, high impedance exists at the ends of the aerial, it makes good sense to use rope to secure the insulators to the halyard. The plaited hollow type of polypropylene rope is recommended for this purpose.

Begin by tying a clove hitch through the egg insulator or a clove hitch around the rope after threading it through a tension or conduit type of insulator. With the conduit, make sure you have countersunk and removed all burrs from the holes drilled through the conduit. You may prefer to feed the end of the rope back inside itself as previously described and feed the end out of the main length of the rope and then back inside again a little further along the rope. This will ensure it does not pull out with annoying results.

Galvanised or copper wire can be used instead of rope and, if so, it is a good idea to use two insulators in series if egg insulators are used. Another type of material to connect the insulator to the halyard is a fairly heavy piece of nylon fishing line. If you are not a fishing enthusiast ask a fisher-friend to explain the secret of tying the ends of nylon as it does not conform to the normal type of knot tying due to the lack of friction in the material. It is an excellent material to use on portable aerials as the material itself can be used as the end insulator for the aerial. To connect the end rope or wire to the halyard tie a galvanised rope thimble to the halyard end of the rope. If this is fitted inside the same fitting tied on a short loop in the halyard the mechanics of the system are up to specifications. To do this, hold each leg of the thimble in a shifting spanner and pull each leg apart. Fit one thimble inside the other and close the thimble up again.

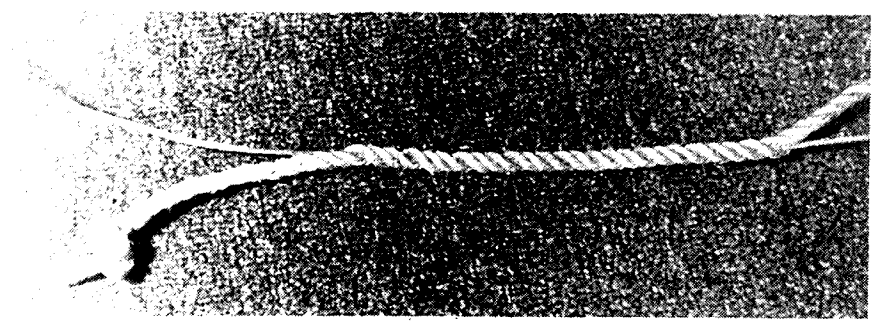


Left: Conduit Insulator Termination to Woven Polypropylene Insulator. Right: Galvanised Thimble to Woven Rope. Rope re- entry into Rope shown open for Demonstration.

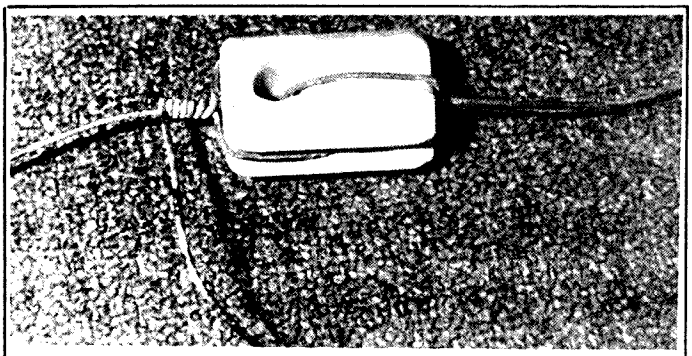
A need sometimes exists to pull an aerial or strain wire up to a tower, building, etc, and secure the end while the wire is still under tension. A very old idea called a "snotter" is ideal for this purpose. Tie a common finger knot in the end of a piece of hauling rope. The lay of the rope is opened up and threaded around the wire for some 15 or 20 turns. The harder the hauling rope is pulled the tighter it will grip the wire and the rope can be tied-off until the end of the wire is terminated and the rope may then be untied and unwrapped from the wire.

AERIAL WIRE TYPES

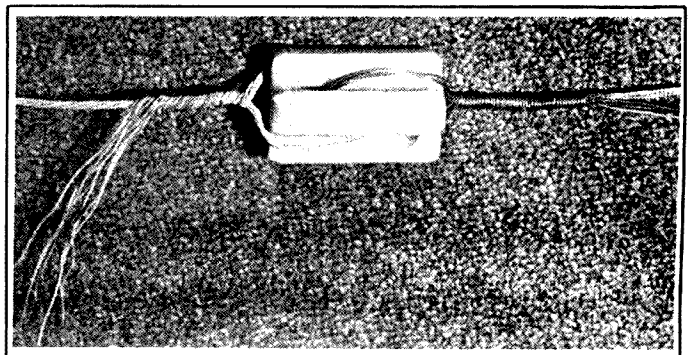
At first sight it appears that any type of wire could be used to construct the aerial, but some types are more suitable than others. When it is considered that the power we want to radiate from the aerial is as high as we can reasonably expect, the IR or DC and/or RF resistance of



"Snotter" for Hauling Aerial or Aerial Tail.



Left: Single Strand Aerial to Tail. Right: Single Strand Aerial Tail with Swaged Copper Tube Termination.



Left: Wrapped Joint. Right: British PO Joint.

the aerial wire should be kept as low as is reasonably possible. This resistance is effectively in series with the useful radiation resistance of the aerial and so dissipates a proportion of the power from our "U-Beaut" transceiver. Considerable money has been spent on this device and it is rated to deliver X watts to the aerial, there is not much point in willfully throwing some of this expensive RF energy away in an aerial with high resistance elements. It is not suggested that the aerial be constructed from heavy copper busbar, but, at the same time, do not build it out of bell wire. It will work but the losses are quite pronounced.

Most authorities suggest from No 8 to No 14 hard-drawn copper wire as the material to use for wire aerials. The reason for hard-drawn copper wire is to limit any tendency for the wire to stretch under strain. It may be heresy, but I suggest that green plastic covered earth wire, such as the old fashioned 7/029 or 7/036 wire, makes a very satisfactory material for the average amateur. I would hesitate to use it on a very long span aerial such as a rhombic of 10 wavelengths per leg at 7 MHz, but for general use, I have found it satisfactory for a halfwave on 3.5 MHz. When using modern types of earth wire I would suggest checking that the number of strands do not exceed seven.

Instead of copper it is possible to use aluminium wire and there are many things in favour of this choice. It is lighter than copper and the DC resistance is only a few percent higher, so efficiency is comparable. You cannot solder aluminium if required, but the purists say you can't solder hard drawn copper either, the reason being that the solder area becomes brittle and may break. (I never solder copper wire where it is under tension, but make it off at a centre insulator and then solder a short tail of the wire where it is no longer under tension). With aluminium it becomes necessary to join by clamping or by twisting the two ends, then clamping. For this purpose, brass electrical service clamps or cable clamps are excellent but do not forget to apply Aluminox® or similar to the joint prior to clamping, particularly if dissimilar metals are being joined. It is advisable to carry a couple of cable clamps in the boot of the car in case a portable aerial coaxial feeder breaks away from the aerial whilst operating portable. (Soldering irons are not often available when camping in the bush.)

One of the peculiarities of RF current is the so-called "skin-effect" where the current tends to flow at the periphery of the conductor and virtually no current flows in the centre of the conductor. There is an apparent contradiction to this phenomenon when a conductor made of a large number of very fine wires is used. Under these circumstances, the RF resistance to current flow increases dramatically and again it is seen the hard-won power is dissipated in a high RF resistance in series with the radiation resistance of the aerial. It is for this reason I suggest that earth wire or stranded wire be limited to seven strands. Incidentally, covered copper wire or house-wiring cables are soft-drawn! They are much easier to handle and have the same tendency to kink during handling as hard- drawn cable. If they are plastic covered, the kink-tendency is improved considerably.

The situation can be improved by unrolling the wire, or by taking five or six turns off the roll from one hand and then reverse the roll in your hand and feed the same number of turns from the other hand. By feeding the wire alternatively the natural curl in the wire cancels out. If any kinking is noticed while constructing or erecting the aerial, drop everything and remove the kink immediately. Do this by hand if possible and smooth out all signs of the kink. Kinks will weaken the wire, especially hard-drawn wire, and will almost certainly fracture sooner or later.

As mentioned previously, the weight of the aerial increases the tendency for the aerial to sag. For this reason it is rarely necessary to use wire heavier than 7/029 or No 12 SWG (or their equivalents) for average amateur use.

TERMINATING WIRES ON INSULATORS

There are many ways of terminating aerial and feeder cables to the various types of insulators available.

Terminating to an old egg insulator is probably the most common case we will find. First, we consider the cable or wire being used. If it is a single strand it is fed through one eye of the insulator and bent "Z" fashion so the main length of wire takes off from the insulator at the centre of the insulator body. The free end of wire is then bent around the end of the insulator and wound carefully, and neatly, around the main wire for some eight or 10 turns. If this wire is needed to connect to a balun or feeder system, it can be left temporarily as is after wrapping to act as a tail for later connection.

If it is no longer required at the end of the aerial it may be cut off and the end pulled round neatly with pliers. In all length measurements of the wire, do not forget to measure from the loop end of the wire, not the place where the wire is twisted around itself.

Another method is to slip one or two short lengths of small, slightly flattened copper tube over the main wire. Bend as before and slip free end of the wire back through the tube and swage the joint by flattening the tube in a vice. Tap the tube with a blunt coal chisel between the two wires and parallel with them to tighten the swaged joint. *Do you wear a belt and/or belt and braces together?* This same theory comes into practice here whether you use two pieces of tube or just one.

If stranded wire is being used, the procedure is different although there is no valid reason why the method described above cannot be used. The usual method is the "British Post Office" or "Britannia" joint or variations of this joint.

Basically, proceed as before and thread the cable through the insulator and bend as before. Now, unravel one strand of the free end of cable after cutting the free end to be one foot or so in length. Wrap the single strand around both pieces of cable together as though winding a coil for some eight turns. Cut off the single strand and complete neatly with pliers. Next, unravel a second strand and coil as before for the same number of turns and finish as before. Repeat this process until all strands on the free end of the cable have been finished off neatly. If the end is needed to connect to feeders, etc. This method will not work so leave several feet on the free end and wind it around the main cable and leave the end free until used. Alternatively, the free end may be untwisted for several inches where it comes out of the insulator body and these strands neatly wrapped around the main cable like a ribbon. The end may be left until required, and, as it was not untwisted it will still be neat.

If it is necessary to terminate the tail from a feeder or similar to the egg insulator it may be brought through the same hole in the insulator and laid into the joint so that you are binding three wires together instead of two. This joint may be soldered to ensure high resistance does not develop in the joint.

If terminating a tension type or conduit type insulator, the wire is just fed through the hole or eye and wrapped around the main length of wire for a number of turns. This is quite strong and will last as long as you are likely to need the aerial. Tails can be finished off as for the egg insulator. If space is required between the aerial wires with egg insulators, two eggs can be wired in series and the spacing made to match the feeder spacing.

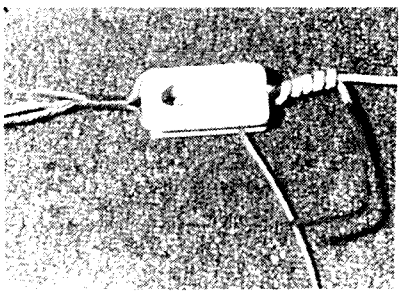
FEEDING THE AERIAL

Having now constructed the aerial to the selected design, it is now time to connect it to that piece of wizardry in the shack. There are two basic types of feeder systems to use — the balanced and unbalanced type of feeders. The balanced type is usually a two wire system (sometimes more). Neither wire is connected directly to ground and ideally each leg is balanced to ground. This can be upset if one leg passes close to an earthed metal pole or similar and the other leg is further away. Therefore, the ideal is to have both legs as symmetrical to ground as possible. Balanced feeders can be obtained in shielded cable form, but these are rather rare so they will not be discussed here.

The impedance of balanced lines is determined by the spacing and diameter of the wires used to construct the line, as mentioned in the text books. From application of this formula it can be seen that it is very difficult to construct a line having an impedance much below 150 ohms. As these lines are balanced there is no need to use a balun to feed the aerial and the impedance can be designed to comfortably match the aerial feed point. The line can be constructed ladder-style using plastic conduit spacers wired to the line conductors. If more spacers are deemed necessary when it is erected, the same length spacers can be drilled and slots cut into the holes with a hacksaw, the extra spacers slipped onto the wires and wired into place so they will not slip out of the slots again.

Spacers about 18 inches apart should be adequate using the smallest size conduit available for the spacers. Unless the once popular 75 ohm twin feeder is available it is not possible to match the centre of a halfwave dipole directly as the 72 ohm impedance is too low to construct a line. This presents no real problem as the aerial centre can have a small gap which is a higher impedance and thus match the line impedance.

At the other end, we find our piece of wizardry has an output impedance of 50 ohms unbalanced and this, in turn, implies that an aerial tuning unit is required. At the very least it is necessary to use a balun. Why not use one giving a 4:1 impedance step up and, hey presto, the problem is solved. A well balanced line, coupled through an ATU and correctly matched to the aerial, should cause very little TVI or BCI.



Left: Teeing Tail to Aerial. Right: Covered Earth Wire to Tail.

If a tail from the aerial and the feeder are brought together after twisted joints as described, they can be twisted together and soldered with no problems as the strain has been taken off the wire before it is soldered. In such an aerial as a centre fed open wire dipole or a G5RV type, it is easier to make up the aerial as one component and then construct the feeders as a separate unit. Some layouts lend themselves to a separate feeder run from the shack to a post below the aerial after the style of a telegraph line, then another length of feeder is run from the centre of the aerial to join the feeder line at the post. This style of construction with 600 ohm feeders was the ideal before the arrival of a cheap and plentiful supply of coaxial cable. They worked, and worked well, but seem "old hat" these days.

A very popular type of balanced feeder can be made from 300 ohm TV ribbon, particularly for feeding a folded dipole made from the same material. If 300 ohm ribbon is used it is preferable to get some of the heavy duty variety as it is a lower loss type. Again, don't send a boy on a man's errand and construct the feeders from bell wire. At the other extreme, do not use massive great cables as these will only add weight where it is not wanted — in the centre of the aerial system.

The other type of feeders are the unbalanced types. This means coaxial cable in the majority of cases. It is possible to have unbalanced feed with wire feeders quite easily such as the old fashioned Windom aerial and wire feeds to vertical aerials. For the wire types of feed the same general remarks apply as for balanced systems. One point to remember is the possibility of increased TVI and BCI with this type of open wire feed.

Because the RF field in a coaxial cable is confined to the space between the inner and outer conductor, the possibility of TVI is greatly reduced. Coaxial cable comes in a great range of types, impedances and power handling ability. Mostly, they are of low impedances in the order of 50 to 75 ohms. This suits the output of the transceiver admirably and one could be pardoned for thinking one was designed for the other! The centre of a dipole aerial can be fed directly with coaxial cable, but this unbalances one half of the aerial. It will work, but with a much greater chance of TVI and reduced efficiency. This problem is easily solved by mounting a 1:1 balun right at the aerial feed point. I personally dislike this method as there is no attenuation of harmonic radiation if the aerial is a multiband type. For this reason, I favour the use of an ATU between the transmitter and aerial. Failing this, install a switchable low pass filter in the feed and fellow amateurs shall heap blessings on you for reducing your harmonics and they may not complain to the RI as was their wont before.

Coaxial cables have some odd characteristics that must be pandered to if a happy and long life is expected from them. Firstly, they suffer from "cold flow", which means the polythene insulation will distort if strained in position for a long period of time. A typical example is the tendency for the inner conductor to gradually work through the insulation if the radius of a bend is too small. It may not short, but it will create problems with the SWR for sure. For this reason, keep the radius of all bends in the coaxial cable as large as possible.

For the same reason it is advisable to support the coax on a strain or support wire where it has a long run unsupported to an aerial. There are places where this is impossible and the coax must swing in space.

Allied with cold flow, in these cases, is the fact that continued swaying of the cable may break the inner conductor. Run a strain wire and tape the coax every couple of feet to the strain wire so that the weight is taken by the strain wire. It is also a very good idea to support a long vertical down drop of coax in several places if possible.

The inner insulation of coaxial cable (polythene) is very susceptible to the action of sunlight and should never be left with the outer stripped from any more than a temporary period. After prolonged exposure to the sun, the insulation cracks and the insulation begins to look like a large number of washers slipped over the inner conductor. Particularly in a salt or corrosive atmosphere the insulation resistance drops alarmingly and the cable end is nearly useless. This can usually be rectified by cutting the end of the cable back until a proper insulation is restored, but a section of the cable is lost! The same treatment will usually remedy a cable which has poor insulation due to moisture penetration from one end. Again, a penalty is paid in the reduced length of cable.

The obvious approach is to prevent the problem before it occurs — cover the polythene insulation in some manner. The easiest answer is to coat the insulation with some material like Silastic® or similar. Silastic has the property of chemical reaction with the polythene but I have used it without any major trauma. A better material, though somewhat messier, is windscreen sealant. This remains chemically inert. Another approach is to cover the polythene with PVC sleeving and seal each end.

Another problem arises when joints are made in coaxial runs. These are usually made by connecting two male connectors through a "through" connector. With constant exposure to the weather, moisture finds its way into the connectors and affects their insulating properties. To prevent this disaster occurring, the connectors and a small length of coax can be taped with a self-sealing tape. This has the property of sealing to itself and becomes an homogeneous mass after a few days. There are many types of this tape available and they can also be used to cover the polythene inner insulation. To remove the tapes, carefully operate on them with a sharp knife and the connectors will be revealed before your startled gaze in their pristine purity again.

It is advisable to remove the strain from connectors joining coaxial lengths, otherwise the cable will probably pull out of the connectors. Do not relieve the strain by tying a knot in the cable although this will relieve the tension satisfactorily. It leaves the cable under stress with a radius which is too tight. Cold flow problems will appear with time. It is much safer to make a loop either side of the join.

A cunning way to defeat the bad habits of cockatoos and galahs (feathered bird types) eating and tearing the coax with their powerful beaks is to thread the cable through 1.25 inch, or larger, plastic conduit. This is too large for "cockie" to fit inside his beak so he can neither chew the conduit or the coax. (Thank you to VK4ZAR for this handy tip).

It pays to check coaxial cable carefully as there are some "El Cheapo" varieties which have a small number of strands of copper wire woven into the outer conductor. These are probably okay for HF or CB operation, but the losses increase with frequency and are useless at 432 MHz. It is worth remembering that coaxial cable attenuation increases with frequency. Whilst not a problem at HF the losses at VHF may dictate the use of a low loss type, even at a much greater price, as is witnessed with the common use of Heliax® types of cable at 432 MHz. This is definitely not the place for cheap cable!

Another source of cable that it pays to check thoroughly is the secondhand and disposals type. Some excellent bargains are available but there can be some "pups" sold in this field. It does pay to try to find out the previous history if possible.

TV 75 ohm types are usually dependent on an aluminium foil shield for the outer conductor with a couple of copper wires running the length of the coaxial cable for outer connections. These are meant to be rigidly mounted to prevent swaying or flexing from breaking the foil outer. It is not really recommended for amateur use.

CONCLUSION

In concluding this series, I would like to acknowledge the work of G3UDO, in *Amateur Radio Today*. From these articles I was able to save myself the calculations on how much concrete weighed, etc.

I would also like to say that it is a case of "Don't do as I do, do as I say" as my present aerial layout is the classic case of before and not after! As all amateurs have said, "I'll fix that before Christmas." But, which Christmas? If you take due note of what I have said you may be on air with your new "U-Beaut" aerial system by the same Christmas, in time to work me and tell me where I went wrong in these articles. *In* the meantime, don't get tangled *up* in your aerial system and happy operating with plenty of DX.

—Photographs courtesy VK4ZDK

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Safety Around the Shack

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How electrically safe is your shack?

Within minutes of reading an interesting article in the February edition of the RSGB journal *Radio Communication* under the title "Safety in the Shack" I read a very sad story in the *IEEIE Monthly News* of an 18-year-old gifted musician who was killed whilst performing at a local discotheque. It appears he received a fatal shock when he touched externally live amplifying equipment and an earthed microphone.

How electrically safe is your Shack?

Are you one of those unfortunates whose house was built around minimum cost and, in consequence, you only have one power outlet in the shack from which you hang numerous extension blocks? You are not alone.

On a hot summers night, do you pad around your shack barefoot?

Have you given any thought to the potential danger our wonderful hobby brings us close to? Most of us probably think the main household general purpose outlet (GPO) fuse is sufficient safety. It is for equipment — not for your life.

In recent years there has been a growing concern for electrical safety. Already some local authorities are including special requirements that necessitate special devices, known as Earth Leakage Circuit Breakers (ELCBs) to be fitted on new buildings and on building sites wherever portable tools and appliances are used. In some countries such as Germany, it is mandatory to have an ELCB (or an RCCB as they are known there) fitted to all new bathroom outlets.

A search of the Australian Standard Association revealed two very interesting publications. MP30-1972 is a report on effects of electrical current passing through the body and AS3190 provides the approval and test specification for current operated (Core-balance) earth leakage devices.

Before getting into the technicalities of how an ELCB operates, let us look at the effects of electrical shocks and just how much our body can withstand.

Our Body

There are four major factors which determine the seriousness of an electric shock.

1 The path taken by the electric current when one sustains an electric shock.
2 The amount of current which flows.
3 The duration of the time for which the current flows and
4 The electrical resistance for the path taken by the electric current.

The most dangerous current path and the one where most electrocutions occur is that path which embraces the heart. This is usually hand to hand and hand to foot. (See Figure 1).

Time and current are the next important factors. Figure 2 shows the zones of effect of AC current (50/60 Hz).

Zone 1 represents an area where no reaction normally occurs, in fact the person is usually unaware of the passage of current through them.

Zone 2 is an area where the person will be aware of the shock, but usually no pathophysiologically dangerous effect will be experienced. Painful muscle contractions are likely at the high side of the curve.

Zone 3 is an area where usually no danger of fibrillation but other dangerous effects may be experienced.

Zone 4 is an area where a possibility of fibrillation exists (up to 50 percent probability).

Zone 5 is an area where a danger of fibrillation exists (greater than 50 percent).

"Fibrillation" is an abnormal conditions of the heart when the normal rhythmic expansion and contractions of the heart muscles takes place. In fibrillation the heart is not capable of pumping blood. If this condition is not corrected quickly death will result.

Perhaps an easier way to understand this is to look at the illustration shown in Figure 3. The general accepted level of current for external body contact is about 1 mA. At that value of current, a slight tingling sensation is perceived. At approximately 9 mA, we reach the "let-go" threshold and our brain commands us to release the shocking source. With increasing the current we reach a condition where we are unable to release ourselves, the "non-let-go" threshold, from the shocking source and eventually we have constriction of the therasic muscles and death can occur.

Time is, of course, most critical. Persons have sustained electric shocks in excess of the non-let-go threshold for very short periods and have lived to tell the tale. However, so often there is no one around you to break the power. Perhaps a better way of understanding the time period is to look at a standard electro-cardiogram of one pulse beat of the heart. (See Figure 4). The period when normal pumping action occurs is during the QRS phase. Immediately after this period we have the partial refractory T-phase, or rest period, of the heart just prior to commencing the pumping cycle again. Taking an average pulse rate of 80 beats to the minute, we have the duration of one cardiac cycle as being 750 milliseconds. The period of the partial refractory. or T-phase, is about 20 percent of the overall period, about 150 milliseconds.

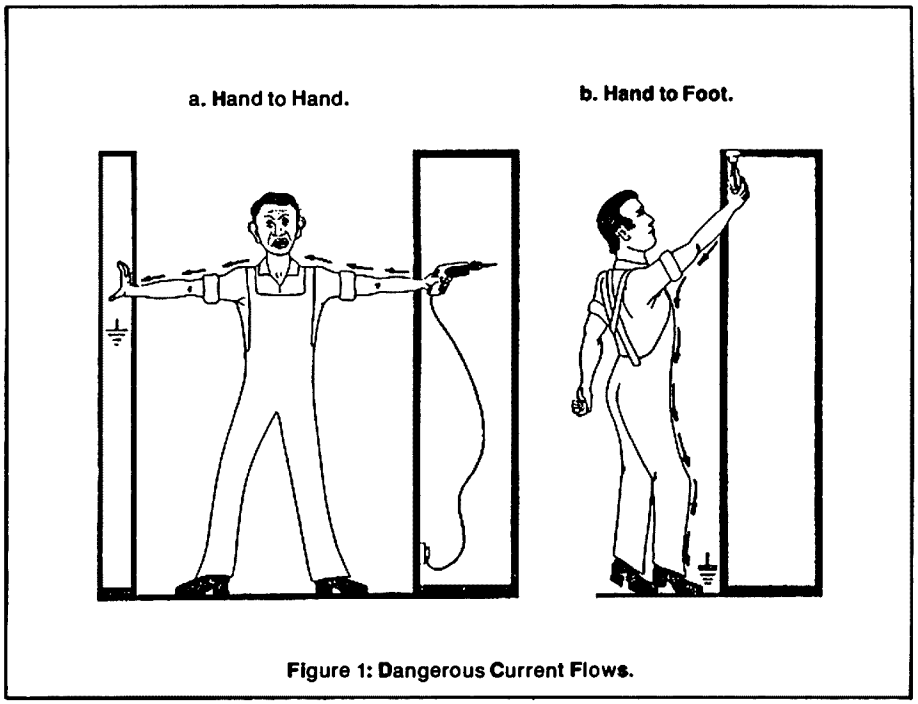


Figure 1: Dangerous Current Flows.

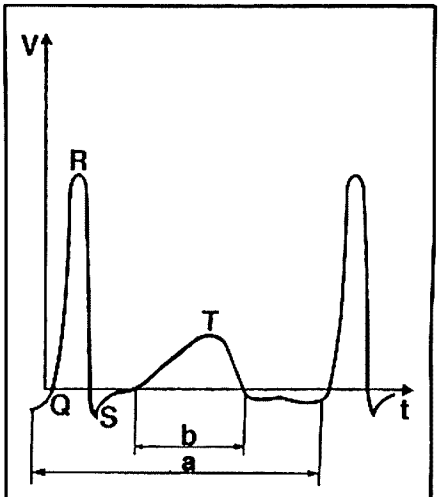


Figure 4: A Normal Electro-Cardiogram.
a. Cardiac Cycle
b. Partial Refractory (critical) Phase.

Should a person be subjected to an electric shock, and draw a current in excess of the ventricular fibrillation threshold current, death could occur if the current is high enough and that current is sustained for as brief a period as the duration of a cardiac cycle, ie 750

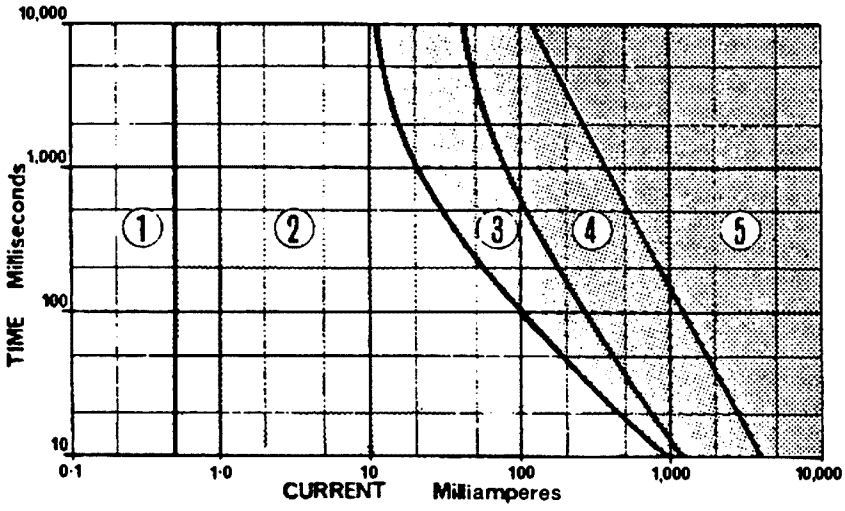


Figure 2: Zones of effects of AC Current (50/60 Hz) on Adult Persons.

current the curve separating zone 3 and 4 in Figure 1, shows a time of 300 milliseconds.

We talk glibly about dangerous voltages. We say "well 50-volts is not so bad, 110-volts, well when I was an apprentice in the workshop, it I couldn't hold 110-volts I was chicken, 240-volts, well you get a shock and 440-volts, that could be dangerous." Foolish talk — it is current that kills and a person can be as easily electrocuted with 110-volts as they could with 440-volts.

Reduce Shock Risks

Two very important rules:

— Always ensure the current carrying circuit is insulated from the frame of the appliance and
— The appliance frame is earthed or is double insulated.

Taking such precautions do not necessarily mean protection against shock, especially to the amateur who is constructing and testing equipment.

Australians are fortunate in having Electrical Safety Standards which are one of the highest in the world and yet the incidence of fatal electrical accidents are also among the highest in the world. A large number of fatal shocks experienced in the domestic situation involves appliance cords and extension cords. Due to the nature of its use, flexible cord and its

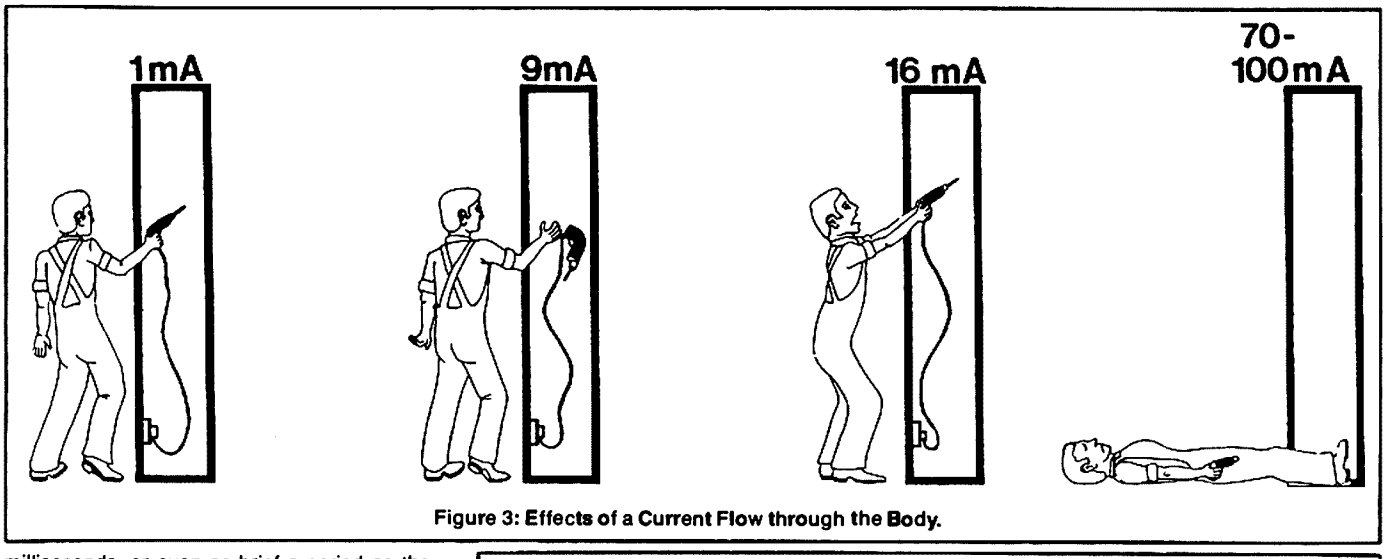


Figure 3: Effects of a Current Flow through the Body.

milliseconds, or even as brief a period as the duration of the T-phase, 150 milliseconds, if the shock coincides.

Frightening, isn't it!

The fourth most important factor to consider in determining the seriousness of the electric shock is the electrical resistance of the body. We are primarily liquid.

As a conduction of electricity, the human body is made up of two major paths. The upper layer of the skin, or epidermis, which is of relatively high electrical resistance, and the tissues, muscles, etc, which lie below the outer skin surface which are of relatively low resistance. Our upper layer of skin is our first barrier of defence. A person with a dry, calloused skin presents higher resistance to shock than a person with a soft skin. Figure 5 illustrates the minimum body resistance levels for external contact with electricity and a current path hand to hand or hand to foot. The relationship of current to voltage is not linear because the body resistance varies with the touch voltage, or breakdown of skin, at increased potentials.

A person with a moist skin, at 250 volts, has a resistance of approximately 1000 ohms, which means we are considering a maximum leakage current through the body of 250 mA. At this

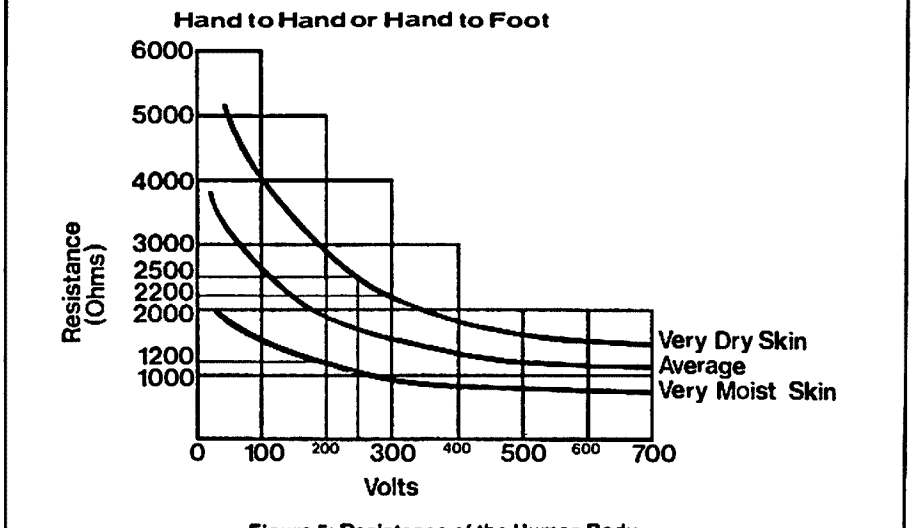


Figure 5: Resistance of the Human Body — Hand to Hand or Hand to Foot.

fittings are more susceptible to damage than permanent fixed wiring.

Wrongly wired plugs are not uncommon and often the unsuspecting user is closer to electrocution than imagined. Statistics show that about 80 percent of electrocutions which occur in the home involve the flow of current through the victim to earth. Persons are not normally accidentally electrocuted between phases or between phase and neutral. Persons electrocuted in this way are persons who normally set out to commit suicide.

Consequently a line of defence is to install an Earth Leakage Circuit Breaker — a device that will trip within 30 milliseconds of detecting current leaking to earth.

To overcome the high sensitivity required, most ELCBs use a polarised release which is capable of being actuated directly by the core output. This highly reliable device has the advantage of being only current sensitive and therefore does not require mains voltage excitation and consequently can operate under any voltage condition.

Sensitivity

It would appear that the maximum sensitivity should be 10 mA, however it is more common to use 30 mA for general applications and the 10 mA being restricted to such sensitive areas as bathrooms. Both types are readily available on the market with Approval Certificates from the Energy Authority. Generally the 30 mA types trip around 26 mA and the tripping time is around 30 milliseconds. AS.3190 states the protective device tripping time should not exceed 100 milliseconds.

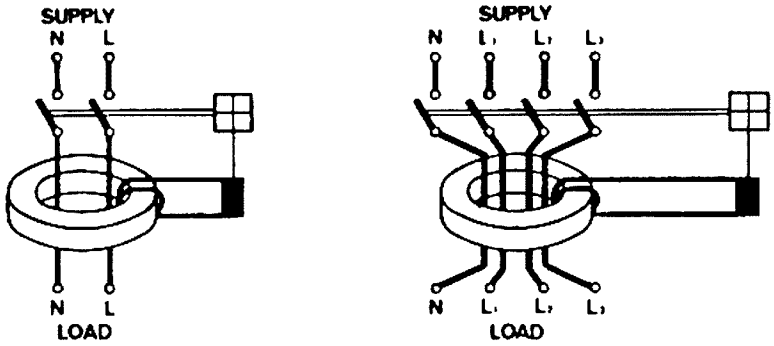


Figure 6: Diagram of the Principle of Core-Balance Protection.

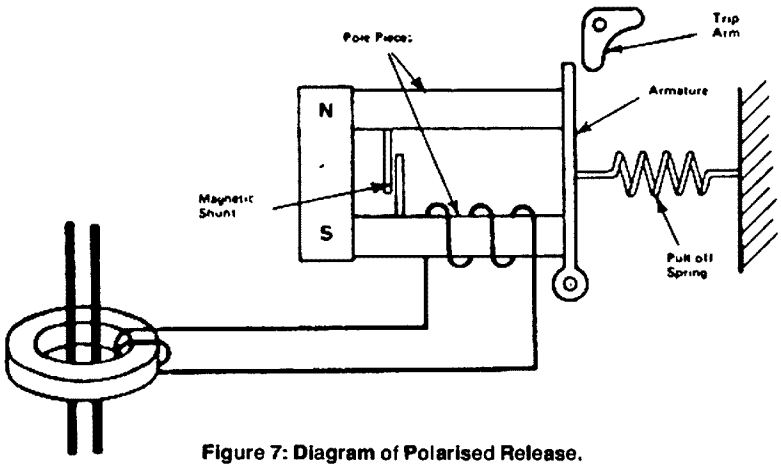


Figure 7: Diagram of Polarised Release.

The Earth Leakage (Core-Balanced) Circuit Breaker

The core-balanced device has emerged as providing the means of detecting very small earth leakage currents. As the name implies, these devices operate on the principal that the flux in the toroidal transformer is balanced under normal healthy conditions; ie the current flowing in the Active wire is equal to the return current in the Neutral wire. Should there be an imbalance because current is leaking to earth, or returning through some other means, then a magnetic flux will be generated in the core. A secondary winding on the core will have a voltage generated in it proportional to this out-of-balance flux and, if it exceeds the standard set, it will trip the breaker. See Figure 6 and 7.

Installation

Before discussing installation we should first understand how our electricity is supplied to our residence or business. Here in Australia we use a system known as MEN, which is the abbreviation for Multiple Earthed Neutral. The main supply (240-volts) is derived from a transformer, the output of which is in a three-phase star configuration. The centre of the star is Neutral and is bonded to earth. When the 240-volt supply arrives at your domestic consumer distribution board it has an Active wire and a Neutral. The Active is connected to the Supply Authority fuse, passes through your consumption meter, to an isolating switch, and then to various fuses, MCBs. The Neutral wire is connected to a Neutral block and an independent earth wire is connected to the same block, meaning that, at this point, the potential voltage is virtually zero.

The house wiring, which is normally three wires comprising an Active (A), Neutral (N) and Earth (E). Both N and E are terminated on the same terminal block at the Distribution Board, but not, of course, connected together at the General Purpose Outlet.

Installation of ELCBs are normally at the Distribution Board, however, when selected protection is required; eg in the shack or around the swimming pool, separate units can be installed. When an ELCB is installed the "load" Neutral must be independent from the supply Neutral and Earth. A typical installation is shown in Figure 9. If you decide to provide ELCB protection at the Distribution Board, you may want to consider selected circuits; eg GPOs, Swimming Pool, Bathroom, Laundry, etc, and leave such things as the Water Heater independent. Figure 10 shows typical wiring of a combination of protected and unprotected circuits.

If you have an outlet in your shack and you do not want to modify your Distribution Board, then consider a small portable unit. These usually have at least two socket outlets and you can still hang your extension blocks on them knowing you have protection.

It must be remembered that you no longer have an Earth wire from the Distribution Board connected to your equipment. Your RF or independent earthing installation is now isolated from the mains Earth. If you use a portable unit, ensure that no other equipment in the shack is connected to any other supply outlet. The UK regulations state — "No metalwork bonded to the main earthing terminal in the Consumer Distribution Unit is allowed within two metres of the radio equipment, this includes things like radiators, electric fires, kettles, etc, which are not connected to the RF Earth is mandatory."

The shack RF Earth, (we hopefully all have them), must have a low resistance. Make sure you use generously sized conductors.

How Much Equipment per Unit?

The ideal would be to have one core-balance unit per piece of equipment, however economic considerations prohibit this. To go to the other extreme and having one unit supplying a whole installation is also not wise as it is likely to introduce operating difficulties. Nuisance tripping can be troublesome. A typical example is a poorly designed fluorescent lamp switching that can create current spikes at switch-on. To overcome this, some manufacturers, such as Utilux and Scanelec have introduced a high current carrying capacity device with a tripping circuit roughly tuned to the power frequency. (Tripping current is still 30 mA). This unit attenuates any high frequency components. Alternatively, there are components that can be fitted to fluorescents that will damp out the spikes.

As the limiting number of GPOs that can be attached to a single ELCB unit can be as high as 50, it should not worry the average home user.

ELCBs are quite small. The Scanelec portable Safeguard unit is about 120 x 140 x 90 mm and the ELCB in an enclosure for fitting into a Distribution Board is 75 x 125 x 75 mm. Price for a portable unit is around $110 and for a Distribution Board unit, around $102.

Warning

ELCBs only protect you against electric shock

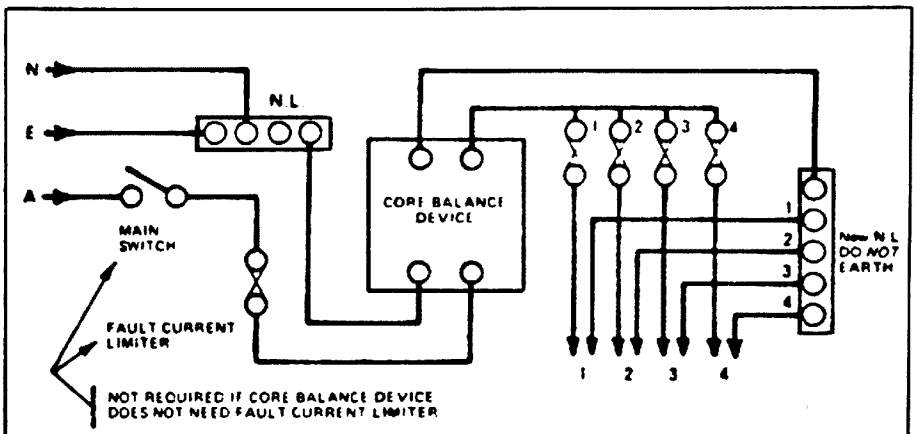


Figure 9: Typical Correct Installation of Core-Balance Device.

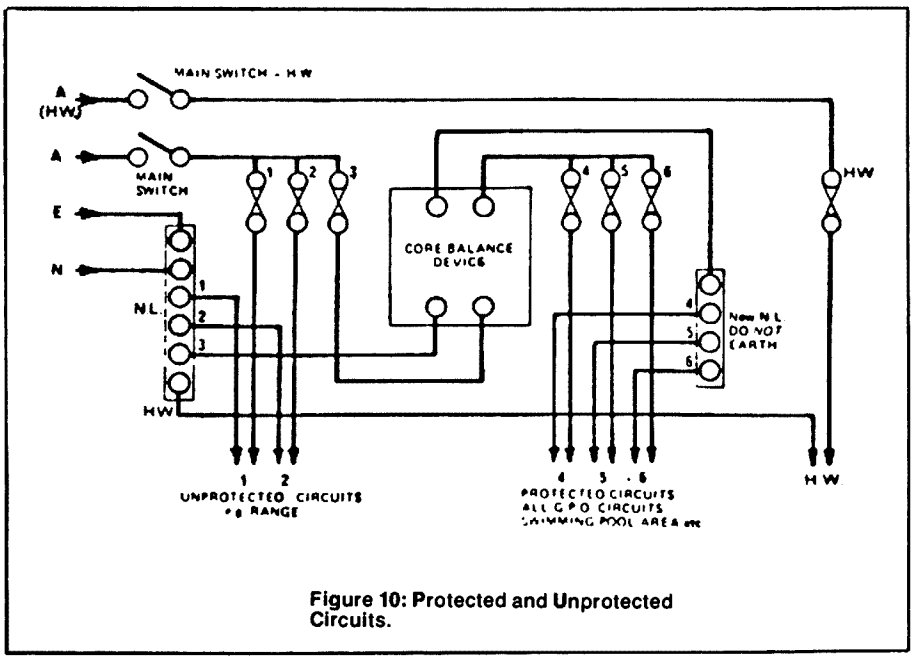
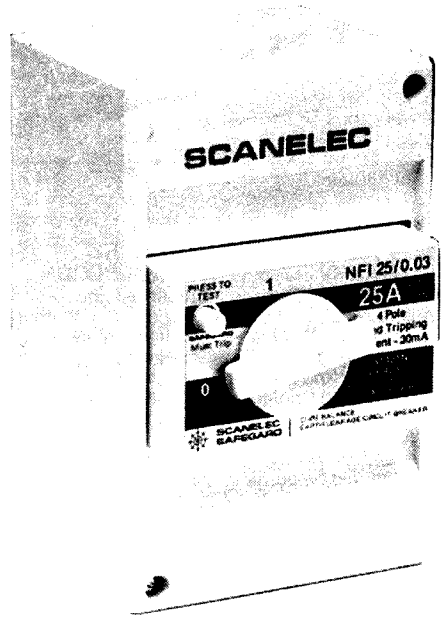
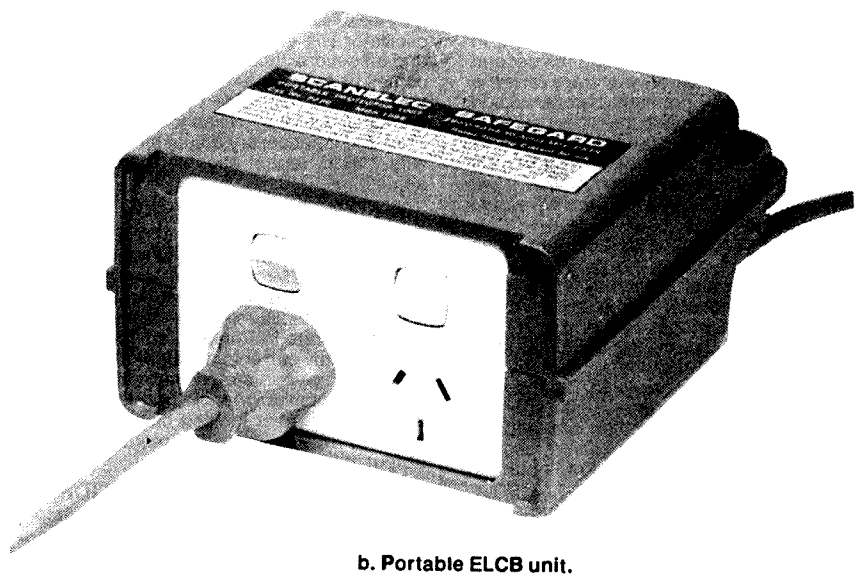


Figure 10: Protected and Unprotected Circuits.



a. For Consumer Distribution Board Mounting.

Examples of ELCB Units.



b. Portable ELCB unit.

from current passing through the body to Earth. An ELCB does not provide protection should you come in direct contact with both Active and Neutral conductors, without passing current to Earth.

It is not a substitute for a fuse or equipment overload protection.

It is also not a substitute for sensible and safe electrical practices in the use of any electrical product.

Complete technical information and application notes can be obtained from the writer at PO Box 231, Frenchs Forest, NSW. 2086.

Acknowledgments: RSGB, EPC Ltd, Ullux Pty Ltd, The Standards Association and R Thomson.

YES! The writer uses an ELCB in the shack!

WARNING: Any electrical circuit modification has to be carried out by an approved electrical contractor — regulations vary from State to State. Please consult your supply authority for advice.

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VHF-UHF BUILDING BLOCKS

Part 2

John Day VK3ZJF
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MODULE A: TWO-METRE TRANSVERTER BUILDING BLOCK

Part one of this series presented the broad outline of this new series of construction projects. In this instalment it is intended to discuss the design problems of the two metre transverter and present a design for a complete 100 mW unit. Printed circuit layouts and details will appear later.

When considering the design of transceiving or transverting equipment several important facts should be borne in mind.

1. For best performance the major bandwidth determining element of the receiver should be as close as possible to the first mixer.

2. To achieve good large signal handling capability the level of spurious responses and phase noise on the first injection oscillator should be as low as possible.

3. Gain before the first mixer should be kept as low as possible.

The first stage in the chain is the preamplifier, it should have a low noise figure (<2 dB at 144MHz), be relatively narrow band and have a good (high) third order intermodulation intercept point (large signal handling capability).

Next comes the most important section of all, the first mixer and the injection oscillator. If the signal from the oscillator is not relatively free from phase noise then the overall performance of the receiver will be degraded. For optimum performance the mixer should have a high injection level (+7 dBm or greater), be accurately terminated on all ports and be followed by an amplifier that can easily handle the large signals occurring out of the nominal passband until the main filter is reached.

INJECTOR OSCILLATOR CHAIN

Two variations on the oscillator chain may be built, the first for 116 MHz injection for use in converting 28 MHz to 144 MHz and the second for 94 MHz injection when the transverter is used with a 5o MHz IF. For ease of construction and testing it was decided that the oscillator should be kept below 100 MHz. At these frequencies it is possible to use designs that are easy to get going, clean and stable. If we were to run the oscillator at 116 MHz life would be a little more difficult.

The oscillator, A1Q1, is a common base Butler arrangement, L1 in the drain circuit is resonant at the crystal frequency in conjunction with the feedback capacitors and is necessary to ensure proper overtone operation of the crystal. The crystal, Y1, is 58.000 MHz third overtone for 116 MHz operation or 94.000 MHz fifth overtone. No provision is made for adjusting the crystal frequency, the normal tolerance of the crystals specified is adequate. The oscillator is followed by a source follower buffer (A1Q2) which drives the low input impedance of the frequency doubler.

Rather than use an active doubler (transistor, FET or MOSFET), a full wave rectifying doubler (A1D1 and A1D2) was chosen. This arrangement, although having a significant insertion loss, of typically 5-7 dB, is trouble free in operation, requires no alignment and gives better suppression of unwanted output products. The trifilar input transformer (A1T1) acts in the same way as a centre tapped power transformer, the two sections of the secondary deliver two outputs 180 degrees out of phase, thus the diodes pass alternate half cycles of the input frequency, resulting in output at twice the input frequency. Following the doubler is a pair of critically coupled tuned circuits to select only the desired output frequency and an amplifier (A1Q3) to raise the output level to +16 dBm to drive two diode double balanced mixers through a resistive power splitter/attenuator arrangement.

The power level from this module can be adjusted by varying the supply voltage to the first two stages. Regulator U1 provides nominal six volt regulated which can be varied with minimal effect on circuit performance. Power consumption of this module is approximately 60 mA at 12 volts regulated. The design was optimised for performance not low power consumption!

As previously stated, it is important that the diode double balanced mixers should see 50 ohms at all ports. By generating a significantly higher level of injection that is needed, the amplifier can be followed by a 3 dB resistive splitter giving two outputs of +13 dBm and a 6 dB attenuator for each mixer to give a reasonably closely controlled 50 ohm source for each.

If the chain is used for 94 MHz injection, the inductors must be changed (refer parts list) and a resistive attenuator is used in place of the doubler. Alignment is simple, apply 12 volts to the board, adjust A1R10 for six volts at the top end of A1L1, in the drain of A1Q1. Remove power and install the crystal on the board, connect a 50 ohm detector to the output and with power applied adjust all slugs for maximum power out. The oscillator tuned circuit may need to be adjusted slightly to ensure the oscillator will start reliably, turn the power on and off several times and check that the output comes up to full level quickly, if not tune A1L1 a turn or two either side of peak level until the oscillator will start reliably. Check the output level and if necessary adjust for +16 to 17 dBm with A1R10, repeat alignment procedure after adjusting A1R10.

TUNING HINTS

If you are using only one of the outputs, the other should always be terminated in 50 ohms (a 51 ohm 0.125 or 0.25 watt carbon resistor is adequate) or the output level and impedance will be unpredictable. All of the amplifying stages operate in Class A, so you cannot use power supply current as a method of tuning up. In fact, if power supply current changes, it usually indicates one of the stages is being over-driven and is leaving class A conditions, the only way to tune this module is with an output indicator.

TRANSMIT MIXER SECTION

The transmit mixer is inherently very simple. It consists of an attenuator section, a mixer and two power amplifier stages. If the specified SBL-1 mixer is operated near its nominal maximum input level (say 0 dBm) then the third order intermodulation products are only 30 dB below the desired output. This is marginal for most applications, by reducing the input level 10dB to -10 dBm (100 uW) the distortion products fall three faster becoming — 60 dBc (dB relative to desired carrier), a much more acceptable position.

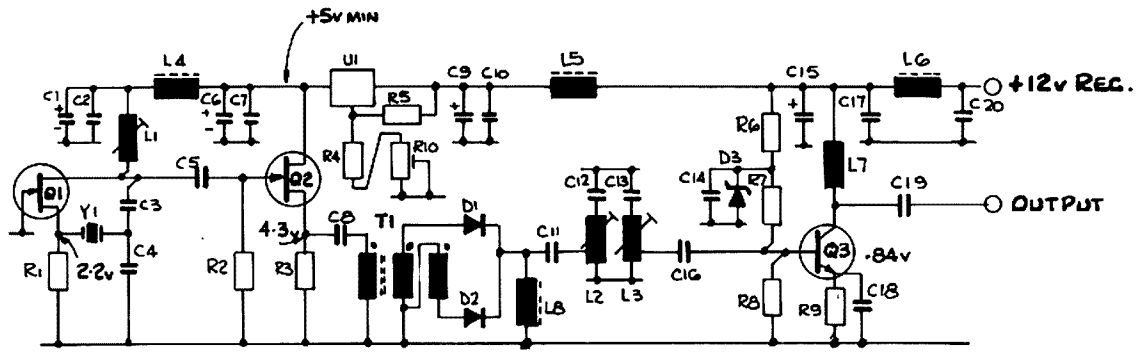
If you are using the transverter with the VK3AFQ transceiver boards then you will have a -10 dBm output available directly, if not then you will need to consult the table of attenuator resistors and fit the appropriate values for your application. The local oscillator input is fitted with a 6 dB pad as discussed earlier.

Output from the mixer is fed directly to a tap on the first of a pair of over coupled tuned circuits which are used to define the basic bandwidth of the transmit converter. The bandwidth of this pair is not sufficient to cover all of the two metre band but will adequately cover 144-146 MHz, the area it is expected to be used in. A low impedance tap on the second tuned circuit is coupled into the first amplifier stage.

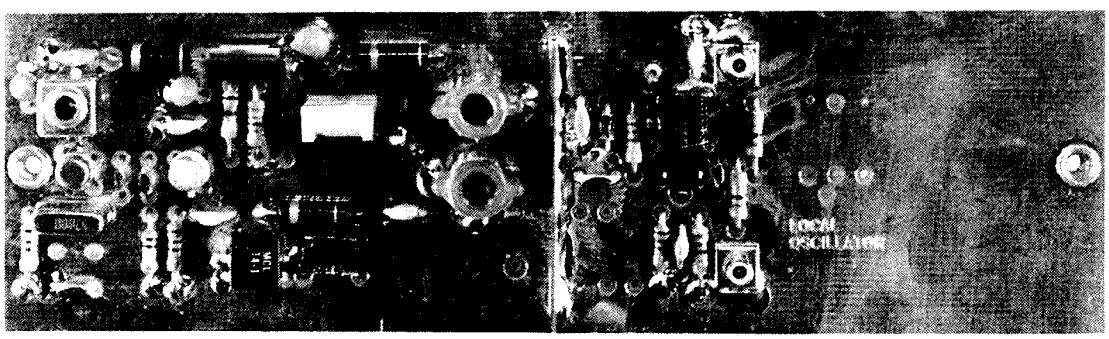
The amplifier used in this design is designed specifically for high gain with very low distortion. If anyone cares to take the time they would find that the impedance matching in these two stages is in fact only optimised on the output of the second stage. This has been done for a very good reason, if the devices were optimally matched the available gain would have been excessively high, this would have (and on the bench has) resulted in uncontrollable feedback. Dual gate MOSFET A2Q1 is operated in a fairly conventional manner, the ubiquitous BF981 is used here because of its high gain, low intermodulation and low noise which is almost as important in transmitters as receivers. The tuned circuit with capacitive tap in the drain is resonant at the operating frequency but provides a non optimum match as discussed. It is ABSOLUTELY ESSENTIAL that this inductor be screened or almost certain instability will result due to coupling from the output matching network.

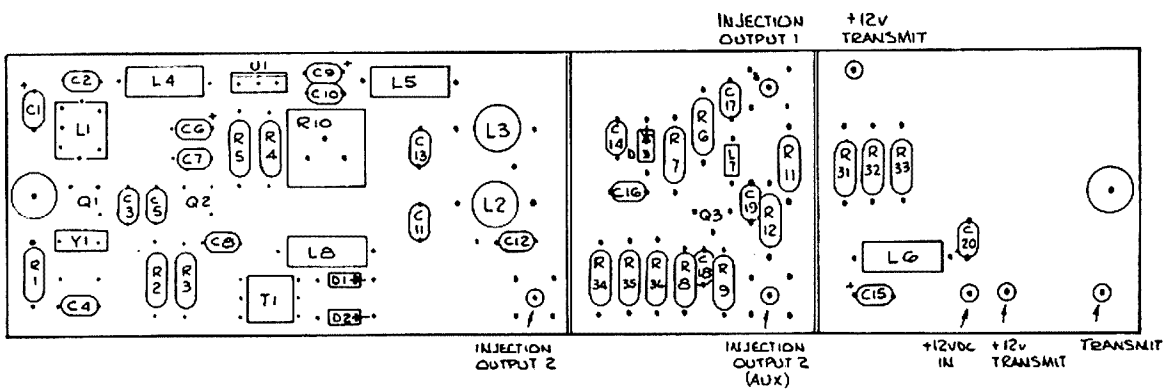
Output amplifier A2Q2 and its associated circuitry is the most complicated single stage in the entire transverter. The BFR96 transistor used here has an fT of approximately 5 GHz and has an unmatched gain of over 25 dB at two metres. Degenerative emitter feedback has been applied to reduce the gain and more precisely define the input and output impedances. A rather complex operating point stabilisation circuit is used to ensure the transistor stays firmly in Class A under all normal conditions. The output power from this stage is nominally +20 dBm (100 mW) with second harmonic suppression of over 50 dB and third order intermodulation products suppressed by a similar amount.

It is suggested that if you intend to build this stage other than on the PCB that has been laid out do so with considerable forethought due to the considerable potential for instability. On the other hand a number of prototype units have shown no tendency towards instability under any circumstances when carefully constructed.

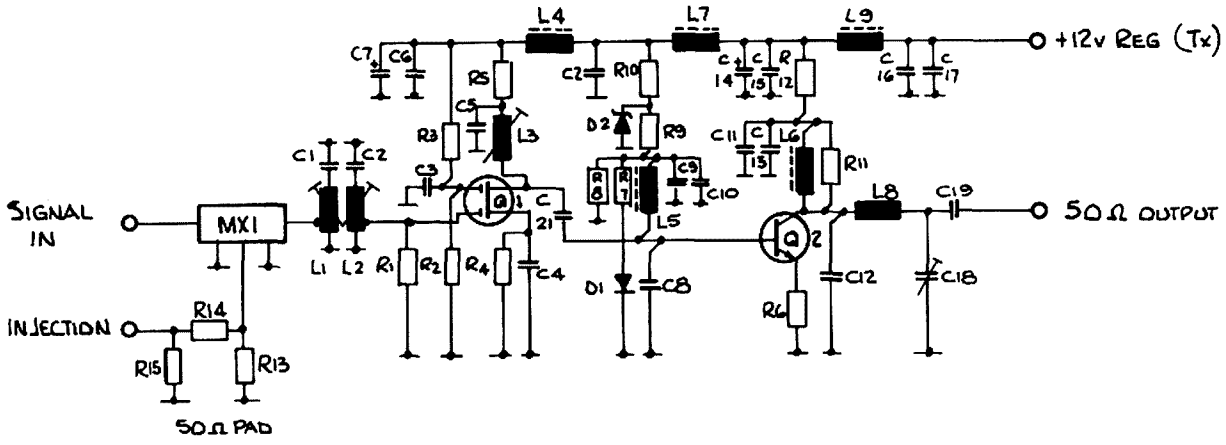


Module A Sub-assembly 1
Injection Oscillator
Module component designations are prefixed with A1

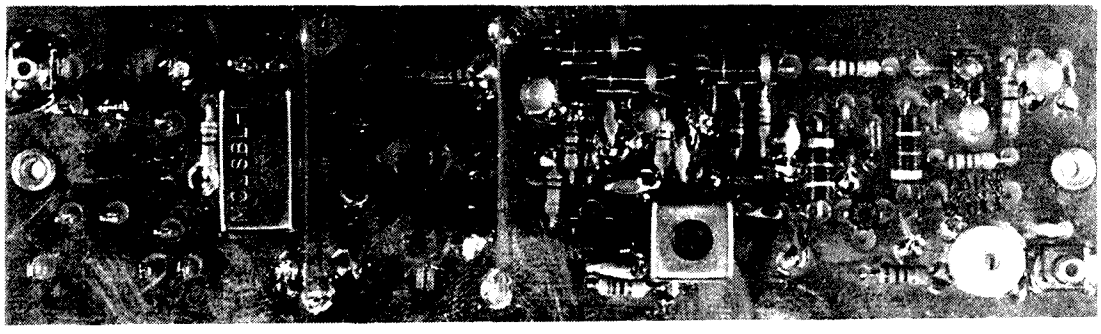


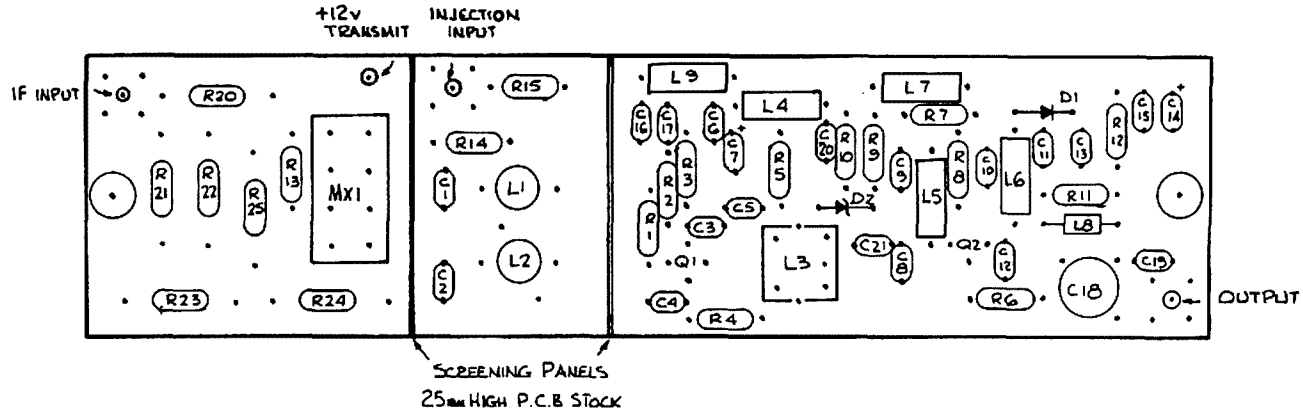


Injection Oscillator — Parts Layout.

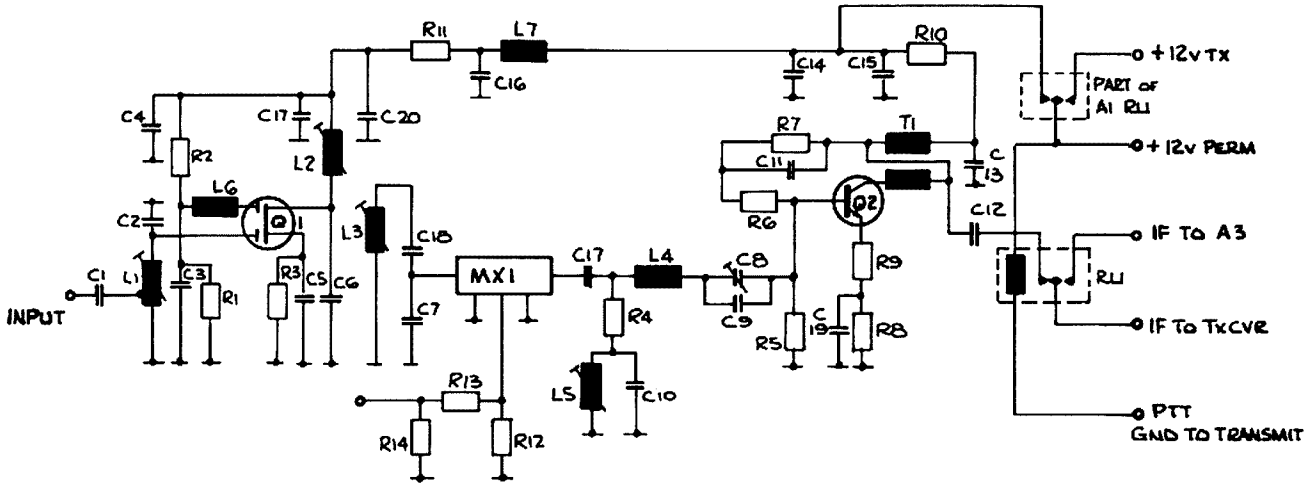


Module B Sub-assembly 2 Transmit Converter
Module component designations are prefixed with A2

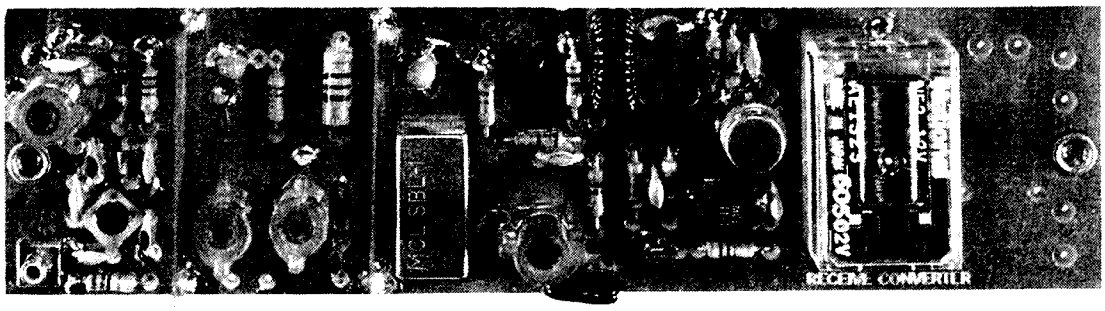


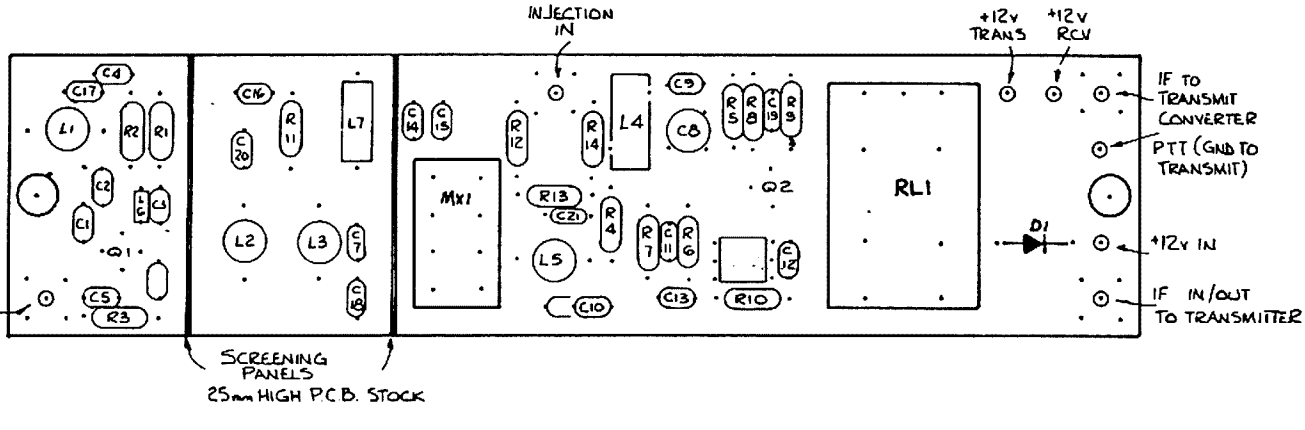


Transmit Converter — Parts Layout.



Module A Sub Assembly 3 Receive Converter
Module component designations are prefixed with A3





Receive Converter — Parts Layout.

RECEIVE CONVERTER

This final segment of the two metre transverter is in fact the most simple. The line up is absolutely classical and no attempt has been made to 'fool around' with a design that has proven immensely successful for many two metre enthusiasts around the world. As in the successful converter design by Harold VK3AFQ, no attempt has been made to 'noise match' the input. It was found that no improvement could be measured unless great care and patience was taken and was thus not considered worthwhile.

The operating point of the BF981 should be set at Id = 10 mA for close to optimum noise performance. Following the amplifier is another pair of coupled tuned circuits, the output of the second being capacitively tapped to drive the mixer.

Much has been written over the years about methods of providing good broadband 50 ohm terminations for double sideband mixers. The technique to be used is known as a bandpass/band stop diplexer. Essentially this is a good type of filter that provides a band pass action with a good 50 ohm characteristic at the input over a wide band of frequencies.

IF Amplifier stage Q2 and its associated components form a broadband Class A amplifier with shunt and series feedback. Not only does this give good overall performance but this stage has a reasonably well defined input impedance of approximately 50 ohms. A signal at the output of the mixer at the IF frequency will be passed to the amplifier by the bandpass element of the diplexer (A3L4, A3C8 and A3C9). At the IF frequency the impedance of this circuit is low allowing a low insertion loss of approximately 0.75 dB on the prototypes presently made, the shunt arm of the diplexer (band stop) will have a higher impedance and thus have little effect. As the frequency moves away from the IF such as for images and spurious responses, the series arm impedance will rise while the shunt arm impedance will fall. This will mean little energy will be transferred but a good 50 ohm match will remain due to the presence of A3R4.

A single tuned circuit in the drain of Q2 is tapped for approximately 50 ohm output impedance to drive the following receiver. As in the case of the transmitter, a 6 dB pad is provided on the mixer LO port.

ALIGNMENT

Having ensured that the local oscillator is working and with the appropriate selection of A3L4, A3L5, A3C8, A3C9 and A3C10 from the option table for your IF frequency you may now proceed to the alignment of this module. With the IF connected and a signal source connected and tuned in, preferably using a beacon or another amateurs signal. Tune A3L1, A3L2, A3L3, A3L5 and A3C8 for maximum signal strength. If a very weak signal is available A3L1 may be optimised for noise figure. This point will not occur at the best gain setting. Simple isn't it, your two metre converter is now working!

CONSTRUCTION

The printed circuit boards for Modules A1, A2 and A3 can be made available in a single piece. If this is done then most of the required interconnection is already done for you. All that needs to be supplied externally is an insulated connection from the 12 volts DC input terminal on the receive converter board to the 12 volt DC input on the LO module. Apart from some means of switching the antenna side, these three modules now form a complete 100 mW two metre transverter.

PART LISTS — MODULE A

Sub-assembly 1, the Injection Oscillator

A1C1	4.7uF	16V or greater Tantalum
C2	10nF	Ceramic bypass
C3	22pF	NPO Ceramic plate
C4	100pF	NPO Ceramic plate
C5	10pF	NPO Ceramic plate
C6	4.7uF	16V or greater Tantalum
C7	10nF	Ceramic bypass
C8	1nF	Ceramic
C9	10uF	16V or greater Tantulum
C10	100nF	Monolithic Ceramic
C11	1n8	Ceramic
C12		See option table
C13		See option table
C14	10nF	Ceramic bypass
C15	4.7uF	16V or greater Tantulum
C16	100pF	NPO Ceramic
C17	1nF	Ceramic bypass
C18	1nf	Ceramic bypass
C19	22pF	NPO Ceramic
C20	100nF	Monolithic ceramic
A1D1	5082-2800	Hot carrier diode
A1D2	5082-2800	Hot carrier diode
A1D3	8.2V	400mw 10% Zener diode
A1L1		See option table
A1L2		See option table
A1L3		See option table
A1L4	22uH	Moulded *miniature* RF choke
A1L5	22uH	Moulded miniature RF choke
A1L6	10uH	Moulded miniature RF choke
A1L7		See option table
A1L8	15uH	Moulded miniature RF choke
A1Q1	U310	JFET (Do not substitute)
A1Q2	2N4859A	(Do not substitute)
A1Q3	BFR96	A BFR96S or BFW92 may be suitable
A1R1	220R	0.125W Carbon Film five percent
A1R2	100K	
A1R3	220R	
A1R4	750R	
A1R5	240R	
A1R6	330K	
A1R7	3K3	
A1R8	1K	
A1R9	33R	
A1R10	2K	Trim pot (Spectrol Model 63)
A1R11	15R	0.125W Carbon Film five percent
A1R12	15R	
A1T1		7 turns Trifilar 26 SWG on Amidon T25-43 core or MCL T4-1 Transformer
A1U1	LM317LZ	TO92 Voltage regulator
A1Y1		*Third overtone crystal HC18/U holder,* series resonant

Parts List - Modulo A - Sub-assembly 2, Transmit Converter.

A2C1	5.6pF	NPO Ceramic
A2C2	5.6pF	NPO Ceramic
A2C3	1nF	Ceramic plate
A2C4	1nF	Ceramic plate
A2C5	1nF	Ceramic plate
A2C6	10nF	Ceramic plate
A2C7	4.7uF	16V Tantalum
A2C8	12pF	NPO Ceramic
A2C9	1nF	Ceramic plate
A2C10	100nF	Monolithic ceramic
A2C11	100nF	Monolithic ceramic
A2C12	22pF	NPO Ceramic
A2C13	100nF	Monolithic ceramic
A2C14	10nF	Ceramic plate
A2C15	10uF	16V Tantulum
A2C16	100nF	Monolithic ceramic
A2C17	10uF	16V Tantulum
A2C18	45pF	Teflon film trimmer
A2C19	1nF	Ceramic plate
A2D1	1N914	or similar silicon diode
A2D2	5.6V	400 mW ten percent Zener diode
A2L1		48A227MPC Tapped 1.75T from cold end
A2L2		48A227MPC Tapped 1.25T from cold end
A2L3		5T 26SWG 4 mm Former (Must have shielded can)
A2L4	10uH	Moulded miniature RF choke
A2L5	1uH	Moulded miniature RF choke
A2L6	1uH	Moulded miniature RF choke
A2L7	10uH	Moulded miniature RF choke
A2L8		4T 4mm Diam Air core, spread 10mm (to fit holes)
A2L9	10uH	Moulded miniature RFC
A2MX1	SBL1	Mini Circuits Labs mixer
A2Q1	BF981	Dual Gate MOSFET (A MFE131 may work)
A2Q2	BFR96S	Trabsistor (do not substitute)
A2R1	100K	0.125W Carbon Film five percent
A2R2	10K	
A2R3	15K	
A2R4	68R	
A2R5	100R	
A2R6	10R	
A2R7	10R	
A2R8	680R	
A2R9	330R	
A2R10	270R	
A2R11	220R	
A2R12	15R	

PARTS LIST — MODULE A

Sub-assembly 1, Injection Oscillator

Part	92-94 MHz	116 MHz	
A1L1	8T 26SWG	7T 26SWG	Amidon L33-10 Former
A1L2	48A287MPC	48A227MPC	Miller coil Tap 1.75 turns
A1L3	48A287MPC	48A227MPC	Miller coil Tap 1.50 turns
A1L7	4T 26SWG	5T 26SWG	Close wound 5mm Air Core
A1C12	6.8pF	5.6pF	NPO Ceramic Plate capacitor
A1C13	6.8pF	5.6pF	NPO Ceramic Plate capacitor
A1Y1	92.000		52 MHz to 144 MHz
A1Y1	94.000		50 MHz to 144 MHz
A1Y1		58.000	28 MHz to 144 MHz

For 92-94 MHz operation leave out A1T1, A1D1, A1D2, A1L8 and put a wire link in as shown on layout diagram.

PARTS LIST MODULE A

Sub-assembly 3. Receive Converter

A3C1	1nF	Ceramic plate
A3C2	2.2pF	NPO Ceramic plate
A3C3	1nF	Ceramic plate
A3C4	1nF	Ceramic plate
A3C5	1nF	Ceramic plate
A3C6	4.7pf	NPO Ceramic plate
A3C7	68pF	NPO Ceramic plate
A3C8		See option table
A3C9		See option table
A3C10		See option table
A3C11	10nF	Ceramic
A3C12	1nF	Ceramic plate
A3C13	10nF	Ceramic
A3C14	100nF	Monolithic Ceramic
A3C15	10uF	16V Tantalum
A3C16	10nF	Monolithic Ceramic
A3C17	10nF	Ceramic
A3C18	4.7pF	NPO Ceramic plate
A3C19	10nF	Ceramic
A3C20	1uF	TAG Tantalum
A3C21	10nF	Ceramic
A3D1	1N4002	Or similar Silicon 1A Diode
A3L1	220nH	48A227MPC Miller coil (Blue)
A3L2	220nH	48A227MPC Miller coil (Blue)
A3L3	220nH	48A227MPC Miller coil (Blue)
A3L4		See option table
A3L5		See option table
A3L6	FC540	Amidon choke bead on lead of A3R2
A3L7	10uH	Moulded RFC
A3MX1	SBL-1	Mini Circuits Labs mixer module
A3Q1	BF981	Dual Gate MOSFET
A3Q2	2N3866	TO-39 Transistor
A3R1	10K	0.125W Carbon resistor five percent
A3R2	22K	
A3R3	33R	
A3R4	51R	
A3R5	1K	
A3R6	560R	
A3R7	3K3	
A3R8	100R	
A3R9	4R7	
A3R10	100R	
A3R11	100R	
A3R12	150R	
A3R13	39R	
A3R14	150R	
A3RL1	NF2-12V	National 2 pole 12V relay

DIPLEXER OPTIONS MODULE-A

Sub-assembly 3, Receive Converter

OPTIONS TABLE FOR IF DIPLEXER

From the following table you should choose a set of values for your particular IF frequency. If you need a set of values for another frequency you can calculate your own from information to be included later in this series.

IF = 10.7 MHz

A3L4	3.9uH	35T 22G T50-10 Amidon Core
A3L5	146nH	48A147MPC Miller coil (Orange)
A3C8	27pF	Teflon foil Philips trimmer
A3C9	51pF	Dipped Mica
A3C10	1500pF	Dipped Mica

IF = 28 MHz

A3L4	142uH	21T 22G T50-10 Amidon Core
A3L5	57nH	48A518MPC Miller coil (Brown)
A3C8	22pF	Teflon foil Philips trimmer
A3C9	10pF	NPO Ceramic plate
A3C10	510pF	Dipped Mica

IF = 52 MHz

A3L4	765nH	16T 24G T37-10 Amidon Core
A3L5	31nH	75F328MPC Miller coil (Orange)
A3C8	22pF	Teflon foil Philips trimmer
A3C9		Not used
A3C10	270pF	Dipped Mica

WIRELESS INSTITUTE OF AUSTRALIA

REMEMBRANCE DAY CONTEST 1987

OPENING ADDRESS

by Dame Beryl Beaurepaire DBE

Chairman, Australian War Memorial, Canberra

Dame Beryl Beaurepaire, as Beryl Bedggood, had an early start in radio.

I was delighted to receive the invitation from your President, Mr David Wardlaw VK3ADW, to open the Wireless Institute of Australia Remembrance Day Contest.

I was particularly pleased because, as Chairman of the Australian War Memorial, I am aware of some direct help given to the Memorial by one of your members. When we started to repair our Lancaster bomber, G for George, our then Director, Air Vice-Marshal Flemming, found that much of the wireless equipment was missing. He and, of course, the Council were delighted when Maurie O'Keefe VK3KO, a former member of the Air Force, offered to help locate the necessary parts. In fact, Maurie himself served as a wireless operator in 460 Squadron based at Binbrook in England and is very knowledgeable in this field.

However, the focus of attention of this contest is to remember with respect those 26 amateur radio operators from throughout Australia who gave their lives in the service of their country during World War II, whilst being members of the armed services and serving in many zones of war.

This contest is conducted on the weekend nearest to August 15, being V-Day of the south-west Pacific Theatre of World War II. Therefore it is an appropriate way to remember those 26 brave men.

The great freedom which the Australian community enjoys today and the particular broad freedoms of amateur operators to pursue their chosen interests within the Amateur Radio Service of Australia are direct results of the demonstration of loyalty and effort of all those who, during wartime, have dedicated themselves to the service of their country and, in fact, in many cases are still serving their country in voluntary capacities.

This contest provides an excellent opportunity for amateur operators, whether they are members of the Institute or not, to come together in a spirit of friendly competition and to reflect upon their individual contribution to the community in which they live.

The Wireless Institute of Australia has, for the past three-quarters of a century, represented the interests of amateur operators in this country. The individualistic nature of your interests in amateur radio will mean that there will be many points of view to represent and the Institute has a difficult role in interpreting and representing those interests to Government and International authorities.

Your support and direct involvement in the affairs of the Wireless Institute of Australia will ensure a continuity and presence of the Amateur Radio Service in the future.

I note with interest that your counterparts in New Zealand are, for the first time, conducting their Memorial Day Contest during the same period as this Remembrance Day Contest, and I am sure there will be much friendly competition and co-operation between you over the next 24 hours.

I hope the co-operation between you and your New Zealand counterparts will continue in the future, not only in this Remembrance Day Contest. Amateur Radio Operators have a great deal to offer our community. After all, we are not always able to afford expensive satellite and computer type communication networks.

Thank you for giving me this opportunity to pay a tribute to the operators who died, and also to all Amateur Radio Operators.

Dame Beryl Edith Beaurepaire

Dame Beryl was born in Melbourne and educated at Fintona Girls School, later continuing her education at the University of Melbourne. She joined the Womens Australian Auxiliary Air Force (WAAAF) later to become the Womens Australia Air Force (WAAF), and known today as the Womens Royal Australian Air Force (WRAAF).

Dame Beryl on graduation, was one of the first eight WAAAF's to be appointed as a Meteorological Officer in 1945.

She has served the community by being a member on numerous voluntary service committees, acting in the capacity as a member, chairwoman, vice-president, president, and even to being the President of her old school's Board of Management.

This lady's community work was recognised when she received the Order of the British Empire in 1975 and further recognition came when she was created a Dame of the British Empire in 1981.

Dame Beryl Edith Beaurepaire, DBE, a very fitting choice, because of her present position as Chairman of the Australian War Memorial and is the first lady to deliver an opening address for a Remembrance Day Contest. She joins the ranks of Governors, Prime Ministers and other notable personalities in this role.

BUILDING BLOCKS REVISITED
Part 5

This article describes two modules. Module One is the board containing RF amplification, signal filtering and mixing processes, whilst Module Seven comprises a board that contains a fixed frequency crystal oscillator, mixer, filters and an amplifier.

Module One can be used for both receiving and transmitting, whilst Module Seven is used to heterodyne the 2.9-3.4 MHz VFO (described in Part 4) up to the injection frequency required for any specific amateur band.

It must again be emphasised that although these two modules are described in the context of an amateur transceiver, they have 'stand alone' uses wherever it is necessary to provide RF amplification, signal frequency filtering or frequency translation in the HF range.

MODULE ONE — RF AMPLIFIER

Figure 23 gives the circuit diagram of the module whilst Figure 24 shows the layout of components on the 6 x 1.5 inch (153 x 38 mm) single sided circuit board.

The device chosen for the RF amplifier is a 2N5109 bipolar transistor. This device was developed for use in CATV applications. It has unity gain/bandwidth of over 1.2 GHz and excellent intermodulation characteristics.

The transistor is used in a broadband configuration and is both preceded and followed by two pole, doubly terminated, bandpass filters to establish the required operating frequencies.

The coil and capacitor values for the various amateur bands are given in Table 1. The design of these filters is based on the method detailed by Hayward and De Maw on page 239 of the ARRL publication *Solid State Design for the Radio,* a book which is obtainable through your Division. Anyone having a requirement for frequency 'slices' other than those set out in Table 1 are referred to that publication. Since this project required the writer to do many of the multi-step calculations, a simple program for a Commodore C64 was developed, to ease the burden. A copy of this program is included with this article for the C64, and should be easily transposed into other BASIC language dialects.

As shown, the amplifier has a gain of 10 to 11 dB and has a -3 dB bandwidth of 1 to 35 MHz. Each of the two bandpass filter sections have a 2 dB insertion loss so that the overall gain of the stage is between 6 and 7 dB. Input and output impedances of both filter sections and of the amplifier are 50 ohms.

The mixer uses the Mini-Circuits SBL1, the same as that used for the product detector of Module Four, described in Part 2 of this series. As indicated, when discussing the product detector DBMs of this type require to 'see' 50 ohms at all three ports if their good intermodulation characteristics are to be realised. An oscillator injection of +7 dBm (5 mW/50 ohms) is also required at pin 8. Provided these requirements are met, the SBL1, will operate at all frequencies up to 500 MHz.

The mixer insertion loss is in the order of 6 to 7 dB, so that the overall gain of the board from the antenna input to IF output is 0 dB, a gain of 1.

This 'no gain' situation is quite deliberate and is in keeping with the current design philosophy of minimising gain until after the IF filter. Since the major contributors to intermodulation are usually the RF and mixer stages, preceding the IF filter, the need to minimise pre-filter gain is obvious.

The RF amplifier is a 'strong' one and operates in Class A, with a collector current of 65 mA. Besides being able to handle received signals of up to S9 + 40 dB (50 mV into 50 ohms) without any discomfort, the stage is also capable of handling transmit levels of up to 10 mW output and still keep intermodulation products below -35 dBm.

Thus, in addition to its receiving function, the unit can be used as a transmit mixer and transmit signal preamplifier. The necessary input and output changeovers are made with miniature relays.

Construction is straightforward and needs only care in parts placement and soldering. The relays are only needed if transceiver operation is contemplated. If they are not used, then the wire links across the appropriate places will be needed to maintain circuit continuity.

The coils L31, 32, 33 and 34 are identical and should be wound as tightly as possible onto the specified core, so that the turns are evenly spaced over 90 percent of the space available.

The capacitors C31 to C36 should be dipped mica types, although ceramic discs could be used if the unit is used for receiving purposes only.

The method of winding the bifilar transformer T31 (and the bifilar and trifilar transformers T2 and T3 of Module Seven) is shown in Figure 25.

When 12 volts is applied and with the two relays inoperative or not installed, the current drain should be around 65 mA.

Tuning the bandpass filters does really require a signal generator at this stage. If one is not available, then the trimmer capacitors should be set at about half capacity and peaked with an 'on air' signal, when all the boards are assembled into a finished receiver.

Whether this alignment signal comes off air or from a generator it should be in the middle of the band of interest and all four trimmers adjusted for maximum output.

MODULE SEVEN — THE INJECTION MIXER

The function of this module is to translate the 2.9 to 3.4 MHz VFO frequency to that for any required (for any specific amateur band) by the receive/transmit mixer of Module One.

The circuit diagram is given in Figure 21, while the layout of the components on the 6 x 1.5 inch (153 x 38 mm) PCB is shown in Figure 22.

Before examining the circuit in detail it is necessary to set out the frequency plan both in general terms and for specific amateur bands.

The frequency of the injection to the receive/transmit mixers is always higher than the signal frequency by the frequency of the chosen IF

$$\text{ie } F(inj) = F(sig) + F(IF) \text{ MHz}$$

Since the IF used herein is 8 MHz this simplifies to:

$$F(inj) = F(sig) + 8 \text{ MHz}$$

This injection frequency is obtained by premixing the 2.9 - 3.4 MHz VFO with the output of a crystal oscillator is:

$$F(xo) = F(inj0 - 2.9 \text{ MHz}$$

The detail for each amateur band is given in Table 2.

The module contains four basic functions

1 A crystal oscillator.
2 An active mixer with broadband output.
3 A bandpass filter.
4 A broadband amplifier.

The crystal oscillator is designed round a BF981 dual gate FET and is so configured that its output can be either on the crystal frequency or at twice the crystal frequency. The mode of operation is determined by the constants of the tuned circuits L9/C19 and L10/C20 and 21.

This approach has been adopted so that the crystal used can remain below the practical manufacturing limit of 25 MHz for fundamental mode units.

Table 2 gives the mode of operation of the crystal oscillator for each amateur band, while Table 3 gives the coil and capacitor data.

Output is taken from the junction of C20 and C21, which point has an impedance, approximating to 500 ohms.

The mixer used in this application is a MC1496 active doubly balanced device. Whilst another SBL1 passive mixer could have been used on the grounds of uniformity, the MC1496 requires less drive and is somewhat more flexible from a design point of view. In this premixing application its inferior intermodulation performance is not as important.

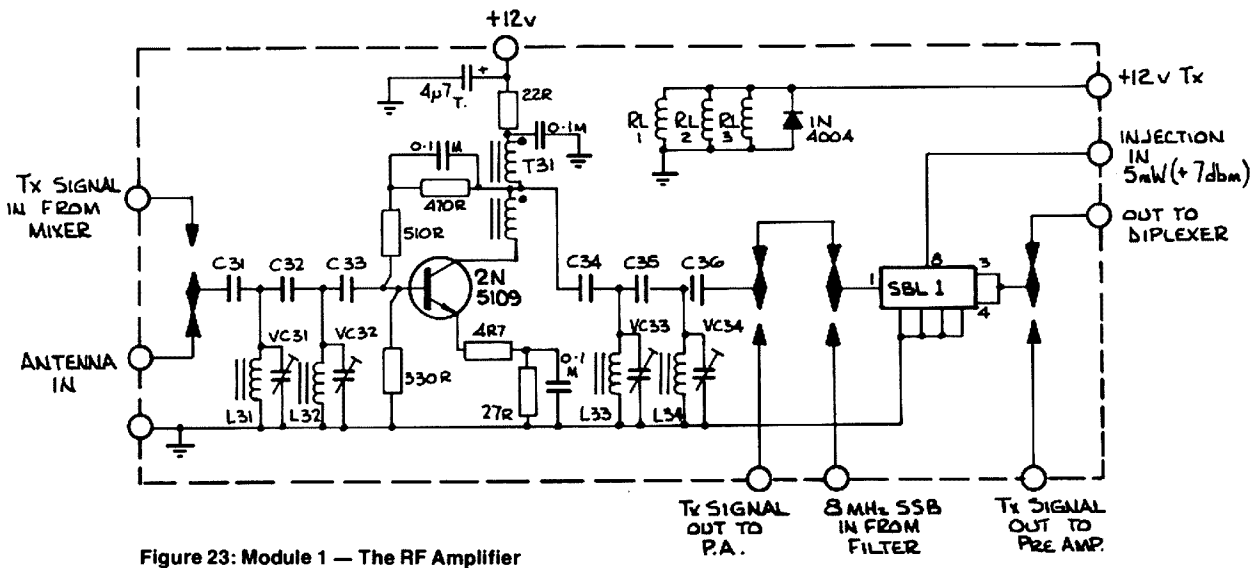
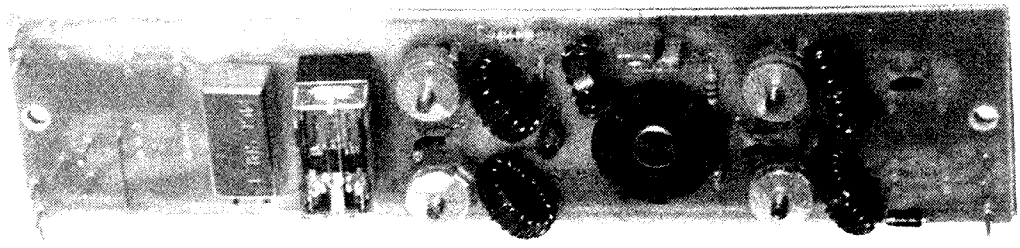


Figure 23: Module 1 — The RF Amplifier Circuit Diagram.

T31 — 10 bifilar turns of 26G Enamelled Wire wound on an Amidon T50/43 Ferrite Ring.

For details of VC31 to VC34, C31 to C36 and L31 to L34 — Refer to Table 4.



Module 1 — The photograph shows only one of the three relays installed on the board.

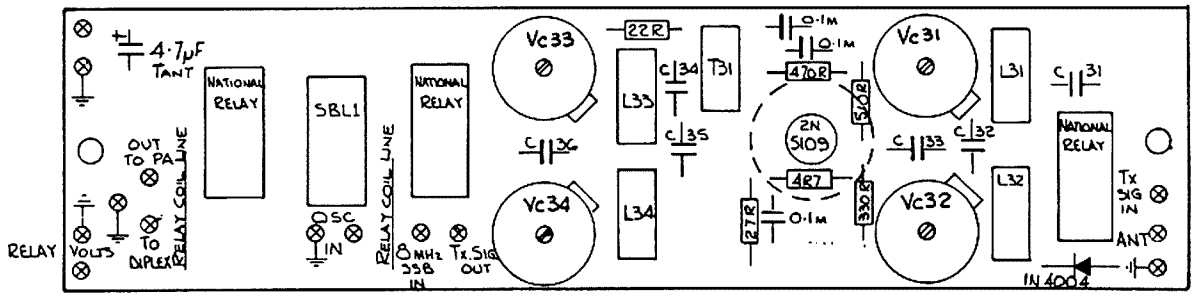


Figure 24: Module One — Layout of Components.

However, provision has been made to improve its intermodulation performance by increasing the current drawn by the device to the maximum allowed by the makers. To do this, the value of the current setting resistor attached to pin 5 has been reduced from the more conventional value of 10k to 3k3.

The crystal oscillator input is to pin 1, while the output of the VFO is injected into pin 8. In both cases series resistors allow the two input levels to be adjusted to 100 mV RMS and 300 mV RMS respectively, these figures representing the optimum injection levels.

Output from the MC1496 is via T2, a trifilar wound broadband transformer. The output from T2 is at an impedance of approximately 200 ohms and is constrained to the desired 500 kHz of operation by a two section bandpass filter. This filter is designed on exactly the same basis as those used in the RF amplifier of Module One, save that the frequency of operation and the input impedances are different. The same C64 program was used to calculate the filter coil and capacitor values for each amateur band given in Table 4.

The (filtered) injection output is around the -10 dBm (0.1 mW) level and is amplified to around +10 dBm (10 mW) by the 2N5179 broadband stage. This output is reduced to the +7 dBm (5 mW) level required by the receive/transmit mixer of Module One, by using a 3 dB resistive pad.

The 3 dB pad has to be there to ensure the 50 ohm impedance that the receive/transmit mixer wants to see, so that it is necessary to generate more power in the 2N5179 stage than is needed. The pad is the dog, not its tail.

CONSTRUCTION

Construction is again simply a matter of putting the components in the right places. The technique for winding L9 and L10 was detailed in Part 3. The only difference in this case is that the formers are first glued to a double (eight pin) coil base rather than two single bases.

The method of winding T2 and T3 is shown in Figure 25.

If the VFO is already up and going, the complete unit can be aligned in the following manner. With the diode probe (Refer Part 2) on the drain of the BF981, adjust the slug of L9. At some stage, the probe meter will register output. Most likely, as the slug is tuned through its travel, there will be a range of slug positions where output is indicated. Set the slug at the centre of this range.

Transfer the probe to the junction of C20 and C21. Adjust the slug of L10 for maximum reading. With the probe still at the junction of C20 and C21, readjust the slug of L9, to ensure its still in the centre of its range.

Set the 50k trimpot between pins 1 and 4 of the MC1496, at one end of its range. Connect in the VFO and set the output to 3.150 MHz. With the diode probe across the output, adjust C25 and C26 for maximum output.

Temporarily disable the crystal oscillator by earthing the 'live' pin of the crystal. Transfer the probe to the secondary of T2. There should be a detectable reading due to the mixer being (deliberately) unbalanced. Adjust the 50k potentiometer through its complete range. At some stage the probe meter reading should drop to zero and then at some later stage, rise again. Set the potentiometer, half way between these two points.

Remove the short across the crystal, transfer the probe to the output pins, and 'retweak' the slug of L10 (NOT L9), C25 and C26 for maximum output. This completes the preliminary commissioning procedure.

In the next issue of the series, the Power Amplifier and associated filters will described.

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Table 1: Band Pass Filter Constants — RF Stage.

BAND	3 dB POINTS MHz	COIL INDUCT µH	AMIDON CORE TYPE	No TURNS	B&S WIRE GAUGE	COIL UN-LOADED Q	C31/C34 pF	C32/C35 pF	C33/C36 pF	APPROX SET VC31 VC-34 pF	VC31/VC34 MAX CAPAC pF
160	1.8 - 2.3	9.0	T68/2	40	26	225	470	120	470	100	130
80	3.5 - 4.0	6.0	T68/2	32	26	225	150	33	150	120	130
40	7.0 - 7.5	2.5	T68/6	23	24	210	62	10	62	120	130
30	10.0 - 10.5	1.9	T68/6	20	24	210	39	4.7	35	90	130
20	14.0 - 14.5	1.9	T68/6	20	24	210	18	2.2	18	45	70
17	18.0 - 18.5	1.0	T50/6	16	24	200	15	2.2	15	60	70
15	21.0 - 21.5	1.0	T50/6	16	24	200	10	1.2	10	45	70
12	24.5 - 25.0	0.5	T50/6	11	24	200	10	1.5	10	70	130
10	28.0 - 29.5	0.5	T50/6	11	24	200	15	2.7	15	45	70

Notes:
1 Trimmers VC31 and VC34 are Philips Type 2222-808. 130 pF — Green-body. 70 pF — Yellow-body.
2 Nearest Metric size of wire can be substituted for B & S Gauge.

Table 2: Frequency Plan.

BAND	SIGNAL FREQUENCY MHz	IF MHz	INJECTION FREQUENCY MHz	VFO RANGE MHz	CRYSTAL FREQUENCY MHz	CRYSTAL OSCILLATOR MODE	CRYSTAL OSCILLATOR OUTPUT MHz
160	1.8 - 2.3	8.0	9.8 - 10.3	2.9 - 3.4	6.90	Fund	6.90
80	3.5 - 4.0	8.0	11.5 - 12.0	2.9 - 3.4	8.60	Fund	8.60
40	7.0 - 7.5	8.0	15.0 - 15.5	2.9 - 3.4	12.10	Fund	12.10
30	10.0 - 10.5	8.0	18.0 - 18.5	2.9 - 3.4	15.10	Fund	15.10
20	14.0 - 14.5	8.0	22.0 - 22.5	2.9 - 3.4	19.10	Fund	19.10
17	18.0 - 18.5	8.0	26.0 - 26.5	2.9 - 3.4	11.55	D'bler	23.10
15	21.0 - 21.5	8.0	29.0 - 29.5	2.9 - 3.4	13.05	D'bler	26.10
12	24.5 - 25.0	8.0	32.5 - 33.0	2.9 - 3.4	14.80	D'bler	29.60
10A	28.0 - 28.5	8.0	36.0 - 36.5	2.9 - 3.4	16.55	D'bler	33.10
10B	28.5 - 29.0	8.0	36.5 - 37.0	2.9 - 3.4	16.80	D'bler	33.60
10C	29.0 - 29.5	8.0	37.0 - 37.5	2.9 - 3.4	17.05	D'bler	34.10
10D	29.5 - 30.0	8.0	37.5 - 38.0	2.9 - 3.4	17.30	D'bler	34.60

Table 3: Crystal Oscillator Coil and Capacitor Data.

	L9/L10							
BAND	CRYSTAL OSC OUTPUT MHz	No TURNS	B&S WIRE GAUGE	METRIC WIRE GAUGE	TYPE	C19 pF	C20 pF	C21 pF
160	6.9	35	32	0.25	Enam	150	180	820
80	8.6	35	32	0.25	Enam	82	120	680
40	12.1	28	32	0.25	Enam	68	82	390
30	15.1	28	32	0.25	Enam	39	47	220
20	19.1	25	32	0.25	Enam	18	22	100
17	23.1	18	26	0.50	Enam	47	56	220
15	26.1	18	26	0.50	Enam	39	47	220
12	29.6	15	26	0.50	Enam	33	39	180
10	33.1 - 34.6	15	26	0.50	Enam	33	39	180

Note:
1 All coils close wound on Neosid 5 mm Forms — Type 722/1.
2 Formers glued to eight-pin double base plate.
3 Tuning slugs all F29.

Table 4: Coil and Capacitor Data for Injection Mixer Bandpass Filters.

	L11/L12								
BAND	3 dB BANDWIDTH MHz	COIL INDUCT µH	No TURNS	ENAM WIRE SIZE B&S	C22 pF	C23 pF	C24 pF	APPROX SETTING C25 pF	APPROX SETTING C26 pF
160	9.8 - 10.3	2.0	22	26	18	4.7	36	100	82
80	11.5 - 12.0	2.0	22	26	15	3.3	27	75	62
40	15.0 - 15.5	0.8	14	24	12	3.3	22	120	110
30	18.0 - 18.5	0.8	14	24	8.2	2.2	18	85	75
20	22.0 - 22.5	0.4	10	24	8.2	2.2	15	117	113
17	26.0 - 26.5	0.4	10	24	5.6	1.5	10	85	80
15	29.0 - 29.5	0.4	10	24	6.8	1.8	15	65	60
12	32.5 - 33.0	0.2	7	24	4.7	1.5	8.2	112	107
10	36.0 - 38.0	0.2	7	24	10	3.9	18	82	72

NOTES:
1 All coils wound on Amidon T50/6 Powdered Iron Toroids
2 C25/C26 in all cases, Philips 2222-808 type trimmers. 130 pF Cmax Greenbody
3 Coil unloaded Q taken as 200 in all cases
4 Filter Input impedance = 200 ohms
5 Filter output impedance = 50 ohms

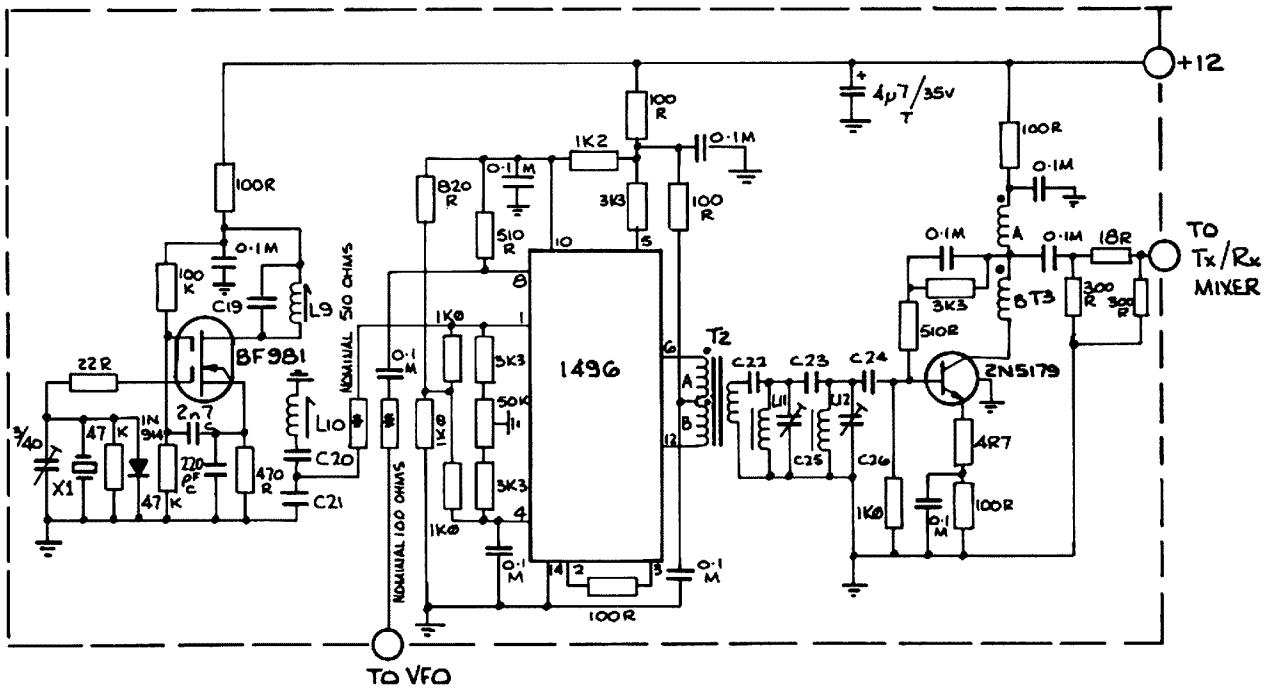


Figure 21: Module 7 — The Injection Mixer Circuit Diagram.

Notes:

1 M = Monolithic Ceramic Capacitor
2 C = Ceramic Disc Capacitor
3 * = Refer Text
4 L9, 10, 11, 12 and associated C — Refer Tables 2 and 3
5 All resistors 0.25 Watt five-percent tolerance
6 T2 = 10 Trifilar turns 26 Gauge on an Amidon 50/43 Toroid
7 T3 = 10 Bifilar turns 26 Gauge on Amidon T50/43 Toroid

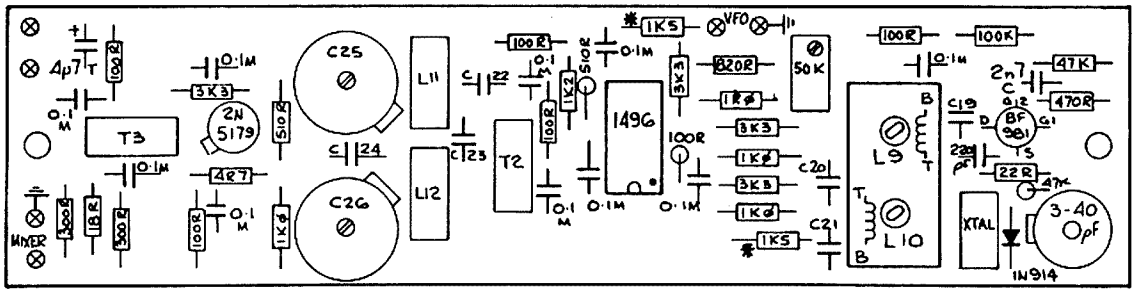


Figure 22: Module Seven — Layout of Components.

+ 3DB FREQUENCY - MHZ -	14.4
- 3DB FREQUENCY - MHZ -	14
INDUCTOR - MICROHENRIES -	2.08
INDUCTOR UNLOADED Q -	225
INPUT IMPEDENCE - OHMS -	50
OUTPUT IMPEDENCE - OHMS -	50
INPUT COUPLING CAP - PF -	14.5
CENTER COUPLING CAP - PF -	1.2
OUTPUT COUPLING CAP - PF -	14.5
INPUT TUNING CAP - PF -	44.7
OUTPUT TUNING CAP - PF -	44.7

Table 5: Example of Program Output.

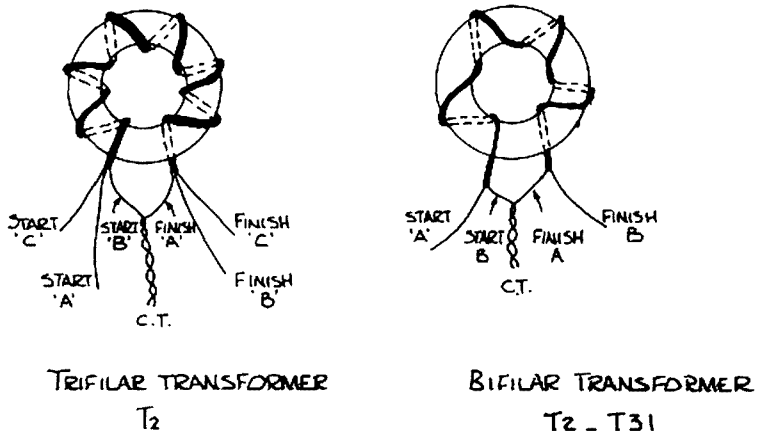


Figure 25: Detail of Transformer.
Trifilar Transformer T2
Bifilar Transformer T2 and T31
Notes:
1 Two or three strands of specified wire twisted together — approximately three turns per centimetre.
2 Identify individual windings with 2-3 mm lengths of coloured PVC stripped from hook-up wire.

```
10 REM"2 POLE BANDPASS FILTERS"
20 POKE 53280,4:POKE 53281,0
30 PRINT CHR$(5)
40 PRINT CHR$(147)
50 PRINT"CALCULATION OF CONSTANTS FOR"
60 PRINT"DOUBLY TERMINATED DOUBLE"
70 PRINT"TUNED BANDPASS FILTERS"
80 PRINT"USING METHOD OF W7ZOI AND W1FB"
85 PRINT"IN SOLID STATE DESIGN FOR THE"
90 PRINT"RADIO AMATEUR PAGE 237 ET SEQ"
100 PRINT
110 PRINT"BY H.L.HEPBURN VK3AFQ"
115 PRINT
120 INPUT"UPPER 3DB POINT-MHZ";F1
130 INPUT"LOWER 3DB POINT-MHZ";F2
140 INPUT"INDUCTOR SIZE-MICROHENRIES";L1
150 INPUT"INDUCTOR UNLOADED Q";Q1
160 INPUT"FILTER INPUT IMPEDENCE-OHMS";Z1
170 INPUT"FILTER OUTPUT IMPEDENCE-OHMS";Z2
180 REM-CALCULATE MEAN FREQUENCY F3
190 F3=SQR(F1*F2)
200 REM CALCULATE 3DB BANDWIDTH F4
210 F4=F1-F2
220 REM CALCULATE ANGULAR FREQUENCY W1
225 PI=3.14159
230 W1=2*PI*F3
240 REM CALC TOTAL TUNING CAPACITY-C1
250 C1=10↑6/(L1*W1*W1)
260 REM CALCULATE LOADED Q- Q2
270 Q2=W1/(2*PI*F4)
280 REM CALCULATE Q3
290 Q3=1.414*Q2
300 REM CALC CENTER COUPLING CAPACITOR-C3
310 C3=C1/Q3
315 C3=C3*100:C3=INT(C3):C3=C3/100
320 REM CALCULATE Q4
330 Q4=1/(1/Q3-1/Q1)
340 REM CALCULATE INPUT RESISTANCE-R1
350 R1=Q4*W1*L1
360 REM CALCULATE OUTPUT RESISTANCE-R2
370 R2=Q4*W1*L1
380 REM CALCULATE INPUT COUPLING CAPACITOR-C2
390 C2=10↑6/(W1*(SQR((R1*Z1)-(Z1↑2))))
395 C2=C2*100:C2=INT(C2):C2=C2/100
400 REM CALCULATE OUTPUT COUPLING CAPACITOR-C4
410 C4=10↑6/(W1*(SQR((R2*Z2)-(Z2↑2))))
415 C4=C4*100:C4=INT(C4):C4=C4/100
420 REM CALCULATE INPUT TUNING CAPACITY-C5
430 C5=C1-C2-C3
435 C5=C5*100:C5=INT(C5):C5=C5/100
440 REM CALCULATE OUTPUT TUNING CAPACITY-C6
450 C6=C1-C3-C4
455 C6=C6*100:C6=INT(C6):C6=C6/100
460 PRINT"INPUT COUPLING CAPACITOR=PF";C2
465 PRINT
470 PRINT"CENTER COUPLING CAPACITOR=PF";C3
475 PRINT
480 PRINT"OUTPUT COUPLING CAPACITOR=PF";C4
485 PRINT
490 PRINT"INPUT TUNING CAPACITOR=PF";C5
495 PRINT
500 PRINT"OUTPUT TUNING CAPACITOR=PF";C6
510 PRINT"PRESS P FOR HARD COPY"
520 INPUTA$
525 IF A$="P" THEN GOTO 540 ELSE END
540 OPEN3,4
550 PRINT#3,"+ 3DB FREQUENCY - MHZ -      "F1
560 PRINT#3,"- 3DB FREQUENCY - MHZ -      "F2
570 PRINT#3,"INDUCTOR - MICROHENRIES -    "L1
580 PRINT#3,"INDUCTOR UNLOADED Q. -       "Q1
590 PRINT#3,"INPUT IMPEDENCE - OHMS -     "Z1
600 PRINT#3,"OUTPUT IMPEDENCE - OHMS -    "Z2
650 PRINT#3,"INPUT COUPLING CAP - PF -    "C2
660 PRINT#3,"CENTER COUPLING CAP - PF -   "C3
670 PRINT#3,"OUTPUT COUPLING CAP - PF -   "C4
680 PRINT#3,"INPUT TUNING CAP - PF -      "C5
690 PRINT#3,"OUTPUT TUNING CAP - PF -     "C6
700 CLOSE3
710 END
```

Appendix 1: C64 Program for Calculation of Two-Pole Doubly Terminated Bandpass Filters.

Spectrum Analyser Waveforms

Lloyd Butler VK5BR
18 Ottawa Avenue, Panorama, SA. 5041

Over the years, the cathode ray oscilloscope (CRO) has been a universal instrument for examining analogue signals.

RAPID ADVANCES IN technology have led to a new era of microcomputer controlled, digitally processed, test equipment, not the least of which is the modern spectrum analyser which enables greater precision analysis of analogue signals than is possible with the CRO.

A spectrum analyser plots signal amplitude (or signal power) as a function of frequency compared to the CRO which plots signal amplitude as a function of time.

The spectrum analyser is not the type of equipment normally within the reach of the radio amateur and because of this, it was thought that it would be of interest to illustrate a few spectrum plots of well-known waveforms.

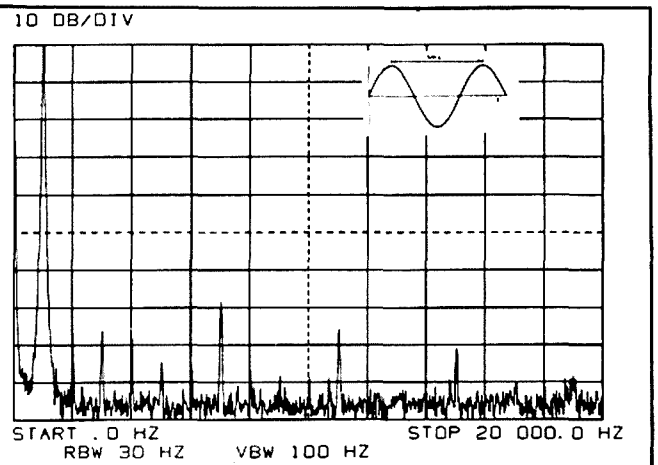


Figure 1: 1000 Hz Sine Wave and Harmonics.

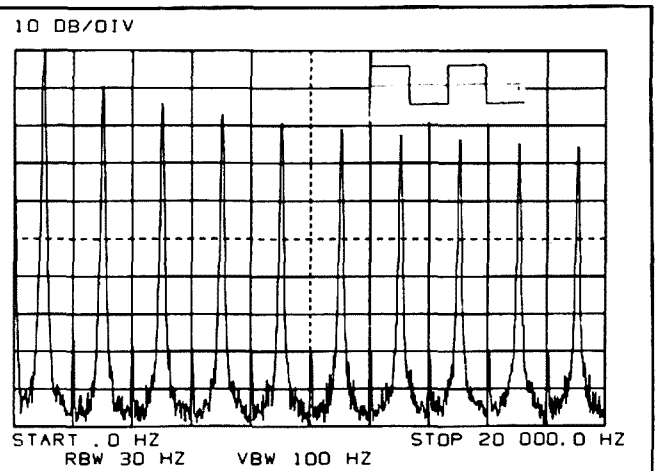


Figure 2: 1000 Hz Square Wave Showing Harmonics to 20 kHz.

BASIC WAVEFORMS

Figure 1 shows the spectrum of a sine wave oscillator with fundamental at 1000 Hz and harmonics up to 20 kHz. The highest level harmonic at 7 kHz is 70 dB below the fundamental, representing a harmonic distortion of 0.03 percent. This is a very good oscillator which would not be matched by many laboratory instruments. It can also be seen that the noise floor is about 95 dB below the fundamental and this is also very good. The oscillator noise level might be even better than this as much of the noise is due to the spectrum analyser itself.

Figure 2 shows a 1000 Hz square wave. A perfect square wave generates odd harmonics to infinity with an amplitude 1/n relative to that of the fundamental or (20 log n) dB below the fundamental. ('n' is the order of harmonic). For n = 3, 5, 7 and 9 this calculates to -9.5, -14, -16.9 and -19.1 dB respectively, very close to the readings shown in Figure 2.

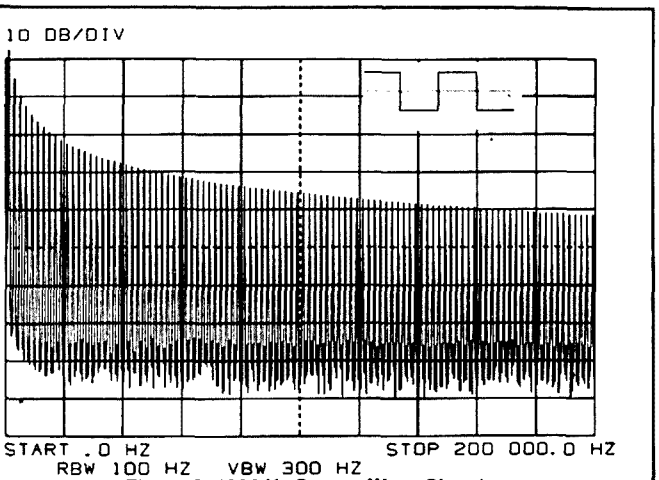


Figure 3: 1000 Hz Square Wave Showing Harmonics to 200 kHz.

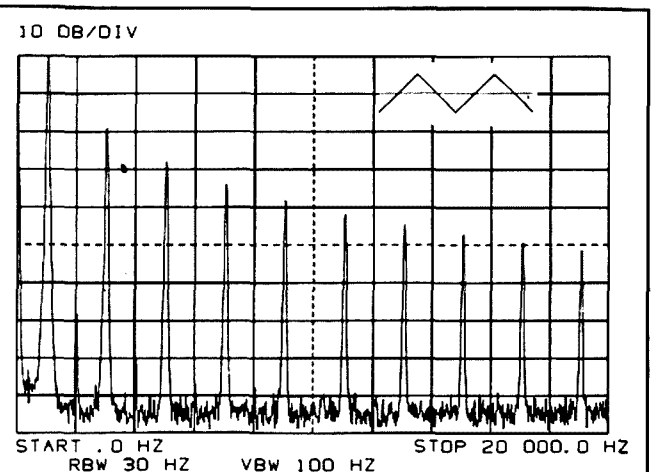


Figure 4: 1000 Hz Triangular Wave.

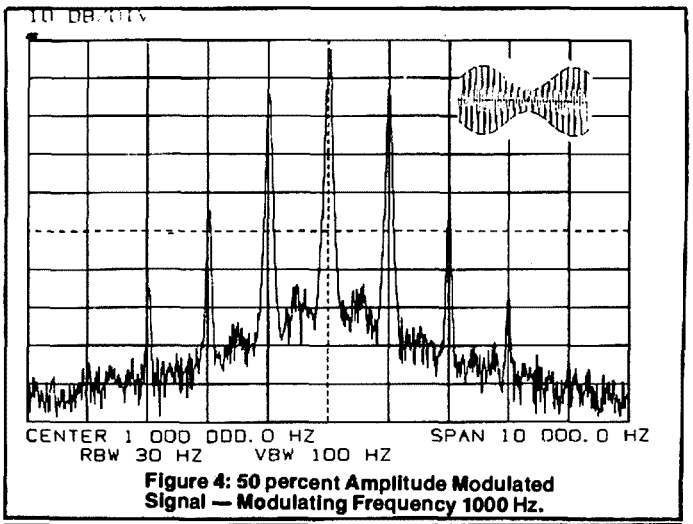


Figure 4: 50 percent Amplitude Modulated Signal — Modulating Frequency 1000 Hz.

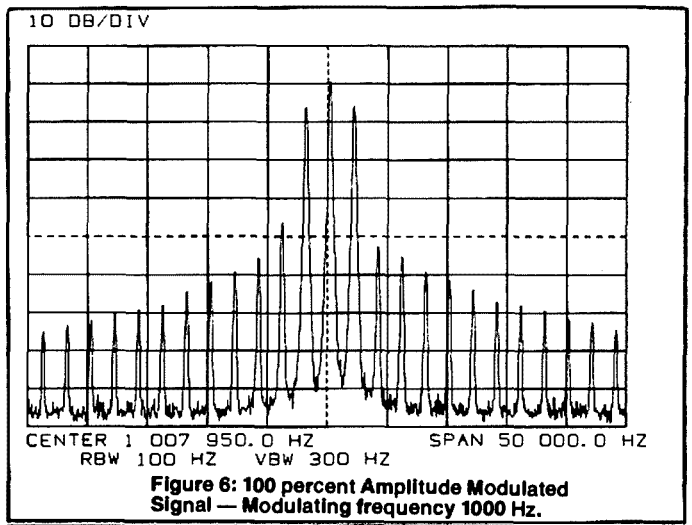


Figure 6: 100 percent Amplitude Modulated Signal — Modulating frequency 1000 Hz.

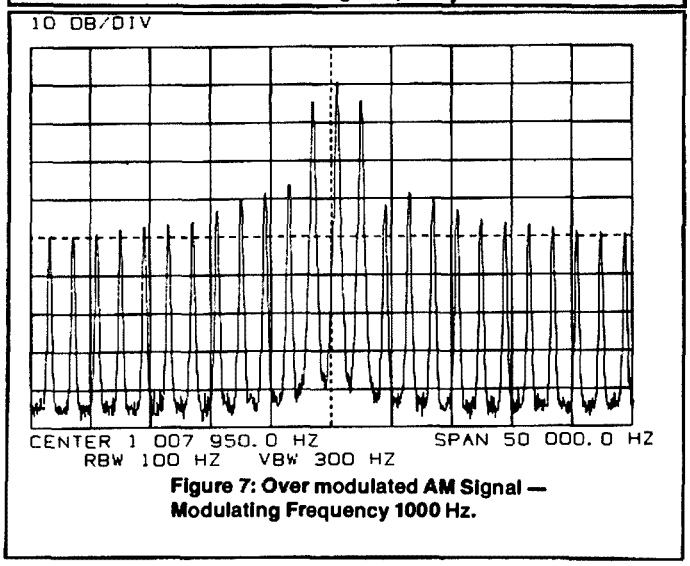


Figure 7: Over modulated AM Signal — Modulating Frequency 1000 Hz.

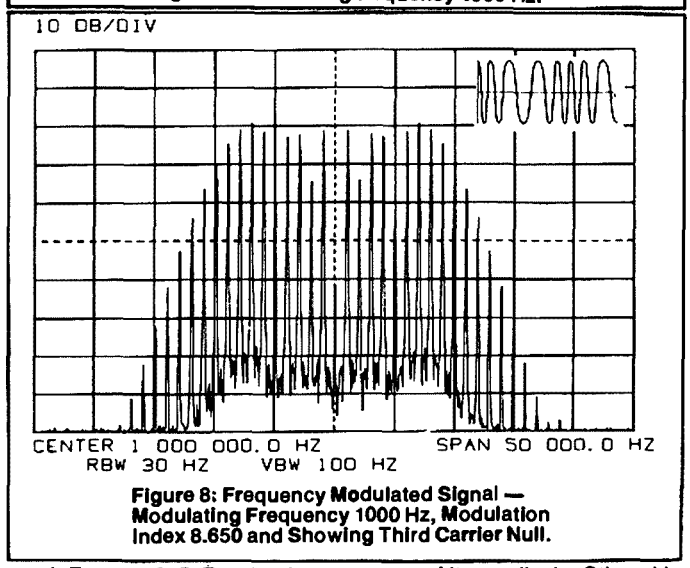


Figure 8: Frequency Modulated Signal — Modulating Frequency 1000 Hz, Modulation Index 8.650 and Showing Third Carrier Null.

Figure 3 is the same square wave plotted out to 200 kHz and showing the apparently unlimited spread of harmonics. From this, it is easy to see why a low frequency square wave oscillator can be used as a marker generator over a wide frequency range.

Figure 4 shows a 1000 Hz triangular wave. A perfect triangular wave also generates odd harmonics to infinity, but each amplitude is (1/n) squared relative to the fundamental or (40 log n) dB below the fundamental. For n = 3, 5, 7 and 9, the calculation is -19, -28, -33.8 and -38.2 dB respectively, again very close to the readings shown.

MODULATION

Figure 5 shows a 1 MHz carrier frequency, amplitude modulated by a frequency of 1 kHz to a modulation depth of 50 percent. For this case, the two side frequencies, 1 kHz either side of the carrier, are 12 dB below the carrier level, or a quarter of its amplitude. Other side frequencies at 2 kHz and 3 kHz, either side of the carrier, are the result of harmonics either in the original modulating tone or distortion caused by the modulation process. The 2 kHz side frequencies are about 30 dB below the 1 kHz side frequencies representing about three percent distortion in the system.

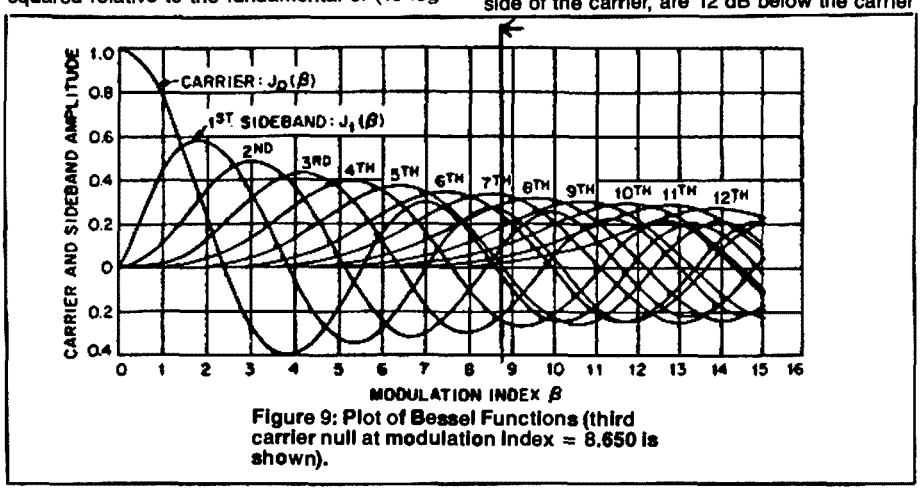


Figure 9: Plot of Bessel Functions (third carrier null at modulation Index = 8.650 is shown).

In Figure 6, the modulation level has been increased to 100 percent and the side frequencies 1 kHz either side of the carrier, are now 6 dB below carrier level, or half its amplitude. The spectrum has been expanded to show many more harmonically related sideband components which now appear. Except for those close to the carrier, most of the components are more than 50 dB down and not of any great concern.

In Figure 7, the carrier is over-modulated and there is now a spread of sideband components about 30 dB down. If this were an amateur radio transmitter, other amateur stations in nearby suburbs would be complaining about sideband splatter.

Figure 8 shows a 1 MHz carrier, frequency modulated by a 1 kHz tone with a deviation of 8.650 kHz, representing a modulation index of 8.650. It can be seen that there are many side frequencies all spaced by an amount equal to the modulating frequency (1 kHz). For this signal, a significant bandwidth of about 20 to 30 kHz is being utilised.

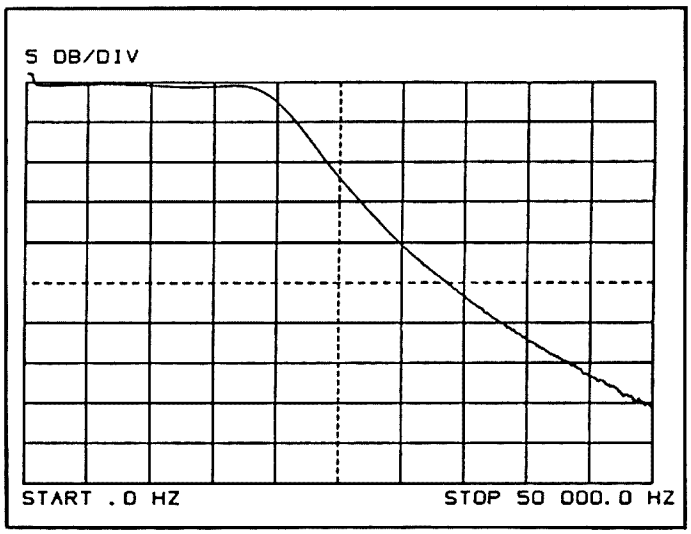


Figure 10: Low Pass Filter Response (fco = 20 kHz).

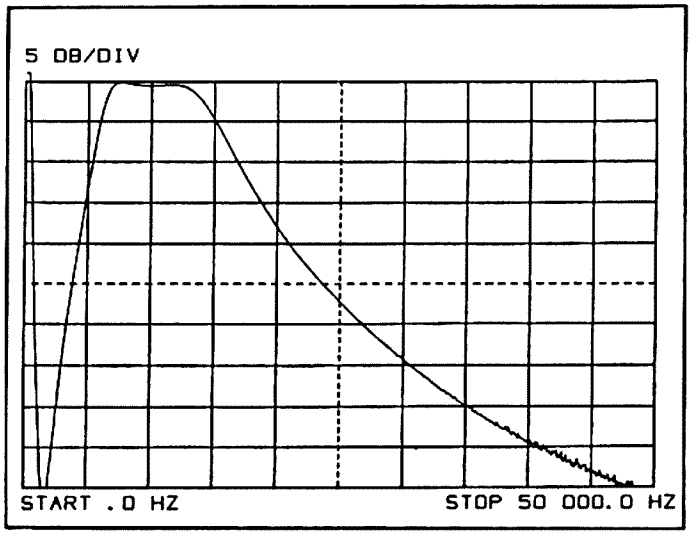


Figure 11: Bandpass Filter Response (fc = 10 kHz, B = 8 kHz).

If we now examine Figure 9, which plots the amplitude of the carrier and side frequencies against the value of modulation index, we can see that there are a number of values of modulation index where the carrier level becomes zero. These are very convenient references to calibrate the amount of deviation. In Figure 8, the deviation has been set to produce the third carrier null at a modulation index of 8.650, so we know precisely that with our modulating frequency of 1000 Hz, our deviation is 8.650 x 1000 = 8650 Hz.

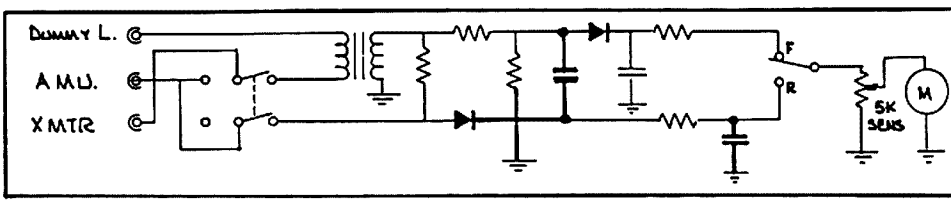
FREQUENCY RESPONSE

Another useful function of the spectrum analyser is to plot the frequency response of a four terminal device such as an amplifier or a filter. In this case, the analyser frequency sweep generator is fed to the input of the device and the output of the device is fed to the input of the analyser. Typical plots of a low pass filter and a bandpass filter are shown in Figures 10 and 11 respectively.

CORRECTION

Unfortunately, there was an error reproduced on the schematic diagram of the "Tune Up Protection Device" page 6 of May AR.

The corrected diagram is as follows.



NEWS FROM LONDON

Tony Smith G4FAI
1 Tash Place, New Southgate, London, N11 1PA

GREETINGS MESSAGES

The nearest thing to Third Party Traffic in the UK is a facility enabling greetings messages to be sent from GB special event stations. Under the control of the licensee, a non-licensed person may speak into the microphone to send a message to any other amateur station. Each person may pass only one message, which must not exceed two minutes.

This arrangement was introduced in October 1982, for contacts with G- stations only. In October 1985, just in time for JOTA, the facility was extended to contacts with stations in the USA, Canada and the Falklands, and it was understood that negotiations were then in hand for similar agreements with Australia and New Zealand. I have since been led to believe that Australia's DOC, in fact, agreed the proposal in May 1985, but I may have misunderstood the situation.

To clarify it, I recently asked the Department of Trade and Industry in London, who are responsible for such matters, what had happened to the proposed agreement with Australia. They replied, "The possibility of approaching the Australian administration to enter into such an agreement still exists. . .it is our fervent hope that we will be able to enter into such an agreement before this year's JOTA but we cannot be certain."

So, perhaps this years Scouts and Guides in the UK and Australia will be able to say a few words to each other through JOTA. It should be understood, though, this is not Third Party Traffic as it is understood in Australia as the messages are not intended for relaying to other destinations. JOTA is an obvious beneficiary, but it does introduce the possibility of greetings being exchanged person to person, by prior arrangement, on special occasions such as birthdays, Christmas, etc.

There seems little interest in the idea of Third Party Traffic in the UK, despite a certain amount of publicity about the Australian experience. The RSGB will not allow articles on the subject in *Radio Communication* in case they prejudice "current discussions" with the DTI. What is being discussed I have been unable to find out for sure, although I think it relates to packet radio. Whatever it is, I think it will be a very long time before there is even a suggestion that it might be possible to send "proper" Third Party Messages via amateur radio between Australia and the UK. But maybe I'm wrong!

RESUME OF BACKGROUND AND SCHEDULE FOR 50 AND 70 MHz BANDS

As from 2300 UTC, May 31, 1987, Class B licensees in the UK are able to operate on expanded 50 and 70 MHz. Amateurs also became the primary users on these bands.

Following are the new provisions in full:

- The 50 MHz band available to UK radio amateurs will become 50-52 MHz
- UK radio amateurs will have primary status from 50-51 MHz and secondary status between 51 and 52 MHz
- There is no restriction on the location of a 50 MHz station — ie /A and /P operation is now possible
- Mobile operation on 50 MHz is not permissible at present
- The 70 MHz band will be expanded to 70.000-70.500 MHz, with UK amateurs being granted secondary status
- Class B licensees will be permitted to operate on both bands

Some of the provisos are:

Antennas for 50 MHz must not be at a height greater than 20 metres above ground level, and must remain horizontally polarised to protect television broadcast transmitters which are still operational in Europe.

For the present, permitted power on 50 MHz remains at 14 dBW carrier and 20 dBW ERP, which was established last year when the band was released to Class A licensees. However, the DTI will review power levels for 50 MHz in six months.

Permitted modes on both 50 and 70 MHz are Morse, RTTY, telephony, data, SSTV, and facsimile.

ar

In response to AR's review of our EAT300A Antenna Tuner In the June issue, please note the following:

EMTRONICS (DIV OF EMONA ELECTRONICS PTY LTD.)

CITY & SHOWROOM 92-94 WENTWORTH AVENUE, SYDNEY, N.S.W. 2000 Ph (02) 211 0988
POSTAL ADDRESS: P.O. BOX K21, HAYMARKET, N.S.W. 2000 AUSTRALIA
TELEX AA73990 EMOLEC

Amateur Radio,
3/105 Hawthorn Road,
CAULFIELD NTH. VIC 3161

23rd June, 1987.

ATTENTION: Mr. Bill Rice- Editor

Dear Sir,

In reference to your "EQUIPMENT REVIEW" article on page 32 of June Amateur Radio - Emtron EAT-300A antenna tuner, I would like to make the following comments.

1. The EAT-300A is not an improved version of the EAT-300 since they are ELECTRICALLY IDENTICAL! Instead EAT-300A is a new unit with many more features and does not supersede the EAT-300.

2. It is customary to rate all antenna tuners in PEP values instead of average and the reviewer should have been aware of it. Believe me, there is a very good reason for this condition. Also power rating is valid only when the tuner is correctly adjusted. A simple mathematical excersize would prove, that at a power level of 300 watts and a dy a ic range of 5 to well over 2000 OHMS a voltage of less than 1000 V would be generated across the terminals. The variable capacitors in our 300 series tuners are rated at 1000 volts; consequently the 300 series tuners when correctly adjusted would easily handle their rated power and therefore any transceiver on the market today.

3. There are two reasons, why I have decided to use a 200 watt FSD power meter in this tuner.
   (a) Since the meter does not indicate PEP but average power, there is no reason for a 300 watt FSD meter.
   (b) The second reason is a practical one! Since all EMTRON CROSS-NEEDLE meters are custom made, and a minimum order of 1000 meters or more is acceoted by the meter manufacturer, it would be rather difficult for us to order a different meter for each product manufactured by EMTRON. As you are probably aware, the same meter is used in EAT-300A, EAT-1000A, EAT-2000A, CP-200 and some other products still on the drawing board.

4. The built in dummy load in EAT-300A is rated 100 watts at 50% duty cycle (or 300 watts at 20% duty cycle). However, since all practical power measurements and tuning of older type transceivers is done well within a minute, I have therefore decided as a precaution to put a one minute limit, although this limit is very much under rated and has nothing to do with the power rating of the tuner. The dummy load is there as an additional and very useful feature and again I repeat has nothing to do with the tuner and its power rating. The reviewer has certainly mixed up everything.

5. Re "AIR WOUND INDUCTOR" overheating; I don't know where and how Ron Fisher got his results from. Let me tell you that several tests have been conducted in our laboratory with continuous 200 watts on 80 metres for 30 minutes, the coil did warm up which is only natural but the temperature level where by touching it with a more sensitive part of a hand was not unpleasant at all. These tests have been performed on a balanced output with impedances ranging from 200 to 800 OHMS. Therefore I completely reject Ron Fisher's claim. For your information the 200 watts continuous power has been generated with a transceiver driving a IL 922 linear amplifier. I can only suggest that Ron Fisher has also slipped badly by suggesting that tuning with 125 watts caused capacitors to spark. He has done precisely what every tuner manual, no matter how poorly written, tries to prevent the user from doing. What he should have done is to adjust the tuner first at low power as suggested in the manual and then apply full power. Nobody in his right mind would do it otherwise.

6. Finally, Ron's criticism of the manual is fully justified. Too much has been taken for granted. These days when most amateurs are appliance operators, we at Emtron should have known better and produced a more detailed OPERATORS MANUAL, which is now in preparation.

Yours faithfully,

RUDI BREZNIK VK2AQI
Emtron Industries

Historic Aircraft Restored

Dave Jeanes VK2BSJ
11 Tanami Close, Belrose, NSW. 2085

THE AEROPLANE

The Boeing-built Catalina flying boat, 'Frigate Bird II' has recently been painstakingly restored at Bankstown Airport by Hawker Pacific Aviation, funded by a Federal grant.

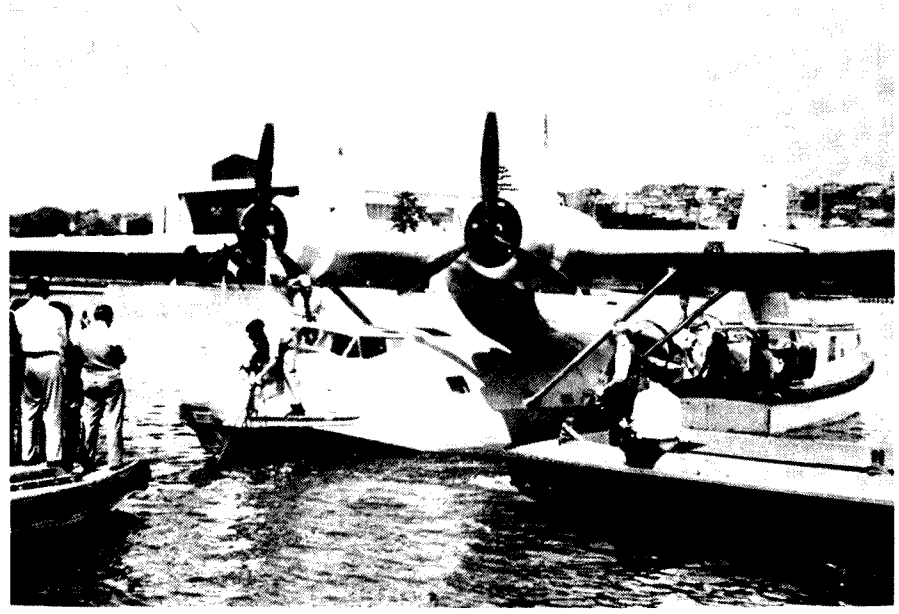
In 1951, this aeroplane made Australia's last great historic flight, from Rose Bay in Sydney to Valparaiso in Chile, to determine if a commercial air service was practical over the vast, empty tracts of the Pacific Ocean.

Early in 1951, the Commonwealth Government provided the aircraft, supplied from several still in service with the RAAF Engineers at Rathmines RAAF Base gave the aeroplane a full overhaul, and, at the time of handing over, it had flown only 1600 hours.

After completing the historic flight of over 15 000 nautical miles, 'Frigate Bird II' languished in hangars and sheds in various places around Sydney, and many of the instruments and much of the interior equipment was vandalised.

The Power House Museum, a section of the NSW Museum of Applied Arts and Sciences, is now the custodian for this great aircraft. Before restoration began the remaining internal equipment was removed into storage. The air- frame was treated inside and out with corrosion inhibitor, then the exterior was sprayed silver to return the aircraft to near its original appearance.

The majority of the original radio equipment has been salvaged, but there are still some items missing. An inventory of this equipment, and a list of missing items is given later.



Slipping the buoy at departure, Rose Bay.

THE CREW

The pilot in command of 'Frigate Bird II' won the Military Cross in 1917, in France, for 'taking part in more than 40 offensive patrols at low altitudes and under heavy fire from the ground'.

In 1933, this same airman won the George Cross for his daring actions, when, as a co-pilot, he climbed out on the spars of the 'Southern Cross' over the Tasman Sea and transferred oil from one engine to another. The pilot of that flight was Charles Kingsford-Smith.

In 1944, he commanded a Catalina Aircraft in a proving flight from Acapulco, Mexico, to Australia, via Clipperton Island and the Marquesas Group of islands.

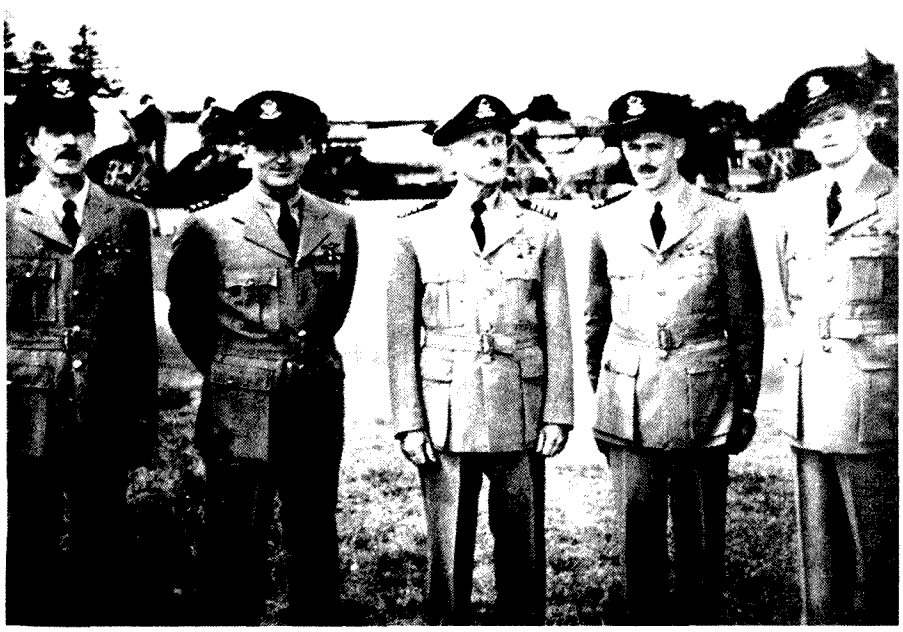
P G (Bill) Taylor was, in 1951, acclaimed 'Australia's greatest living airman'. His cool skill and courage resulted in the successful flight to South America of 'Frigate Bird II'.

Bill Taylor chose well when he enlisted Harry Purvis as his co-pilot for the Chile flight. Harry Purvis had a brilliant career in the RAAF in World War II, was decorated and promoted to Wing Commander. His exploits in aviation during and after the war make exciting reading in his autobiography, 'Outback Pilot'. For many years Harry operated his Cessna aircraft, and his motel at Ayers Rock before finally retiring to Cairns.

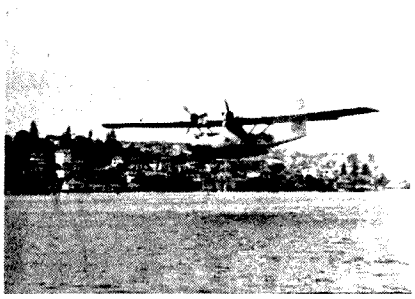
Angus Allison was trained as an aircraft electrician in the RAAF during the war, and later became a Flight Radio Officer with Trans Oceanic Airways, operating in flying boats out of Rose Bay, Sydney Harbour. P G Taylor was a TOA captain at that time, and Angus crewed with him for many years. Part of Angus' many duties with TOA was maintenance of the electronics on their four engined flying boats, and he was able to bring these skills to bear in the operation of the Chile flight.

'Blue' L'Huiilier was chosen as flight engineer for the Chile flight for one reason — he was the best. 'Blue' also flew with TOA as a flight engineer, and worked in the hangar on the maintenance of the flying boats. His training, temperament and engineering flair earned him his place in aviation history.

Jack Percival was Executive Officer and Official Correspondent for the flight. Jack had earned his stripes as a foreign correspondent with AAP, and was brought back from an assignment in Korea, to join the flight. Jack Percival was then, for many years, aviation editor for the *Sydney Morning Herald*.



The Crewmen from left — Jack Percival, Harry Purvis, P G Taylor, Angus Allison and Blue L'Huiilier.



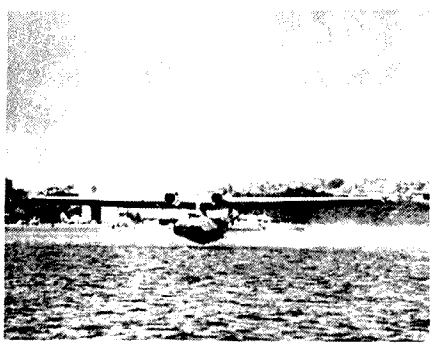
Frigate Bird II lands after a test flight at Rose Bay.

These five men operated the aeroplane under the most strenuous conditions, without relief, for stretches of up to 18 hours continuous flight. They went where no man had flown before. They flew over tiny atolls, the inhabitants of which had never seen or heard an aeroplane. And the bottom line was — "they succeeded".

THE FLIGHT

Just imagine — it is 1951 and you are the Radio Officer of a Catalina Flying boat about to take-off from Rose Bay on a flight that will take you halfway around the world. As R/O it is your job to handle the mooring equipment, so you let go of the buoy cable from the aircraft bollard, slam the hatch closed and scramble through a narrow space between the pilots' seats, back to your station amidships.

The aircraft is now bouncing and swaying around on the water as the skipper revs up first one engine and then the other in the pre-flight checks. You can see the Flight Engineer's feet braced just above you, high above on his elevated perch in the strut supporting the massive wing. You put on your headset and switch the intercom so you can hear the shouted commands between pilots and engineer.



Take-off from Rose Bay for Grafton.

There is a brief calm as the engines are throttled back before takeoff. Final checks are completed. Rose Bay tower gives clearance on VHF, then you see the co-pilot pushing the two overhead throttle levers hard against the stops. The aeroplane accelerates rapidly and you slide sideways in your seat, bracing against the motion. Your log starts to slip off the table and a cold flask topples and goes rolling down the fuselage. After a series of quick bumps the aeroplane is airborne, the engines screaming, slightly out of synchronisation. The co-pilot eases back the throttles, the engine noise becomes tolerable, and a great calm takes over in the aircraft. You think of the old saying, "An aeroplane is safe in the hangar, but that is not what aeroplanes are for."

No time for musing; the aeradio station will be waiting for your departure message. You switch on the Collins ART-13 transmitter and RA-X receiver, tune to 3.985 MHz MCW, tweak up the antenna loading and reach for the Morse key.

'VZSY VZSY de VHASA VHASA, dep hwl'

The reply is a laconic 'K'. He has been waiting for you ever since you spoke with him on the 600 ohms just before going aboard.

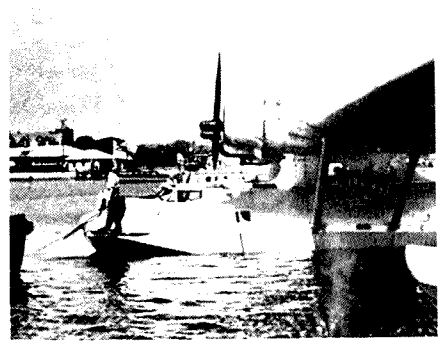
'R VHASA dep VZSD 130140z ETA Grafton 130520z'

'R skeds 15 and 45 cul.'

That is possibly how Angus Allison recalls it from all those many years ago. I spoke with Angus recently about the trip. Much of the excitement is still there, communicated as he related this or that incident. Angus loaned me his album, bursting with photographs and newspaper clippings of the day, so that I may 'get it right.'

The flight proceeded without undue incident, departing from Australia at Grafton on the Clarence River. The flight sectors for the next several days were in easy stages; Noumea, Suva, Western Samoa, Cook Islands and then Tahiti, which was to be a staging point before venturing into the 'unknown'. Easter Island was to be the acid test, landing there in the open sea, and refuelling from drums carried out from shore in an open boat.

The aircraft had been fitted with Jet Assisted Take Off (JATO) rockets at Rathmines, to augment engine power during the open sea takeoff at Easter Island. When tested before leaving Australia, P G Taylor reported the aircraft took off like a fighter plane. Each JATO rocket weighed 90 kg, and provided almost 400 HP for several seconds



Moored in the Clarence River at Grafton.

during the critical takeoff run. Could the airframe stand the stresses of a heavy fuel load, rough seas and the fantastic kick of the rockets, two mounted each side of the fuselage? The crew chewed over this rather hair-raising prospect during the long hours of the flight to Tahiti.

Communications had been good. Angus worked hard at the key, sending position reports, receiving weather forecasts, and passing long commercial telegrams back to Sydney Radio. The 8 MHz frequencies were used into Nadi in Fiji and then to ZKAI, the New Zealand aeradio station at Apia, right through to Tahiti. The French station, FPB, at Tahiti was worked on 8 MHz, but at poor signal strength.

A landing was made at Mngareva, south-east of Tahiti, to refuel. The fuel had been stored under palm leaves on the beach of a lagoon. The crew swam the drums out to the anchored aircraft and laboriously refuelled by hand pump. Whilst on the water here Angus made contact with both Easter Island and Chilean stations on 11 and 6 MHz.

The flight to Easter Island was uneventful, but by arrival time the wind had swung around to make the proposed landing site on the western side of the island a lee shore, with rough seas. P G Taylor landed the aircraft in calmer seas to the east of the island, and anchored near the rocky shore to await the fuel launch. When the boat arrived, the refuelling was carried out successfully. However, the wind veered to the east and the aircraft was prevented from taking off by rough seas.

Angus and Harry Purvis went ashore to find a heavier anchor to help the aircraft rode out the rough seas overnight. But rising seas broke the anchor lines whilst they were ashore and the engines were started to keep the aircraft off the rocks. There was no alternative, other than attempt to taxi the aircraft around to the leeside of the island. P G found that green water was coming up over the propellers as he attempted to taxi into the seas. He swung the aircraft around and drifted backwards, steering by revving one of the other engine together with rudder and aileron. A broken anchor line started to tangle with the propellers, and P G climbed out forward to cut it free. He fell overboard, but managed to grab a line thrown by Jack Percival, and was pulled back aboard.

Eventually the aircraft reached quieter waters and was topped up with more fuel for the 2000 mile flight to Chile. Wasting no more time, a takeoff was attempted, with the JATO rockets fired at the critical moment. The aircraft lurched into the air and climbed slowly towards the east. Chilean radio stations were worked on 4, 8, 11 and 12 MHz frequencies during the 17 hours of the flight, and the aircraft landed at the Chilean Airforce Base at Quintero, right on schedule and into aviation history.

TODAY — 1987

"Frigate Bird II" is due to be moved into the Power House Museum soon, where she will join other historic aircraft that have brought Australia into the frontiers of aviation. Meantime, the equipment missing from her inventory will be sought, by appealing to the nation through the media. The following is a list of the radio equipment originally fitted for the flight, and the asterisks indicate the missing components.

Main Transmitter	Collins ART-13 * Antenna Coupler CJP-47281 Dynamotor CWD-21932
Main Receiver	RA-X1 *
Command Transmitter	T-18 2.1-3.0 MHz T-20/BC-457 4.0-5.3 MHz T-21/BC-458 5.3-7.0 MHz Modulator MD-7 * Dynamotor DM-33 or DY-8 *
Command Receiver	R-27/BC-455 6.0-9.1 MHz * R-25/BC-454 1.5-3.0 MHz R-26/BC-454 3.0-6.0 MHz
Selector Box	ARC-2 (two missing) *
Intercom Box	C-70/AIA-2
Radio Compass	BC-433G Receiver * BC-434A Control Panel LP-21A Auto Loop
VHF Transceiver	SCR-522 * Cockpit Controller *

If you can make any of these missing components (*) available to the Museum, please contact Ian Debenham, Assistant Curator Transport, Power House Museum, PO Box K346, Haymarket, NSW. 2000, telephone (02) 217 0111.

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RADIODES

BASIC ELECTRONICS[1]

When current takes a sudden jump,
Like water squirting from a pump.
It has far more than one effect.
A few of these we shall select —
And briefly here consider.

As current rises in a coil,
Apart from pure resistive toil,
It works and makes by wondrous ways,
Another current — out of phase —
That tries to push it backwards.

If a capacitor now we try,
(Potential must not be too high).
We get another swift reaction,
Bearing a similar reaction —
But now surprisingly, it leads.

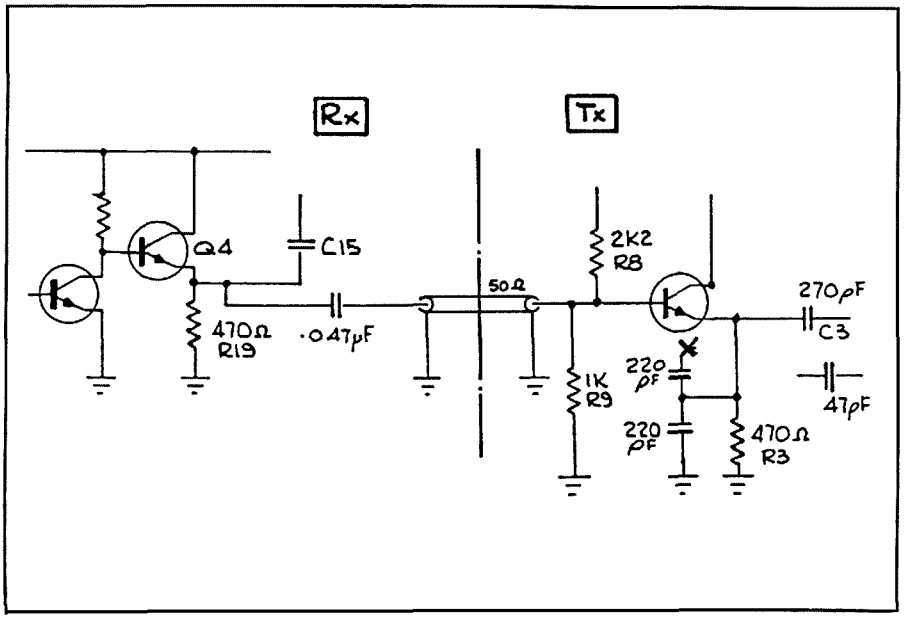
Put alternating current through
Both together — something new. . .
Meter tests — you may make many,
Result, however, there's not any —
In fact the whole thing vanishes!

—"Hambard" (Originally printed in the Nigerian ARS Newsletter 1970s)

Novice Notes

CONVERTING THE DC86 VFO

Drew Diamond VK3XU
Lot 2, Gatters Road, Wonga Park, Vic. 3115



It is possible to use the DC86 Receiver VFO as the VFO for the Four Watt CW Transmitter for transceiver operation by making the following modifications.

ON THE FOUR WATT TRANSMITTER

- Disconnect the top 220 pF styro capacitor (C1).
- Replace the 47 pF NPO (C3) with a 270 pF ceramic.
- Remove the crystal.

ON THE DC86 RECEIVER

- Connect a short length of miniature 500 ohm coaxial cable between the output of the VFO (top of the 470 ohm resistor) and crystal input (where the crystal connects) of the Four Watt Transmitter, inner to the top of the 470 ohm (receive) and "hot" side of where the crystal used to connect; ie base of Q1 (transmit). A .047 uF capacitor must be connected in series with the inner of the coaxial cable.

NOTE

A switch or relay will be necessary to transfer the antenna from receive to transmit during transmission.
(The "on-air" signal may have a slight chirp due to pulling of the VFO frequency by the keyed stage).

REFERENCES

Amateur Radio, December 1985
Amateur Radio, October 1986

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THIRD PARTY TRAFFIC

ALL YOU WISHED TO KNOW BUT WERE AFRAID TO ASK

HISTORICAL BACKGROUND

The WIA first sought third party privileges in June 1977. The Institute had been concerned for a very long time at the effect of third party restrictions on the ability of amateurs to be prepared for emergencies for the best practice in passing messages is to pass messages. In different States the then existing prohibition was interpreted differently and there was no doubt that amateurs were being inhibited, both in practice and in actual emergency situations.

It is worth pointing out that certain restrictions are essential. The ITU Radio Regulations define Amateur Service. The restrictions imposed ensure that there is no inconsistency between the definition and the privileges sought and gained for the Australian Amateur Service. It should also be pointed out that the prohibition against international third party traffic is also to be found in the ITU Radio Regulations, though these Regulations specifically allow Administrations to agree to the exchange of third party traffic by amateurs between their respective countries.

THIRD PARTY TRAFFIC APPROVAL

In opening the 1980 Remembrance Day Contest, the then Minister for Post and Telecommunications, Mr Tony Staley, announced that the prohibition on third party traffic for Australian amateurs would be removed forthwith. The Department advised the WIA that the conditions to apply would be the same as those used by the FCC in the USA, namely:

"The transmission or delivery of the following amateur radiocommunications is prohibited:

a International third party traffic, except with countries that have assented thereto.
b Third party traffic involving material compensation either tangible or intangible, direct or indirect to a third party, a station licensee, a control operator or any other person.
c Except for an emergency communication as defined in this part, third party traffic consisting of business communication on behalf of any party. For the purpose of this section, business communication shall mean any transmission or communication, the purpose of which is to facilitate the regular business or commercial affairs of any party.

In essence, these conditions imposed three prohibitions. Firstly, there must be no material compensation of any kind to an amateur or any other person. Secondly, the message must be non- commercial. Thirdly, until Australia entered into the necessary agreements with other countries permitting third party traffic, third party messages could only be passed within Australia. These conditions were precisely the conditions that the WIA believed should apply as expressed in their 1977 request.

These third party privileges did not include phone patch, that was a separate matter which has since been negotiated with Telecom, be it on financial conditions less favourable than some amateurs would wish.

THIRD PARTY AGREEMENTS

Following the release of third party traffic privileges in 1980, the WIA submitted, to DOC, a list of countries with whom third party agreements should be negotiated. That list was revised by the 1984 Federal Convention when the following motion by VK5 was adopted unanimously:

84.09.16 The Executive should pursue strongly the matter of Third Party Traffic using the following criteria:

1 All countries with whom the USA has third party agreements
2 All countries in which Australian Service Personnel are stationed
3 The United Kingdom

The country list is shown in Table 1, where the status of negotiation of agreement is recorded. In establishing agreements, DOC first communicates with the other country's communications department and, if indications are favourable, the matter is passed to the Department of Foreign Affairs to formalise an agreement.

As negotiation of a third party traffic agreement takes place on a government level, approaches by individual amateurs are of questionable value, indeed they often set back the cause of diplomatic negotiations. Australian amateurs who wish to extend the lest identified by the motion above (check the USA list before writing!) should work through the WIA who will make an initial approach to the national amateur radio society before conveying the request to DOC for action. In any event, do not write direct and embarrass everyone involved. Incidentally, the 1987 Federal Convention resolved to write to amateurs who had made direct approaches advising them of the problems such actions create.

At the 1982 Federal Convention, the WIA Federal Council prepared a Policy Statement on Third Part Traffic. That statement, reference 82.092/1 Appendix C9, is reproduced as an Appendix at the end of this article.

Obviously the motion 84.09.16, given above, elaborates on the last resolution paragraph of this Policy Statement and reflects the most recent views of the council.

RADCOM ACT

The Radiocommunications Act 1983, calls up the following Radiocommunications (Licensing and General) Regulation concerning conditions for communications by amateur stations:

"14 For the purposes of sub-section 25(1) of this Act, the following conditions are prescribed in relation to a licence in respect of a transmitter that forms part of an amateur station:

a the licensee shall not, when communicating with another amateur station, transmit any messages other than messages of an unimportant character in language relating to experiments, or consisting of remarks of a personal nature;
b the licensee shall not, on behalf of a third party, undertake the transmission of messages —
1. that directly or indirectly enable any person to obtain a pecuniary gain or other reward; or
2. that relate to the commercial or financial affairs of any person;
c the licensee shall not transmit messages to an amateur station in a country other than Australia the government of which has given notice that it objects to the transmission and reception of messages between amateur stations in that country and amateur stations outside that country;
d notwithstanding that the government of a country other than Australia has not objected to the transmission and reception of messages between amateur stations in that country and amateur stations outside that country, the licensee shall not, on behalf of a third party, transmit messages to an amateur station in that country unless the government of that country has made a special arrangement with the Government of the Commonwealth with respect to the transmission and reception of messages, on behalf of third parties, between amateur stations in Australia and amateur stations in that country."

The *Amateur Operators Handbook* contains statements similar to Regulation 14 above. The Regulation being of more recent origin should be observed.

In due course, a three leaflet series will replace the *Amateur Operators Handbook*. The second of that series "Part 2 — Operating Conditions" contains the following reference to third party traffic:

"3.2 Third Party Traffic
3.2.1 Transmissions by an amateur station licensee, on behalf of a third party, shall be restricted to conversations/messages of a technical or personal nature.
3.2.2 The licensee of an amateur station, when transmitting messages on behalf of a third party, shall not:

a transmit messages to another country unless that country has made a special arrangement with Australia in relation to the exchange of such traffic;
b undertake the transmission of a message that;
1. directly or indirectly enables any person to obtain a pecuniary gain or other reward; or
2. relates to the commercial or financial affairs of any person.

3.2.3 Except in a declared emergency or natural disaster, the licensee of an amateur station shall not solicit for third party traffic."

DOC have advised that electronic mail, store and forward message systems and the like constitute messages the same as spoken text or CW messages.

It is acceptable to send a message to a person in a country with whom Australia does not have an agreement provided it is passed through another country with whom both Australia and the destinations country have agreements.

SOLICITING THIRD PARTY TRAFFIC

In late 1986, DOC, in order to clarify the issue on soliciting third party traffic, and in elaboration of an *Amateur Radio* editorial, provided the following advice:

* amateur operators should only solicit for messages as an aid to providing third party traffic communications in a declared emergency situation or natural disaster; and
* any advertising for such messages should be conducted in a responsible manner and involve no pecuniary gain or other reward.

DOs AND DON'Ts

Some dos and don'ts for amateurs conveying third party traffic follow;

DO

1 operate only within Australian Regulations
2 know the countries with whom Australia has third party traffic agreements
3 let the WIA know of any additions you wish tc be added to the third party traffic negotiating list
4 support the WIA to negotiate initially with the national amateur radio societies for third party traffic acceptance
5 respect other nation's radio regulations even in emergencies as they apply to that nations activities
6 Remain within DOC guidelines if you solicit third party traffic
7 Conduct your third party traffic activities within your capabilities without making promises you are unable to fulfill.

DON'T

1 Pass third party traffic to countries with whom Australia has not an agreement
2 Attempt to initiate third party traffic agreements privately either with foreign governments or their amateur societies. You will only create diplomatic embarrassment
3 Attempt to initiate third party traffic agreements in an emergency via DOC until you are clear as to the circumstances and nature of the need. Often the involved nation's emergency plans come into force and your offers may

hinder rather than help. Remember, amateur resources are limited and may be over committed unwittingly.

4 Rush off to disaster areas either within Australia or overseas. The disaster control agency has ultimate responsibility for requesting and directing assistance. For overseas situations, their national authorities must make requests through NDO, who co-ordinate all Australian assistance.

5 Intercept communications and pass the contents to unauthorised parties such as the press or news media.

Table 1: Countries with whom Australia has initiated Third Party Traffic Agreements.

USA	In place and operating
Canada	In place and operating
PNG	Not agreeable
India	Not agreeable
Israel	In place and operating
UK	Being negotiated
Venezuela	Being negotiated
Liberia	Being negotiated
Honduras	In place and operating
Uruguay	Not agreeable
Panama	Being negotiated
Ghana	Not agreeable
New Zealand	Request made
Philippines	Being negotiated
Vanuatu	Being negotiated
Solomon Islands	In place and operating
Mexico	Request made
Mauritius	Not agreeable
Guyana	Being negotiated

APPENDIX — POLICY STATEMENT ON THIRD PARTY TRAFFIC

Given that:

1 The ability of the amateur radio service to provide public service through the use of amateur frequency bands, specialised equipment and knowledge;
2 The ongoing need to promote the amateur radio service to the general public in a proper manner;
3 It is desirable to develop operating skills within the amateur radio service;
4 There is potential for the development of national and international goodwill;
5 The operation of official WIA emergency networks usually necessitates third party traffic;
6 Amateur radio operators have an individual right to choose whether or not to become involved in such third party traffic.

This Council resolves to:

1 Support the use of third party traffic handling privileges by amateurs on all amateur bands and by all interested amateur radio operators, providing strict adherence to the Regulations is maintained at all time;
2 Support official WIA emergency networks providing assistance to official counter disaster agencies;
3 Support the existence of networks for facilitating third party traffic handling;
4 Educate interested amateurs in third party traffic handling techniques, procedures and responsibilities;
5 Promote co-ordination between third party traffic networks and official WIA emergency networks;
6 Continue to pursue the establishment of third party traffic agreements/arrangements with other countries.

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An Innocent Abroad

John Lingards Sykes G3SRK
7 Hill Top, Lingards Road, Slaithwaite, Huddersfield, HD7 5UA

The plight of a young radio officer. Salt pork and dried peas are not so bad after all!

After less than four weeks experience as radio officer of the coasting vessel S/S *Whitwood*, my employer, the Marconi International Marine Communication Company, considered me ready for deep sea duties. I was appointed to the S/S *Kassala* another coal carrier, but twice the size of my first vessel and loading for Genoa. The romance of my situation, mill worker to merchant navy foreign-going officer in less than 12 short months, seemed almost too good to be true. Italy had always held a special place in my heart, ever since making up my mind to become a radio officer. My boss, Senator Marconi, was an Italian and without him there would not have been any wireless telegraphy or wireless telegraphists, possibly for years to come. Again, as every schoolboy knows, Christopher Columbus was a Genoese and sailed from Genoa to find the New World.

The voyage from Sunderland to Genoa, through the notorious Bay of Biscay, past the mighty Rock of Gibraltar and across the eastern Mediterranean was scheduled to take 12 days and the good ship *Kassala* did it on time. The dreaded Bay of Biscay turned out to be as calm as a duck pond and I was both disappointed and relieved. Gibraltar was as impressive as I had imagined and the Mediterranean was blue and smooth. On the early morning of the 12th day I dressed in my best uniform and was ready to go ashore hours before we tied up. Noticing that the Chief Engineer was still in his working clothes I asked in some surprise, "Aren't you going ashore, Chief?" "I've been here before, Sparks, and I don't think I'll bother the beach this time." His words staggered me and I never guessed how short a time it would be before I echoed them.

I had no duties in port and as soon as the port doctor and the customs officials had completed their routine duties, I was free to step ashore. The Great War had ended just six months earlier. Italy had suffered greatly and could be feeling bitter and I was a bit apprehensive how I would be received; with clenched fists or open arms? I could not possibly have guessed.

Immediately upon walking through the dock gates I was attacked; no, not attacked; besieged, by a host of 20 or more thin, ragged and very dirty urchins all chanting the one English sentence they had been taught: 'Johnny, Johnny, you come sleep my sister, only 50 Lira.'

So that was it! Defeated, they were now endeavouring to convert us by propagating their siesta habit. Certainly they must be in a bad way if beds had to be shared but they were not going to catch me. From the appearance of the touts themselves, it was certain that the beds would have fleas and possibly bugs as well. Besides, it was only 10 o'clock in the morning and I was not going to hang around for three hours just to indulge in an afternoon nap. With great difficulty and only after scattering a handful of small coins, I managed to escape my besiegers and set about exploring my first foreign city.

The city was disappointing, run-down and shabby. The evidence of poverty and defeat was everywhere. Shops empty of goods and the people on the streets empty of hope. The buildings that had appeared white and stately when viewed from a few miles out at sea revealed themselves on close up as dirty gray tenements, dilapidated and neglected. Several times during the course of the next hour I was stopped and, in sign language, asked for a cigarette, but as I was a non-smoker I was unable to oblige.

The few items for sale that I did see looked very cheap in terms of the prevailing rate of exchange though doubtless expensive to the local people. I was particularly impressed by the sight of a magnificent lobster bearing a price tag of 20 Lira (about a shilling). I would buy it and present it to the officers' mess. It would make a welcome change from salt beef and dry hash. The smiling shop-keeper, in response to my pointing finger, lifter the lobster from the window and then picked up a large knife. "No no, total, completo." I signalled that I required the whole lobster at which the patron places it on a pair of scales and said something in Italian. Unable to understand I handed him a pencil and memoed that he should put it in writing. This he did: 850 Lira! Indignantly I pointed to the price tag, 20 Lira. I was informed in passionate language that even I could understand that the price was 20 Lira per 25 grams or just about an ounce and the scales read 1.5 kilograms. With my face redder than the lobster I fled the shop to imprecations very like 'perfidious Alion' as spoken in Italian. It was time to return to my ship and dinner of salt pork and dried peas.

However, returning to the ship proved less simple than I had imagined. I had not taken particular notice of where the ship was lying. After all, the S/S *Kassala* was easily recognisable on account of her yellow funnel. On entering the dock area I looked around for my ship and to my consternation there wasn't a yellow funnelled vessel in the harbour, not one! I was in a state of near panic. Had my floating home been moved around some corner or had she sailed and left me to those sleepy sisters and irate shop-keepers. Where was the British consulate? At the end of a dreadful half-hour, I managed to find an Italian seaman who had a smattering of English and to him I explained my plight. I was told not to worry and that, in exchange for five English shillings, handed over in advance, he would guide me to my ship. Never was money handed over more willingly nor guide followed more closely. We walked not more than a few hundred yards and there was the dear old *Kassala* but now with a *black* funnel. The explanation turned out to be very simple. The ship had been sold whilst on the high seas and after I had left her three hours earlier the funnel and masts had been repainted in the new owners' colours.

Gratefully I ate my pork and peas, followed by rice pudding and prunes, before retiring to my cabin and a British siesta in my own bunk followed by a game of draughts with the Chief. I had had enough of foreign parts for one day!.

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PHONE—PATCH HISTORY

Jim Linton VK3PC
4 Ansett Crescent, Forest Hill, Vic. 3131

Phone-patching is an integral part of Third Party Traffic handling, but its approval and use in Australia has had a protracted history.

When the announcement of Third Party Traffic privileges was made by the then Postal and Telecommunications Minister, The Honorable Tony Staley, in August 1980, Phone-patch was assumed by some to be an automatic flow-on.

At the WIA Federal Convention in 1981, (Agenda Item No 81.1201), a motion was passed that "Following the recent lifting of the prohibition against the handling of Third Party Traffic. . .the Executive negotiate with the Department of Communications further to remove the prohibition against Phone-patch Traffic (which appears in the regulations)."

But in May 1981, Telecom produced a policy making Phone-patch "expressly not authorised for personal use" or for use with radio equipment licensed under the Amateur Radio Service, and CB radio. It restricted the availability of Phone-patch to business communications only, and even then it could not generally be used in certain geographic areas — and was restricted to outside cities served by Telecom's Public Automatic Telephone Service which was new and being expanded. Telecom saw the interconnection of radio and telephone as competition to its mobile telephone service.

Preliminary experiments with acoustic coupling were being used by at least one radio amateur to "patch himself" on air to remotely operate his HF transceiver using the VOX mode. An article called "Phone-patching. . .Why not?" (ARA, Vol 4, No 2, 1981) criticising the prohibition on amateur Phone-patch has an almost immediate response from Telecom wishing to set the record straight. A conference was called by Telecom on June 30, 1981, attended by Jim Linton (author of the ARA article) and he invited Alan Noble VK3BBM, to represent the Wireless Institute of Australia. Telecom explained that the so-called prohibition on Phone-patch for the Amateur Radio Service was only a temporary measure so it could separate its considerations of business and private users of radio. This conference, which lasted 90 minutes, was the first occasion that Telecom has discussed Phone-patch with the Amateur Radio Service.

During the discussions some Telecom fears and barriers to Phone-patch for hobby communications melted away. This meeting set the foundation for a continuing dialogue between Telecom and the Amateur Radio Service.

Telecom, at the June 1981 Conference, promised a review of its policy relating to Phone-patch for radio amateurs would be completed by November of that year. To keep the matter moving, a prototype amateur Phone-patch unit was built by *Tara Systems* — Australia's foremost Phone-patch manufacturer for business two-way radio users and essential services.

At 1010 UTC on Monday, September 7, 1981, Australia's first authorised amateur radio Phone-patch contact was made. Telecom had agreed to allow a limited amount of Phone-patching so that amateur Phone-patch operations could be demonstrated — DOC also gave its permission. The first contact involved VK3PC in a 21 MHz contact with VK9ZG, on Willis Island, and patching members of the Weather Bureau Expedition on Willis to relatives in Melbourne (ARA, Vol 4, No 6, 1981). A later demonstration through VK3PC, patched a member of Telecom's engineering staff so that he could assess the facility.

Then,. Phone-patch for the Amateur Radio Service was dealt a body blow when it was learned that Telecom had decided to put the issue of interconnection between radio and the telephone network to the Federal Government's wide- ranging inquiry into telecommunications services, headed by Jim Davidson. This meant that Phone-patch for radio amateurs had been lumped together with considerations about whether business radio users should obtain widespread access to the facility.

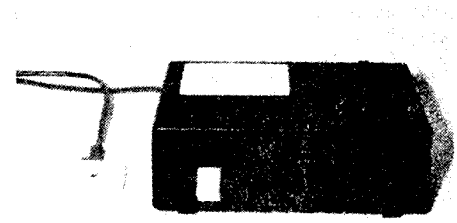
Numerous representations and inquiries were made to Telecom, including a letter-writing campaign to the Minister for Communications, but it was not until September 6, 1983, that a breakthrough came. Telecom announced in a news release headed "Radio Phone-patch connections to be liberalised" that it intended to widen the range of circumstances in which mobile radio could be patched into the telephone network. It said the facility would be confined to specified groups — these included emergency services, amateur radio operators, CB operators and common-interest groups using mobile radio. A Telecom spokesperson said the new policy would allow radio amateurs to use the Phone-patch arrangements already available in some overseas countries.

When the conditions applying to this "Liberalisation" of Phone-patch were released on September 26, 1983, a number of objections were made on behalf of the Amateur Radio Service. These included objections to a prohibition in the conditions on Third Party messages — the key basis of amateur radio Phone-patch — and a $2 a month access charges and socket connection costs.

Telecom agreed on the Third Party objection, and in June, 1985, when it issued revised policy and conditions, excluded the Amateur Radio Service from the prohibition on Third Party Traffic.

On August 6, 1985, WIA Federal Executive member, Jack O'Shannassy VK3SP and Jim Linton VK3PC, met with Telecom representatives to explore ways of resolving outstanding matters. This was followed up with another meeting on October 14, 1985. As a result of the two meetings, special conditions were drafted relating to the interconnection of Amateur Radio Communication Services (see details elsewhere in this article) with the telephone network. Telecom also offered to work with the WIA towards developing suitable circuitry and construction details for an interconnect (Phone-patch) unit which could be Telecom permitted. Within the WIA Victorian Division work was being done to design such a Phone-patch.

At this time, (independently), Sam Voron VK2BVS, who had been intimately involved in seeking Phone-patch for many years, also sought ways of getting a suitable inexpensive Phone-patch unit. A radio amateur, Geoff Donnelly VK2EGD, heard about Sam's desire to have a home-brew unit available and offered him assistance. Geoff works with Telecom's design laboratories in Sydney, and, with approval of his superiors, designed and built a prototype Line Isolation Unit (LIU), to go



between the Telecom line and amateur equipment. After testing, it was refined by Geoff before being sent to the WIA to seek Telecom approval. The LIU has been approved by Telecom and full details are published exclusively this month in the WIA journal, *Amateur Radio*.

SPECIAL CONDITIONS APPLYING TO THE AMATEUR RADIO SERVICE

The normal mode of Phone-patch operation is only a home station and at one end of a radio contact.

In a normal single-ended Phone-patch connection, normal Third Party requirements will apply.

Phone-patch access for mobile units will be permitted via a home station, but not directly via a repeater station. Repeater contacts can be Phone- patched, but only via a home station.

Under WICEN operation, or other emergencies involving natural disaster and/or life-threatening situations, together with unavailability of normal communications, double-ended Phone-patch will be permitted as a special condition. Under duly authorised WICEN exercises, training involving the use of double-ended Phone-patch will be permitted on a self-regulation basis by the Wireless Institute of Australia. The WIA will be responsible for authorising such exercises and will keep a record of such exercises and training arrangements. These records will include the details of the radio amateurs involved, the call signs, and period of authorisation.

This authorisation procedure will be available to any radio amateur wishing to establish local community emergency arrangements to the Institute's standards of service. This can include appropriate community service activities and public displays of the hobby.

The above special conditions, agreed to by Telecom and the WIA, will be reviewed in 18 months.

PHONE-PATCH GUIDELINES

1 Only Telecom approved equipment may be connected to the telephone network.

2 Use Phone-patch in accordance with Department of Communications regulations, particularly in relation to handling Third Party Traffic, and station identification at least every 10 minutes.

3 Brief the phone party on what is acceptable and unacceptable conversation to be transmitted via amateur radio. Any matter which is profane, obscene, indecent or otherwise objectionable is not permitted. Transmissions from Third Parties must be limited to remarks of a personal character for which, by reason of their unimportance, recourse to the public telecommunications service is not justified. Do not hesitate to interrupt a conversation

being patched through your station it you consider it may breach regulations.

4 Explain the patched conversation will be one-way at a time and to indicate that it is the other person's turn to speak they say "over".

5 Keep in mind Phone-patching is dependent on the standard of signal received off air and the quality of the telephone line. A very poor quality patch will not help either of the parties involved or the image of amateur radio. The transmission of poor quality signals from an amateur station is not permitted.

6 Avoid putting to air unnecessary dial clicks and telephone tones.

7 If you, as a radio amateur, use the telephone end of a phone-patch, avoid using your call sign if the transmission is on a band for which you cannot operate under your grade of licence.

LINE ISOLATION UNIT (LIU)

All apparatus connected to Telecom's Public Switched Telephone Network must be authorised by Telecom and have an authorisation number. The WIA "Amateur to Telecom" Line Isolation Unit (LIU) has been given a Telecom authorisation number. Each LIU must be constructed precisely as set out in this article, inspected and then certified by the WIA as meeting Telecom requirements before the authorisation number can be applied and the devise used.

Why not a Phone-patch unit instead of a LIU? The approach taken for the Amateur Radio Service has been to get a LIU authorised by Telecom which allows currently available unapproved Phone-patch units to be used. Later, home-brew Phone-patch unit may be presented in *Amateur Radio*.

The Telecom authorised LIU as explained in this article goes between the Telecom telephone line and the Phone-patch equipment. For example, the Kenwood Phone-patch PC-1 and other similar unauthorised units can now be used in conjunction with the LIU.

DESIGN

The "Amateur to Telecom Line Isolation Unit" has been designed for the WIA by Geoff Donnelly VK2EGD, who works with Telecom Design Laboratories in Sydney. He designed the PCB, built up a prototype, and, after exhaustive testing, decided, in consultation with Sam Voron VK2BVS, to have the WIA submit it to Telecom for official certification tests and approval number. Geoff is to be congratulated for his extremely worthwhile contribution to amateur Phone-patch.

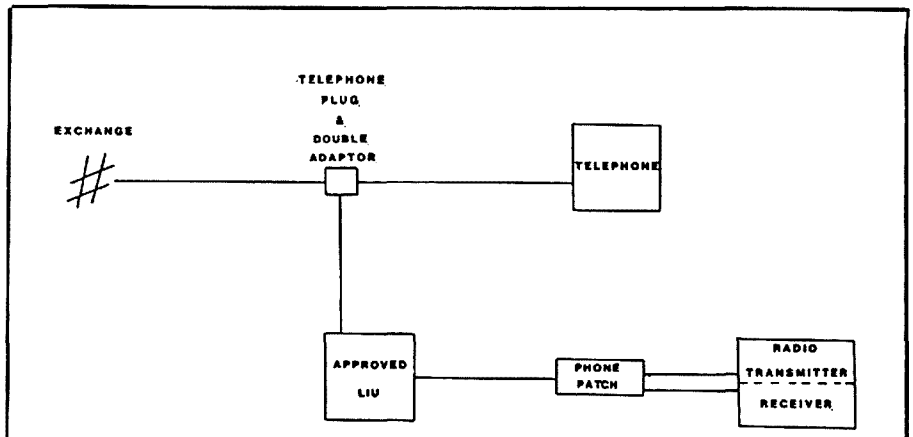


Figure 1 — Connection Block Diagram.

Telecom has agreed to allow radio amateurs to reproduce the original "Amateur to Telecom Line Isolation Unit". Provided the constructed units are identical to the authorised, and certified by the WIA, then these units will be considered as authorised. The precise instructions must be followed to ensure it meets the exacting standards required by Telecom.

AUTHORISATION

The WIA is to be the grantee of the authorisation and will be responsible for ensuring constructors comply with the conditions contained in the authorisation.

Figure 1 shows the method of connection for the LIU in a typical amateur Phone-patch.

The double adaptor places the telephone in parallel with the LIU so that the telephone can be used as a monitor during the patch operation. The LIU is for manual operation only, the radio amateur must be present to set up the call and operate the patch.

Following representations by Sam Voron, special dispensation has been given to the Amateur Radio Service permitting this LIU to be plugged into a normal telephone socket, thus eliminating the need for Telecom to install a special socket.

CIRCUIT DESCRIPTION

The associated telephone must be used to originate and answer a telephone call.

When the LIU is switched "on" it places a DC loop on the line — this will hold a call even is the telephone is hung up. This prevents the operator receiving or originating any further calls so it is necessary to ensure the unit is switched off when not in use.

To indicate the LIU has looped the line the LED will light via a diode bridge and zener. This ensures the LED will light regardless of line polarity which can change during the progress of a call or due to repair works on Telecom lines. The zener and series resistor regulate the current in the LED and keep it constant.

The capacitors across the diode bridge and line are to prevent RF appearing at the diodes and being detected, thus producing unwanted signals on the telephone line. The four 10 ohm resistors also reduce RF injection to the telephone line by providing additional RF impedance. In the event of a fault, the resistors will burn out and provide a little extra safety factor.

The back-to-back diodes and the capacitor on the amateur side of the transformer are arranged to clip any signals on the line to a level of 0.6 volts; signal levels of -10 dBm or less are unaffected.

The LIU electrical test is that it must be able to isolate 3500 volts AC when applied to the Telecom line and any other point on the LIU, including banana sockets and switch.

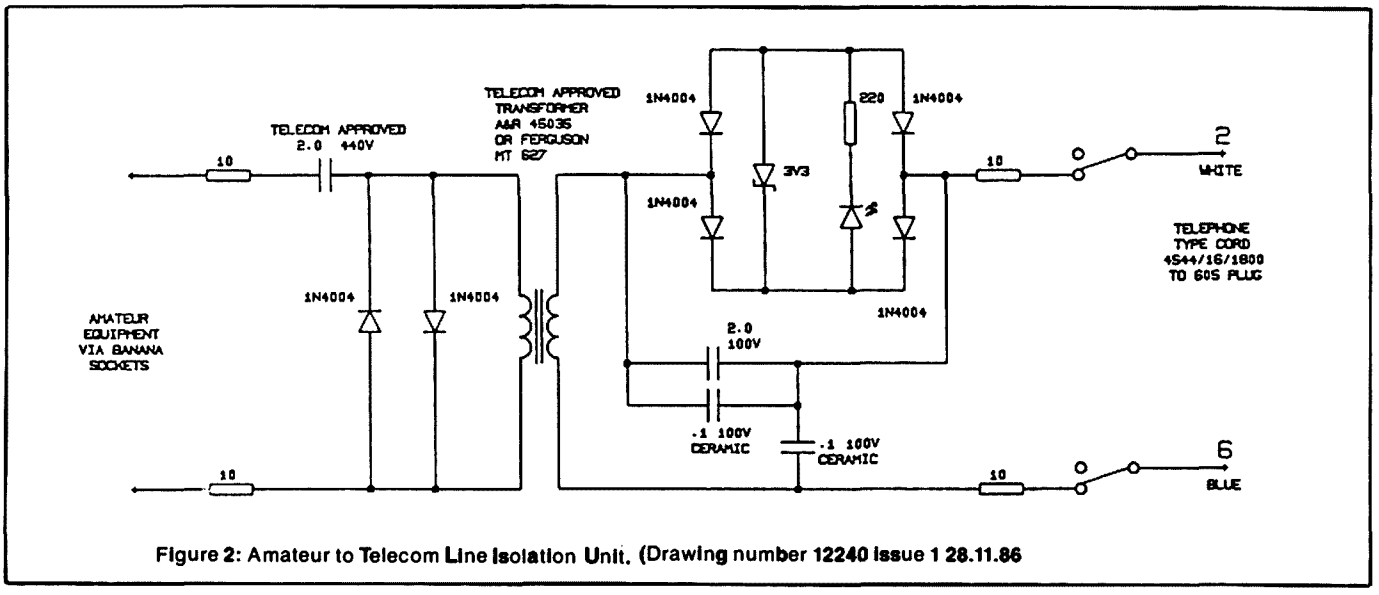
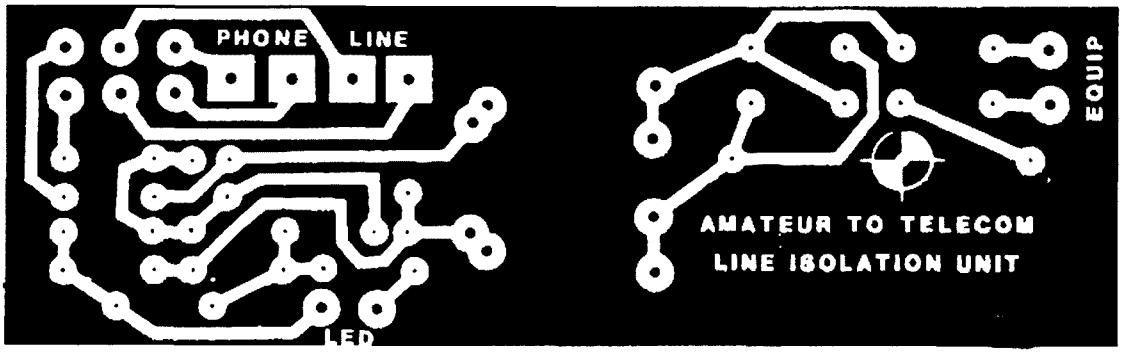
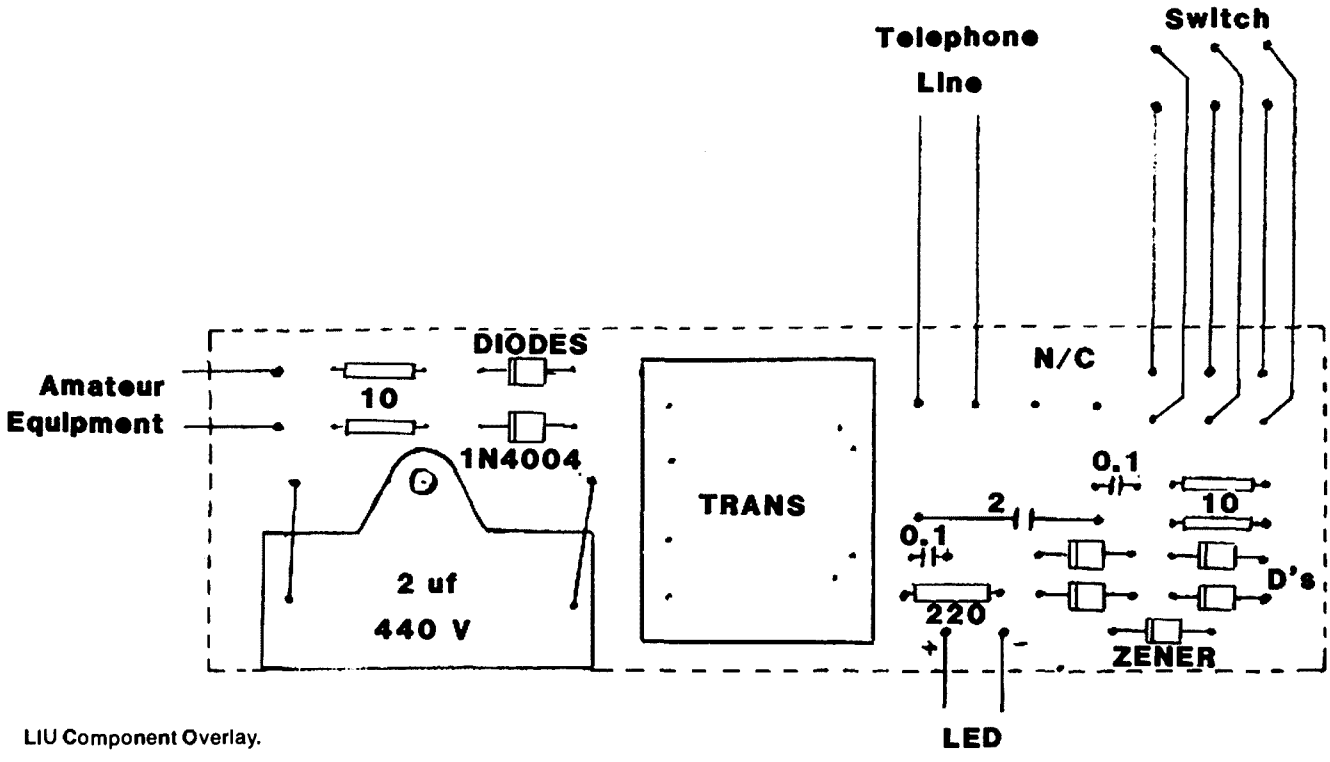


Figure 2: Amateur to Telecom Line Isolation Unit. (Drawing number 12240 Issue 1 28.11.86



Printed Circuit Board.



LIU Component Overlay.

NOTES ON SAFETY

The LIU must prevent both Transverse and Longitudinal dangerous voltages which are or may be present in private apparatus, from reaching the Telecom line. Transverse voltages appearing on the *line side* of the LIU are limited to a safe value (ie below 30 volts AC peak) by the diodes when 240 volts is sconnected across the Phone-patch connection of the LIU. The 2 uF capacitor limits the current to the diodes and thereby prevents their failure during fault conditions.

The transformer must withstand a test voltage of 3.5 kV AC RMS for one minute between windings. The completed LIU must withstand the same test voltage connected between the Telecom line connector and all external private wiring, which is isolated from the line and also any exposed metal of the LIU. To achieve this, the layout of the printed circuit board tracks on opposite sides of the transformer interface must be such that the isolation provided by the transformer is not bridged by close proximity of the PCB tracks (ie the spacing or barrier between tracks must not be less than five millimetres).

The exacting safety requirements imposed by Telecom are designed to prevent dangerous voltages reaching its network which can pose a serious hazard to Telecom staff and equipment. But the LIU level of isolation also protects amateur equipment from any voltage spikes or surges on telephone lines.

CONSTRUCTION

The WIA "Amateur to Telecom" LIU is a relatively simple unit to construct and should be well within the capability of any radio amateur. It has just one transformer, six diodes, a zener, five resistors, four capacitors, a switch, and a LED — estimated cost to make was $50.

Of special importance is the safety aspects of the unit — see the section "Notes on Safety". The unit is constructed in an all plastic box, the control switch is all plastic externally and the PCB layout ensures isolation of amateur and Telecom circuits. Telecom approved transformers and capacitors are used as required.

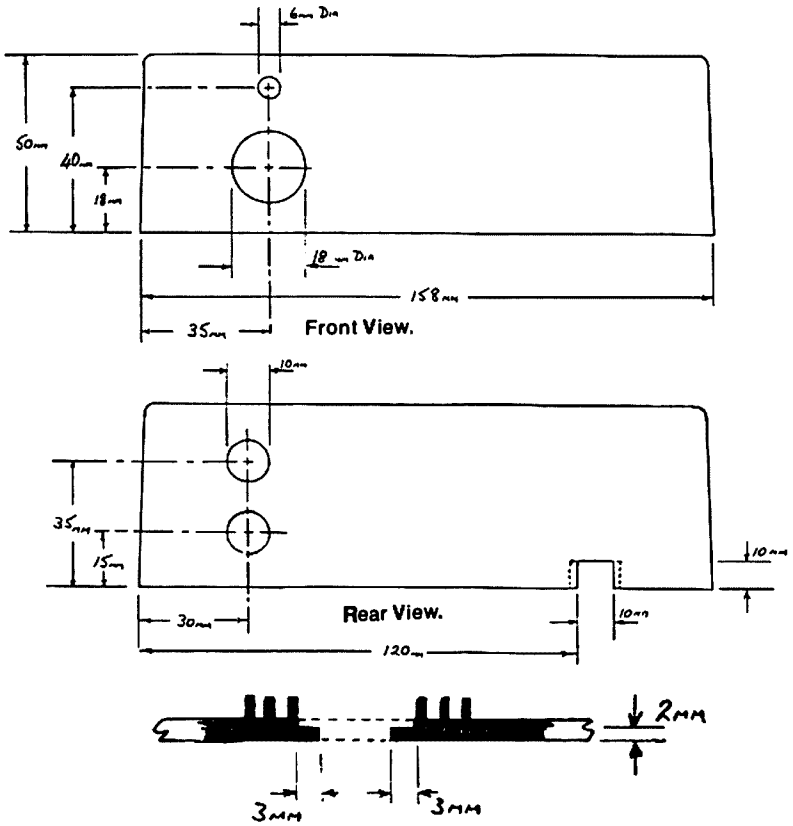
CIRCUIT BOARD

The PCB layout and component overlay are included in this article. However, some amateurs may wish to make their own PCB. If so, it must be fibreglass 0.1 inch thick. The PCB fits directly into the box so no special mounting is needed.

BOX

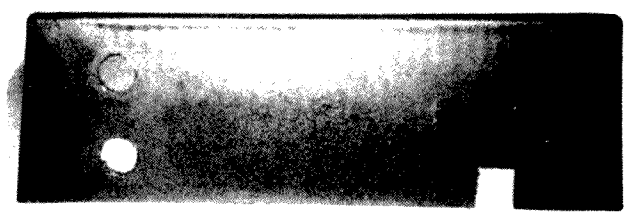
The plastic box is prepared by following the box drilling and cutting detail diagram in Figure 3. The slot for the cord is made by inserting two saw incisions 10 mm down into the box. The waste piece can be broken out with pliers and the slot smoothed with a file. Reducing the thickness of the box wall for three millimetres either side of the slot can be achieved with a chisel — be careful not to cut right through, leave a little extra material rather than taking too much. Check that the Telecom cord restraint fits snugly into the slot. A small area of the box lid rim will need to be filed away to allow the lid to fit around the cord. Inspect the slot with the lid in position and remove the rim material visible in the slot.

Fit the plastic switch to the front large hole and the LED mount and LED to the smaller hole — discard the washers supplied with the switch as they are not required. The two



Slot viewed from Base showing inside wall thinned to accept Telecom cord restraint.

Figure 3: Box Drilling and Cutting Detail.



Rear Panel of Plastic Box.

banana sockets mount into the two rear holes.

The wires joining the switch, LED and banana sockets should be approximately 120 mm long. Use at least three different colours on the switch for easy tracing. Align the PCB switch pads and the switch, and wire each connection one-for-one from the switch to the pads. Rotate the switch so that the LIU is on in the down position. When in the final position, apply a little plastic cement to prevent the switch moving.

CORD

Now to the difficult part — soldering the Telecom cord to the PCB. The cord specified has four conductors. Only two, the white and blue, are now required so cut off the red and black wires. The blue and white wires go to the *line* pads on the PCB — no connection is made to the *phone* pads on the PCB. These *phone* pads were made redundant when Telecom agreed to operating the LIU in parallel to the telephone.

The cord connection is a crimped connector on to a plastic covered tinsel, not wire — this is for flexibility. Heating these crimped connectors excessively will destroy the reliability of the connection, so take care. Use a pair of long-nosed pliers to hold the crimped connector (tag) and solder a small area of the tag. Solder the PCB pads (line only needed) then, while still holding the tag with the pliers, sweat the tag to the PCB. If the join becomes overheated throw the cord away and start again with a new one.

Add the four stick-on feet to the base of the plastic box and the unit is ready for operation.

PARTS LIST

The following is a complete list of parts required for the LIU.

1 Transformer, Arlec 45035 Telecom approved.
1 Plastic Box (all plastic) DSE H2851.
1 Switch, DPDT (plastic) DSE S1393.
2 Banana Sockets (black) DSE P1732.
1 Bridge Bypass Capacitor, polyester 2 uF DSE R2140.
1 2 uF 440 V Capacitor, Jaycar EE5120, Telecom approved.
6 Diodes, IN4004 DSE Z3204.
1 Zener Diode, 3.3V 1W IN4728 DSE Z3515.
1 LED 5 mm diameter DSE TL4211.
1 LED Mount "Cliplite CLF 280RTP" C&K Electronics.
4 10 ohm ½ watt Carbon DSE R1226.
1 220 ohm ¼ watt Carbon DSE R1058.
2 .1 uF 100V Ceramic Capacitor RF/Bypass DSE R2360.
4 Stick-on Rubber Feet DSE H1745.
1 Telecom Cord 4544/16/1800.
1 Telecom Plug 605 DSE F5117.
1 Telephone Double Adaptor DSE F5112.

APPROVAL INSPECTION PROCEDURE

To comply with Telecom requirements for inspections and approval of completed LIUs, an inspection officer has been appointed. He is none other than Geoff Donnelly VK2EGD, the designer of the equipment! Geoff hopes to carry out the task on his own. If the demand for certification is much greater than expected, it may be necessary to arrange for an added inspector, possibly in another State. Initially, units for inspection and approval should be adequately packed, marked "LIU for approval" and mailed to VK2EGD, C/- VK2 Division WIA, PO Box 1066, Parramatta, NSW. 2150.

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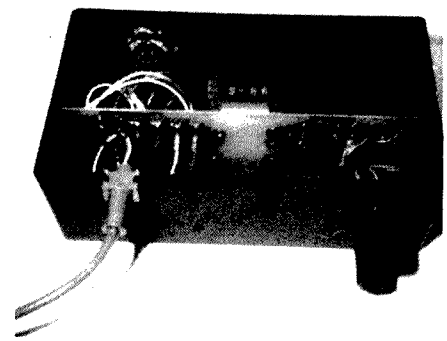

PCB Inserted in Box.

How's DX?

ARCHDIOCESE OF DETROIT

Members of the South-eastern Michigan DX Association will operate Special Event Station *K8JP*, commemorating the visit of Pope John Paul II to the Detroit-area, September 19, from 0001 to 2400 UTC. Operation will be on 10 metres through to 80 metres, both phone and CW.

For a special commemorative QSL card, send QSL, SAE and IRCs to Larry Zabkowski K8NLD, 18082 Gaylord, Fraser, MI 48026.

SAHARA DXPEDITION

Did you hear S0RASD. A special DXpedition was organised by the LYNX DX Group, between August 6 and 16, 1987, to operate the station S0RASD (Republica Arabe Saharaui Democratica). Operators were EA2OP, EA2JG, OH2BH, EA2AJH, F6EXV, EA2ANC, EA2ANH, EA2XC and EA2BXQ.

QSLs for the operation go to Arseli Etxeguren EA2JG, Las Vegus 81, 01479, Luyando, (Alava), Spain.

THE SUNDAY MORNING BROADCAST

Bud Pounsett VK4QY
33 Lassetter Street, Kedron, Qld. 4031

The Divisional Broadcast each week is an essential part of all Division's activities and, in the minds of most amateurs, is a real service.

A good news service keeps the ordinary amateur informed of what is going on in amateur circles and happenings on a worldwide, nationwide and state level. Our weekly news services can bring this information to the amateur and shortwave listener much quicker than the written word such as in our journal, *Amateur Radio*.

A good news service must be formatted to attract as many listeners as possible. Well-informed members are usually happy members who in turn make the life of Divisional councillors happy, too.

To achieve this objective, the service must be interesting, topical and well- presented. The last requirement is very important. In this day and age, people, and that includes amateurs and shortwave listeners, listen to or watch, one or more professionally presented news bulletin every day. A poorly presented newscast will lose listeners and watchers very quickly. Here in Queensland, with the VK4WIA news each Sunday, we strive to reach that goal of professional presentation.

Essentially, a news editor must have his sources of information. As the VK4 news editor, I am very fortunate in having a very good rapport with all council colleagues who pass on items to me. The VK4 Federal Councillor makes sure that I get copies of all manner of papers, letters, newsletters and releases that come from the Federal Office. Many of the State's clubs send their monthly newsletters, and when the occasion arises, letters are received that give further information. Individuals also contribute by telephone or post and point is made of using this material as it encourages them to submit more news at a later date. Of course, a lot of eavesdropping on nets, particularly the Queensland Club Net on Tuesday evenings, is a great source of material.

Having obtained this information, the next sequence is to combine it in an interesting semblance of order. Over the years, a format has been developed that follows the following pattern:

Very Brief Opening
Federal News Insert
Top Priority News (if available)
Overseas News
National News
State News
DX News
Club Notes
Sign Off

The format is not a rigid one but generally the above order is maintained. The VK4WIA news session actually starts at 2255 UTC. The period 2255 to 2300 UTC is taken up with a repetition of call signs and a list of frequencies. This is to enable stations relying on HF propagation to check for the best reception before the news begins.

Exactly at 2300 UTC, the news begins with a brief (about 30 to 40 seconds) announcement with the news reader greeting listeners and introducing herself and then introducing the federal segment. The federal news is always introduced as it gives a smoother presentation and is always back announced such as 'That was Ron Fisher VK3OM' or 'Bill Roper VK3ARZ' as the case may be.

Because the Queensland broadcast is a network effort, there are a number of stations who must identify within each 10 minutes. To assist the relay operators, the identification cue is always the same, 'And now a pause for station identification,' and always with the same voice. A pause for about five seconds and the announcement, 'This is VK4WIA.' At that time the relay operators give their own calls. Following this the announcement, 'You are listening to the weekly news broadcast from the Queensland Division of the Wireless Institute of Australia, coming to you from Brisbane, Australia.' This acts as a buffer between the identification and the next news item. If the first few words of the buffer are chopped, it is of no concern. Again, at the end of the bulletin, a standard sentence is used, '. . . wishing you good morning from VK4WIA.' This alerts the relay operators that the session has finished.

To achieve a smooth presentation, live once per week, is difficult. For this reason the bulletin is put down on tape, usually early on Saturday morning. I am very fortunate that my wife Bonnie, is a good reader and was willing to become VK4WIA's news reader. She is probably the best known non-amateur voice on the amateur bands in Australia. The first tape run has stops, starts and mistakes, although Bonnie does a remarkably expert job of reading matter sometimes quite foreign to her. This is particularly so with satellite and packet items. This reel-to-reel tape is then edited to another reel-to-reel tape and finally on to cassette for delivery to the network manager.

One may ask about last minute items not being included in the news. Last minute items are fairly rare, apart from the unhappy task of advising of a Silent Key. When this occurs, after the final tape is made, the network manager does it at an appropriate point in the broadcast.

The next task is to get it on the air. In Queensland, there is no divisionally owned equipment or even a complete transmitting facility. The news is transmitted on all of the frequencies by individually owned stations and it is quite a team, ranging from Brisbane to many regional centres. The network manager is Jack Gayton VK4AGY, at Woody Point, on the Redcliffe Peninsula. Jack transmits the bulletin to several two-metre repeaters, including Brisbane, Gold Coast, Sunshine Coast, Darling Downs and the Brisbane UHF repeater. The relay stations receive, generally, one of the uplinks and relay it to their assigned band. There is a relay station for each of the bands from 160 through to 10-metres. The 30-metre band is primarily used as a feeder service to regional areas for relay to their two-metre repeaters during this period of poor and uncertain propagation. Use of the 10 MHz frequency for the broadcast, will be monitored for use as propagation conditions improve.

Whenever possible the same people perform the same task each week. However, holidays and other personal commitments do intervene and the network manager has a few standby operators who can fill in. This is not so on the production side. Usually, I am away on holidays when the broadcast is in recess over the Christmas-New Year period, generally a period of three Sundays. One year, we recorded the last session before Christmas and before leaving to go to Samoa. It was a rather odd sensation listening to ones own voice on the Sunday morning broadcast, at noon the day before due to the time difference. There is one other time in the year when a Sunday is missed and that is the Remembrance Day Contest weekend.

How long does our VK4WIA news bulletin last? Just as long as it takes to present it. This is somewhere between 20 and 30 minutes. By putting it down on tape and thereby having a smooth presentation, our bulletin covers much more than a live broadcast in a given time.

After the news is completed, the various relay stations conduct a call-back session while some regional stations have a local news session. There are generally, spread over the various frequencies, well over 100 stations calling in each week. The call signs presently represented are VKs 2, 3, 4, 5 and 8, FK8, H44, KX6, P29, YJ8 and ZL when there is a sunspot minima. With such response, the news team feels that their efforts are not in vain.

For those readers who may like to listen for yourselves, VK4WIA can be heard from 2255 UTC Saturdays (0855 EAST on Sundays in Australia) on one of the following frequencies: 1.825, 3.605, 7.118, 14.342, 21.175 and 28.400 MHz on the HF bands. Also it is broadcast on several repeaters in the south-eastern corner of Queensland and on many regional repeaters. All listening amateurs are invited to call in and give a report and their thoughts on the broadcast. The relay stations will be listening for you on the next and subsequent broadcasts.

ar

VHF UHF — an expanding world

Eric Jamieson VK5LP
West Terrace, Meningie, SA. 5264

All times are Universal Co-ordinated Time and indicated as UTC

AMATEUR BANDS BEACONS

FREQUENCY	CALL SIGN	LOCATION
50.010	JA2IGY	*Mie (Near Nagoya)*
50.075	VS6SIX	*Hong Kong*
50.090	KH6EQI	*Honolulu*
52.013	P29BPL	*Loloata Island*
52.020	FK8AB	*Noumea*
52.100	ZK2SIX	*Niue*
52.200	VK8VF	*Darwin*
52.250	ZL2VHM	*Manawatu*
52.310	ZL3MHF	*Hornby*
52.320	VK6RTT	*Wickham*
52.325	VK2RHV	*Newcastle*
52.345	VK4ABP	*Longreach*
52.350	VK6RTU	*Kalgoorlie*
52.370	VK7HST	*Hobart*
52.418	VK0MA	*Mawson*
52.420	VK2RSY	*Sydney*
52.425	VK2RGB	*Gunnedah*
52.435	VK3RMV	*Hamilton*
52.440	VK4RTL	*Townsville*
52.450	VK5VF	*Mount Lofty*
52.460	VK6RPH	*Perth*
52.465	VK6RTW	*Albany*
52.470	VK7RNT	*Launceston*
52.485	VK8RAS	*Alice Springs*
144.019	VK6RBS	*Busselton*
144.400	VK4RTT	*Mount Mowbullan*
144.410	VK1RCC	*Canberra*
144.420	VK2RSY	*Sydney*
144.430	VK3RTG	*Glen Waverley*
144.465	VK8RTW	*Albany*
144.470	VK7RMC	*Launceston*
144.480	VK8VF	*Darwin*
144.485	VX8RAS	*Alice Springs*
144.550	VK5RSE	*Mount Gambier*
144.565	VK6RPB	*Port Hedland*
144.600	VK6RTT	*Wickham*
144.800	VK5VF	*Mount Lofty*
144.950	VK2RCW	*Sydney*
145.000	VK6RPH	*Perth*
432.057	VK6RBS	*Busselton*
432.160	VK6RPR	*Nedlands*
432.410	VK6RTT	*Wickham*
432.420	VK2RSY	*Sydney*
432.440	VK4RBB	*Brisbane*
432.445	VK4RIK	*Cairns*
432.445	VK4RTL	*Townsville*
432.450	VK3RAI	*MacLeod*
432.535	VK3RMB	*Mount Buninyong*
432.540	VK4RAR	*Rockhampton*
1296.171	VK6RBS	*Busselton*
1296.420	VK2RSY	*Sydney*
1296.480	VK6RPR	*Nedlands*
10300.000	VK6RVF	*Roleystone*

The only matter to report this month on the beacons is another letter from Steve VK4KHQ, at Mount Isa, in response to the letter I had written to him. I mentioned last month that Steve was running a keyer on six-metres and his letter confirms that it operates on 52.060 MHz, between 0100 and 0500, Monday to Friday, using CW with 10 seconds transmit and five seconds receive and the occasional calls on RTTY (45.45 baud, 170 Hz shift). This latter is as a result of his acquisition of a Tono Theta 7000 communications computer which has replaced the TRS80C computer. Steve plans to be on as often as practicable and could be heard at hours other than those indicated. He worked VK5ZDR on 27/5, VK2BHO at 0355 on 12/6 and VK2DDC at 0420, both on SSB after using the keyer. This has confirmed, for him, the need to keep within hearing range during the receive cycles!

Whilst still on the matter of the beacons, I once again impress on the various beacon co-ordinators to supply me with the information requested last month so that any corrections can be made to the published list. Please make sure you do it.

FROM JAPAN

A letter from Yoshi JA1VOK, reports they had a great six-metre opening on June 16/17. He worked KH6JJI at 2230, KH6IJ at 2232, and heard a weak K6MYC/KH6 beacon on 50.110 MHz at the same time on 15/6. The KH6EQI beacon was not heard. Yoshi suggests the 50.110 MHz beacon has replaced KH6EOI? Signals were up to 5x9 plus 30 dB, and the opening remained until 0130 on 16/6. They were heard again the next day from 2145 to 2320. This shows multi-hop Es can be available during the lower part of the cycle and indicates the Northern Hemisphere may be going to have a good summer Es season.

Yoshi said that strong Es signals have been heard on two-metres. He worked many JH6 (Kyushu area) and JR6 (Okinawa) stations from 0140 to 0350 on 210/6. Best DX was JS6AXB on Miyako Island between Okinawa and Taiwan, distance about 1900 kilometres. On 21/6, he worked JA8UGJ, in north Hokkaido, at 0712. The distance was 1100 kilometres.

The Japanese magazine, CQ *ham radio*, courtesy of Graham VK6RO, for May 1987, lists the following stations as having been worked from Japan; VK6RTT heard 1808 on 19/3; VK4RTL heard 1525 on 20/3; VK4FNG at 1538, VK8ZLX at 1608 (and twice later), all on 20/3; VK8ZLX at 1541 on 21/3; VK6RTT at 1555 and VK8ZLX at 1600 on 23/3, also VK8ZMA at 1605; VK4FXX and VK4FWX around 1500 on 28/3; VK4FWX at 1330, VK8ZMA, VK8ZLX, VK4FXX and VK8JH, around the same time on 29/3. A VK3 was heard at 1400.

The June issue of the same magazine carries even more contacts, extending right through to 24/4. Stations being worked include VK8ZLX, VK8ZMA, VK4FXX, VK4FWX, VK8ZCU, VK4ALM, VK4BRG, VK4FXZ, VK4ADT, VK6JH, VK2DDC, VK4FNQ, VK2BA, VK4TUB, VK6YA, VK2QF, VK4JH, VK2BHO, VK8GF, VK6IU, VK6JQ, VK4KAA, VK6KXW, VK6RO, in addition many beacons were heard plus many hearings of VK and ZL television stations. It appears the equinox has provided stations over a very wide area with contacts to Japan, so perhaps my urging for operators to be aware of possible contacts around that time have not gone unheeded. Also, interesting to note, the JAs have also been working KH6, HL1, HL4, HL5, KG6DX, and the occasional HL2. As we start the slow climb out of the low part of the cycle we can expect even more such contacts with an even greater range of stations involved.

The May issue of the magazine carried brief information on a 12 element 50 MHz Yagi on a boom 15.62 metres long, weight of the antenna being 16.2 kg, with a gain of 15.2 dBi, which is about the same as a pair of eight elements without the advantage of lowering the angle due to stacking. So here is an opportunity for those of you who want something really long in your backyard. The design is due to JQ1BSQ, and is called the SS-126.

USING TWO-METRES MOBILE

David VK3AUU, has sent some information covering his recent trip to Broken Hill via Mount Gambier (for the Convention), where I was able to speak to him personally once again. His main purpose in writing was to pass on to newcomers (and others) that two-metres SSB has a lot to offer when it comes to operating mobile.

The unit used is an FT-221 driving a MM linear amplifier. While with Chris VK5MC, after the Convention, they measured 90 genuine watts output and the preamplifier gave a very respectable 1.7 dB NE The antenna is a horizontally polarised halo attached to a ski-bar about one metre above the roof, fed with a delta match, 4:1 balun and RG8.

First contact was from Hamilton to VK3LK, at Heywood, about 80 km. From there into Mount Gambier he worked VK5NY at Mount Wilson, a distance of 350 to 400 km. A few days later, at Naracoorte, he again worked VK5NY and could hear VK3AIH, at Portland.

On the road to Adelaide, through Keith, the Mount Gambier beacon was audible all the way to Murray Bridge, even while crossing the old bridge into the town. This is just over 300 km. From the hill on the Adelaide side of Murray Bridge, he worked VK5NC, while VK5ZDR was worked with 10 watts output.

The run to Broken Hill proved to be the highlight of the trip. David maintained contact with VK5RO nearly all the way to Olary, which is some 330 km. During this contact he was also able to hear Col working KH6JJI, via OSCAR-10, which was low down on the eastern horizon. After VK5RO disappeared, he was able to work VK5ZDR, for another 20 km. Reports being received back indicated both Col and Mick were receiving David better than he could hear them due to extra noise in the mobile environment.

A few days later, from Cobram in northern Victoria, David worked VK2YEZ, in Griffith, with 10 watts at 180 km.

Concluding, David says it should be noted all home stations were running powers of around 100 watts with horizontally polarised antennas. Except for the first contact with VK5NY, there did not appear to be any enhanced conditions. The distances covered are in excess of twice the range of most FM repeaters and he feels this demonstrates the superiority of SSB for extended mobile work. Thanks for writing, David.

I might mention that, *even* back in the AM days, I did extensive mobile working with only 15 watts output with a good converter fed into a much improved Command receiver and distances out to 300 km were frequent contacts. Several times I sat on small rises and set up a three element Yagi which resulted in contacts to 600 km and further.

Summing up, I suppose it is just so easy to work FM via repeaters that most have no need to try anything else, but this will not suffice for the DX hound, so the rewards are there if you are prepared to make the effort.

VOICE SIGNALS OFF METEOR TRAILS

"Washington — Strategic Systems Division of GTE Government Systems Corporation has transmitted spoken messages more than 800 miles by bouncing radio signals off meteor trails in obtain in nearly all cases, a narrow exclusive allocation for the amateur and amateur-satellite services adjacent to a wider, shared allocation.

"Unfortunately, in the bands between 420 MHz and 10.5 GHz, we are not so lucky, and there was no possibility at WARC-79 of improving our relative status, at least internationally. Some consideration already is being given within IARU to the matter of objectives for a possible future WARC, and draft suggestions for consideration by the IARU Region 3 Conference, in Auckland, in November 1985, were transmitted to the Conference by the IARU Administrative Council. Briefly, the draft asks that the regions consider the desirability of seeking segments of the 420, 902 (in Region 2), 1260, 2300 and 10,000 MHz bands as primary allocations without relinquishing the remaining secondary allocations. While this process is still in an early stage, I believe it would be entirely appropriate for you to seek WIA support for this approach at the next Region 3 Conference, scheduled for Korea in October 1988.

"The pressures on our access to the microwave bands are bound to increase, both domestically and internationally. I would encourage you to work with the WIA to see that the fine record of Australian support for amateur radio allocations

will continue. 73. Sincerely; David Sumner K1ZZ, Executive Vice- President, ARRL."

That such matters are understood by the ARRL is encouraging to us here and we hope the WIA will continue to do all in its power to try and obtain some exclusive segments, even if smaller than we have been accustomed to, in those bands 420 MHz and above. The band of main concern at the moment is 2300 MHz and the proposed introduction of a number of channels for Multipoint Distribution Systems (MDS). Even a 10 MHz exclusive segment commencing at 2300 MHz would be a great help, even if only to maintain the harmonic relationship from 1152 MHz, one of the prime originating frequencies when one goes higher up the spectrum, eg 2 x 1152 = 2304 MHz.

I am grateful to the Federal Executive of the WIA (via Peter Gamble VK3YRP), for keeping me informed on developments for these bands, and to Wally VK6KZ, for the information he feeds me from time to time.

CHANGE OF ROLE

I note that Ken McLachlan VK3AH, has relinquished his "How's DX?" columns in AR after a period of six years. I have always read his notes with interest as they have kept me informed of happenings around the world in an area away from the generally smaller areas involved in the VHF/UHF scene.

Ken has set a very high standard with his information and a good example of how such a column can be made interesting, something which is always a challenge. I wish Ken well in whatever he does to fill the vacuum (and fill it he will(and await with interest the column to be prepared by his successor. Best wishes from the VHF/UHF fraternity, Ken.

SSB ON MICROWAVES

From Bill Tynan W3XO, and *The World Above 50 MHz*, in *QST* who says that it was not long ago that SSB/CW operation at 10 GHz and above would have been all but impossible for amateurs. However, many are reporting such activity at 10 GHz, some with commercial transverters from SSB Electronics, but quite a few with home constructed gear. But SSB at 24 and 47 GHz!

Bill says; "Just after the June column I received word from WA3RMX/7 regarding work that WB7UNU, and he have been doing on those bands. Last summer they worked over a 115 mile path on the 13, 9, 5, 3, and 1.2 cm (24 GHz) bands using SSB in each case. He disagreed with the proposed 100 mile requirement to be listed in the Microwave Standings in *QST* for bands 24 GHz and above, pointing out that at 47 GHz and above, absorption in the atmosphere and lack of equipment to generate sufficient power to overcome it, make that figure very difficult to attain. He went on to explain that WB7UNU and he had already worked over a five mile path on 47.040025 GHz SSB, and later had extended this to 13.92 miles."

So, all this adds up to some exciting times ahead for those prepared to work and build the required equipment for such bands. Has anyone in Australia anything to report on those bands? Please let me know.

FROM THE UK

I note, in a comment from Steve VK5AIM, that *Practical Wireless* has taken over *The Short Wave Magazine* so I expect we can see a few changes. I have often been able to quote from their columns in the past those matters which seem relevant to us in VK.

I note that the 50 MHz band has been officially released to Class B stations and certain restrictions have been eased, although some European countries are very much against any relaxation of regulation in regard to that band as they have long term plans to use Band 1 for television.

More stations are appearing in the UK on 50 the ionosphere." *Fancy that!*

The report is contained in January 1987 *Aviation Week and Space Technology* and is by Jay C Lowndes, sent to me by Damien Vale VK3CDI, of Mildura, with the comment "The military discover meteor scatter!"

A few other extracts from the same article says; "The division compresses a speaker's voice into digital bursts short enough to reach the receiver before ionised gas trailing a meteor can dissipate.

"Optimum operating frequency is 40 to 120 MHz. Multi-path Interference is too great at lower frequencies because normal electron density in the atmosphere is sufficient to scatter the signal. Operation of HF radio is from 5-25 MHz, optimum for total reflection. Electron densities of meteor trails are insufficient to scatter a signal at frequencies higher than 120 MHz.

"The master station has 500 watts of power and remote stations have 300 watts. All stations have a Yagi-Uda antenna of five elements ranging four to eight feet long.

"Two tests last summer consisted of transmissions from Westborough to a receiver near Sebago Lake, at Brownfield, Maine, 120 miles away and to Winchester 418 miles away. Meteor Communications built the 50 MHz transceivers.

"Mr Herman said the maximum range of meteor-burst voice is 1240 miles using a meteor at an altitude of 62 miles, but optimum coverage is afforded at ranges of 360-960 miles. A link as short as 150 miles takes longer to establish because there are fewer meteors between the transmitter and receiver than at longer ranges.

"The largest number of meteors encounters the Earth between 4 am and 10 am because the atmosphere acts as a trap for meteors along the Earth's orbit. Herman said the minimum incidence of meteors occurs from 6 pm to midnight. During the early morning hours, a point on the Earth's surface faces toward the planet's direction of motion in orbit.

"The division's voice-transmission technique uses artificial intelligence to match spoken words to simplified digital signals.

"Voice input from a microphone or telephone handset is sampled and converted into a digital bit string at seven bits/character in the American Standards Institute format called ASCII. The voice recognition system that accomplishes the conversion contains a 1000 word dictionary and was supplied by Kurzweil Applied Intelligence, Inc, Waltham, Mass.

"Encoder software developed by GTE residing in a personal computer then matches the string of characters to phrases stored in the memory, which further packs the data into two bytes/word or phrase for storage in the transmitter buffer.

"The system transmits an idle probe signal that cycles every 20 milliseconds. When a response to the probe from the remote receiver alerts the system that a meteor trail is at the intersection of the transmitting and receiving antenna beams and has an electron density sufficient to complete the link, the transmitter bursts the contents of the buffer to the receiver.

An average meteor trail lasts 300 milliseconds. The four-kilobit/second data rate employed during the GTE tests was sufficient to move 12 words in 48 milliseconds, so one meteor could handle about 70 words on the average, according to Herman, who said hardware is under development for operation at up to 64 kilobits/seconds.

"The processing sequence is reversed at the receiver using GTE-proprietary decoder software and a DEC talk voice synthesiser supplied by Digital Equipment Corporation."

So, there you have the basic idea. It is of particular interest to the military because it is resistant to interception and jamming because signals reflected from a meteor trail cover an area on Earth only 30 miles long by 15 miles wide, and the timing of a transmission burst is unpredictable since it depends upon random events in nature. Some satellite antenna beams cover an entire hemisphere.

Whilst amateurs may not have used these exact techniques, sufficient work has been done in many places to indicate meteor scatter contacts are possible using both CW and voice, so there has been some good pioneering by all parties. Very interesting.

THE MICROWAVE BANDS

Wally Howse VK6KZ, has sent me a copy of a letter he received from the American Radio Relay League Inc (ARRL), dated 17/6 in response to his letter of 6/6 (a fast reply), and as it is very relevant to these columns in view of my comments in previous issues in support of Wally's moves for better understanding of our position in regard to the microwave bands, in particular.

The letter reads, "Your call sign is, of course, well-known to us from your record of accomplishment in the microwave bands, and your concerns are certainly justified. The relative desirability of narrow exclusive versus wide shared bands was discussed extensively during the period leading up to WARC-79. These discussions led ultimately to our being able, in the bands above 10.5 GHz, to MHz and, during an opening on 20/4/87, CT1WW, in Portugal, worked more than 70 stations in the UK. Several beacons are now operating and these are alerting stations to band openings.

In the August issue, a further clarification of the lifting of restrictions is set out. Of interest is that the UK stations have been allocated primary status from 50 to 51 MHz and secondary status from 51 to 52 MHz. The restrictions on portable and alternative address operation have been abolished but mobile operation remains out. The maximum antenna height remains at 20 metres above ground level and power levels remain at about 25 watts for CW and 100 watts PEP for SSB (each as measured as ERP to a dipole). The power levels are to be reviewed at the end of the year.

Also, from *Practical Wireless* is the news that "the sun is now in a period of transition, where the old and new cycles are overlapped with spots appearing together in both latitudes. Three sunspots were counted on 22/4 and 30/4, and four sunspots on 25/4 and one each on the interim days.

"The solar flux was 73 units on 1/4 and then rose sharply to peak at 101 by 11/4. It stayed in the 90s until 20/4, then fell back into the 70s for the rest of the month. The average for April was 85 units. It is almost certain we have passed the sunspot minimum and started Cycle 22 and by the end of the year the smoothed monthly sunspot number should be around 25. The Monthly Mean is the daily sunspot number for each day of the month divided by the number of days in the month. The Smoothed Monthly sunspot number is the total of the last 12 monthly mean sunspot numbers divided by 12."

Incidentally, a graph printed in June *CQ ham radio*, in Japan, showed the solar flux units on a daily basis through April and follows very closely with the figures set out above, although they indicate a peak of 105 units on 16/4 whilst still agreeing with the 101 on 11/4. My Japanese was not quite good enough for me to risk saying something which was a wrong interpretation of the graph, but it is interesting that the information from the UK has allowed me to fill in that gap.

CHANGE OF LOCATION

After living in the same house at Forreston for over 30 years and many more years longer living in the area, VK5LP has definitely decided to move QTH on August 24, and will now be living in Menginle, 148 km by road from Forreston in a south easterly direction and this being about the same distance from Adelaide by road. Air miles from Adelaide are about 70. Meningie is situated on the shores of Lake Albert and is 15 km from the coast which gives it a superior climate to places like Robe and Kingston, which get quite a lot of dirty weather. It should be close enough to obtain some benefits from coastal ducting!

Apart from the milder climate which my health requires, the situation was looked at from a VHF/UHF standpoint, naturally! After trying to share in contacts being made by stations on the Adelaide plains, I eventually had to be content with only working stations at the absolute peak of any opening, which might only be for half an hour or less and then at signal strengths which, to say the least, were most frustrating and this was particularly so on the 70 cm band. Bob VK5ZRO, could work Aub VK6XY, in Albany, at 5x9 +40 dB on 70 cm and I might be able to work him at 4x2! My 60 dB hill was a good attenuator to the west! Despite all the problems, I did achieve a goal I had set many years before, that of Working All States on two metres, which I finally did when I worked VK8GF, in Alice Springs, December 1985. It took 25 years of hard work but I do have a certificate now to prove that it was done and from the same location for all contacts. I now need VK4 and VK8 on 70 cm to achieve WAS on that band.

The Meningie location looks very good. There is a small rise looking west about two kilometres

away and, right next to me is a small rise looking south-east. Both of these can be looked over with an antenna height of about 35 feet, which is less than half the height I have been accustomed to at Forreston. After getting over these rises, there is nothing in the way, being water right to Albany in the west, and water and undulating country to the south-east, Melbourne and Tasmania. In all other directions there is nothing in the way that can be seen and this will give me a much needed incentive to become more operationally active than I have been for sometime now.

I may not be able to have the large antenna arrays I have become used to, but then again I really won't need them. But, I plan to have the best antennas I can arrange for 52, 144, 432, and 1296 MHz, the first two will sport new coaxial cable and the latter two will be fed with heliax, and all bands will have masthead amplifiers. Fortunately, the television reception is very good at Meningie, where average antennas are used and no masthead amplifiers are necessary, so i do not really anticipate much in the way of TVI.

The house is a two storey place on the corner of West Terrace and South Terrace, but I propose using West Terrace, Meningie, SA. 5264, as my address and with a number for the house eventually. For the present, that above address will be redirected for the time being. We will be living in the upper storey and the shack will be downstairs where everything will be done whilst walking on carpet! What a change from concrete floors and mats. Even my workshop will be located in the same area, so if it is a really cold day I don't need to go outside at all, which should be a help.

As uprooting oneself after such a long time is an awesome task, it will be awhile before I can become fully operational, but I would hope to be operational in time for the summer Es season on all four bands. I will *keep* readers informed.

As I have said previously, I have reluctantly had to accept that my planned EME operation has had to be abandoned despite all the work I have done on the dish. In its place I want to do some work on the bands up to 10 GHz if this is possible, at first concentrating on 2304 and 3456 MHz and hoping to exploit that water path through to Albany and to Melbourne. It will be a challenge but at least I should have a start in having a location which should make these bands a possibility for satisfactory operation. I also want to work Wally VK6KZ, on 576 MHz! I am also looking, with interest, to Alice Springs and Peter VK8ZLX, for a 70 cm contact before long when he completes the upgrading of his equipment; and, in view of what Roger VK5NY, almost accomplished last year on 70 cm to Brisbane, that State is not as remote for that band as it may seem. Who knows what the future holds?

Having now come to terms with the idea of shifting (my family group has been in this area since 1854) I am at last becoming a little excited at the possibilities the location at Meningie offers, especially after having been virtually suppressed for 10 months of the year at the *Forreston* location.

CLOSURE

Unfortunately, there is really little I can report on the bands at present, mostly I suppose because I have been off two-metres for some time due to rotator trouble and, with the impending move, the 70 cm system has been dismantled, leaving only six-metres to be attended to in the next couple of weeks. My weekly scheds with Mark VK0AQ, will also be terminated for a while and there will be a need to decide what form of HF antenna one can use on a normal house block — there is no room on my towers for HF beams!

So, until next month, I close with two thoughts: "An adventure is an inconvenience rightly considered; an inconvenience is an adventure wrongly considered" and "The first man to tear a telephone book in half undoubtedly was the father of a teenager."

73, The Voice in the Hills (soon to be changed!)

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NOTE NEW AODRESS AT HEAD OF COLUMN!

Intruder Watch

Bill Martin VK2COP
FEDERAL INTRUDER WATCH CO-ORDINATOR
33 Somerville Road, Hornsby Heights, NSW. 2077

Unfortunately, I open the column this month with sad news, having heard that Henry Sporrer VK2DUO, became a Silent Key during July. Henry was a good supporter of the Intruder Watch, and we will miss him. On behalf of the Intruder Watch I offer condolences to his family.

May 1987, brought no startling news to the notice of the Intruder Watch, but we received good support for the month from:

VK2s EHQ, NRR, PLL, Arthur Bradford; VK4s AKX, BG, BHJ, BTW, DAM KHZ; VK5TL; VK6RO; VK7RH and VK8s JF and HA.

There were 68 AM-mode intruders reported, 129 using CW-mode (A1A), 88 intruders were reported using RTTY (F1B mode), 46 were using other modes, and 22 intruders supplied us with their call signs.

A common intruder, reported as "EEARQ", using CW, is believed to be really the Vietnamese intruder "VRQ", sending poor identifications. A letter to the Indonesian Amateur Radio Society, *ORARI*, seeking help in the problem of commercial traffic on 14.051 MHz in the CW-mode, has brought no response to date. I sometimes wonder if anyone really cares if their amateur bands are used for anything from passing traffic relating to the sale of timber, to politically-motivated propaganda. (Concerned amateurs excepted, of course).

The number of pirates reported on the 28 MHz band from IARU Region 1 who are located in Spain and Italy should make us thankful here in VK that we do not suffer the same problem.

The two common intruders to both Region 1 and to us here in Region 3 are, however, Radio Tirana (Albania) and Radio Beijing (China). The absence of both these transmissions would see us much better off, particularly on the 40-metre band. *We live in hopes . . .*

The reading of the DARC (West Germany) Intruder Watch Summary brings me back once again to the proliferation of CB operators originating in Spain. Ulrich DJ9KR, the DARC IW Co-ordinator, has, in his summary for May 1987, listed approximately 60, (Yes **60**) CB operators, all located in Spain, who have been using our 10 metre band, and giving their QSL addresses out on air! Armed with this information, I am prompted to ask why their local administration cannot do something about it? Of course, there are many questions without answers in this life, aren't there?

So there we are for this month; thanks to all those who are lending a hand, and I hope to hear from those who have yet to contribute the odd report to aid the preservation of our exclusive amateur bands of frequencies. See you in October.

ar

BEACON/REPEATERS

Tim Mills VK2ZTM
FTAC BEACON CO-ORDINATOR
PO Box 204, Willougby, NSW. 2068

YOUR INVOLVEMENT IS REQUIRED

One of the agenda items raised at this years Federal Convention concerned the determination of a national standard access tone for FM equipment and operation. The item was submitted by VK2 and was agreed to in principle by all States. The Federal Technical Advisory Committee (FTAC), was directed to investigate and determine a suitable standard/s and to report back to the Federal Council.

Currently, in Australia, there is no standard for tone access systems for the Amateur Service. Without a standard there is a wide range of equipment available for purchase which is either fitted with a tone system or is available as an accessory.

BACKGROUND

When permission to develop repeaters was granted in Australia in mid-1968, one of the conditions was that all systems had to be open access. Overseas there has been the tendency to use some form of tone access. In Region 1 (Europe) it has usually been a tone burst at the start of transmission, automatically or manually applied for a part of a second, using an audio frequency round 1750 Hz. This opens the repeater and then allows it to operate as a Carrier Operated Relay (COR) until time out is reached or there is another burst of tone to reset the timing period.

The alternative tone system employs a continuous sub-audible tone whenever the transmitter is on air. This approach tends to be used by the private or closed repeaters in the USA. It is also used in the two-way radio industry, particularly where channels are shared by several users. By 1995, all Australian (commercial) systems will require a form of coded and identified access. The sub-audible range used is from about 60 to 200 Hz.

Without the need for tone access in the Amateur Service no standard has been developed in Australia. It is not envisaged that this current research is to require tone access to be used in place of the present COR control. However, the increasing pager interference on two-metres, or perhaps shared channel access on six-metres, is a possible use for an access tone system. It has been felt that a standard should exist to enable manufacturers to include or make provision for a common system, if and when the need arises.

The line of thinking has been for a sub-audible system, as the encoding and decoding facilities are standard and existing technology. The suggested frequency in the agenda paper was 123 Hz. It is firstly a whole number and falls in the mid-range. If the chosen frequency is too low, it suffers attenuation in the (radio) audio system. If it is too high it becomes audible to some listeners not unlike a 50 Hz hum.

FTAC now seeks an indication of interest from all amateurs. Please register, by writing to FTAC, WIAFE, PO Box 300, Caulfield South, Vic. 3162, or to the address at the top of this column. Alternatively, you may ring the Federal Office on (03) 528 5962 or the VK2 Office on (02) 689 2417 to register. Further technical background may be obtained from your Divisional Federal Councillor. If you already have thoughts on the subject, commit them to the written form of expression and forward to FTAC.

Information will also be included in the news broadcast.

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MOSQUITO AIRCRAFT RESTORATION

Keith Muller
C/- Department of Aviation, PO Box 24, St Marys, NSW. 2760

In *Amateur Radio* July 1986, an article was published telling the story of the restoration of Mosquito aircraft, A52- 319.

As the writer of that article, I endeavoured to stimulate interest in the proposed restoration of A52-319 for the Australian War Memorial, Canberra.

I hoped there may have been a fleeting interest by a few of the Wireless Institute members concerned with the future of a wonderful piece of Australian Aviation Heritage.

Not in my wildest dreams did I expect the flood of WWII memorabilia that was made available.

The original article requested specific equipment for the Mosquito's inventory, however members sent articles of a military nature as well and these were subsequently sent on to the Australian War Memorial, who benefitted greatly from this bonanza.

It is wonderful to know there are people in this world that have managed to protect articles of such historical importance, as so much has been destroyed in the past.

Recently a book was published in England by the author, Stuart Howe, with the title *Mosquito Survives*.

This publication tells the story of 28 individual Mosquito aircraft around the world that have survived the ravages of 40-odd years and, with the small miracles and hard work by devoted restoration teams, to rebuild these aircraft.

In some cases they were bare skeletons of aircraft used as hen houses in New Zealand, or rotting in a kibbutz in Israel.

Restoration, in most cases, has reproduced the sleek beauty of DeHavillands masterpiece that helped us enjoy the mode of living we now have, by out- flying the enemy of the WWII years.

Meanwhile, back to our Mosquito, A52-319, at Hawker-DeHavilland (Aust).

John Chadwick has organised the rebuilding of the broken fuselage, the control surfaces, the two Merlin engines and numerous parts of the general aircraft.

The wings are the next important project requiring much expertise in woodworking-techniques as a great amount of damage occurred due to neglect of the past years.

The radio equipment restoration is progressing with the HF radio T1154/R1155 nearing completion and looking good.

The SCR-522/TR-5043 VHF equipment outwardly looks great but is yet to feel 28 volts surging through its veins!

We have almost all of the ancillary equipment for the DF side of the R1155 Marconi HF receiver.

An IFF set, SCR-695/BC-966 was presented, but the genemotor with coding gear box is still required. Also, the control box for the IFF

A Loran has eluded us to date! The AN/APN-9 Loran was used in the Australian design PR-41 Mosquito.

An inverter, PE-206-A was donated. This is the 115 volt 400/1100 Hz power source for the AN/APN-9 Loran set, so it is hoped some kind person will complete the radio inventory with the donation of a Loran set.

It is intended that all the radio equipment will eventually be in working- order, making A52-319 a rare model amongst the remaining Mosquito aircraft in the world.

At this point, I would like to indicate the gratitude of the Australian War Memorial with Mr Bob Cowley, the Curator of Military Technology, expressing his thanks to all members kind enough to donate their treasures of the past, in many cases, real personal memories.

As in the last article, should you wish to help complete A52-319, please contact the writer at Department of Aviation Transmitter Station Llandilo, NSW, phone (02) 628 9777 or (02) 628 9466, or write to the above address.

Some of the minor articles still required are:

- Servicing or operating manuals for the AN/APN-9 Loran and SCR- 695/BC-966 IFF
- Open black rubber coated Air Ministry earphones.
- WWII oxygen masks.
- Air Ministry khaki cloth or leather helmets.
- The open-type Loop Antenna as used in English aircraft.
- Two-pin Cannon power supply plugs for the PE-94-B power unit used in the SCR-522 equipment.
- Valve types transmitter pentode VT-104, power triode VT-105, type 6SC7 and thyratron 2051.
- The Londex relay type 220 with resistance unit type 52 or 52A for the HF T1154/R1155 rotary power unit voltage regulation.

These components would be very rare but, judging by the response to the July 1986 request, it would not surprise me if they became available.

I would like to add my personal thanks for all the donations and good wishes. It certainly helps on a project of this size.

Spotlight on SWLing

Robin Harwood VK7RH
52 Connaught Crescent, West Launceston, Tas. 7250

Recently, I have been fortunate in having the opportunity of using a Tono Theta 777 modem. This unit is designed to go between the receiver and a computer terminal and can be used on several modes. I was very impressed with its versatility, once I had mastered how to program a computer, something I had previously not attempted. The unit requires an RS 232 interface and not all TUs have this, especially the Commodore, yet this can be overcome. I strongly urge you to check if your TU has an RS 232 compatibility, as I am aware of one individual who obtained this modem, only to find his computer did not have the RS 232 socket. Fortunately, he was able to obtain information to have an RS 232 to plug through his TU, thanks to VK7NRR.

It was very interesting, comparing the performance with my own Tono 9000E. A plus for the Theta was the ability to receive ARQ and FEC traffic (AMTOR). Although I did find it difficult to get an accurate readout, due to adjacent signals, compared to RTTY. The number of amateurs on AMTOR has steadily increased over the past years, judging by the traffic on or about 14.070 MHz.

Another plus for the Theta is the ability to automatically track Baud rates on RTTY. This provided some surprises as there are a few commercials that don't send exactly at standard rates. For example, the Korean Central Newsagency, in Pyongyang, was tracked at 53 Bauds. But the Theta had trouble in tracking BIT inversion RTTY, yet this may be well due to my inexperience. Incidentally, it is virtually impossible to get a readout on BIT inversion, unless you happen to know what multiple combinations are being employed.

Most RTTY signals are using BIT inversion in some form, although some are still using plain language. Unfortunately, fewer press agencies are now on HF each year, most having gone to satellite or cable feed. I find that the only consistent RTTY copy is from stations sending meteorological information in the METEO format, which is internationally recognised.

Conditions have gone down over June and July, as the Solar Flux dropped. In the daytime, there were plenty of European and North American signals, with Middle Eastern signals coming through early in the afternoon. I am pleased that this location seems better than where I was previously, although I suspect that it is more likely to be the antenna direction. South Americans do not seem to be better, especially on the tropical bands. Also, Africa is hard to hear, mainly because there is a hill to the west of me, which effectively blocks signals from that area, yet the low solar flux could be contributing as well.

Don't forget that there are two broadcasting periods starting this month. The first one commences on Sunday, September 5, from 0100 UTC and is known as the S87A period. The second will be Sunday, September 26, when Europe goes off Summer Time. This is the S87B period. Broadcasts beamed to European audiences will be one hour later. Also, the Peoples' Republic of China goes off Summer Time on September 13, so domestic programming will be one hour later there also, as will international stations with Chinese language programming. This is only the second year that the PRC have adopted daylight saving.

Another nation that experimented with Summer Time this year was South Korea, but it did not affect its external broadcasts.

It has been officially confirmed that the ABC Networks will be operational for 24 hours permanently. The Metropolitan and Regional Networks commenced on Saturday, August 1 and the National Network is to commence on October 1. This in itself is going to be interesting as they are going to relay Radio Australia on MW between midnight and dawn, enabling listeners overseas to hear Australia on MW. The drawback for us is that it will deny Australian DXers the opportunity of trying for DX signals, on ABC channels. Also, there are a significant number of Australian commercial stations operating 24 hours.

There are various ways around this, primarily the erection of a MW loop. These do work surprisingly well, especially with a preamplifier added to it. Bob Padula, in Melbourne, recently resurrected his loop antenna and was surprised to hear some DX signals around local sunset. This has prompted me to consider erecting a MW loop myself to compensate for the ABC operating around-the-clock.

Incidentally, I am consistently hearing American commercial MW stations, particularly on 1.540 MHz. I have heard them as early as 0730 UTC and as late as 1200 UTC. There appears to be several stations on frequency. Recently, I was fortunate to be able to utilise Andre VK7AE's Beverage for 160 metres, at North Riverside. Despite the transmitter for 7LA being only 300 metres away, I was clearly able to hear the Americans. Fortunately, 7LA have since relocated their transmitter across the river at Rocherlea. They are now operating with five kilowatts. Perhaps reception will be better now! I know that Andre is no longer getting RF sparks around his antennas and the hash and birdies have gone. I expect that he will pop-up on 160 metres before too long.

The other news for July is the sudden appearance of RS 10 and 11. There will be plenty written about it in the AMSAT column, so I am not going to duplicate it here. It has certainly been interesting noting when 15 metres comes through, that multipath signals are retransmitted, and there is a characteristic flutter compared to the QSB from signals within the footprint of the satellites. By this time I hope to have worked through the satellite.

Well, that is all for this month. Until October, the very best of 73 and good monitoring!

Robin VK7RH

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Awards

Ken Hall VK5AKH
FEDERAL AWARDS MANAGER
St George's Rectory, Alberton, SA. 5014

Awarded to **Sample** for promoting activity on the 10m (28MHz) band, in order to complete the requirements for this award.

The Basic (Western Third) Certificate of the Ten-Ten International Net Inc, Twenty Eight Chapter. (See June AR, page 52 for rules of the award).

AWARDS ISSUED IN MAY AND JUNE

WAVKCA

1535	Riga Club Station UQ1GWW
1536	George Khodjaev UA4PW
1537	Juri I Vucolov UA4FZ
1538	M B Mezhlumov UI8OAA
1539	Alan J Abel ZL2QR
1540	Hiromi Soga JI1FJV
1541	Toshi Tayama JM1BRP
1542	Jo Moon Ho HL1LW
1543	Benny Wyenantea YB3CN
1544	Alan Viegas VK8AV
1545	K D Gott VK3AJU

HAVKCA

126	Segy V Makhota UA6-101-373
127	V V Shishko UD6-001-220
128	Vladimir Ulyanov UA3-151-408
129	Vlad Prostomolotov UA4-152-2
130	Vladimir P Shalun UB5-073-1610
131	V I Zinchenko UA3-170-372

WAS VHF

171	J McGrath VK4JM (52 MHz)

DXCC PHONE

356	Des Hancox VK2AGA

DXCC CW

129	Les Hawkins VK4DA

DXCC OPEN

236	Les Hawkins VK4DA

DXCC UPDATES

VK2BQS	169 open	
VK3OT	302(4) open	299(4) phone
VK4LC	307(35) phone	
VK5MS	316(47) phone	

Contests

Frank Beech VK7BC
FEDERAL CONTEST MANAGER
37 Nobelius Drive, Legana, Tas. 7251

CONTEST CALENDAR

SEPTEMBER

12 — 13 European DX Contest Phone Section
19 — 20 Scandinavian Contest CW Section
26 — 27 Scandinavian Contest SSB Section
26 — 27 CQ WW DX RTTY Contest

OCTOBER

3 — 4 VK/ZL/Oceania Contest Phone Section (Rules August issue)
10 — 11 VK/ZL/Oceania Contest CW Section (Rules August issue)
11— — RSGB 21/28 MHz SSB Contest
— 18 RSGB 21 MHz CW Contest
24 — 25 CQ WW DX Phone Contest

NOVEMBER

7 Australian Ladies' Amateur Radio Association Contest
14 — 15 European DX Contest, RTTY Section
28 — 29 CW WW DX CW Contest

The contest news for this month will not be as extensive as that provided by Ian VK5QX, the past FCM, who has supplied readers with a wealth of contest news and helpful information over the years. Ian has also given me a great deal of assistance during the changeover period. Maintaining lines of communications and locating new sources of contest information will be given a high priority.

I have enjoyed contests for more than 27 years and have always found the mainstream contests to be almost as good as a calendar and the conduct of participants generally very good, whether the contest be a hectic 24 hour world-wide spectrum contest or the more sedate QSO party. In these contests the participants do not feel they need to swat up on the rules every year as they seem to run for years without rule changes. This, I am sure, has much to do with their popularity, as has the stability of these major contests run throughout the year been essential to the orderly spread of contests during the year. The entrants look for the dates that entries close and for any changes first. They then look for any minor changes in the rules — in short, stability is the name of the contest-game and I do not intend to change any rule without a very good reason.

The RSGB Commonwealth Contest is a good example of stability, for more than 20 years I have enjoyed this annual event and cannot remember when the rules were last changed, and it is usually on in the first or second weekend in March. The same contestants can be heard each year and you sometimes wonder why so-and-so was missing last year, but, sure enough, he is heard again the following year. The results are always very interesting with the same stations appearing in the top few positions year after year.

Comments on the contest usually spell-out how the participants have enjoyed the contest and tried hard but. . .and hope to do better next year! More often than not, they do improve the total score by trying something new even though they know that they will never make a score that will place them in the top 10, for instance, because of the geographical location of the station location. This is healthy and shows that the entrants are, in the main, joining in the battle for the pure enjoyment of the sport.

However, it has saddened me to read, over the past couple of years, the comments of a few entrants from our country complaining about the contest not being fair because they say that Canadian stations have an unfair advantage because of their location in North America, and suggest some magic formula be applied to make it "fair." This may well be the case, but these contests are for our enjoyment and training. To change rules to suit everyone who complains long enough would make contests far too complicated for the average operator to enjoy.

The VHF contest scene can, in my opinion, be improved and simplified to some extent by the introduction of the Maidenhead Locator System. The fact that only 19 entries were presented to the FCM following a major VHF contest speaks for itself. I am certain that a few hundred stations spent some time working up a lather in a mad flurry of activity, but after the contest was over thought, "why take the trouble to enter the log." Perhaps, dear reader, if you had taken a few minutes to enter your log you would probably have a nice little sheepskin on the shack wall today. Enough said. . .

A group of us down here in deepest, darkest Tasmania are looking at ways to introduce the Maidenhead System of location blocks into the contest scene. This system is becoming very popular throughout Europe and America and will be used universally in due course. Because of the areas of the grids that may be used, contests where distances can play a role become easier to calculate and ways of making VHF contests more interesting to participate in become possible without making then too complicated to enter.

Some articles on the Maidenhead Locator System appear on page 28, *Amateur Radio* January 1985, page 35 August 1985 and in the NZART Call Books. (There is also a Maidenhead Pamphlet listing world-wide locations which is available from WIA Magpubs and some Divisional Bookshops).

EUROPEAN DX CONTEST — SSB Section

TIME — 1200 UTC, Saturday, September 12, to 2400 UTC, Sunday, September 13, 1987.

BANDS — 3.5, 7, 14, 21 and 28 MHz.

CLASSIFICATIONS —

a Single operator — all bands. All work including logs, etc, to be done by one.
b Single operator — high bands. As above, but operation on 14, 21 and 28 MHz.
c Multi-operator — single transmitter. Only one single transmitter on any band at one time is permitted.
d SWL.

REST PERIODS — Only 30 hours of operation out of the 36 hours are permitted for single operator stations. The six hours of non-operation may be taken in one, but not more than three periods at any time during the contest and have to be marked in the log.

EXCHANGE — A contest QSO can only be established between a non- European and a European station. Exchange the usual five or six digit serial number RS/T report, plus a progressive QSO number starting with 001. (See special regulations for RTTY).

POINTS — Each QSO counts as one point. A station may be worked only once per band. Each confirmed QTC, given or received, counts as one point.

MULTIPLIERS — Non-Europeans: the multiplier for non-European stations is determined by the number of countries worked on each band. (See European countries list).

SCORING — The final score is the total QSO points plus QTC points multiplied by the total multipliers from all bands.

QTC TRAFFIC — Additional point credit can be achieved by making use of the QTC traffic feature. QTC means reporting back the data of a QSO between a non-European and a European station earlier in the contest. It can be sent from a non-European to a European station. The basic contest QSO sense is that after a number of Europeans have been worked a list of these QSOs data c an be reported back during a QSO with another European station.

A QTC contains the time, call sign and QSO number of the station being reported (eg 1307/DA1AA/431. This means that you worked DA1AA at 1307 UTC and you received the serial number 431).

A QSO can be reported only once and not to the station contacted in the QSO.

Only a maximum of 10 QSOs to a station is permitted. You may work the same station several times to complete the 10 QTCs. Only the first contact, however, has QSO point value.

Keep a list of QTCs sent. QTC 3/7 means that this is the third series of QTCs sent and that seven QSOs are reported.

If more that 100 QTCs are claimed, a list of the calls from or to whom the QTCs were received or sent, is requested.

CONTEST AWARDS — Certificates will be awarded to the highest scorer in each classification in each country, reasonable score provided. Continental leaders will receive a plaque. Certificates will be awarded to stations with at least half the score of the continental leader.

DISQUALIFICATION — Violation of the rules of this contest or unsportsmanlike conduct, taking credit for excessive duplicate QSOs, any altering or forging of log entries in order to increase the actual score will be deemed sufficient cause for disqualification. The decision of the contest committee is final.

LOGS — It is requested to keep the log as it is in the DARC log sheets. Computer logs are accepted. All entrants are required to submit a list of stations worked for each band on which they made more than 200 QSOs. For each duplicate QSO removed from a log by the checker the penalty is crossing out three valid contacts. Any change of bands has to be marked in the log.

You may have WAEDC log and summary sheets by sending a large SAE and IRCs to the address below. Each log entry has to be sent with a summary.

SPECIAL REGULATIONS FOR SWLs — Participation is only possible in the single operator/all band classification. Any SWL may not be a member of a team participating in the transmitting category.

All call signs — Europe or non-Europe — may only be logged once per band. It is not necessary to hear both stations of a contest QSO, but the serial number sent by one station and both call signs have to appear in the log. Each contest QSO logged counts as one point. QTCs count one point each, if the sending and receiving station Is logged for the first time. Multipliers count according to the European and the DXCC countries list.

SPECIAL REGULATIONS APPLY FOR RTTY — In the RTTY section of the WAEDC, all regulations are the same but to generate more activity in Europe and to raise the number of QSOs, points contacts between European stations are permitted. QTC traffic however, is only permitted between Europeans and non-Europeans and multiplier and multiplier regulations, are as above.

DEADLINE FOR LOG ENTRIES — CW — September 15. Phone — October 15. RTTY — December 15, 1987.

MAILING ADDRESS — WAEDC Contest Committee, PO Box 1328, D-8950 Kaufbeuren, Federal Republic of Germany.

EUROPEAN COUNTRIES LIST — C31, CT1, CU, EA, EA6, EI, F G, GD, GI, GM, GM Shetland, GU, GW, HA, HB, HB0, HV, I, IS, IT, JW Bear, JW Spitsbergen, JX, LA, LX, LZ, OE, OH, OH0, OH0M Market Reef, OK, ON, OY, OZ, PA, SM, SP, SV, SV5 Rhodes, SV9 Crete, SV Athos, T7, TA European Part, TF, TK, UA1, 3, 4, 6, UA2/UZ2F, UA Franz Josef Land, UB, UC, UN/UK/UK1N/RA1N, UO, UP, UQ, UR, Y2, YO, YU, ZA, ZB2, 1A0, 3A, 4U1 Geneva, 4U1 Vienna, 9H1.

28TH SCANDINAVIAN ACTIVITY CONTEST

TIMES — CW on September 19-20. Phone September 26-27.

1500 UTC Saturday to 1800 UTC Sunday.

This contest is the world working Scandinavian stations. The same station may be worked on

each band for QSO and multiplier credit. The prefixes used in Scandinavia are:
LA, LB, LG, LJ (Norway), JW (Svalbard and Bear Island), JX (Jan Mayen), OF, OG, OH, OI (Finland), OH0 (Aland Island), OH0M (Market Reef), OX, OY, OZ, SJ, SK, SL, SM, TF.
BANDS — 3.5, 7, 14, 21, and 28 MHz according to IARU band plans. 3.560-3.600, 3.650-3.700, 14.060-14.125 MHz should be kept free of contest activity.
CLASSES — Single operator and multi-operator, single transmitter, all bands only. Multi-operator must remain on the same band for at least 10 minutes. Also, QRP operators (maximum of 10 watts output) and SWL (only SAC stations may be logged).
EXCHANGE — RS/T plus a QSO number starting with 001.
POINTS — European stations score one point for each SAC contact. Non-Europeans score one point on 14, 21 and 28 MHz.
MULTIPLIER — Each call area in the above list of SAC countries worked on each band (call areas, not prefixes).
FINAL SCORE — The sum of QSO points from all bands multiplied by the sum of the multipliers from each band. Scoring for SWLs is the same as above.
AWARDS — Certificates to the winning stations in each class, both CW and phone in each country and each USA call area. QRP stations will be listed in one common list. The non-SAC SWL winner will be awarded, plaques to the top scoring station in each continent. The usual disqualification criteria will be observed. Include a summary sheet and a dupe sheet for logs with more than 200 QSOs. Also a signed declaration.
DEADLINE — Mailing deadline is October 30.
ADDRESS — Send logs to: SRAL Contest Manager, Erikki J Korhonen OH4NRC/OH8RC, PO Box 44, SF 00441, Helsinki, Finland.

RSGB 21/28 MHz SSB CONTEST — Transmitting Section

PERIOD — 0700 to 1900 UTC, October 11, 1987.
SECTIONS —
a UK Single Operator
b UK Multi-operator, Multi-band
c Overseas Single Operator
d Overseas Multi-operator

FREQUENCIES — 21 and 28 MHz. Entrants are requested not to operate in the bands 21.400-21.450; 28.000-28.500 and 29.100-29.700 MHz.

EXCHANGE — RS report and serial number starting with 001.

SCORING FOR NON-UK STATIONS — Three points for each completed contact with a station in the British Isles. Multipliers are: G2, G3, G4, G5, G6, G8, G0, GD2, GD3, GD4, GD5, GD6, GD8, GD0, GI2, GI3, GI4, GI5, GI6, GI8, GI0, GJ2, GJ3, GJ4, GJ5, GJ6, GJ8, GJ0, GM2, GM3, GM4, GM5, GM6, GM8, GM0, GU2, GU3, GU4, GU5, GU6, GU8, GU0, GW2, GW3, GW5, GW5, GW6, GW8, GW0. Contacts with GB stations will not count for points or multipliers. For all entrants, the total score will be the number of points on each band added together, multiplied by the total number of multipliers gained on each band. Unmarked duplicate contacts for which points have been claimed will be penalised at the rate of 10 times the claimed points. Entries with more than five unmarked duplicates are open to disqualification.

LOGS — Logs sheets to be headed date, time UTC, station worked, RS and serial number received, multiplier, points claimed. A summary sheet listing multipliers worked on each band must be included.

DECLARATION — With each entry there must be a declaration, signed and dated, that the station was operated within the rules and that the decision of the council of the RSGB shall be final.

ADDRESS FOR LOGS — All logs must be sent to RSGB Contest Committee, PO Box 73, Lichfield, Staffs, WS13 6UJ, England. These entries must be received by December 7, 1987.

AWARDS — Overseas stations will be awarded certificates for the leading three entrants overall and, at the discretion of the contest committee, to the leading station in each country.

RSGB 21/28 MHz SSB CONTEST — Receiving Section

SCORING — Overseas SWLs should log only British Isles stations in contact with overseas stations taking part in the contest. Scoring and multipliers as per the transmitting section.

LOGS — Logs to be headed date, time UTC, call sign of station heard, RS and serial number sent by station heard, call sign of station being worked, multiplier, points claimed. A summary sheet listing multiplier heard on each band must be included.

NOTE: In the column headed station being worked, the same call sign may only appear once in every three contacts logged except when the logged station is a new multiplier for the receiving station. Also, the station heard may only be logged once on each band for the purpose of scoring.

DECLARATION — Each log must be accompanied by the following declaration "I declare that this station was operated within the rules of the contest and I do not hold a transmitting licence for frequencies below 30 MHz."
AWARDS — As in transmitting section.

RSGB 21/28 MHz CW CONTEST — Transmitting Section

PERIOD — 0700 to 1900 UTC, Sunday October 18, 1987.
SECTIONS —
a UK Section
b QRP UK Stations using less than 10 watts input
c Overseas Section
d QRP Overseas Stations using less than 10 watts input
FREQUENCIES — 21 MHz only. Entrants are requested not to operate in the band 21.075-21.125 MHz.
EXCHANGE — RS/T report and serial number starting with 001.
All other details as in the SSB section.

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Know your Second-hand Equipment

Ron Fisher VK3OM
3 Fairview Avenue, Glen Waverley, Vic. 3150

A Bit of this and a Bit of that!

This month, rather than devote the whole column to one manufacturer, I thought it might be a good opportunity to look at some of the equipment readers have requested to be reviewed.

However, before starting on them, a few words about older rigs in general may be appropriate. Firstly, *older* in this reference is to equipment over 15 years old. If you are working on a tight budget, many of these old rigs look to be an excellent way of getting on the air. And, indeed they can be, but it is necessary to check them out properly before parting with your hard-earned cash. Following is a list of things to do when trying out a new-found bargain.

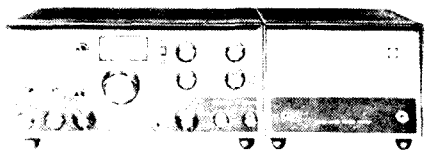
1 Stand back and take a good long look at it. Is the paint worn? Are there knobs or switches that don't look original? Have extra plugs or sockets been added to the rear panel? Is the original instruction book available? Have any modifications been noted in the book?

2 Turn the power on and check the receiver operation. Is the audio and RF gain control scratchy in operation? Are there loud clunks when switches are operated? Turn on the crystal calibrator and zero the VFO. Sit back for 10 minutes and check how much the unit has drifted — is it more than you can tolerate? Check the receiver's sensitivity, preferably by comparing it with another rig. If you cannot do this, does the receiver sound "alive" on, say, 10 metres?

3 Tune up the transmitter and check the power output on all bands with a power meter. Is is often a good idea to take your own power meter/dummy load. Well, how much power should you get? Even today, most transmitters are rated power input and not power output. You should, as a rule of thumb, get about half the power out on the lower bands and a little less on 15 and 10 metres when measured in the CW mode. Plug in the microphone and check that the power output is about the same with a steady whistle.

If the unit passes all of these tests, go ahead and buy it if the price is right.

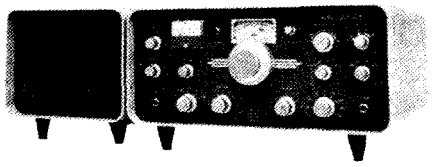
Now, on to some typical old units — and one not so old!



THE SWAN 350 and 500 HF SSB TRANSCEIVERS

These American-made transceivers became available in 1964 and 1967, respectively. They were valve-type transceivers and covered the 80 to 10 metre bands. A separate AC or DC power supply was required and the photograph of the 500 shows the matching Swan AC Power Supply. The 350 used 6HF5 valves in the final and gave about 150 watts output, whilst the 500 used 6LQ6 valves which, while rated at higher power, gave about the same output as the 6HF5s. General performance for the time was quite good, however some of the problems were — poor AGC action with a lot of pumping on strong signals. There was also overload and distortion on strong signals, and quite an amount of warm-up drift which varied fro band to band due to band-switched VFO.

Price when new was about $600, including the AC power supply. Optional extras included the AC and DC power supplies. VOX was not built-in but was available as an option. Secondhand value today, taking into account everything said at the beginning of this column, would be about $200.



THE KW-2000 SERIES HF TRANSCEIVERS

Produced in England by KW Electronics, who manufactured a wide range of amateur equipment in the late 1950s and 60s, the KW-2000 transceivers were produced between 1964 and the mid-1970s. They were often referred to as English "Collins" equipment, although the only similarity was that they both used a 455 kHz mechanical SSB filter. The four models were:

— the 2000 with one 6146 final and about 50 watts output

— the 2000A with two 6146s and 100 watts output

(Both of these units only covered 200 kHz in each tuning range (again like Collins) and had a very poor string driven dial with extremely close spaced calibration marks).

— the 2000B featured a much improved dial drive with two speed tuning while

— the 2000E changed to 500 kHz coverage for each range.

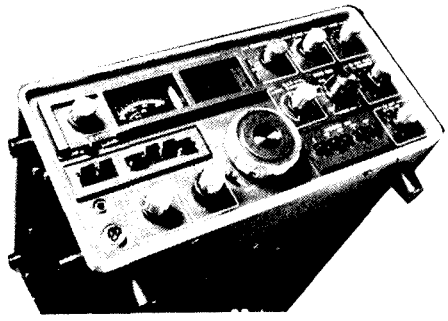
Problems apart from the early series dial drive were:

— poor sensitivity on 15 and 10 metres

— VFO drift which seemed to be worse on the later E-model than on the earlier ones.

Later dial drives were subject to wear and often became very sloppy. KW products over this period were handled by three different distributors in Australia, but overall not many were sold.

The KW Company is still "alive and well" in the UK but these days it imports and sells Ten-Tec equipment. However, they still stock many spares for the old KW transceivers. Price when new was about $600 with AC power supply. Secondhand value today would be about $225.



THE UNIDEN 2020 HF TRANSCEIVER

This was the one and only HF amateur transceiver produced by the Japanese Uniden Company. First sold in Australia in mid-1975, the 2020 was reviewed in the May 1976 issue of AR. It was a solid-state unit with valve driver and final transceiver that covered 80 to 10 metres in 500 kHz bands. However, there were several unusual features. The 500 kHz bands were actually tuned in five 100 kHz segments, each of which was selected by five push-buttons to the right of the tuning-knob.

The frequency readout was part digital and part analogue, but with the analogue part made to look digital. Opinion on the frequency selection and readout is divided; you either love it or hate it. The 2020 featured a built-in AC and 12 volt DC power supply, two speed RIT and an excellent noise blanker. General performance was very good on SSB and a built-in CW filter provided good selectivity in this mode.

Price new was $550, secondhand value today would be about $350. An external VFO and matching speaker were offered as options. As the Uniden Company went out of amateur equipment after producing the 2020, some spare parts are nearly impossible to obtain.

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LOGGING CALL SIGNS

Don Law VK2AIL
RMB 626, Adelong Road, Tumblong, NSW. 2729

A computer program for logging call signs and details for the VZ300.

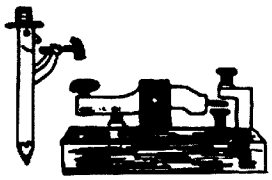
```
  5 REM "STATION LOG"
 10 CLS
 20 INPUT X $
 30 RESTORE
100 DATA VK2AIL, DON TUMBLONG 80
    1130 7.10.86 FLIES KITES
  ↓
  ↓
  ↓
  ↓ Depending on RAM size
9000 READ A$, B$
9010 IF X$ < > A$ THEN 9000
9020 PRINT B$
9030 GOTO 20
```

Type RUN call sign RETURN.
If not listed you get OUT OF DATA error.
Type LIST.
Enter call sign using next line number.
(You may use two lines of data) ie NAME, QTH, BAND, TIME, DATE, REMARKS.
(Dump on tape after each session).
Use two tapes alternately for safety.

er

Thought for the Month

Progress is like a wheelbarrow — if you don't keep pushing it stops.

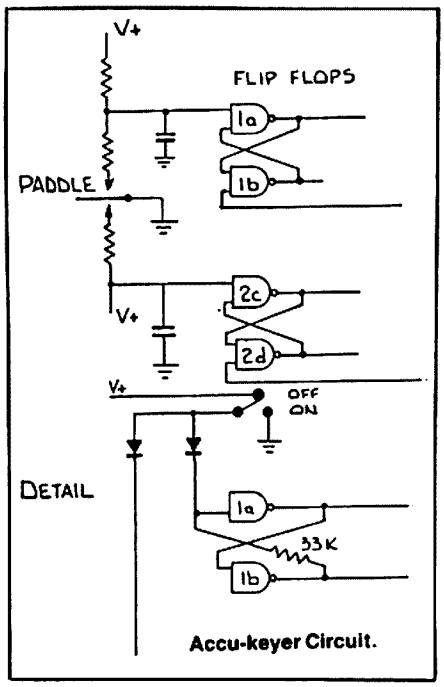


Pounding Brass

Gilbert Griffith VK3CQ
7 Church Street, Bright, Vic. 3741

I goofed. Apologies.

Referring back to May AR, I gave some circuit modifications for the Accu- keyer. It seems a few people have been in bother because the circuit quoted in AR of February is different to the circuit I was referring to, which is the original as published in EA 1978. Anyway, any amateur worth their salt will be experimenting, and should know the basics of the circuit, especially if they have built one. Don't be afraid to change values here and there to see what happens.



Accu-keyer Circuit.

Passing on circuits modifications is a dodgy business at best, how many antenna designs have you tried that didn't work?

I have been busy with a number of things, among them is digital circuits. I have a modification for the Accu-keyer — a weight control, but I have not tried it yet because I don't understand how it works! Also, I gave my keyer away and must convince the new owner to try it.

I have written to the USA for prices on Curtis chips and sent them an order on spec, so I am keeping a list of those who want them and will let you know.

Please help when writing to me by enclosing an SSAE for a reply. Otherwise it will take six weeks for a reply through the column.

I haven't been on air very much lately, but I did have a QSO with Colin VK3DEG, and he sent me some information on the Early Bird Net. You can look for them on 3.547 MHz at 2100 UTC. The control station is Eric VK3EDS, and Jack VK3CJT, on Saturday. Transmitting stations are Harvey VK3AHU, Laury VK3CLV, and Colin VK3DEG. The session consists of Morse/Readback/Morse/ Readback from 2100 to 2145 UTC approximately. The practice is at 10 WPM (12 WPM character speed ITU), and Colin finished his stint with a faster passage at 12 WPM-plus. All material is DOC type text with no punctuation. Similar to the examinations!

In addition to receiving practice, they also offer sending practice and critique, with one to one tuition if required, by mutual agreement.

They also offer an award. A good achievement award requires 20 participations in the net, the passing of a DOC type 10 WPM test in sending and receiving. There is more! An award for SWLs who have to collect 40 five character groups which are sent at the rate of two each morning.

Each Wednesday, net graduates are asked to control proceedings, this gives them an opportunity to access progress and capabilities.

Because of the demand, Colin also runs a net at 0815 EST on 3.534 MHz, Mondays-Fridays. Look for him, VK3DEG or Jeff VK3BZZ.

Colin, who says he is about 70 years, learned Morse whilst in the RN during 1940. He has had an interest in Morse ever since, and, as you can see, he is one of the few who give their time helping newcomers in getting started. Many thanks Colin.

Don't forget to have a listen to 144.950 MHz on your hand-held if you require a bit of receiving practice. This is a Melbourne service but check your Division to see what they have in your city.

DX WITH A DIT

Dan O'Brien W6PB, had a marvellous sense of humour, and he was a pure genius at practical jokes. Dan used to play a trick on Bud Bane W6WB, every so often. It seems that once in a while Bud would call some rare DX somewhere and Dan would try to put a DIT right after the "W" in "WB", making it sound like "PB".

It worked sometimes, and the station W6WB was frantically calling would come back to W6PB, when all Dan sent was one DIT! When Bud found out about what was happening he left less space in between the "W" and the "B", and to this day he seems to rush his call, leaving a minimum space between the W and B.

(Rich Lawton N6GG, looking back to the early club days in the 40th Anniversary issue of the "the DXer", monthly bulletin of the Northern Californian DX Club, October 1986).

from Morsum Magnificat

A SPARKER'S "IF"

If you can keep your head when all the buntings
Are losing their heads and blaming it on you;
If you can read through atmospheric crashes
With signals fading down to near "R2";

If you can send and not get tired sending

And when you stumble, make a neat erase;
If you can read without the old complaining;
"His Morse is just a damn disgrace";

If you don't fill the unforgiving minute
With sixty seconds worth of IMIs
And if you always use correct procedure,
But still don't talk too much, nor look to wise;

If you can live with buntings, jeeps and stokers
And tolerate both Pusser's rum and stew;
And copy when reliefs are in their hammocks
And never miss a group with every spew;

If officers and chiefs and drunken Yeomen
Can heckle you and still your nerves won't fray;
Then you're a damn good sparker son — you've made it!
You're earning every penny of your pay. . .

MUL.

CUL es 73 es 88, Gil VK3CQ.

ar

MORSEWORD 6

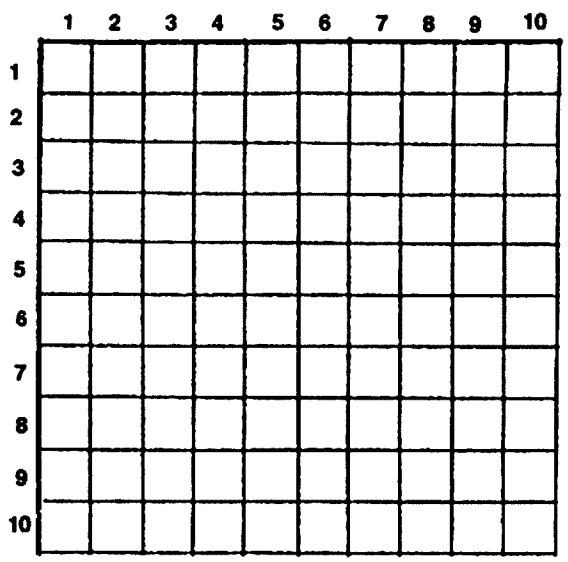
***Compiled by* Audrey Ryan**
30 Starling Street, Montmorency, Vic. 3094

ACROSS

1. Take flight
2. Snowy rain
3. $10
4. Certain
5. Affectedly Artistic
6. '. . . . upon a time'
7. Nudge
8. Monster
9. Parson's house
10. '. . . . and that'

DOWN

1. 'To and . . .'
2. Family dwelling
3. To enclose
4. Pig
5. A breed of dog
6. Spots
7. Gippsland city
8. Platform
9. Printing fluids
10. Needle cases



Solution page 63

Australian Ladies Amateur Radio Association

Joy Collis VK2EBX
PUBLICITY OFFICER, ALARA
Box 22, Yeoval, NSW. 2868

Women become involved with amateur radio for many different reasons: for some it is a case of "if I can't beat them, join them," others find it a means of overcoming loneliness, and sometimes it is a way of coping with boredom caused by injury or incapacity.

One thing they all have in common is a determination to obtain that licence, and get started on what is generally agreed to be a satisfying and rewarding hobby, which cuts across the barriers of age and social status. One comment often heard is "I have made so many friends!" What more can one ask of a hobby?

This is how Margaret VK4AOE, discovered amateur radio:

HOW I BECAME INVOLVED IN AMATEUR RADIO

My introduction to amateur radio was many years ago when my brother, Harry VK4LE, "got on air." Hours of sleep were forfeited on many nights as I listened to the interesting goings-on in Harry's shack. (The spiders approved of his open wire feedline too). Then Harry moved, and I acquired an OM and four offspring.

End of story, I thought.

However, about a decade ago a specialist informed me that I would lose all useful sight in one eye and there was a fair chance the same may happen to the second eye. So there was a need for another pastime to replace needlework which I have always enjoyed doing.

The big hunt started for a way to gain the necessary knowledge — what did I have to learn, where did I get the books or whatever I needed from — the questions I asked myself were endless. The frustrations from unanswered letters (they may have been lost in the post), only made me more determined. Perseverance paid off and I acquired a small stack of study material.

Then a novice course conducted by Claud VK4UX, made things much easier and VK4VCE came on air in January 1980, followed by VK4AOE, two years later.

The fact that I was educated by the Queensland Primary Correspondence School, with my mother as Home Supervisor, and I didn't go on to high school did not deter me. It just meant that I had to work harder. The name of the game is "Determination to Succeed."

Incidentally, a change of doctor and a small operation later, plus one contact lens, I still have one good eye and the other partly useful. The big plus is many new friends and a great hobby.

ALARA COMMITTEE

At the Annual General Meeting held on August 24, the following Committee was elected:

Marilyn Syme VK3DMS	President
Jennifer Warrington VK5ANW	Secretary/Vice-President
Val Rickaby VK4VR	Treasurer/Souvenir Custodian
Margaret Schwerin VK4AOE	Vice-President
Helene Dowd VK7HD	Past-President
Mavis Stafford VK3KS	Awards Custodian/Historian
Marlene Perry VK2KFQ	Contest Manager
Meg Box VK5AOV	Minute Secretary
Joy Collis VK2EBX	Publicity Officer
Gwen Tilson VK3DYL	Sponsorship Secretary
Kim Wilson VK3CYL	Librarian
Bron Brown VK3DYF	Editor/VK3 State Representative
Bev Hebiton VK6DE	VK6 State Representative

At the time of writing there is no confirmation of the VK2, 4, 5 or 7 State Representatives.

There are a few changes: Kim VK3CYL, replaces Bev VK6DE, as Librarian. Poppy VK6DE, has handed the VK6 State Representative's respectively.

ALARA-MEET

The second ALARA Get-Together, in Adelaide, is now only a few weeks away, and we are looking forward to meeting each other and participating in the interesting program arranged by the VK5 members. We are all hoping the weather will be kind to us, but plan to enjoy yourselves even if it proves the reverse.

ALARA CONTEST — November 7, 1987

The gremlins have been very active regarding the 1987 ALARA COntest, which will be held on Saturday, November 7, from 0001-2359 UTC.

The contest was incorrectly reported as October 14 (July AR) and November 14 (ARA, Vol 10 Issue 2). There was a further error in the ARA announcement which stated "ALARA members send RS/T, member number, name and serial." ALARA members do not have member numbers. Exchanges are: RS/T, serial number beginning at 001, name and ALARA member.

Non-member YLs (and OMs) — RS/T, serial number beginning at 001 and name.

Hopefully this will clear up any confusion.

We are anticipating an even bigger and better contest this year, and are hoping that many of our DX members will be able to participate. We also hope to have the OM support we have enjoyed in recent years.

Last year we had a winner for the Florence McKenzie Trophy — Bobbie VK2PXS, and hopefully this year will see the novice YLs again competing for this beautiful award.

The Florence McKenzie Trophy is now permanently displayed in a special glass case in the WIA Victorian Divisional Rooms. Our thanks to the VK3 Division.

Mavis VK3KS, is willing to assist anyone wishing to brush up on their CW. She has a CW sched on 80 metres on Monday nights after the ALARA Net.

ALARA AWARD

Alan Viegas VK8AV, received Award No 128 on May 2, 1987.

The first ALARA Award was issued on March 13, 1980, to G4EZI, with No 2 being issued to Austine VK3YL, endorsed "First VK." Freda VK2SU, gained the "First All CW" endorsement. Elizabeth VE7YL, has four awards with her different call signs: YB0ADT, VE7BIP, PJ2CC, and GU4LMW/A.

As the number of ALARA members has grown, the award has become easier to achieve, and is certainly worth the effort required.

Cost of the Award is $A3 or seven IRCs, and the Award Custodian, Mavis VK3KS, is willing to accept Australian 50 cent stamps in lieu of the odd- dollar.

YL ACTIVITIES

Congratulation to Jenny VK5ANW, who has been re-appointed to the position of VK5 Divisional President. Congratulations are also due to Mavis VK3KS, winner of the VK-YL section of the 25th Anniversary WARO Contest. Mavis received a beautiful silver coaster for her achievement.

Grace VK7NNN, is a regular check-in on the Tasmanian Devil Net each Tuesday on 80 metres. Rae VK9NXY, is active from Christmas Island. Bev VK6DE, has been on a four-wheel-drive trip "up north." Look forward to hearing all about it Bev. Akiyo JH1GMZ, has visited many countries including the USA, China, Korea and Thailand. She has not yet been to Australia, but is hoping to get here one day.

YL CONTESTS

16th JLRS Party Contest

Phone: From Saturday September 26, 1987 at 0300 UTC to Sunday September 27, 1987 at 0300 UTC.
CW: From Saturday October 3, 1987 at 0300 UTC to Sunday October 4, 1987 at 0300 UTC.
Operation: All bands and all modes may be used in accordance with operator and station licenses. Crossband operation is not permitted.
Scoring: Phone and CW will be scored as separate contests, submit separate logs for each contest.
Logs: Signed by the operator must be postmarked not later than October 20, 1987.
Send logs to the Contest Custodian, Chizue Yamada JA1EYL, 5-28-4 Nakano, Nakano-ku, Tokyo 164, Japan.
Suggested Frequencies:
PHONE: 14.160, 14.280, 21.280, 28.600 MHz.
CW: 14.060, 21.060, 28.060 MHz.

Howdy Days — Sponsored by YLRL

To be held from Wednesday, September 9, at 1400 UTC to Friday September 11, 1987, 0200 UTC.
Operation: All bands and modes may be used, no crossband operation. Operating breaks must be indicated in log. Logs must be received by October 7, 1987.

YL Anniversary Party

CW: Wednesday, October 14, 1987 at 1400 UTC to Friday, October 16, 1987 at 0200 UTC.
SSB: Wednesday, October 28, 1987 at 1400 UTC to Friday, October 30, 1987 at 0200 UTC.
Logs: Must be postmarked by November 14, 1987 and be received by December 12, 1987.
Logs for the two YLRL contests should be forwarded to Mary Lou Brown NM7N, 504 Channel View Drive, Anacortes, WA98221, USA.
Further information on all contest can be obtained from Bron Brown VK3DYF Please include SAE with your request.

NEW MEMBERS

Warmest greetings to new members:
Kathy VK3XBA, Jean KA7SWH, Gaby DL2BCH, Rae VK9NXY (Christmas Island), Bonnie Pounsett (wife of VK4QY), Cathi KA1OKF, and Hazel VK4MAZ.

Hazel VK4MAX, regularly drove her teenage son to Oakey for novice classes, and decided she might as well study too. The result, a new call sign on the air. Congratulations Hazel.

Ann VK4ANN.

CHANGE OF CALL SIGN

Congratulations to Anne ex-VK4KZX, now VK4ANN. A very appropriate call sign.

Jan VK3DMH, changed not only her call sign, but also her name (see March AR). Jan is now VK3HD.

See you all again next month.

73/33, Joy VK2EBX.

ar

Radio Amateur Old Timers Club

Kevin Duff VK3CV
PUBLICITY OFFICER
Radio Amateurs Old Timers Club

HISTORY OF THE RAOTC

Back in 1974 it was suggested to Bob Cunningham VK3ML, during a QSO over the air, that there should be some sort of Old Timers' Club in Australia which would permit amateurs who had talked to one another for many years, to unite in a common cause for the continuation of the friendships that had made on the air over so many years.

Bob Cunningham took the initiative and talked about the idea with many amateurs on and off the air. The result was one of great enthusiasm amongst all those contacted for an early move to form the Old Timers' Club.

The first move was to present the idea at a suitable function where various ideas could be discussed. Thus the first dinner was held on February 5, 1974, at the Sciences Club, Clunies Ross House, Royal Parade, Melbourne. It was also the venue for meetings of the IREE Headquarters and was therefore an appropriate place for meetings. Bob Cunningham chaired this first meeting with the able assistance of the late Ivor Morgan VK3DH, who later became inaugural secretary. The original qualification for membership was that an applicant had been licenced for a period of 40 years. However, after all those present had voiced their comments, this qualification was reduced to 25 years. The outcome of the discussions on that memorable evening resulted in the formation of a constitution upon which to base the proposed Old Timers' Club.

At the inaugural dinner, we were fortunate in having, amongst our guest, Alan Butement VK3AD, and the late Max Howden VK3BQ. In the very early years of amateur radio, Alan was G6TM, and made history by establishing contact with Australian and New Zealand amateurs, in addition to amateurs in many other parts of the world. He spoke of those early days and the "Address-in- Reply" was given by the late Max Howden, the first Australian amateur to make two-way contact between Australia and the USA and the UK by both telegraphy and telephony. There were 38 amateurs at that dinner and they formed the nucleus of the present Radio Amateur Old Timers' Club of Australia.

During the following year, a draft constitution was drawn up and a suggested committee arranged, composed of Bob Cunningham VK3ML, President; Ivor Morgan VK3DH, Secretary; Ray Jones (SK) VK3RJ; John Tutton VK3ZC, Alan Butement VK3AD; Les Gough VK3ZH (SK); Max Hull VK3ZS; Stan Dixon VK3TE; and Harry Cliff VK3HC Treasurer. During that year, Bob Cunningham visited New Zealand and met with Casey Harris about the functions of the ZL club. Casey was then Secretary of the OTCZL. The RAOTC Australia was later to become affiliated with both the OTCZL and the RAOTA of the United Kingdom under the Presidency of G2UV. At the 1975 Annual Dinner the constitution was adopted and the aforementioned committee appointed.

At first, it might have appeared that the RAOTC was a Victorian affair but it was soon to become recognised as being international with a large application for membership from all States and from many overseas amateurs in the UK, USA, Germany, South Africa, New Zealand, Sweden and other countries — the overseas applicants are still steadily growing.

Until 1984, the Club circulated a newsletter to its members twice every year. This was replaced in 1985 by *OTN* the journal of the Radio Amateur Old Timers' Club of Australia, which is published and circulated annually, finances permitting.

About 800 copies of the journal are printed and, with the cost of stamps, envelopes, etc, included, this comes to a large sum. If members could donate something, no matter how small, to help pay the cost of our journal, this would be greatly appreciated. Donations can be forwarded to: The Secretary, RAOTC, Harold Hepburn, 4 Elizabeth Street, East Brighton, Vic. 3187.

The enthusiasm of Old Timers in joining this club has been most gratifying to its founder and committee members — past and present. Its continutation is greatly subject to younger Old Timers offering their services in an administrative capacity as the old Old Timers necessarily have to retire. We look forward to an expanding membership and the assistance of capable members to keep the RAOTC functioning on into the 1990s.

VICTORIAN MEMBERS LUNCHEON

The Annual Victorian Luncheon of the RAOTC will be held on Wednesday, September 23, at the usual venue, the City and Overseas Club of Melbourne, 291 Dandenong Road, Windsor. Members should arrive about 12.30 pm for lunch at 1 pm. An application form will be forwarded to Victorian members but all members are very welcome to this get-together.

New Club members are always welcome and membership accorded to radio amateurs who have been qualified to hold an amateur licence for 25 years. If you would like to join, send a SASE to Harold Hepburn, 4 Elizabeth Street, East Brighton, Vic. 3187, for an application form.

FEEDBACK

Feedback from amateurs suggests that the articles taken from the 1915 editions of *Wireless World,* and published in the June 1987 Radio Amateurs Old Timers' page, were enjoyed. Some more of these pieces are included this month.

AN AUSTRALIAN INCIDENT

Hospitality Repaid by Treachery

In our last number we devoted considerable space and prominence to emphasising the necessity for wireless amateurs placing themselves unreservedly in the hands of the British authorities with regard to their apparatus. We trust that our appeal, grounded on patriotism as well as self-interest, will have been effective. Our attention has recently been called to a paragraph in this connection which was cabled over from Australia. At Melbourne, as recently as an early date in March, the military authorities seized a wireless plant at the residence of an employee of the Western Electric Company named Bleeck. The man was of German parentage, in constant touch with his relatives in the Fatherland, to which country he was in the habit of paying frequent visits. The fact that this discovery only occurred eight months after the war had been in operation points to the necessity for continuous and unceasing vigilance.

ROYAL NAVAL DIVISION

Public School Battalion

The Admiralty have given official permission for raising a Battalion of 1 000 men, which will be strictly limited to Public School or University Men and who will serve together as a Unit.

Training is now going forward.

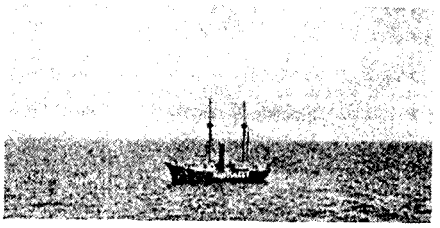
Applicants desiring to enroll should apply at once to

ROYAL NAVAL DIVISION
6, 7, 8 Old Bond Street,
London, W.
Telephone . . . Regent 5515.
GOD SAVE THE KING

A SOLITARY OUTPOST

A Visit to a Nantucket Lightship

The island of Nantucket forms the eastern-most of a group of islands lying off the south-east coast of Massachusetts, and is one of the danger spots of the Atlantic seaboard of the United States of America. On the north shore is situated Nantucket town, *possessing* a nearly land-locked harbour and a population of about 3 000 inhabitants. In times past it formed the seat of an important whaling Industry, but its claims to fame now rest almost solely on its attractions as a summer resort for the workers of the large cities on the neighbouring main lines. The trend of the coast lends itself admirably to the formation of shoals which constitute a dangerous menace to the mariner. To minimise this danger as far as possible the Commissioners of Navigation of the United States have established a light vessel, of which we are able to reproduce a photograph. We are extremely fortunate in having obtained this as fog surrounds the little ship for the greater part of each year. It possesses an electric lantern containing a light which occults every 15 seconds, and situated on the foremast. It is a steam lightship, and is anchored in 20 fathoms of water, having been placed there is 1909. The height of the lantern above sea level is 50 feet, and the light is visible for 13 miles. We are indebted to Mr W Condon for the photograph.



Nantucket Lightship.

"Those are my ohming pigeons."

A SUGGESTED SUBSTITUTE FOR A "BUZZER"

A recent number of the *English Mechanic* contains a rather amusing letter, referring to the Postmaster-General's notice concerning wireless apparatus. Mr Howard J Duncan, who writes the letter, states that it "may interest some of our wireless amateurs to know that a fair substitute for a 'buzzer' may be made by slipping the point of a dinner knife under a dinner plate till it reaches near the centre, and then operating the handle of the knife in the same manner as a Morse key. In this way it is possible to practice Morse without offending the Postmaster- General or infringing the Defence of the Realm Act." We note that Mr Duncan does not consider this quite equal to the

regular "buzzer" and only recommends it as a "stop-gap."

MISCONCEPTION OF WIRELESS POSSIBILITIES

Mr Charles R Gibson has been contributing long articles recently to the *Glasgow Herald* on the present use of wireless by the belligerents, and in the course of one of them tells an amusing story which , according to the writer, was repeated to him with portentous seriousness as an incident of the greatest gravity which had recently come under the narrator's personal observation:

"Two German workmen had been arrested as spies, and there had been discovered, hidden beneath the hearthstone of the kitchen on their two- roomed tenement house, a complete wireless installation capable of transmitting messages to Berlin."

Mr Gibson comments that it is possible to send wireless messages as far as from here to Berlin, but not with apparatus that can be stowed away beneath a kitchen hearthstone, or even contained in a large room.

FROM the Antipodes through the medium of the public press — in this instance the *Sydney Sun* — comes news of an invention which (if only it were true) would revolutionise the face of the earth. Under the heading of "Bullroarers versus Ultra-Violet Rays" our contemporary contrasts the methods of old time rainmakers with that of the oldest modern exponent of the art: "The rain-maker in our modern invention does not need to wear a head-dress of feathers and paint false ribs on his body with pipeclay; nor does he need a cannon or a cauldron like later members of the profession. All he does is sit in front of a switchboard, ascertain by 'phone or wireless where the rain is wanted and how much, push in a few plugs and touch some buttons. Then it's time for the populance to rush for the shops where they sell umbrellas for 2s 11d."

Rain in Australia by wireless! If only it were true.

RAPID WIRELESS SERVICE

On the last trip of the Cunard steamer *Franconia*, when the boat was 60 miles off New York, a passenger sent a Marconi-gram via the Western Union to San Diego, Cal, prepaying the reply. The message was sent through the Marconi station at Sea Gate and, to the astonishment of the passenger, the reply was delivered to him in 55-minutes. This is probably a record-breaker on sending a wireless message from a ship at sea across the continent and delivering a reply on board ship.

A VARIABLE CONDENSER

Mr N J de Waard suggests the following method for making a variable condenser:

Take two test tubes such as are used by chemists, one fitting easily into the other, and both being filled with water. Spirals of copper wire reaching to the botttoms should be placed in each tube, that in the latter being of such diameter as to allow a smaller tube to slide up and down it. According to Mr de Waard, mercury does not give better results than water.

TECHNICAL MAILBOX

TS-820S FAULTY READOUT

This problem has shown up in number of TS-820S transceivers and in each case a clean up of the connectors has restored the operation of the readout to normal (at least for some months).

To clean the connectors:

Turn off mains power to the transceiver and remove the top and bottom covers of the TS-820S as per details on page 33 of the Instruction Manual.

Remove the eight top cover screws and the nine bottom cover screws. Unplug the speaker lead and lift away the covers.

Locate the Counter Assembly Unit (X60-1020-00) shown on page 42 of the Instruction Manual. Disconnect the cable connectors from the top and bottom of the Counter Assembly Unit.

Remove the four screws from the lower side of the transceiver holding the Counter Assembly Unit to the chassis. The unit can now be removed from the chassis.

Remove the four screws holding the shielded Counter Assembly Unit Box together. Then remove the four screws that hold the two PCBs in place. Each PCB can now be separated from the centre shielded piece. All connectors can be cleaned and sprayed with one of the contact type pressure-pack sprays.

After assembly (in reverse order to the above), the readout should be working again. At least until the next time it needs a maintenance 'clean up.'

—Contributed by Les Brennan VK4XJ

(Thanks Les for your handy hint. Other readers must know a handy hint regarding their equipment. Please write it up and share it with other amateurs in Technical Mailbox.)

Education Notes

Brenda Edmonds VK3KT
FEDERAL EDUCATION OFFICER
PO Box 883, Frankston, Vic. 3199

During a recent few days in Canberra I had extensive discussions with DOC officials about a number of matters related to education and examinations. These discussions have been fully reported to the Executive, but it is probably appropriate to publish some comment here for the benefit of members. Firstly, I would like to express my appreciation of the assistance and co-operation extended to me by the DOC officials, and the time they gave me. It made the visits most productive.

One of the outcomes is that the proposed Study Guide, to accompany the novice syllabus, is now almost finished. We went through it in detail and negotiated over any differences of opinion. Some minor amendments have now been made, and the final draft sent back for the "Seal of Approval", after which we can produce and distribute it.

I am sure it will be a most useful document for both students and teachers. There will, of course, always be some disagreements, but I think we have succeeded in restricting the potential questions to a reasonable level. My sincere thanks go to all those who have assisted in its production thus far.

The preparation of a similar guide to accompany the AOCP/AOLCP syllabus was also discussed, and work had started on this. I would be pleased to hear from any members who would like to assist with this project by reading and criticising drafts as they are produced. Comments from those who are teaching or have taught AOCP classes would be most welcome.

I have had several requests lately for sample regulations examination papers, which I have been loathe to supply because those produced in 1982 are a little outdated and I have not had time to write new ones. So, I asked for a sample paper to be released for circulation.

However, as changes to the regulations have restricted the number of possible questions and, as the new leaflets on regulations and operational procedures are soon to be released, it was felt that release of actual question was inappropriate. Instead, the Department will edit my collection of papers to remove questions which no longer apply. This should leave us with, I hope, about two approved sample papers.

I spent several hours inspecting examination papers, at both levels but concentrating on the novice papers, for standard of questions and overall balance. I did not record criticism in detail, but on average there were about two or three questions per paper where I objected to either the wording, the content or the standard of the question.

Admittedly, I did not read all the papers that have been used, but it is obvious from what I did inspect that the question bank is limited and questions are being recycled.

Taking a paper that was used in August and November 1986 as the standard, I compared questions on the earliest papers and some from the middle years with it.

Of the 50 questions on the 1986 paper, seven appeared in identical form on at least one of the first three papers, 17 had been modified only slightly without altering the sense or difficulty and a further seven were reworded versions or variations of the earlier questions.

It does not seem to me that the standard of the questions has risen significantly.

What may have given rise to the idea that the novice examination standard is rising is the fact that the questions distribution on the earty papers was different — the first paper had 18 questions and the second 14 questions from Section 1 of the syllabus (Electrical Laws and Circuits), whereas the later papers have used the formula given in the syllabus; ie eight questions from Section 1.

It is worth noting that I do not recall any complaints about the published table of distribution of questions.

It is also significant that, for the last four examinations for which figures are available, the pass rates have been over 50 percent.

Discussions on other topics will be reported later.

73, Brenda VK3KT

Electro-Magnetic Compatibility Report

Hans Ruckert VK2AOU
EMC REPORTER
25 Berrille Road, Beverly Hills, NSW. 2209

Are we alone?

For many years we seemed to suffer more than other community groups from lack of EMC. This is no longer so. The usefulness of amateur radio depends on maximum receiver sensitivity, as possible at the prevailing "state-of-the-art," which makes it harder to work in a polluted propagation medium. We have warned the industry, and also the frequency spectrum administration authorities, of the ever increasing number of EMC collision problems, as we go from the electrical to the electronic age. We have not only air and water pollution and deforestation, but also pollution of the frequency spectrum.

Earlier EMC Reports dealt with the problems faced mainly by radio amateurs, but we are no longer alone. Some measures (often only partly effective) have been undertaken by standards commissions and appliance manufacturers, to reduce the RFI from electrical appliances (mainly sparking motors and power lines). Unwanted radiation from television and broadcast receivers has also been dealt with, but the steps taken are often not good enough if the wanted signal is of low field-strength.

EMC and RFI problems became extremely serious at rocket ranges in the USA, where it was feared that signals from hand-held or mobile transmitters could affect rocket operation and testing on the ground. Soon firms appeared which specialised in checking and cleaning up the unwanted radiation from the many communication services. We have now the 'Interference Control Technologies, Inc' (USA), which conducts courses in German, French, Swedish and English and other languages where required. There are offers of EMC software, EMC technology magazines, EMC at EXPO 1986. EMC courses are being held in London, Paris, Munich, Amsterdam, Melbourne, New Zealand, Stockholm, Goteborg. There is no doubt that very soon the EMC engineer of any company dealing with electrical and electronic devices (there will soon be no others!) will hold a very important position. His knowledge and investigation will decide whether a product complies with the necessary EMC standards and is thus acceptable to the public. It is hoped that soon technical colleges and universities will offer courses in EMC.

DOC will need a substantial upgrading of facilities for mobile and laboratory testing. Radio amateurs are often especially equipped to work in this field. Many VK radio amateurs are radio inspectors. In West Germany the Radio Amateur Club of the Post Office is affiliated with the DARC. Other radio amateurs are with the Ministry of Science and Technology, because their private experience adds to their professional training.

It was reported earlier, that in West Germany the Engineers Association, the Standards Committee and the Electronic/Electric Industry (manufacturers and importers) worked out EMC standards during 10-15 years of discussions, testing and developing of measuring methods. The results of this work have been submitted to the ITU for the benefit of those countries which cannot afford to do the job all over again, or to help those who do not have the technology and know-how at this stage. DOC in VK has this information too. In West Germany one finds radio amateurs at all levels of the committees and organisations dealing with EMC.

EMC Symposium in Europe

Every year there is an EMC Symposium in Europe, including Eastern Europe. (The "iron curtain" does not stop RFI and EMC problems!). In even-numbered years the meetings take place at the technical university of Zurich (Switzerland) and during odd numbered years the meetings are held at Wroclaw (Poland), a city known as Breslav for 600 years prior to 1945. These conferences are attended by specialists of the following organisations:

URSI, CCIR, CCITT, IEC, CISPR and Region 1 of the IARU.

The group of radio amateurs is led in Poland by SP9ZD and the West German group by Dr Gerhard Blechert DL9TJ and (Ministry of Science and Technology) and Gunter Schwarzbeck DL1BU (honorary technical officer of the DARC and manufacturer of EMC testing equipment).

The June 1986 meeting in Wroclaw was attended by 215 engineers and scientists from 19 countries. Dr John Allaway G3FKM, represented Region 1 of the IARU. The lectures are presented in English and Russian (simultaneously translated). Fred Johnson ZL2AMJ, described cooperation between NZART and the ZL authorities. The recent meeting in Zurich was attended by DL1BU (who was visiting Australia last month). He told me that most of the participating persons were either professors or radio amateurs!

This shows that we all can learn from each other about solving EMC problems. This writer hopes to get copies of the symposium lectures which dealt with EMC and amateur radio from G3FKM, DL1BU, and in the West German magazine *Funkschau* articles in issues 16 and 17 of 1986 by DL9AH.

AR Showcase

UNINTERRUPTIBLE POWER SUPPLIES

The Westpower Uninterruptible Power Supply is based on transistor regulated ferroresonant technology. The system is well-proven, exceptionally robust and provides a facility for very flexible load discrimination.

The design provides an extremely low component count which significantly increases reliability when compared with other units. It can also operate continuously with 100 percent imbalance of phases in a three-phase system (both single-phase and three-phase systems are available as is any required voltage output).

Units rated up to 1 kVA are available ex-stock and are housed complete with sealed, maintenance-free battery, in attractive cabinets to harmonise with modern office decor.

The Westinghouse Rectifier can also undertake on-site monitoring of power supplies using microprocessor-based equipment designed to identify a broad variety of mains aberrations. A full written report containing recommendations of the best solution to each client's individual problem is produced.

For further information contact Westinghouse Rectifier Pty Ltd, Box 267, Williamstown, Vic. 3016, phone (03) 397 1033.

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CELLULAR MOBILE PHONE

For the busy executive on the move, there is now only one cellular mobile telephone that does not compromise according to David Gill of Captain Communications. David sells Novatel cellular phones, but found it necessary to add essential features wanted by people "on the move". His engineering staff have built the "perfect mobile phone."

"The Executive" is the perfect communications aid for people on the road, and is perfect for events like exhibitions and whenever an urgent "carry about" phone is needed. It is completely self-contained in its own rugged attache case, has automatically adjustable power output up to the legal limit of four and a half watts, works on all power sources, has an inbuilt high gain antenna built into the lid of the attache case and many other features.

For further information and pricing call David Gill, Captain Communications, 28 Parkes Street, Parramatta, phone (02) 633 4333.

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NEW ICOM DEALER IN QUEENSLAND

Oblis Electronics are happy to announce that they have recently become a dealer for Icom Australia.

Oblis have, for many years, been leaders in the sales, service and installation of two-way radio, marine radios, citizen band radios and accessories to suit. They are now expanding their range and include Icom amateur, marine and commercial radios.

Fully trained technical staff include two licenced amateurs, Ian VK4YIP and Chris VK4TCH.

Oblis have recently moved to new larger, air conditioned premises at "Truck City", 1717 Ispwich Road, Rocklea, Qld. 4106, phone 875 1155.

The friendly staff at Oblis Electronics will be pleased to assist with any inquiries.

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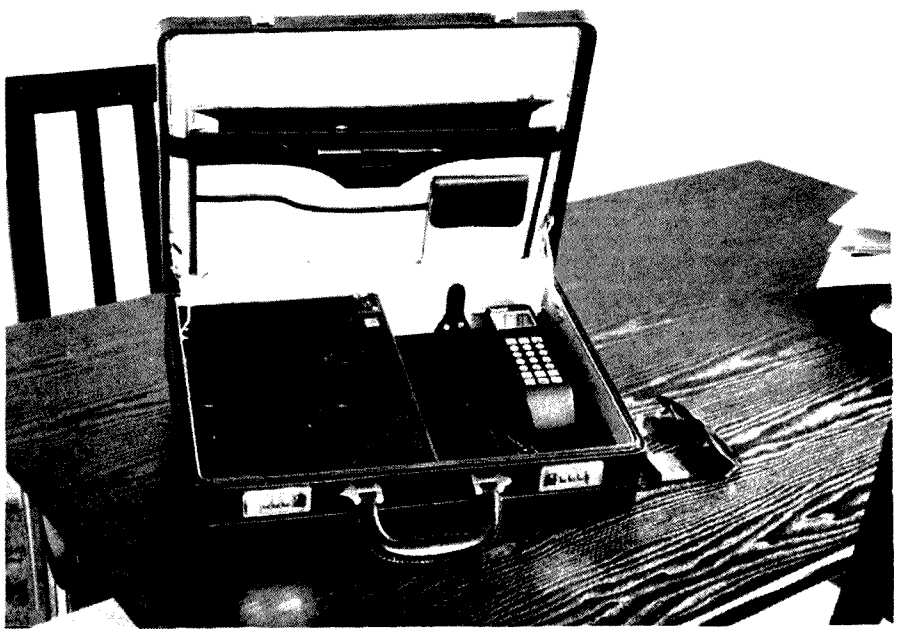

AMSAT Australia

Colin Hurst VK5HI
8 Arndell Road, Salisbury Park, SA. 5109

NATIONAL CO-ORDINATOR
Graham Ratcliff VK5AGR
INFORMATION NETS
AMSAT AUSTRALIA
Control: VK5AGR
Amateur Check-In: 0945 UTC Sunday
Bulletin Commences: 1000 UTC
Primary Frequency: 3.685 MHz
Secondary Frequency: 7.064 MHz
AMSAT SOUTH WEST PACIFIC
2200 UTC Saturday
14.282 MHz

Participating stations and listeners are able to obtain basic orbital data, including Kepierian Elements from the AMSAT Australia Net. *This information is also included in some WIA Divisional Broadcasts.*

ACKNOWLEDGMENTS

Contributions this month are from Bob VK3ZBB, Graham VK5AGR and UoSAT Bulletins.

AMSAT-AUSTRALIA NEWSLETTER

This fine monthly publication, published on behalf of AMSAT- Australia by Graham VK5AGR, now has 212 subscribers. Should you wish to subscribe, send a cheque for $20 made payable to AMSAT-Australia to AMSAT- Australia, c/- PO Box 2141, GPO, Adelaide, SA. 5001.

The newsletter provides the latest news items on all satellite activities and is a must for all those seriously interested in amateur satellites.

SUNDAY EVENING NEWS BROADCASTS

The value of the Sunday Evening New Broadcasts has been demonstrated once again in recent months with the launch of RS-10 and RS-11 and the commencement of the Fuji OSCAR 12 BBS Bulletin Board Service. The frequency is 3.685 MHz, at 1000 UTC.

SOVIET RS SATELLITES

RS-10 and RS-11 were launched on June 23, from a Soviet launch site as secondary payloads with COSMOS 1861.

Element Set	10
Reference Epoch	87 175.83580769
Inclination	82.9234
RAAN	52.3986
Eccentricity	0.0010447
Argument of Perigee	256.9500
Mean Anomaly	103.0527
Mean Motion	13.71876972
Decay Rate	6.0e-07
Rev #	21

RS-10 and RS-11 were built at the Tsiolkovskiy Museum for the History of Cosmonautics, in Kuluga, an industrial centre 180 kilometres southwest of Moscow. The chief architects of the transponders, called BRTK-10, were Aleksandr Papkov and Viktor Samkov. BRTK stands for the Russian equivalent of *Equipment for Radio Amateur Satellite Communication.* The overall project management is in the hands of DOSAAF, a military-related organisation whose major mission is the training of pre- draftage youth in militarily significant technology.

The following are the frequencies for the two new RSs:

RS-10

MODE	UPLINK BAND MHz	DOWNLINK BAND MHz
K	21.160 — 21.200	29.360 — 29.400
T	21.160 — 21.200	145.860 — 145.900
A	145.860 — 145.900	29.360 — 29.400
KT	21.160 — 21.200	29.360 — 29.400 + 145.860 — 145.900
KA and	21.160 — 21.200 145.860 — 145.900	29.360 — 29.400

Beacons: 29.357, 29.403, 145.857 and 145.903 MHz.
The RS-10 ROBOT uplinks are thought to be 21.120 and 145.820 MHz.

RS-10

MODE	UPLINK BAND MHz	DOWNLINK BAND MHz
K	21.210 — 21.250	29.410 — 29.450
T	21.210 — 21.250	145.910 — 145.950
A	145.910 — 145.950	29.410 — 29.450
KT	21.210 — 21.250	29.410 — 29.450 + 145.910 — 145.950
KA and	21.210 — 21.250 145.910 — 145.950	29.410 — 29.450

Beacons: 29.407, 29.453, 145.907 and 145.953 MHz.

FUJI OSCAR-12

The long-awaited Bulletin Board System (BBS) of Fuji OSCAR-12 has been successfully loaded and is apparently functioning well. Over one hundred messages were estimated to have been posted and received in its first few days of operation. This comes after more than 10 months of hard work and disappointment with earlier software problems and constraints on use imposed by a tighter than expected power budget.

Version 1.0 of the mailbox program has the following commands:

F	List latest 10 message headers with message number
F*	List all the message headers
R <n>	Read a message. You will be asked receiver and subject. Send <CR>. < CR> or <CR> ^Z <CR> to end the message.
K <n>	Kill message numbered <n>. A message being read by other station/s cannot be killed. FO-12 BBS is a multi-user system. Only the originator of the message can kill messages.
H	Help.

The call sign of FO-12, which is used to connect, is 8J1JAS. If more than 50 messages are posted, older ones will be overwritten. Maximum available memory for message storage is 192 kilobytes. There will be no command to logout. Simply disconnect using the TNCs disconnect command.

While the BBS is in operation, the digital repeater is disabled.

UOSAT-2 DCE

In a symbolic, but significant achievement, a greeting message originated at the headquarters of the Radio Society of Great Britain (RSGB) has been relayed to the headquarters of the American Radio Relay League (ARRL). The relay was accomplished by satellite and terrestrial packet networks all within the amateur radio domain. The message originated by RSGB Secretary, David Evans G3OUF, in London, was sent to UoSAT OSCAR-11's Digital Communications Experiment (DCE), by the Surrey DCE station. It was then retrieved by K1KSY, in Massachusetts. K1KSY, recently commissioned his DCE ground station.

The message was then relayed via the terrestrial packet radio network to Newington, Connecticut, via W1AW-4. It was then delivered to ARRL Executive Vice-President, David Sumner K1ZZ, at ARRL Headquarters.

The UO-11 DCE has been in operation for several years but recently several additional DCE ground stations and special authorisation from the British regulatory authorities have facilitated the new milestones in DCE use.

PARTICLE/WAVE SURVEYS

UO-11 will be programmed to take a series of particle/wave surveys this week. The surveys will be taken in the evening (UTC), as the satellite crosses the Atlantic Ocean, and the data will be downloaded from the DSR at 4800 bit/sec on 435.025 MHz over Surrey each morning. C E Newton G2FKZ, from the RSGB Propagation Studies Committee is hoping that these surveys will show evidence that mechanisms other than multi-hop sporadic-E skip are responsible for summer-time trans-Atlantic openings on 50 MHz. "The problem we have is to find a rational explanation (for) the propagation mode that carries a 50 MHz signal across the Atlantic during June/July late in the evening." Present theories incorporating multi-hop sporadic-E are "not tenable," he says. So, with the help of the UO-11 P/W Correlator, Mr Newton is looking for a source of electrons that could charge the ionosphere during these openings. "If we can find (electron) precipitation in this zone, then that would be the start of a new theory." We will report the results of this experiment in a future UoSAT Bulletin.

AMSAT-UK/UOSAT COLLOQUIUM

Welcome to all those attending the Second AMSAT-UK/UoSAT Colloquium, at Surrey this weekend, July 19-20. This year's gathering, with a large and distinguished international contingent, promises to be an important meeting for the Amateur Satellite Service.

The International contingent includes Graham VK5AGR, and Ian ZL1AOX.

GEOSYNCHRONOUS TESTS PROPOSED

Representatives of AMSAT-NA, IRRL and TAPR, recently met with NASA managers and engineers at the NASA Lewis Research Center, in Cleveland, to map out plans for experiments on the NASA ATS-3 geosynchronous spacecraft. The general plan calls for experiments in new technology and exercising emergency communications systems.

TAPR's FO-12 modem, which has the 1200 baud PSK modem built in, will become an important experimental apparatus on the ATS-3 tests. Packet radio experiments using FSK had previously been tried on ATS-3 with poor results. The improvement using the PSK modems is anticipated to be substantial. The TAPR DSP Project will also likely find useful data resulting from the ATS-3 experiments.

ATS-3 currently serves a variety of users in the Pacific and Antarctica with various voice and data services. It has expended its station keeping fuel and its orbit is now inclined about 12 degrees to the equator. Nevertheless, its potential to serve as a test bed for Phase 4, pointed out by PY2BJO, last December, makes it attractive.

DOPPLER TRACKERS WANTED

Joe Bijou WB5CCJ, says he is interested in working with amateurs who are competent in making satellite Doppler measurements. Joe would like to set up some experiments to determine how well individuals can actually determine the Doppler shift and position of a satellite using conventional equipment and techniques.

These experiments may be important in terms of AMSAT's planned "Techno- Sport" activity next year, on Phase 3C. One major component of the Techno- Sport activity will be hidden transmitter location via satellite. For further information, please contact Joe at Silicon Solutions, (USA phone number) 713 661 8727.

ARIANE LAUNCHES TO RESUME

Sources indicate Ariane-space plans to resume launches from Kourou with the V-19 mission September 8. Getting this launch off on time is essential if the previously announced schedule is to hold. That schedule shows AMSAT's Phase 3C aboard Ariane V-22 as presently scheduled for January 1988. AMSAT is planning for the January

OSCAR-10 APOGEES — SEPTEMBER 1987

				SATELLITE				BEAM HEADINGS					
				APOGEE	ECO-ORO	s		SYDNEY		ADELAIDE		PERTH	
DATE SEPT 1987	DAY NO	ORBIT NO	UTC HH MM:SS	LAT DEG	LON DEG	AZ DEG	EL DEG	AZ DEG	EL DEG	AZ DEG	EL DEG
1	244	3172	1446:58	22	144	57	-2				
2	245										
3	246	3175	0145:18	22	310					302	-2
4	247	3177	0104:11	23	300					308	5
5	248	3179	0023:03	23	291					314	11
	248	3181	2341:56	23	282			306	0	322	16
6	249	3183	2300:50	23	272	304	-1	312	6	330	21
7	250	3185	2219:43	23	263	310	5	320	12	340	24
8	251	3187	2138:35	23	253	317	11	328	17	350	27
9	252	3189	2057:28	23	244	325	16	336	20	0	27
10	253	3191	2016:22	23	234	333	20	346	23	11	26
11	254	3193	1935:15	23	225	343	23	356	24	21	24
12	255	3195	1854:07	23	215	353	25	6	24	30	20
13	256	3197	1813:00	23	206	3	25	16	22	38	15
14	257	3199	1731:53	23	197	13	24	26	19	46	10
15	258	3201	1650:47	23	187	23	21	34	15	52	4
16	259	3203	1609:39	23	178	32	17	42	10	58	-3
17	260	3205	1528:34	23	168	40	12	49	4		
18	261	3207	1447:26	24	159	47	7	55	-2		
19	262	3209	1406:18	24	149	53	1				
20	263										
21	264										
22	265	3214	0023:31	24	306					305	0
	265	3216	2342:25	24	296					311	6
23	266	3218	2301:17	24	287					318	12
24	267	3220	2220:09	24	277			309	2	326	17
25	268	3222	2139:04	24	268	307	1	316	8	335	21
26	269	3224	2057:56	24	259	314	7	324	13	344	24
27	270	3226	2016:51	24	249	321	12	332	17	355	26
28	271	3228	1935:43	24	240	329	17	341	20	5	26
29	272	3230	1854:35	24	230	338	20	351	22	15	24
30	273	3232	1813:29	24	221	347	23	1	23	25	21

SATELLITE ACTIVITY FOR THE MONTH OF APRIL & MAY 1987

1 LAUNCHES

The following launching announcements have been received:

INTL NO — 1987	SATELLITE	DATE	NATION	PERIOD min	APG km	PRG km	INC deg
036A	Cosmos 1838	Apr 24	USSR	5hr 12m	17550	213	64.7
036B	Cosmos 1839	Apr 24	USSR	5hr 12m	17550	213	64.7
038C	Cosmos 1840	Apr 24	USSR	5hr 12m	17550	213	64.7
037A	Cosmos 1841	Apr 24	USSR	90.5	403	225	62.8
038A	Cosmos 1842	Apr 27	USSR	97.8	678	648	82.5
039A	Cosmos 1843	May 05	USSR	89.5	312	214	70.4
040A	Horizont 14	May 11	USSR	23h 21m	35174		0.5
041A	Cosmos 1844	May 13	USSR	102.0	879	861	71.0
042A	Cosmos 1845	May 13	USSR	90.4	400	217	70.0
043A	USA 22	May 15	USA				
044A	Progress 30	May 19	USSR	88.8	255	192	51.6
04SA	Cosmos 1846	May 21	USSR	89.2	314	196	82.4

2 RETURNS

During the period 71 objects decayed including the following satellites:

1987-021A	Cosmos 1824	Apr 22
1987-034A	Progress 29	May 11
1987-035A	Cosmos 1837	Apr 28
1987-037A	Cosmos 1841	May 08
1987-039A	Cosmos 1843	May 19

3 NOTES

1979-057A — NOAA 6 was deactiviated on March 31, 1987.

—Contributed by Bob Arnold VK3ZBB

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date but believes a launch late in the first quarter of 1988 is more likely. Ariane launches have been on hold for a year, since the V-18 third stage developed an ignition problem resulting in the total loss of the mission. A new ignitor has now been qualified and thoroughly tested.

AMSAT OSCAR-10

Very good operating conditions have returned to AMSAT OSCAR-10, Mode B. Much improved sun angles and good co-operation by users in adhering to the operating guidelines have combined to provide the very good conditions.

Because of the favourable conditions and good user compliance, the command team decided to increase the operating time. Beginning Monday, June 8, UTC, the operating schedule was increased to allow operation from MA 20 through 250. This schedule will remain in effect until July 20. The satellite is currently experiencing perigee eclipse so it must not be used after MA 250. It is now concluded the two-metre omni-antenna is switched in line.

Please stay in tune with official bulletin sources for any schedule changes.

UOSAT-1

UoSAT-1 has returned to normal operations, although a small OBC software bug caused the WOD collections to malfunction last week. The new version of the 'Diary' for UO09 has been written by Steve Holder, and includes expanded command functions which considerably enhance spacecraft operations. The expansion of the UO-9 Diary does, however, consume more OBC memory with the result that WOD survey periods will be somewhat shortened — we cannot have everything!

UO-9 HF BEACONS

The UO-9 21.002 MHz beacon has been tracked regularly by G4VRC, at UoS — reports on reception of this beacon please.

UOSAT-2

Amateur Store-and-Forward Communications activity on the UO-11 DCE is growing fast with batches of messages being carried from individual amateur stations connected to the terrestrial amateur radio packet networks in the UK, USA and Australia.

SMOOTHED EPHEMERIS FOR OSCAR-10 de G3RUH

Epoch Year	1987	
Epoch Time	166.173272	days
Inclination	27.38	degrees
RA of Node	16.47	degrees
Eccentricity	0.603	—
Arg of Perigee	216.30	degrees
Mean Anomaly	0.0	degrees
Mean Motion	2.05877145	rev/day
Decay Rate	0	rev/d/d
Epoch Rev	3011	—
Semi-major Axis	26105.3	km
RAAN Dot	-0.1564	deg/day
Arg Peri Dot	0.2622	deg/day

de Colin VK5HI

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Club Corner

SHEPPARTON AND DISTRICT AMATEUR RADIO CLUB INC

The Shepparton and District Amateur Radio Club will hold its fourth Communication Day on Sunday, September 20. All previous events have been popular with amateur radio operators and those with just an interest in radio and communications.

Amateur radio is an ever changing hobby and, to prove this point, it is planned to have a computer display, based around communications, operating on the day. This will be IBM compatible and some Public Domain programs will be available.

This will provide a little "New Technology" to ease the burden of design. it is hoped to have participation of computer dealers as well as the traditional amateur retailers and distributors.

With many new rigs arriving on the market and prices starting to fall a little, there will be the chance to buy equipment at attractive prices. There will be participation of disposals dealers and a trade table. Catering will be available and tea and coffee is free of charge. Pay a visit to the Club on the day!

Talk-in will be on two-metre repeater, VK3RGV, (146.650 MHz) and HF (3.590 and 7.063 MHz). The Club Call Sign, VK3DBS, will be used. UHF CB repeater CH3/33 will also be monitored.

Early indications are that there will be a working AUSSAT station, a working packet system, demonstration amateur radio station, computer display and bargains from the dealers. What more could you want?

For further information contact the Club at PO Box 692, Shepparton, Vic. 3630, or phone Peter O'Keefe VK3YF, on (058) 21 6070 (AH).

ar

THE HILLS AMATEUR RADIO GROUP (Perth)

Attendances on the last Wednesday of every month in room C3 at Kalamunda High School (and visitors are always very welcome), average 32 amateurs, SWLs and upgrading CB operators, for lectures, demonstrations and videos.

Dine-outs provide regular opportunities for wives and girlfriends to join in.

Phil VK6ZPP and family, who took first place.

Fred VK6UR, who won fifth place overall, but rated first applause for his "hat array".

This program of involvement went one step further on Sunday July 12, 1987, when members, their families and friends took to their cars for a Radioactive Fun Rally.

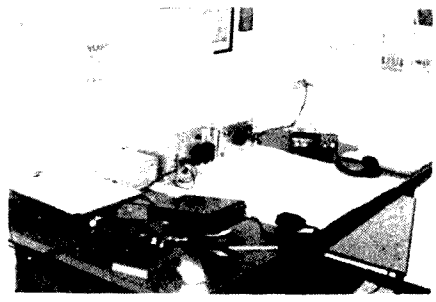
Organisers, VK6UV and VK6HQ, designed the rally around a 45 to 50 kilometre course, removing the need for speed. Maximum correct answers with minimum kilometres was the objective. Six of the 36 clues/directions could only be obtained by contacting Control on two-metres! A couple of these "check- points" were especially selected to be "scratchy" reception areas. In some cases, the two metre frequency to call on had, itself, to be worked out from the clues along the way. It was said that one mobile reversed to a better radio location to avoid penalty kilometres to make contact!

First place was won by Phil VK6ZPP and his family with a full set of answers and 45.9 kilometres. Phil's equipment was a TR-751A with 25 watts into a 4.2 dB seven-eighth antenna. Phil is a member of the Northern Corridor Radio Group.

Phil VK6ZKO, second place winners.

Second place went to Phil VK6ZKO, and family with 35/36 and an incredible 39.0 kilometres. Phil parked at strategic points and his boys sorted for clues! Phil used a FT-290R with two watts to a magnabase five-eighth in the centre of the roof.

Coming in a close third was another Northern *Corridor* team, that of Gary VK6XQ, also with 35/36 and an excellent 42.5 kilometres.



Ready to chart mobiles around the course at Rally Control.

The control station used three vertical antennas, an IC-245, FT-290R and FT-480R, plus an IC2A and indoor vertical on a Perth repeater for back-up. Once or twice both VK6UV and VK6HQ, at the Control Point, had their hands full!

Apparently everyone is talking favourably about the Rally and any odd gliches should have been eradicated by the time for the next one comes along!

Contribution and Photographs by John Hawkins VK6HQ, Secretary, HARG

ar

BRISBANE NORTH RADIO CLUB

The Brisbane North Radio Club held its Annual General Meeting on Friday, May 22, 1987. The new executive elected at that meeting is as follows:

President/Station Manager VK4WIN	Ed VK4ABX
Vice-President	Laurie VK4BLE
Secretary	Mike VK4BMD
Treasurer	Don VK4FBA

Don is the only member of the previous executive to run for re-election — President John VK4APZ and Secretary Noel VK4BIF, both decided to take a well-earned rest!

The Club meets every second and fourth Friday of the month, 1930 EST, at Room 23, Hooper Education Centre, Kuran Street, Wavell Heights. Visitors are most welcome.

The Club Net is held on USB at 0930 UTC each Monday *on* 28.420 MHz ± QRM. Net control *is* VK4WIN, usually operated by Ed VK4ABX, Club President and Station Manager.

Operators who contact club members can apply for the *Brisbane North Radio Club Award* by writing to the Awards Manager, PO Box 78, Chermside, Qld. 4032. To qualify for the award, Australian stations must obtain three points. Contacts with club members count for one point only, while contact with the club station counts for two points. Contacts can be only any band, but contacts via terrestrial repeaters and crossband modes are not recognised. Each club member can be contacted only once for the purpose of the award. Cost of the award is $A1, three IRCs or stamps to the value of $A1, whichever is appropriate to cover return postage. All awards will be fully endorsed with the mode of operation.

Michael Dower VK4BMD, Secretary, BNRC

ar

SUMMERLAND AMATEUR RADIO CLUB

The Summerland Amateur Radio Club has now completed arrangements for a new home at Richmond Hill. The one acre site has a large building with an adjoining garage, and these will admirably fulfill most of the Clubs needs. Line-of-sight restrictions preclude it becoming a repeater site, however, this is a small price to pay when compared to all the other goodies envisaged. Considering the last Club Rooms, the Goonallabah Scout Hall, was destroyed by fire in 1979, it will be pleasant to "hand-the-hat" and "put-the-feet-up" again!

A licence has been received for a new repeater, VK2RBB, situated on a mountain near Byron Bay. This should provide a better service for coastal

members and should be popular with amateurs travelling on Highway One. Further news about the channel, opening date, etc, will be published shortly.

Jim Cunningham VK2ESI, Publicity Officer, SARC

ar

RADIO ENTHUSIASTS CLUB OF THE BLIND

The Radio Enthusiasts Club of the Blind announces the Executive Officers, who were elected for the next 12 months at the recent 1987 Annual General Meeting:

Chairman	Frank Robinson VK3DBK
Deputy Officer	Robert Toseland VK3CTR
Secretary	John Machin VK3CCC
Treasurer	Brian Sitlington
Equipment Officer	David Ditchfield VK3YSK

The Club has been most successful since its inception in 1978, something of which the members can indeed be proud. However, the Committee is anxious that the Club sets fresh goals so that members enthusiasm does not wane. The Club has maintained a steady membership for the past nine years and it is very pleasing to see quite a number of members study for and pass their amateur radio examinations.

The Club usually meets on the third Wednesday evening of each month at the Association for the Blind, 454 Glenferrie Road, Kooyong, when matters of common interest regarding radio related topics are discussed. On a number of occasions the Club has welcomed guest speakers and members have had the opportunity to examine various items of equipment demonstrated by the speaker.

Members have visited Radio Australia's transmission facility at Lyndhurst and were afforded a very informative tour of the site.

Members have also joined with members of the Southern Peninsula Amateur Radio Club and Frankston and Mornington Peninsula Amateur Radio Club for an entertaining barbeque and field day.

Tribute is paid to the Club's Equipment Officer, David VK3YSK, for the wide range of projects he has undertaken. Amongst his commitments, David has been responsible for the construction of the Club's Mobile Operating Desk, which is almost ready for use. The material for this project was kindly donated by Bob Cunningham.

David also produces a recorded Newsletter, circulated on a C-90 cassette to blind people, locally and interstate. Anyone wishing to receive the Newsletter should contact David at the Association for the Blind, Kooyong, for further details.

Several technical publications are now available on cassette for visually handicapped people on a monthly basis. These are made possible through the kind permission of publishers and many hours of recording by volunteer readers. Len Childs and Roy Taylor are circulating C-90 copies of questions of technical interest produced in Great Britain by the OTI Talking Newspaper. Michael Gamble is regularly recording extracts from *Electronics Australia* and Tom Walsh continues his gigantic task of reading *Amateur Radio Action* and *Amateur Radio* each month. These are distributed on four-track cassette by the Royal Victorian Institute for the Blind. Thanks to the distributors and narrators of these magazines.

Thanks also to Bill Gates, the Association for the Blind, 3RPH, Maurice McKernan, Frank Feldman, Bob Cunningham and other amateur radio associates for the assistance given to the Club in various ways. All help is much appreciated.

Contributed by John Machin VK3CCC, Secretary, RECB

ar

BRISBANE NORTH RADIO CLUB

From steam engines, dating from early this century, to the latest "black-box" amateur radio equipment, was the scene at the *Yesteryear Machinery Rally*, conducted by the Queensland Antique Machinery Restoration Society (AMRS), over the Queen's Birthday long weekend, in the North Brisbane suburb of Apsley.

The Rally is an annual event, and up to this year was located in one of the southern suburbs. As part of the attractions, the Brisbane Amateur Radio Club have always demonstrated amateur radio. To reciprocate, the AMRS demonstrate some of their antique machinery at the annual BARCFEST.

In an attempt to spread interest in their hobby around Brisbane, ARMS decided to hold their event alternately in the southern and northern suburbs. As North Brisbane is the area of interest to the Brisbane North Radio Club, the Brisbane Amateur Radio Club suggested that they would be the more logical club to co-operate in the 1987 Rally.

Brisbane North, in trying to spread the opportunity for publicity for the amateur movement as widely as possible, invited the South East Queensland and Teletype Group (SEQTG), the Brisbane ATV Group and the Brisbane Area WICEN Group to participate. It was unfortunate that the ATV Group were unable to attend, however the other two groups accepted the invitation.

In fact, in David Brownsey VK4AFA, the SEQTG has a very potent salesman. David set up two Model-15 teletype machines at the door, and visitors found it hard to pass his salesman's patter. After three days talking, David had practically lost his voice by the time the Rally concluded.

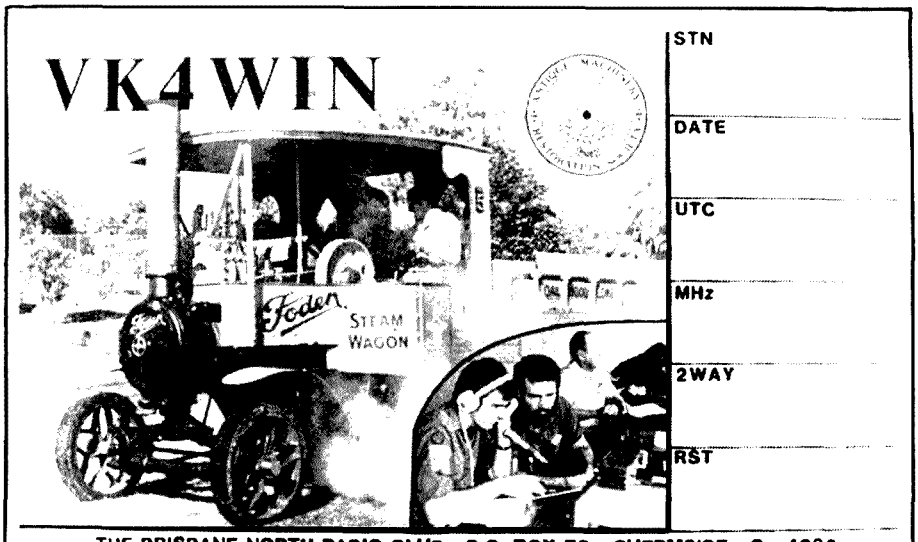
Brisbane North operated two transceivers, one mainly CW and the other SSB. Whilst the SSB attracted some attention it was the CW that drew the crowds. To cater for this interest, the operator wrote down the incoming Morse verbatim so that visitors could read over his shoulder. On the sending side, other club members gave a running precis.

The station, using the Club Call Sign, VK4WIN, was operated for the full three days by a series of rostered members. To confirm the many contacts made, a special QSL card was produced.

The interest shown in the Club's display, and also those of the SEQTG and WICEN, was most gratifying and the three groups will most certainly participate the next time the Queensland Antique Machinery Restoration Society comes to North Brisbane.

Contributed by Brian Mennis VK4XS

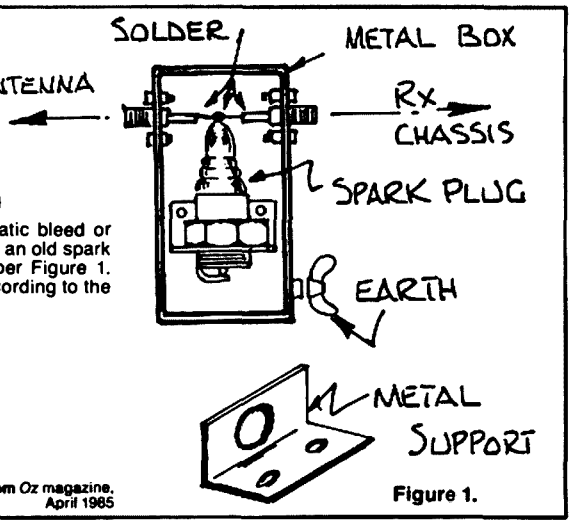
ar



The Special QSL Card. The Foden Steam Wagon was one of the highlights ot the antique machinery part of the Rally. The inset shows, from left, Laurie VK4BLE, Bill VK4MWZ, and John VK4APZ, operating the HF transceivers.

STATIC BLEED

A cheap and simple device for a static bleed or lightening arrester can be made from an old spark plug mounted in a diecast box as per Figure 1. Gap distance should be adjusted according to the transmit power.



—Contributed by Allan VK4KAJ, idea from *Oz* magazine, April 1985

Figure 1.

VK2 Mini-Bulletin

Tim Mills VK2ZTM
VK2 MINI BULLETIN EDITOR
Box 1066, Parramatta, NSW. 2150

THE NOVICE PRIVILEGE DEBATE

This subject has raised a lot of discussion following the Federal Convention held in early May.

Divisional Council arranged a forum to discuss the issue in late May. A report of that forum was prepared and circulated to the various clubs for their comment and input to a second forum. All amateurs were also invited, by way of the broadcasts, for their own submission.

A second forum was held on July 3, to receive a report on the replies. Council, at their July meeting, considered the conclusions of the forum. A summary of the various points of view has been detailed in the report below.

It still appears that some further debate could be required on this subject as the opinions expressed in the various club submissions ranged from either in total support to total rejection, or at some point between these limits.

Council would like to thank both clubs and amateurs who responded.

This report summarises the results of two open forums, as well as submissions from clubs and individual amateurs, on the subject of suggested additional privileges for Novice Amateur Licence Holders.

It is clear that overwhelming support exists for the concept of a common band available to all classes of licence holders. It is recognised that, whilst there is divided support for the allocation of part of the 144-148 MHz band to novice licensees, there is little support for the allocation of the entire 144-148 MHz band.

A high level of support is indicated for the allocation of a part of the 70 cm band to novice licensees and this would appear to be the preferred option.

Little support was shown for the allocation of part of the six-metre band, or for part of both the six-metre and two-metre bands. Consensus was also reached that "data" modes should not be granted to novice licensees, regardless of what bands were allocated.

The subject of the current JA/VK reciprocal agreement was discussed and the general feeling was that this agreement was inequitable by virtue of the fact that it introduced a unique class of licence into Australia, access to which is not available to Australian amateurs of a similar technical level to their Japanese counterparts.

The Council of the VK2 Division of the WIA concurs with the feelings expressed by the various respondents and, as such, will forward this summary, together with all the relevant documentation on which it is based, to the Federal "Future of Amateur Radio" Committee, which has been instructed to examine this matter.

The findings and progress of that Committee will be reported through our normal channels of communication.

PUBLICATIONS

Our bookshop is out of stock with the 1987 *ARRL Handbooks* and Overseas *Call Books*. The next stock to be available will be the 1988 editions. To help determine the requirements, members are invited to place an order with the Divisional Office during the usual hours, 11 am to 2 pm Monday and Friday, or 7 to 9 pm Wednesday nights. Orders may be placed by personal attendance, by telephone on (02) 689 2417 or to the postal address at the head of this column. Advance orders will be taken for the 1988 *ARRL Handbook*, *1988 International Call Book*, or the *1988 North American Call Book*. The expected price of each publication would be in the range of $35 to $40. Advance orders may be placed with the office until September 30, 1987. Delivery is anticipated to be in the early part of 1988.

Most *other* titles are available, ex-stock. A list is available from the office.

CONFERENCE OF CLUBS

The next Conference of Clubs will be held in November. A reminder to club secretaries that the close of agenda material will be Friday, September 11, at the Divisional Office.

DIVISIONAL BULLETIN BOARD

The Division has a trial Bulletin Board for the Sydney region, operating on the system operated by Andy VK2AAK, Channel 7600, call sign, VK2AWI. General information and some broadcast information is available. Members can leave information for the broadcast, addressed to VK2KFU. Please note however, information for the Divisional Office should be sent direct, in written form, via the normal postal address, PO Box 1066, Parramatta.

WICEN

A reminder that the Batemans Bay Car Rally Exercise will be held on Saturday, September 12. (This is a changed date from that quoted in previous notifications).

The Hawkesbury Canoe Exercise will be held over the weekend of October 10- 11.

A reminder that there is a WICEN Net for the Sydney region each Thursday evening at the new time of 9 pm, on repeaters VK2RWS, 7150/8275. These repeaters are available for general use outside activations and exercise periods. The time out on both repeaters is 30 seconds and the system must be allowed to fully drop-out before the next transmission, to get the full time period.

YOUR RD LOG

Have you posted your log yet? If not, please so so now to help the VK2 Division.

1988 IS APPROACHING FAST

How do you as an amateur, or perhaps the club you belong to, intend to celebrate and take part in various activities? A forum has recently been held in Sydney at Amateur Radio House in an attempt to find out. There will be many overseas amateurs who will be seeking special contacts with Australia next year (our Bicentenary). While the Institute or your club will be able to think up various activities, it will require your involvement to man the special event stations or to be on air to provide the contact. The Division is maintaining a register of activities and personnel able to assist. Please advise the Divisional Office of *your* plans. The Divisional Broadcasts will keep you informed of happenings when we become aware of them.

DIVISIONAL NEWS

There are many sources for you to catch the weekly news sessions.

First, there are the two sessions on Sunday. The morning at 11 am local time, with the evening session at 7.30 pm. The program may be direct from VK2WI or via the many relays. Should you miss these, there is the news highlights on the telephone answering machines at (02) 651 1489.

If you have packet radio, most of the material read live from VK2WI is available from VK2AWI, on 7600 in the Sydney area and on some other systems around the State. (Taped material is not included at this stage).

If you are able to view VK2TVG, in Sydney, on Channel 35.5, a summary of VK2WI material is included in the programs news segment. Some material also finds its way to the RTTY VK2TTY session.

Finally, your club net may obtain a copy of the material from the bulletin board and use it during the nets.

Through one of these sources you should be able to keep in touch with the various happenings and events which play a part in the amateur radio activities in VK2.

NEW MEMBERS

The Division would like to welcome the following who joined with the July intake.

J M Brook	Assoc	Campbelltown
F T Dickson	VK2FTD	Lane Cove
N J Kirk	VK2ENA	Condobolin
G E F Voigt	VK2MAJ	Ermington

TWO METRE SIMPLEX CONTEST

In an attempt to encourage non-repeater activity, a two-metre simplex contest will be held on the evening of Friday, September 25, 1987, between 2100-2300 hours local (9 to 11 pm). Operation to be in the segment 145.000-145.600 MHz. Mode FM. Contact — exchange a three digit number (starting at 001) and your postcode, one contact per station. Scoring — one point per contact. Final score — number of contacts multiplied by the number of different postcodes worked. Area of operation — throughout VK2.

Logs to be returned to Contest Manager, PO Box 1066, Parramatta, NSW. 2150, by October 2, 1987. Sections — City and Country highest scores. Event Co- ordinator — Peter VK2EMU.

Further details in the various broadcasts, or in an information sheet from the Divisional Office, or most clubs.

SLOW MORSE SESSION

Operators are still urgently required for the nightly VK2BWI session on 3.550 MHz. Vince VK2CVR, has had a change of work location and times which prevents him continuing as the co-ordinator. The number of operators have fallen in recent times leaving some nights uncovered. Most of the current team are novice licensees and thanks must go to them for continuing with the session. The more operators, the lighter the load on the rest, so this is an opportunity for those who like the mode to train others to follow in their footsteps. If you can help, please check into the session at 7.30 pm and advise Ross VK2BRC, of your interest. Alternatively, contact the Divisional Office.

ar

VK4 WIA Notes

Bud Pounsett VK4QY
Box 638, GPO, Brisbane, Qld. 4001

EXPO 88

Yes, amateur radio will be displayed at Expo 88 in Brisbane, from April until October next year. As yet, there are no details but we do know that something in the region of $50 000 worth of space will be available to the Institute, free of charge. The other good news is that transmissions from the site will be allowed.

At first, there was a complete ban on any radio transmission from Expo 88, but after the good work of John Aarsse VK4QA, and Theo Marks VK4MU, this has now been lifted. Next month much more will be known and the Expo 88 amateur committee will be getting down to some solid organising. The biggest problem will be the manning of the amateur exhibit for a period of 184 days.

THE JACK FILES MEMORIAL CONTEST

It was very pleasing to note the excellent support that our Queensland contest received this year. The operating was of a very high standard and it was indeed a very friendly and enjoyable affair. This year there was plenty of publicity. The rules were in *Amateur Radio, Amateur Radio Action* and in our Queensland insert in AR, *QTC*. As well as this, the contest received many mentions on the VK4WIA news broadcasts. Conditions were not very helpful and 80 metres carried almost all the traffic on the Saturday night. However, 40 and 20 metres proved to be the best bands on Sunday morning. Pity the poor novice operators who had to put up with an almost dead 15 metre band. The preferred band segments for both CW and phone worked extremely well. After speaking with Joe Ackerman VK4AIX, the Queensland Contest Manager, it seems likely that there will be a separate CW section in 1988.

73, Bud VK4QY

ar

David Jerome VK4YAN, the Divisional President, proudly displays the Remembrance Day Contest Trophy which was won last year by VK4. It is ours to keep for this year — time will tell.

Photograph courtesy Bud Pounsett VK4QY

VK3 WIA Notes

NEW MEMBERS

The following applications were received for the month of June 1987 and accepted by Council on June 25, 1987.

Robert Beacham	VK3MAC
Cyril Black	VK3KUZ
Daniel Dobrosak	VK3KKW
Peter Fawcett	VK3APF
Sydney Fullarton	
Kenneth Goninan	VK3PUA
David McLachlan	VK3XQH
John Manganas	
Larry Micallef	VK3ZLM
Ian Morris	VK3TAD
Robert Parker	VK3XRP
Julian Rose	
Norman Smith	VK3BDE/ WA6ABD
Bruce Watts	

ar

QSP

ABC EXPANSION

Four million rural Australians will soon have a choice of two ABC radio stations.

The Communications Minister said the extra service with some 300 new transmitters and an upgrading of 33 existing regional stations would be completed by 1992.

THOUGHT FOR THE MONTH

A fool says "I can't" a wise man says "I'll try"!

Five-Eighth Wave

Jennifer Warrington VK5ANW
59 Albert Street, Clarence Gardens, SA. 5039

Despite the fact that the school holidays might not have been the best time to hold a working bee, I would like to thank the following who did turn up to help. Bill and Gill Wardrop, Sue and Steve Mahoney, Max Brandt, Don McDonald, Darcy Hancock, Lloyd Jury, and Hans Van Der Zalm. For once, the non-council members out-numbered the Council members.

Jobs completed included, weeding the outside area, cleaning the outside of the windows, making the classroom windows shut again, replacing the clock and the trophy case front (taken down for decorating) and Lloyd has started work on a screen (for want of a better description) to stop Gill freezing to death when she serves the tea and coffee at meetings!

There are still a few jobs left so we still might have another working bee. We are looking at improving the old "Pug Hole" area and will start by planting the slopes with ground-cover plants to keep the weeds down. We would also like to pave the central area with paving stones or bricks, so if you have any of those items (including the plants) please let us know, we would be pleased to hear from you.

We reason that it would not only make less work, it would also be possible to use it as a barbeque area from time to time.

I would like to thank Merv Millar VK5MX, for his generous donation of a new clock in the transmitter room. I understand that the old one had ceased to be reliable and Merv took it upon himself to organise a replacement and has donated it to the WIA. This is not Merv's only generous act. Besides being one of the 160 metre operators for the Sunday morning broadcast and keeping the 10 metre beacon running; about this time every year Merv donates $20 and a certificate which he had printed, at his expense, to the best newcomer on the Display of Members' Equipment night (at the September meeting). Called the "Millar Award" its aim is to encourage new home-brewers within the hobby. With this in mind, and the chance to win several other vouchers and the ICS Award, presented annually by John Moffatt, of International Communications Systems, from Port Adelaide, for the best overall winner, I hope that you will bring along your latest piece of home-brew equipment, be it a transmitter, receiver, piece of test equipment or something else relevant to the hobby, and demonstrate it (or at least talk about it) at the meeting on Tuesday, September 22.

Lastly, would you please give some thought to our activities next year for the Bicentenary. So far the only thing that we have been asked to be involved with is a special event station at Walford Anglican School for Girls. No date has been set for this.

If you have some suggestions for suitable types of activity please let us know. By next month we may even be able to name a co-ordinator (or we may be calling for volunteers!).

ar

TIME TO SMILE AWHILE

It is the little things in life that make you happy, but only if you cannot get your hands on the big things!

* * *

Give some people an inch and they'll call a surveyor!

* * *

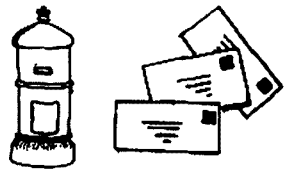
Home is a place where a man is free to say what he pleases because no one is paying any attention to him anyway.

* * *

Remember — patience is a virtue that takes too long.

From Lee KH6BZF in *KH6BZF Reports*

Over to You!



Any opinion expressed under this heading is the individual opinion of the writer and does not necessarily coincide with that of the publisher.

ODE TO THE WHINGERS

I received my AR Journal, the month it was July,
I read the members letters, they nearly made me cry!
They were all about subscriptions, so much money to be paid,
Everyone was crying poor, it made me quite dismayed!

As I am on a Pension of just ninety bucks a week,
All their crying and their wailing, seems to me an awful cheek!
For *I* pay my subscription every time it comes around,
And I think I'm very lucky that the price has been held down!

Don't they realise the goodies that the Institute provides,
With AR posted monthly, and the benefits besides?
So stop your Cussed Whinging, and get up off the heap,
The subscription to the Institute, ***Is really very cheap!!***

Ray Price VK2AWQ,
26 Bay Street,
Tathra, NSW. 2250
ar

STRICT BUDGET

I have been prompted to write this letter by the editorial in the July edition of AR, as well as the letters written by W D Verrall VK5WV, Steve Curtis VK3CAX and Maurie Dewhurst VK5PMD. I have held an amateur licence since November 1981, and am currently 25 years of age. I am also a little disturbed about the direction that amateur radio is taking.

For the past three and a half years, I have been a full-time tertiary student, and due to the necessary self-imposed strict budget limitations, have been unable to continue as a member of the Wireless Institute of Australia. Until now! Why did I rejoin? Because I am in need of a QSL Bureau.

This last statement, which may seem a little irreverent considering that the WIA exists for the benefit of all amateur radio operators, might cause some others to wonder as to the reasons why they are members. I do read AR, and enjoy doing so. In the past I have had access to it via financial *members*. It will be a pity if it is to suffer because of the current state of the economy.

During a recent discussion with some other amateurs regarding the lack of young people in the hobby, it was revealed that yesterday's potential amateurs are probably today's computer enthusiasts. The comment by Steve Curtis VK3CAX, could be seen as proof of this. I get the feeling that these days, amateur operators can target high school students as potential members of the hobby, but they can also expect a time lag of up to eight years until those student become amateurs. Why? Most likely because of the current price of amateur radio equipment. In comparison, relatively cheap entertainment can be provided for the whole family by a home computer. Why not build your own equipment? Who wants to go through the experience of home-brewing a transceiver when one can just turn to the home computer for a meaningful and educational pastime?

No. I am not against home-brewing. Far from it. The only working piece of equipment I have at my QTH is a home-brew one watt CW rig for 40 metres. The next piece of equipment I will bring to operational use will not be an "all singing, all dancing, price on application (because we don't want to scare the daylights out of you)" rig which operates for you while you do something else. It will be home-brewed, albeit based around the IF strip and PLL circuitry taken from an **SSB CB** unit. Why go to all that trouble, some may ask? Well, you never know, but I may learn something about radio! And, if my rig goes QRT, at least I can fix it!

Both Steve VK3CAX and Maurie VK5PMD, make valid points in this direction. Drew Diamond and others have shown people that home-brewing is not so hard. These amateurs are to be commended for their efforts. Unfortunately, the non-availability of parts for the general home-brewing of RF equipment *does* nothing to encourage people. I think a standing joke up here in VK4 is hearing about someone trying to find a local supplier for something as simple as an RCA CA3028 amplifier! A typical answer from retailers is "I'm sorry Sir, we don't have those in stock."

It is my impression that if amateur radio operators do not start turning the hobby back into a scientific one, then amateur radio as we know it will not exist, say, 20 years from now. "Grim Reaper" thoughts, some may say. But, if we do not do something about it now, tomorrow may be too late. We could be facing a "use it or lose it" situation with the under-populated 70 centimetre band sooner than currently anticipated. A large number of amateurs appear to have given up experimentation and instead act like high- power CB operators. Eventually, maybe not tomorrow, or next year, but eventually the government and the people are going to ask "Why do we need these amateur radio operators anyway?" It is a thought that we all should bear in mind.

73

Michael Dower VK4BMD,
10 Chartwell Street,
Aspley, Qld. 4034.
ar

MEMBERSHIP — A MARKETING APPROACH

I read with interest letters from VK3CAX, VK5WV and VK5PMD, in AR, Vol 55, No 7, July 1987. Also the editorial of the same issue also on the subject of membership and how to contain costs, etc. Many other members have written on this subject in past editions of AR.

Ladies and gentlemen, may I be so bold as to say that *we (ie* the WIA and its members) may be taking a negative and defensive approach to this problem. After all, being defensive can ultimately lead to one backing oneself into a corner with nowhere to go.

In today's business world, the art of marketing is used extensively to evaluate, develop, manufacture, distribute and sell products and services. Very few companies exist today without some sort of marketing input. In the medium, to larger corporations, this function is performed by a professional marketing practitioner.

The WIA has products and services. Don't be under the misapprehension that these will sell themselves. Some might, but one must bear in mind that *today's society* is, albeit *unconsciously*, geared towards having products marketed to them.

All products, services, and the companies that market them have **S**trengths, **W**eaknesses, **O**pportunities and **T**hreats. (SWOT, remember that!).

They also have **F**eatures, **A**dvantages, **B**enefits. (FAB, remember this too).

In simple terms, to market a product or service, the four Ps of marketing *must* be applied. They are:

Product
Price
Place
Promotion (Yes, remember this as well).

You may not be aware of it, but most of the things that you purchase are a direct result of some form of marketing campaign. "No" you say.

Well, ask yourself this, (and answer honestly!) when was the last time that you purchased something that you could have done without?

Products and services fall into two broad categories — needs and wants! You may have purchased that new linear amplifier because you *wanted* it, but it is quite questionable whether you *needed* it or not (a higher gain antenna may have been a better all-round choice!).

The point I am making is that WIA membership could be sold to a person not currently desirous of membership with good marketing and sales tools.

Go back to the little marketing lesson above — SWOT, FAB, 4 x P. There is no reason why a suitable marketing campaign could not be successfully mounted by the Institute. All that is needed are the right people.

There must be some marketing people out there who could formulate such a campaign. My own view is that it would be better to have marketing people who currently are not members of the Federal Executive, or State councils.

I suggest this simply because being closely involved in a situation can often promote tunnel vision, and thwart one's ability to think laterally.

A fresh, unbiased approach is needed. Perhaps some of the cynics who do nothing but knock the WIA (members and non-members in particular) would be interested in contributing.

Amateur Radio Action appears to be a great forum for these type of people who appear to lack the fortitude and tenacity to join the Institute and make change for the better. It appears all too easy to sit back and pick, than to be constructive.

Don't misunderstand me, I am not suggesting that the knockers out there in anti-WIA land are stupid, far from it. But for the good of the hobby, amateur radio, this would appear to be a great way for them to actively participate in a campaign to:
(a) increase WIA membership
(b) put forward a working model of what the Institute should be, to attract and better serve the amateur today.

Membership pricing, etc, have been put forward as reasons for not renewing membership. But how many of us purchase things throughout the year that we want, but don't really need?

Pricing is often only a small barrier to the marketer!

Well, how about it? I guess I have thrown down the gauntlet to some degree but I believe it is worth a try.

I am prepared to be part of a sub-committee or whatever, to tackle this most urgent problem, but it is not a one-man job.

There must be talented marketing people out there who can make a contribution.

I would be interested in the Editors comments as well I await your feedback from members, and non-members alike.

Yours faithfully,

Bruce Kendall VK3WL,
8 Walwa Place,
Werribee, Vic. 3030.

Thanks for your suggestions, Bruce. Much food for thought. Ed.
ar

MAKE US PROUD, NOT ASHAMED

I am outraged at what you are doing to my magazine, *Amateur Radio*. Of course costs are increasing, and of course you have to be frugal, but how dare you decide that I can't afford it so you are going to emasculate it.

Instead of the "Victorian Cringe," the rats-in-the-hole syndrome, you should be telling us how lucky we are to have the best magazine available, and the price is going up to maintain that excellence. Instead, all we get is this poor mouth attitude — "Gee, fellas, we think this is an overpriced, poor relation publication so we have decided to downgrade it further."

There will always be a minority of members who say they are too hard up to afford AR. I would ask them, how many cigarettes do they smoke, how many beers do they drink, how much do they put through the poker machines. Maybe they cannot

choose AR over some other discretionary expenditure, but how dare you decide for me that I cannot afford AR either. For the genuine cases of low incomes, there can always be "pensioner rates," or some minor arrangement.

Look at the number of magazines available in the newsagents today. There are literally hundreds of computer, electronic, and similar hobby magazines vying for the consumer dollar. The point is they are being sold, and not one of them is apologetic about its existence, or its price.

Consider the locally produced radio/electronic magazines — I venture to say that each WIA members buys one, or more likely all, of them each month. These magazines sell for between $2 and $3.50 each, and one even costs $4.75 (may they rest in peace).

If AR is perceived as value, then we will buy it, and may I suggest that it would be no hardship to delete one of the other magazines to do so, if finances are so critical.

I note with dismay that you are going backwards to a two-colour cover, but this is a typical defeatist solution. The problem is not going to go away — costs will be even higher next year — what are you going to do then, leave out the ink?

The amateur community needs communication. The efforts of the WIA in this regard has always been poor, but deliberately reducing the communications, by going to six issues per annum, or worse still, leaving it up to individual States to do their own, unco-ordinated thing is tantamount to disbanding the WIA. In case you think I exaggerate, look back over the pathetic history of the WIA, the splinter groups that formed, the States that went their own way because no common thread held them.

This country has more disposable income than ever before, there are very few genuine poor amateur operators, we will buy a more expensive magazine, and we want to be proud of our only WIA amateur publication. For heaven's sake, stop being so down in the mouth and think positive. Put the price up sufficient to maintain the only good thing that has come out of Victoria, and tell everyone how great it is, how it should be twice the price and how lucky we are to have it. Make us proud, not ashamed!

Yours sincerely,

Colin MacKinnon VK2DYM,
52 Mills Road,
Glenhaven, NSW. 2154

ar

NOT A MATTER OF PRIORITIES

As a small boy I was offered the choice of a Mars bar or a coconut slice; not both — that would have been considered greedy. I chose what I enjoyed most.

One Winters evening in 1952 I had a home-brew TRF receiver and a 'spider's web' transmitter spread out on the setee, together with a 350 volt power supply modified to produce 700 volts. Before the electrodes blew up, ruining the seat covers with an evil smelling goo, which invoked a barrage of startled and choice invective from my wife through a thick chemical fog, I worked Lima, Peru. My first CW contact ever. The joy and excitement of that occasion was eclipsed in 1953 when I became G3IBR.

Currently, I enjoy the absolute magic of an IC-720A black box; although my novice son (VK2MRL) and I are working on a home-brew 80 metre CW unit for portable use. (We both need to get our CW into shape).

Naturally I am nostalgic about the past but I have no wish to, neither can I, go back there. By the same token, downgrading AR would be a retrograde step which could be effortlessly avoided. All it would cost me is about 10 cigarettes or a glass of alcohol per week. It is not really a matter of priorities but what we enjoy most. So let us do it! Print and be damned is the appropriate cliche, I think.

Yours, 73,

Don Law VK2AIL,
RMB 626 Adelong Road,
Tumblong, NSW. 2729

ar

STANDARDS

I am disturbed but not surprised at your comments in response to VK3ANJ's letter in June AR.

Any private organisation must, by definition, have allegiance to its members . . . deny this and you will lose even more of your members!

The WIA in seeking to improve the well-being of its members could well be very much against the interests of the members of the Australian Amateur Radio Movement who are not members of the Institute.

Because the WIA is a privately aligned organisation it cannot be truly impartial, which must, by any "equal opportunities" be a disqualification when becoming involved in areas which affect non-WIA members.

Indeed, increased numbers provide economies of scale. However, these increases necessitate increased responsibility . . . a virtue which the Institute as a whole finds difficult to understand or locate.

Yours sincerely,

A D Tregale VK3QQ,
73 Nepean Street,
Watsonia, Vic. 3087

(Footnote) A letter was received from VK3ANJ (see elsewhere in these pages) but it raised different topics. Ed.

ar

WON'T DAMAGE IMAGE

Our executive members are accountable to the ordinary members but if we do not know what they are doing how can we know what they are doing wrong?

Ordinary members do not know what the executive are supposed to be doing.

In the interests of a better informed membership would you consider donning an 'independent editors' hat and publish the following in AR?

Division and Federal Constitutions or the equivalents. (That might occupy one issue).

Proposed agenda for council meetings for timely comment by members.

A resume of the motions put at each council meeting and the results.

I am sure those 'crumbs' would quell temporarily the growing unrest among the 'plebs.'

I have put similar suggestions to executive councillors but most have been impolitely and effectively ignored.

It will not damage your image if you hang up that apologist's hat for a little while.

Yours sincerely,

Lindsay Lawless VK3ANJ,
Box 112,
Lakes Entrance, Vic. 3909

(Footnote) The Federal Memorandum and Articles of Association run to 32 double spaced A4 pages. I assume each of the seven Divisions would be of the same order. One issue? Executive agenda normally precede meetings by only a few days. Divisions are probably similar. Executive and Divisional minutes could be published, but space is already insufficient. Selected highlights are covered by Federal broadcast tapes, also computer bulletin boards in some areas. Ed.

ar

DON'T LOWER THE STANDARDS

Recent discussions re increasing amateur radio membership have one thing in common — lower the standards, and remove some of the hard work needed to gain a licence. While we are in this frame of mind, I put forward a plea on behalf of a large group of potential members — the retirees.

At an ever increasing rate our society is changing to a position where we now have more people leaving the work-force than entering it. In a word, there are now more wrinkles and they are increasing at an alarming rate. They have the financial resources to take up a new hobby, at a time when they have the time and the need for new interests.

They have fewer outlets for their time and money than the young. There could not be a better hobby for a retiree than the means to maintain contact with his fellows, to have the refreshment of new fields, the need and opportunity to stir his little gray cells, and getting him from under the feet of the little woman would be a public service.

There is a new crop of retirees every year, so once the area is tapped, the flow will continue. Naturally there is a catch.

From, say, 50 years of age, most people suffer from a deterioration of memory. The medical fraternity call it short term memory loss. This complaint has the effect of making our examination system more difficult for the old than the young.

My plea is not to lower our standards, but rather to make it equally difficult to enter our ranks irrespective of the age of the potential member. There are enough penalties to growing old, let us redress the balance. Grade the pass rate to the examinee's age. Tap the retiree potential and help society as much as we help ourselves.

Short term memory deterioration is well-known and documented, medical advice could, no doubt, put a finger on the disability. Maybe a pass rate of 68 percent for 55-years, 65 percent for 60-years and 60 percent for all over the age of 65-years!

The retirees will still have to work harder than the young, but at least let us recognise and reward their harder effort.

Yours sincerely,

Hal Wise VK2HW,
4 Turner Street,
Balmain, NSW. 2041

ar

NOVICES ON TWO-METRES

It is my opinion, and always has been, that novices should be allowed on two-metres.

However, not with all privileges. Simplex only and 10 watts power. After all, they must have something left to update to.

Nine or 10 years ago, when the novice licence was introduced, the mistake was made then not to give novices a band on which they could communicate with all amateurs.

All this time novices have not been able to speak to limited licence holders. A common band is a must.

Six metres has two things against it. The availability of equipment and the TVI problems that it would cause in certain areas. 70 cm is another band that could be used, however, once again, the equipment is limited and expensive.

The logical choice is two-metres, but let us not give too much away for free.

Incidentally, if it is okay to give novice licence holders two-metres without a special test, then why not give the limited licensees the same HF privileges as novices (phone only). If it is fair to one it is fair to the other!

R K Rehe VK4AIO,
7 Guardsman Avenue,
Alexandra Hills, Qld. 4161

ar

AMATEUR RADIO IS NOT WHAT IT WAS

Having read and heard extensive comment on the subject of two- metre privileges for novice licensees, and having attended two forums conducted by the VK2 Division of the Institute, I should like to make some observations of my own.

It is obvious that this proposal cannot be dealt with in isolation, but must be looked at in conjunction with the wider consideration of the future direction of amateur radio. Realisation of this seems to have polarised most amateurs into one of two groups. These might be described as, on the one hand, conservative, reactionary or idealistic, and, on the other, progressive, pragmatic or realistic. After reflection, I must support the latter.

The first group appears to contain a large proportion of "old-timers", full and limited-call amateurs, who seek to preserve the hobby as it has always been, who emphasise its general and experimental nature, and who are concerned with such aspects as "maintenance of standards" and "quality of content." They adhere to the belief that a comprehensive technical knowledge should be a prerequisite for licensing, and that even the novice standard is adequate only as an interim measure. What they do not seem to realise is that these views are only relevant within the fraternity, and have little bearing on the attitudes of commercial interests or such external bodies as DOC.

The second group appears to be composed of

those members from all sections of the service who have the vision to see that only an increase in our numbers will preserve for us the spectrum space we now occupy. The success of Japanese and American moves to increase their numbers must be an indication of the way to go. We must acknowledge the changes that progress in technology has brought about. *Amateur radio is not now, and can never again be, what it was.*

I believe that amateur band usage should not be related to technical expertise when we see, in commercial and government operations, the use of much higher powered and more sophisticated equipment by totally unqualified personnel. The equipment is, of course, type-approved by DOC. If there is to be a fundamental change in our licensing system, I feel that it should start with a basic licence permitting low power telephony operation on amateur bands above 30 MHz, and that the required technical knowledge should be confined to that necessary to operate type-approved equipment, which should be the only kind of equipment authorised for use by amateurs in this licence category. From that point, licensees should be able to progress to participation in other aspects of the art, such as home-brewing, experimental work, CW, and digital techniques, etc, by demonstrating their ability in those aspects and having their licenses endorsed accordingly. Once their endorsements cover the international requirements for HF operation, they should be allowed unrestricted access to all amateur bands. This approach would end the situation where a full-call amateur is permitted to operate all authorised forms of equipment in all authorised modes, notwithstanding that very few, if any, such amateurs are familiar with all of these forms and modes. This is particularly true of full-call amateurs licensed 20, 30, 40 or more years ago, and who have never had to demonstrate their knowledge of more recent developments.

If this proposed basic license smacks of CB-type operation, I do not see that as an obstacle. One reads and hears deprecating references to CB operation by amateurs, and yet many amateurs use their equipment for exactly the same purposes, and surely this is a legitimate aspect of the hobby! Perhaps, if a scheme such as I suggest had existed at the time the CB service was first approved, many of the CB fraternity, some of whose operating ability and enthusiasm would put many amateurs to shame, would now be part of a larger, stronger and more influential amateur body.

Further, I would suggest that we would no longer need a segregated call sign system, except, perhaps, to distinguish all-band amateurs from those confined to above 30 MHz. With adequate penalties under the Radcom Act, and with computer access to each amateur's licence conditions, breaches could quickly be established during random inspections or in cases of unacceptable operation and offenders brought to book.

Finally, I would say to the idealist, be careful that, in trying to preserve an outmoded concept, you do not wind up with a greatly reduced spectrum allocation in which to work.

Yours sincerely,

S V Ellis VK2DDL,
98 Holmes Street,
Kingsford, NSW. 2032
ar

QRO OR QRP BY TV

Australian amateurs beware — your transmitter power could be controlled by your neighbour's domestic entertainment equipment!

There are indications the UK DTI (DOC) is considering adopting CENELEC proposals for "receiving" apparatus immunity.

In broad terms, the CENELEC draft specifies a series of tests to be performed on domestic entertainment equipment based on a local transmitter producing a radiated field strength of 1.8V/m at the item under test.

Some idea of the effect of this very low immunity figure is illustrated by a station on the two-metre band running 150 watts to a nine element Yagi at 20 metres. The RF produced gave a 6V/m field strength alongside a television receiver in an adjacent property, when beaming in that direction.

In this instance it would be necessary to reduce the transmit power to 10 watts in order for the field strength to meet the 1.8V/m limit.

If these proposals are adopted it will *mean* that amateur stations are no longer licenced by RF power, but by field strength. This would mean restrictions on types of antennas, and many other factors which influence the field strength around the station.

At present most amateur stations in the world are licenced by RF power level, and can use any type of antenna. To be licensed by field strength would place heavy restrictions on the freedom of the amateur movement.

At least one West German television manufacturer can produce television receivers with an immunity in the order of 100V/m, and have demonstrated they can run a transmitter *and* a television receiver on the same feeder with no interference.

Field strength measurements can only be near predictable in ideal non- cluttered situations — introduce the effects of domestic wiring, pipe work building, etc, and the readings outlined would be anyone's guess. Is this a good basis for legally enforceable variations to the amateur licence?

Yours sincerely,

A D Tregale VK3QQ,
73 Nepean Street,
Watsonia, Vic. 3087
ar

LONG WIRE OF COINCIDENCE
Army Signals in 1930-34

I was pulled up short by the last paragraph of the article in AR, July 1987, pp28/29, describing the Type-133 transmitter.

The author asked if anyone recalled the "Ack" or "Cork" sets which were apparently used by the Army up to the beginning of WWII.

By coincidence, it was only a few days before publication of this article that I was one of a group visiting the Army Signals establishment at Simpson Barracks, in Watsonia.

The Museum, at Watsonia, does not have either an "Ack" or "Cork" set, but I was able to give it a good newspaper photograph of three signallers from 3rd Division Signals, W/T Section, operating an "Ack" set at Seymour, about 1930 during an annual camp in the days of compulsory military training. I also gave a small amateur photograph of a tent housing a "Cork" set with its large frame aerial.

I do not recall details of the "Cork" set except that it did use a generator driven by a *Douglas* motor cycle engine as mentioned by John and a frame aerial as noted above.

The "Ack" set was a three-man pack. Transmitter, receiver and six volt accumulator plus aerial kit.

Frequency range was probably in the region of the 200 metre band. Transmission was MCW with a choice of three or four audio tones so that several stations could operate on the same frequency.

In training, the objective was to run to a designated spot with the equipment, erect aerial, tune up and send a signal in about three minutes.

The CO of the unit at the time was Colonel (later Major General) J E S Stevens and I can still recall him impressing on us that in action, "You don't walk, you don't run, you go at the (expletives deleted) gallop!"

Our OC W/T section was Captain (later Colonel) Stewart Embling VK3DC, ex OA3DC. By some means he persuaded the higher-ups to let us try shortwave operation.

A MOPA transmitter was built by Army Ordnance which was then located at Broadmeadows, Vic. This operated from a six volt accumulator with HT provided by a genemotor located in the same wooden case as the transmitter! (No reports of pure DC note were ever received!). Power was probably about 25 watts.

Antenna, also provided by Ordnance, was end fed with twisted flex feeders!

The receiver was built by volunteers on Sunday afternoons in VK3DC's shack in Toorak. It consisted of a regenerative detector followed by one or two stages of audio.

I cannot recall the frequency range but we did work amateur stations in the 30/40 metre band.

The transmitter and receiver no longer exist but it is known that a set of photographs of it were given to the Signals Museum some time ago by Colonel Embling and it is hoped that these will be located shortly.

If any reader has photographs or manuals of the "Ack" or "Cork" sets, the Army Signals Museum would be more than grateful to receive them. The address is, Curator Army Signals Museum, Simpson Barracks, MacLeod, Vic. 3085.

Allan Doble VK3AMD,
206 Poath Road,
Hughesdale, Vic. 3166
ar

ANTENNA TUNER

I read with great interest the Equipment Review of the Emtron EAT-300A Antenna Tuner in *Amateur Radio* June 1987.

The interest is because I own the "Economy Version" viz the EAT-300, and plan to buy an EAT-300A later in the year. Both Rudi Breznik and John George assure me that the tuning coil, condensers and basic circuitry are the same in both tuners.

I agree that tuning with the EAT-300 is very critical but I have learned to live with this. Aerials range from a 27 MHz mobile magnetic base whip to 10 metres of wire (emergency antenna), 135 feet of wire (main antenna), and 200! feet of wire when working portable each week.

Here are some examples from April 13, 1987:

FREQ MHz	1.629	1.775	1.828	3.575	7.075	14.106
SWR	<1.05	1.3	1.25	<1.05	<1.05	<1.05

When tuning a new aerial for the first time, I use initially 10 watts, then 20, 50 and 100 watts. I have had no trouble with arcing-over for any of my random wire end-fed antennas.

Thank you very much indeed for the regular Equipment Reviews.

Cordially,

John Robinson,
203 Tryon Road,
Lindfield, NSW. 2070
ar

APPROXIMATIONS FOR π

Having noted the headline *Ubiquitous* 2π, AR, July 1987, and read recently somewhere about *Metric* π (!), I have been reminded of some approximations, involving π, which make calculations simple if an electronic calculator is not to hand.

(= represents "approximately equal to).

$$\pi = \frac{100}{32}$$

Note that this is only half of one percent different from the true value of π. It has the advantage that the top line is a power 10 and the bottom line a power of two, making for easy paper and pencil calculations with 10s partially cancelling milli or micro, kilo or mega, prefixes when working out reactances or resonant frequencies. Similarly:

$$2\pi = \frac{100}{16}$$

Reactance of (electrolytic) capacitors in AC power supplies:

Power Line Frequency = 50 Hz

Hum Frequency (Full-Wave Rect) = 100 Hz

Typical Capacitance = 16 uF

Substitute in $Xc = \frac{1}{2\pi fc}$

And get: $Xc = \frac{1}{2 \times 100/32 \times 100 \times 16 \times 10^{-6}}$

Cancel out the 10s and twos and get:

$$Xc = \frac{1}{2 \times 100/32 \times 100 \times 16 \times 10^{-6}}$$

$$\simeq \frac{1}{10^{4} \times 10^{-6}}$$

$$\simeq \frac{1}{10^{-2}}$$

$$= 10^{2}$$

$$Xc = 100 \text{ (ohms)}$$

Thus reactance of a 16 uF capacitor at 100 Hz is 100 ohms — a useful and easy figure to remember.

So, of course, if 32 uF then Xc (at 100 Hz) = 50 ohms, or if 8 uF then Xc (at 100 Hz) = 200 ohms.

Yours faithfully,

Barrie Stevenson VK2ZSV,
21 Glendower Avenue,
Eastwood, NSW. 2122
ar

THANK YOU

I would like to take this opportunity to thank those responsible in the Institute for the manner in which this Company's modest advertising appropriation has been handled over the past 12 months when it has not always been possible to supply 'camera ready' copy.

I have been an advertiser in *Amateur Radio* magazine for 40 years and have always had a reasonable return on cost. My recent advertisement in the magazine for a Dip Meter has excelled any previous results. I believe this has been due primarily to the excellent Equipment Review conducted by Gil Sones which was published in the magazine.

It would seem that such reviews would more than convince prospective advertisers of the value of advertising in *Amateur Radio*.

Yours faithfully,

G Maxwell Hull,
Manager,
William Willis & Co Pty Ltd,
98 Canterbury Road,
Canterbury, Vic. 3126
ar

Silent Keys

It is with deep regret we record the passing of —

MR G W CAMP	VK2NZ
MR PHILIP CORLISS	VK2ANG
MR G MAXWELL HULL	VK3ZS
MR H A LEE	VK6AE
MR V MATHEWS	VK6VN
MR R W PATTERSON	VK2AJW

Obituaries

PHILLIP EVERETT CORLIS VK2ANG
November 3, 1904 — June 27, 1987

"A man with an inexhaustible zest for life, learning and discovery." That was how a reporter from the *Newcastle Herald* described Phil Corlis in an article he wrote about him in 1963, and this is how Reverend Bruce Edgell prefaced his address at Phil's Memorial Service at the Uniting Church, Armidale on June 30, 1987.

Phil was born in Casino, his father being a well-known GP on the North Coast. His grandmother (Corlis) had also been a doctor, an immigrant from Canada, the first woman doctor to be registered in Australia. His childhood years were spent in Ballina, Bangalow and Grafton. Classical music was very much part of his life, and he was apprenticed as a piano tuner in the early 1920s. His work required him to travel through Central Queensland in a car loaded with portable gramaphones, harmonicas, records and sheet music; and to go from one station property to another, over roads that were often bad and treacherous. He also tried his hand at dairy-farming for a while near Nambour, before moving to the New South Wales North Coast again, pursuing his piano tuning career.

When World War II was declared, Phil joined the Army and served in Signals. He was also a Physical Training Instructor. Later in the war he was transferred to the Munitions Department, working in Newcastle.

Phil and his wife, Ivy, reared their family of four sons in Newcastle, where they lived until about 1970, when they moved to Armidale. Here Phil resumed his profession as a piano tuner. He had obtained his AOCP in 1947 and was an active amateur and member of the WIA, helping many newcomers with equipment and CW training. Phil was also skilled in sheetmetal working, cabinet-making, gem-stone cutting and rifle shooting, with added interests in astronomy and orchid growing. His two metre high grandfather clock and spinning wheel still grace the hallway in the Armidale home.

For most of the last four years of his life, Phil had not enjoyed good health, but, despite failing eyesight, he still continued as an active member of the Armidale and District Radio Club. A large attendance at the Memorial Service bore testimony to Phil's standing in his church and the general community. Radio club members now record their appreciation of Phil's life and work and their heartfelt sympathy to Ivy and family.

John Moan VK2KA and Hans Van Dar Drift VK2KHV
ar

FRANK O'DONNELL VK2QC

Frank passed away on Monday, July 6, 1987.

He had been on air for approximately 40 years and moved to Dalmeny from Victoria about 10 years ago.

Condolences are extended to his wife Meg, and family.

Stan Bourke VK2EL
ar

HENRY SPORRER VK2DUO

It is with deep regret we report the passing of Henry Sporrer VK2DUO, on Monday, July 6, 1987 at the age of 70 years.

Henry suffered a massive heart attack. He was well-known on the HF bands, a stalwart of the Intruder Watch and was one of nature's gentlemen.

Deepest condolences are extended to Margaret and family.

Ian O'Toole VK2ZIO on behalf of the Castle Hill RSL Radio Club

MAX POTTS VK2EK

It is with deep regret we report the death of Max Potts VK2EK. Max passed away in the early hours of June 2, 1987, aged 72 years.

Max's first call sign was VK2ZMP Later he upgraded and obtained the call VK2BMH. Upon the death of his friend, Ted Kenny, and at the request of Ted's widow, Max received VK2EK.

Max was an early member of the Waverley Radio Club, in which he was an active member. He later moved to Wentworthville, where he resided until his death.

In his youth Max was associated with the early days of aviation. He was a friend and mechanic of Sir Charles Kingsford Smith.

Max joined an engineering organisation where he rose to an executive position. The stress of this position caused Max to retire earlier than normal with ill-health. The side-effect of his treatment caused deterioration of his health, a condition he lived with for the rest of his life.

He was an inspiration to all his friends. Although often in pain, he rarely complained. Keeping his scheds with his mates on two-metres was often difficult, but his cheery voice gave no indication of his condition.

Max is survived by his wife and pal. Edna, sons Denis, Max, Tony, Kerry, Paul, daughters Denise and Janice and brother Reg.

On behalf of Max's friends deepest sympathy is extended to his family.

Ken Ledsam VK2ST
ar

STEVE ST GEORGE VK4SE

The inimitable Steve has gone and amateur radio is very much poorer with the passing of VK4 Sugar Easy, (as he wished to be known), on July 10, 1987. This entertaining raconteur had finally lost his last battle against illness which had plagued him for the last few years.

Steve was born in 1916, and his RAN service began upon enlistment in 1935. He saw service on various vessels including the Australian Naval Cruiser, *HMAS Canberra*, and the British Naval Cruiser *Shropshire*. His ship patrolled the Atlantic waters off Spain during the Spanish Civil War in 1936, and he saw duty in the Red Sea and Indian Ocean during the Abyssinian War in 1937.

During WWII, Steve was aboard *HMAS Canberra*, which was torpedoed and sunk in Guadacanal. The ship's ensign, which draped his casket at his funeral, was heroically rescued by him just before the sinking and has been bequeathed to the War Memorial in Canberra. Very few of Steve's friends knew of his dedication to the naval tradition and the part he played.

As a civilian he retained his interest in radio and television, working for the ABC in Toowoomba and Sydney, a local commercial and interstate stations. Following his retirement he became very interested in amateur radio and was a foundation member of the Darling Downs Radio Club and a past president.

There are many amateurs today who can thank Steve for the classes he conducted (up to 30 students at a time), which enabled them to obtain their licenses. His home and shack were always open to anyone with a problem or a desire to acquire more knowledge. He was a member of the SES and his prime achievement in this field was organising the rescue of a locally manned yacht (one of his pupils) which was dismasted and out of fuel some 200 miles off the shipping lanes near South Africa. Steve alerted Air Sea Rescue in Canberra, maintained contact with the vessel for several days, assisted by a local amateur, two Western Australian amateurs, and a South African operator. Due to a failing battery supply their tenuous link with Steve in Toowoomba was maintained using CW which enabled searchers to pinpoint their location and direct a diverted a freighter to rescue the *White Wave* and her crew of three and deliver them safely to their home port of Brisbane.

Steve's wife predeceased him 18 years ago. Deepest sympathy is extended to his daughter Anne and son John.

The large representation of district amateurs and ex-service personnel at the funeral service was an indication of their high regard for our late colleague. Farewell Steve, a true amateur.

Eric Wissemann VK4AOA on behalf of the Darling Downs Radio Club
ar

DEE DAVIS KA6BXV/7

Australian and New Zealand 10 metre enthusiasts were saddened to learn of the passing of a friend, Dwain Davis KA6BXV/7, on July 1, 1987.

Dwain, better known as Dee, had an affection for Australia and New Zealand and derived great pleasure from studying the countries and speaking with his friends, many of whom he had met during a visit six years ago.

Dee's love for Australia was so strong that his family requested *Waltzing Matilda* be played at his church memorial service as a final tribute to the country and people he loved so much.

To his wife, Earline, and family, Tom, Margerite, James and Paul, we extend our deepest sympathy.

Ian Buchanan VK2KL on behalf of VK4FE, VK6MD, VK2KL, VK2EER
ar

M F POTTS VK2EK

To our host of friends in amateur radio . . .

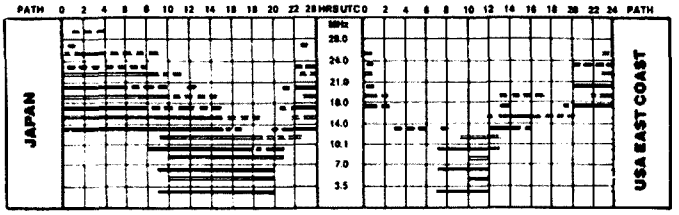
Of great comfort during our sorrow were the expressions of sympathy conveyed to us in many ways.

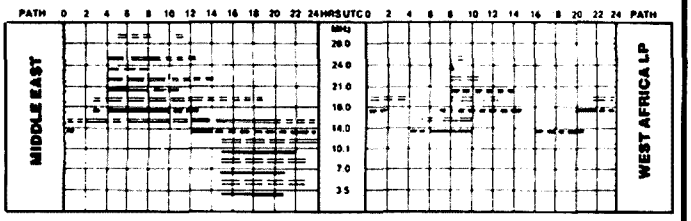
We deeply appreciate your thoughtfulness and thank you most sincerely.

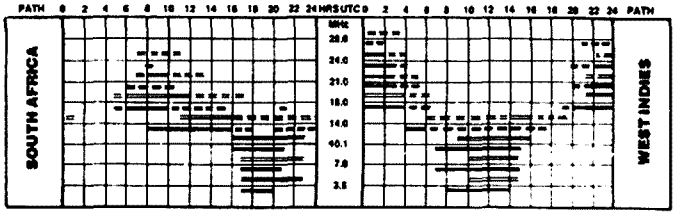
Mrs Edna Potts and Family
ar

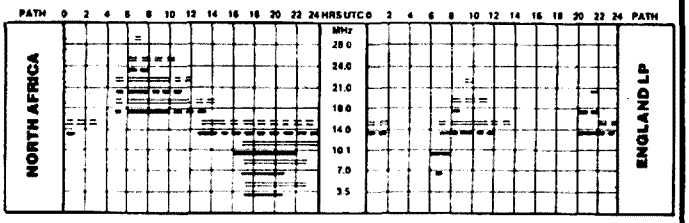
Ionospheric Predictions

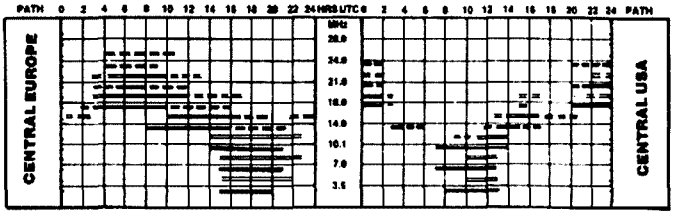
Len Poynter VK3BYE
14 Esther Court, Fawkner, Vic. 3060

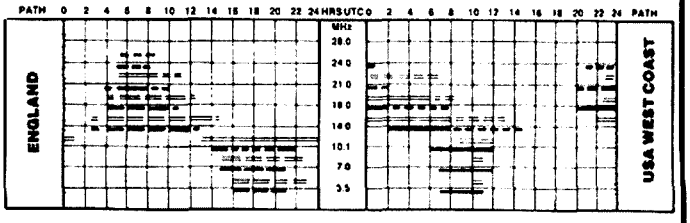


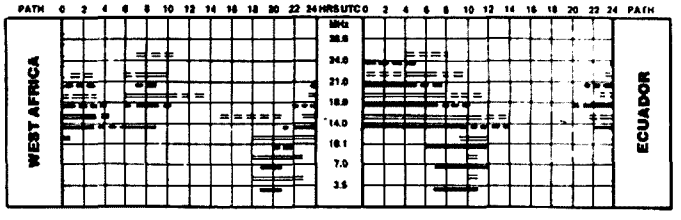


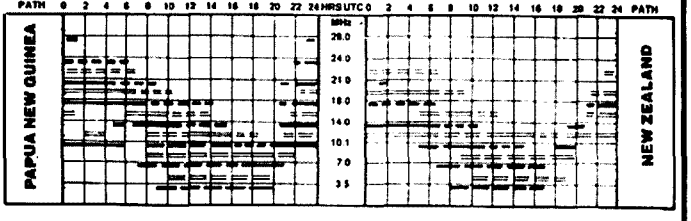












LEGEND

From Western Australia (Perth)

From Eastern Australia (Canberra)

Mixed mode dependent on angle of radiation (long broken lines).

Better than 50% of the month, but not every day (continuous lines)

All paths unless otherwise indicated; (ie LP = Long Path) are Short Path.

Less than 50% of the month (short broken lines).

Predictions are presented courtesy of the Department of Science, IPS Radio and Space Services, Sydney.

Solar Geophysical Summary

MAY 1987

Solar activity was low in May except for two M1 flares on 24 and 25th. Throughout the month there were a number of regions visible on the solar disc and the largest of these was responsible for the two solar flares. This region was responsible for the rise in the 10 cm flux values in the second half of the month.

The 10 cm flux ranged between a low of 75 on the 31st from a high of 98 on 19-22nd. The monthly averaged sunspot number was again high (30.6). The high values for the last two months have pushed up the yearly averaged sunspot numbers for October and November 1986. This means that September 1986 is almost certainly the month of the solar minimum and the start of Solar Cycle number 22.

Geomagnetic activity for the month was mainly quiet with only two disturbances. On May 25, the A was 22 and on the 29th it was 21.

From data supplied by the *Department of Science IPS Radio and Space Services*, May 1987

AR

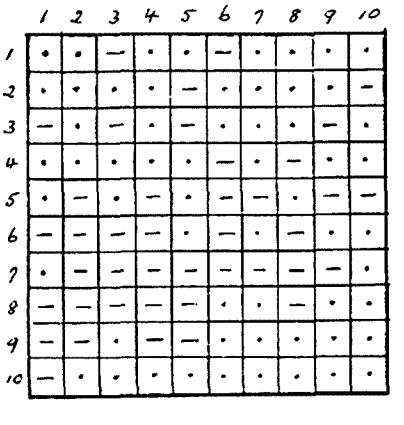
COMPUTER PROGRAMS

Dua to the length and quality of some computer program printouts, it is frequently impossible to reproduce them effectively for others to copy. Members interested in particular programs are advised to contact the author for an original copy of the relevant program. (Please include an SASE).

Solution to Morseword 6

Across: 1 flee 2 sleet 3 tenner 4 sure 5 arty 6 once 7 jog 8 ogre 9 manse 10 this

Down: 1 fro 2 home 3 cage 4 hog 5 pug 6 dots 7 Sale 8 stage 9 inks 10 etuis



DEADLINE

All copy for inclusion in the **October 1987** issue of *Amateur Radio*, including regular columns and Hamads, must arrive at **PO Box 300, Caulfield South, Vic. 3162, at the latest, by 9 am, September 21, 1987.**

Hamads

PLEASE NOTE: If you are advertising items FOR SALE and WANTED please write *each* on a separate sheet of paper, and include all details; eg Name, Address, Telephone Number, on both sheets. Please write copy for your Hamad as clearly as possible. *Please do not use scraps of paper.*

- Please remember your STD code with telephone numbers
- Eight lines free to all WIA members. $9.00 per 10 words minimum for non-members
- Copy in typescript, or block letters — double-spaced to *Box 300, Caulfield South, Vic. 3162*
- Repeats may be charged at full rates
- QTHR means address is correct as set out in the WIA current Call Book

Ordinary Hamads submitted from members who are deemed to be in the general electronics retail and wholesale distributive trades should be certified as referring only to private articles not being re-sold for merchandising purposes.

Conditions for commercial advertising are as follows:

$22.50 for four lines, plus $2.00 per line (or part thereof)

Minimum charge — $22.50 pre-payable

Copy is required by the Deadline as indicated on page 1 of each issue.

TRADE ADS

AMIDON FERROMAGNETIC CORES: Large range for all receiver and Transmitting Applications. For data and price list send 105 x 220 mm SASE to: **RJ & US IMPORTS**, Box 157, Mortdale, NSW. 2223. (No inquiries at office . . . 11 Macken Street, Oakley). Agencies at: Geoff Wood Electronics, Lane Cove, NSW. Webb Electronics, Albury, NSW. Truscott Electronics, Croydon, Vic. Willis Trading Co, Perth, WA. Electronic Components, Fishwick, Plaza. ACT.

WANTED TO SWAP— NSW

FT-690R ALL MODE 6m TX: plus 10W amplifier & 6m beam for HF Tx — 100W PEP & digital. In GC only please. Also FT-480R, all mode 2m unit for base station scanner. Licensed amateurs only. S Reeves VK2CT, QTHR.

WANTED — NSW

2m FM RIG: SSB if possible. No hand-helds please, for approx $250. John VK2CJV, QTHR. Ph: (02) 809 5024 AH.

DRAKE R-7A, JRC NRD-515 RECEIVERS: & KX-3, SX-3 Mizuho antenna tuners. Also old *Amateur Radio* magazines. Would also like to hear from R-7A & NRD-515 radio users. Tony. Ph: (042) 29 2573.

HF TRANSCEIVER: Yaesu, Kenwood, or Icom. Good condition. Prices $200-$400. Vlado VK2AEA/OK3CUU. Ph: (02) 891 2276.

YAESU FT-200 HF SSB TRANSCEIVER: In working order. Ian VK2DNI. Ph: (02) 871 4471.

YAESU FT-780R 70 cm ALL MODE TRANSCEIVER: Larry VK2EOY. Ph: (02) 949 3124.

WANTED — VIC

CIRCUIT DIAGRAM: Televideo terminal & keyboard, model 950. Original or photocopy. Jules Perrin. Ph: (03) 369 6573.

LOG PROGRAM: Software or program for use with Apple IIe to log QSOs in contests. Will pay any costs involved. Mast sections. Threaded mast sections 2.75 ins (70mm) to fit ex-Army tripod mast combination. Ken VK3AJU, QTHR. Ph: (03) 527 9029.

PHILIPS REMOTE CONTROL HEAD: Suitable types are CU941, CU938. Prefer unit in working order. These units were supplied to work with the FM828 & FM747 series of Philips radios. Details & price to Ron VK3XOA, QTHR. Ph: (053) 35 6017.

WANTED — OLD

IC-402 PORTABLE 432 MHz TRANSCEIVER: Must be in good condition. Price to VK4KAL, QTHR. Ph: (079) 85 4168 (AH).

MORSE KEY PADDLE TYPE: Prefer simplex bug, however interested in suitable electronic type. Tom Sawers VK4AOG, QTHR.

YAESU FL-2100Z LINEAR AMPLIFIER: in good condition. No mods, prepared to pay sensible price. Price & details to VK4ATQ, QTHR. Ph: (07) 374 1008.

FOR SALE — NSW

ANTENNAS: KW Electronics multi-band dipole all-weather traps. $60. 12 element 2m Yagi. $45. 17 element 70 cm Yagi. $45. Larry VK2EOY. Ph: (02) 949 3124.

ARLEC 13.8V 2A POWER SUPPLY: $90. Pearce Simpson SSB AM CB with PLL. $120 ONO. Conrac B/W eng monitor CRT still good. Solid State. $180. VK2CJV, QTHR. Ph: (02) 809 5024.

COAXIAL WAVEMETER: (lixed) 23 cm band BNC in/out. Similar to that in RSGB VHF-UHF Manual 3rd edition, page 10.28. $30. VK2ZD. Ph: (02) 427 3281.

KENWOOD 2m FM MOBILE TRANSCEIVER: TR 7730. Excellent condition. $350. Also Yaesu 2m FM hand-held FT208 with charger. $200 ONO. Andrew. Ph: (02) 635 4883 AH.

KENWOOD SM220 STATION MONITOR: Complete with manual & lead. In excellent condition. $425. Ray VK2AWQ, QTHR. Ph: (064) 94 1347.

KENWOOD TS-430S HF TCVR: with PS430 power supply, CW narrow & AM filters, FM board fitted, MC42S scan microphone, OC lead, manual, flawless condx. $1500. Kenwood TS930S (on board power supply) lifted CW narrow filter, manual, excellent condx. $1950. Owner returning to UK. George VK2EZA/G6VS. Ph: (047) 30 1666.

KENWOOD TS-520S TRANSCEIVER: Like new, has had little use together with manual & carton. $495. John VK2VJD, QTHR. Ph: (047) 51 4257 evenings & weekends.

SWAN 500 & P/S: Hallicrafters SX-110 general coverage receiver; Granger 174 four channel transceiver; BC 221 frequency meter with P/S & calibration book. All with manuals. VK2AKR, QTHR. Ph: (02) 61 4659.

TELETYPE MODEL 33KSR: New type-cylinder, 300 baud, 7 data bits, even parity, 1 stop bit. Ideal as printer for any PC (letter quality) or for RTTY with Baudaut to ASCII conversion. $120. VK2DWO. Ph: (02) 858 1085.

YAESU FT107/DMS TRANSCEIVER: WARC bands. As new condition, with factory service manuals. $750 ONO. Also Swan 100MX transceiver factory service manual. $10. VK2BTL, QTHR. Ph: (02) 487 3383, 359 3434.

YAESU FTDX401: Excellent condition, plus collectors items! Geloso VFO, new in carton, Collins mechanical filter 2.1 kHz. Offers? VK2DDR. Ph: (02) 949 3426.

FOR SALE — VIC

ALLIANCE ANTENNA ROTATOR & CONTROL BOX: in working order. Requires some maintenance. $70. VK3EJV. Ph: (03) 438 2878 after 6 pm.

TEN TEC ARGONAUT: with complete documentation plus 240 VAC power supply. Tx side partially faulty. $100. Ph: (03) 699 9584.

YAESU FT-101Z TRANSCEIVER: In good condition. Late model, hand book. $500. Casey VK3ABC, QTHR. Ph: (051) 74 7553.

FOR SALE — QLD

ALPHA 76PA"E": 3x8874 Eimac triodes, current model, absolutely mint & unmarked, whisper quiet full ducted blower cooled, 1 kW cont. Duly 1/P, P1-L o/p, 1.8-2 & 3-30 MHz. Possibly the best amp available today. Ph: (07) 378 1876.

FT-7 HF TRANSCEIVER: Covers 80-10 metres. As new still in box. Would suit novice. $385. Pal VK4VGS. Ph: (071) 85 1240 After 6 pm.

JUNK BOX CLEAN OUT: Transmit variable capacitors ex-TU9A units: 2 x 77 pF; 1 x 116 pF, 2 x 20 pF, 1 x "BUD" 100 x 100 pF 2 mm spacing; 2 x 140 pF & 1 x 100 pF ex Command tx. Various 2 & 3 gang "F" B/C types (AWA make). VK4KAL, QTHR. Ph: (079) 85 4168 AH.

KENWOOD R-1000 RECEIVER: with service manual. $350. Icom IC-551, 6m transceiver with FM, VOX, & PBT boards fitted. $400. VK4KEE. Ph: (071) 28 2785.

RACAL RA217D SOLID STATE COMMUNICATIONS RECEIVER: (RA329 system). SSB/AM/FM/FSK 1 to 30 MHz, plus down to 200 kHz. VGC in transit case complete with manuals (comprehensive). $450. Also Racal RA17C valve communications receiver still in current use by departments. VGC. Complete with manual. $450. Marconi TF995A/5 VHF FM/AM signal generator complete with manual. $800. AWA TV sweep generator, 5" CRO, calibrator & FSM. The lot $350. Please Contact Bob VK4OY. Ph: (07) 396 0886.

TOWERS: Hills 4-section winch-up to 100 ft. Heavy galvanised, complete with rigging. $775. Also Hills 3-section winch-up to 55 ft. $475. All in good condition. VK4YF, QTHR. Ph: (071) 82 1183 or (075) 48 3184.

TS-130S, IC-740: or similar compact mobile rig in top condition required. Details to John VK4SZ, QTHR. Ph: (070) 61 3286.

FOR SALE — SA

HUSTLER MOBILE ANTENNAS: incl 6, 10, 15 & 80m resonators. Complete with HD spring base. $150. VK5FH, QTHR. Ph: (085) 56 2253 AH.

VZ300 COMP & RTTY MODEM: Data cassette, demo tape WKSP manual, comp manual, all leads. As new. $180 plus freight. Morse-A-Keyer, keyboard type. 5-45 WPM adjustable, inbuilt side tone osc, 5V PW PK, instructions. As new. $100 plus freight. VK5PH. Ph: (088) 53 2091.

FOR SALE — TAS

YAESU FT-980 GEN COV TCVR: as new, boxes, service manual etc. $1900 ONO. Yaesu FT209RH access 2 metre h/held. Solt case, PA3 mobile charger, adaptor, ext *speaker/mic.* What *offers? Kenwood TM411A, late model* UHF FM, 25W t/ceiver, mobile. As new, boxes, etc. $485 ONO. VK7AN, QTHR. Ph: (003) 31 7914.

STOLEN EQUIPMENT

An Icom IC022A VHF FM transceiver has been stolen from Roger Henley VK2ZIG. Serial number is 3402112 and the original microphone has been replaced with a Willis-brand microphone.

If any members are offered this transceiver or have any knowledge of it, they are requested to contact Ermington Police Station, your local police or Roger VK2ZIG.

Advertiser's Index

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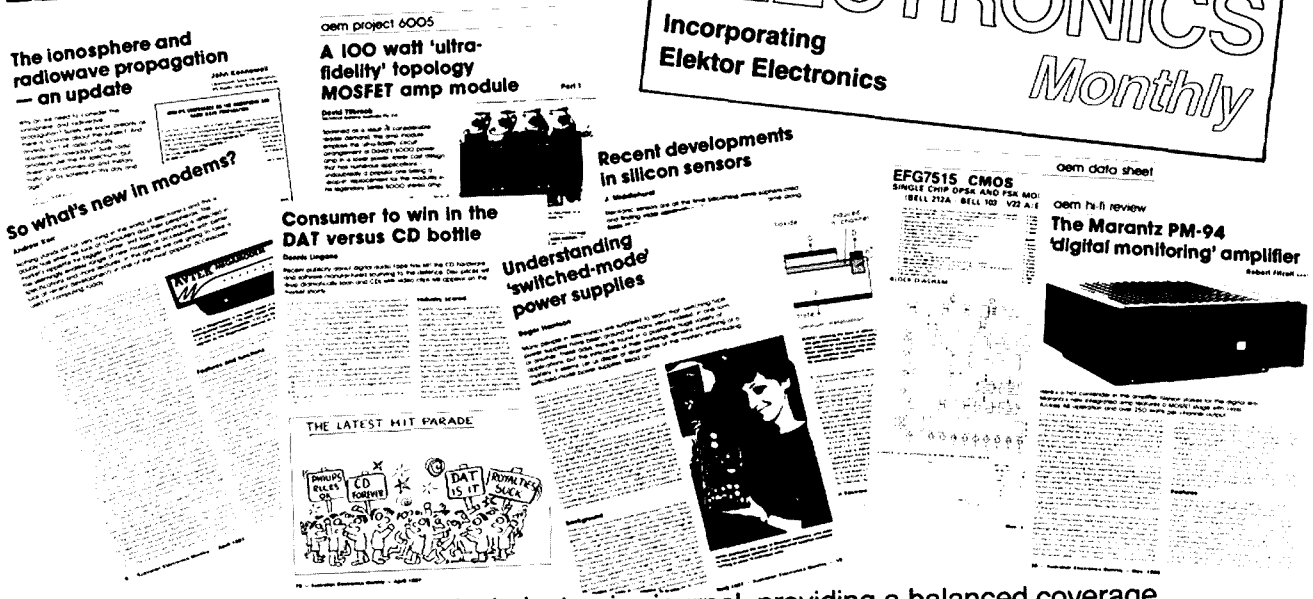
Roger Harrison's
Australian ELECTRONICS
Incorporating Elektor Electronics *Monthly*



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  – a whole section each month devoted to electronics enthusiasts exploring computing and computing enthusiasts exploring electronics.
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  – news, reviews and practical features on RF techniques and radio communications, covering everything from circuit techniques to cellular radio, from satellites to amateur radio.
- **Topical technical features**
  – covering consumer electronics, topical technological and scientific fields, current issues and circuit techniques.
- **What's new in the market**
  – occasional features on new products and developments, giving topical and informative coverage of specific fields and product groups.

You'll find something to interest you every month in Australian Electronics Monthly, no matter what your special interest might be. The magazine is "sectioned" into categories for easy reading and easy reference, each section headed by its own news column.

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The first multi-band transceiver that'll impress everyone except car thieves.

The new ICOM IC-900A is a totally new modular concept in multi-band amateur radio transceivers.

First, it's designed to fit into the stylish, compact instrument panels of modern cars rather than the glove box. Secondly the modular concept makes theft less attractive.

You see, what makes this concept so impressive is that the main and most expensive components of the radio can be secured and hidden away in the boot.

Its technology is equally impressive.

The IC-900A is the first known to use optical fibre technology in an amateur transceiver. It uses optical fibre cable as a link from the two interface units. One for the remote controller and the other for the band units.

This provides an accurate display of frequency and memory data for any data for any two bands in use.

The IC-900A has a multi-band independent receive and transmit capability. So, it can monitor and use each installed band simultaneously, giving the effect of multiple transceivers.

The transceiver has 10 programmable memory channels in each band unit; up to 60 memories all together. Tuning can be selected in 5 KHz, 10 KHz, 15 KHz, 20 KHz and 25 KHz steps. Options include either the UT-28 Digital Code Squelch (DCS) unit or UT-29 Tone Squelch Unit.

The UX-19 band unit covers 28-30 MHz with 10/1 watt selectable output. The UX-59A covers 50-54 MHz at 10/1 watts. The UX-29A covers 144-148 MHz at 25/5 watts (a UX-29H version offers 45/5 watts). The UX-49A covers 430-440 MHz at 25/5 watts. And the UX-129A covers 1240-1300 MHz.

If you find all this impressive, you'll be most pleased to read that the IC-900A handbook is excellent and simple to follow. Especially on installation procedure.

Perhaps the best thing to do is to visit your ICOM dealer and see how more impressive the IC-900A is in the flesh.

For details of your local dealer phone ICOM on Melbourne (03) 529 7582 or (008) 33 8915 from elsewhere in Australia.

ICOM

Amateur Radio

JOURNAL OF THE WIRELESS INSTITUTE OF AUSTRALIA
VOL 55, No 10, OCTOBER 1987

IT HAD TO HAPPEN!

BUILD-IT-YOURSELF 'AT' COMPUTER!

At last! The perfect opportunity for the hobbyist to build the perfect computer. . . Perfect because it has in it what YOU want! All the features of the "AT" - blinding speed, high expandability, and so on - but you put it together yourself - and $ave!

There's more: each board or module comes with a full 12 month warranty PLUS individual, professionally prepared manuals - no Jinglish to decipher!

And best of all, you don't have to buy it in one hit: add what you want, when you want it (and when the pocket allows it!)

Look at the features:

SUPERB QUALITY HINGED CASE

"Baby AT" case in heavy gauge steel, heavily covered in damage-resistant bone crinkle finish. The lid is hinged and locks up for instant internal access - no more undoing screws! Large enough for expansion - but features a footprint of just 430mm square! Cat X-1005

ONLY $175

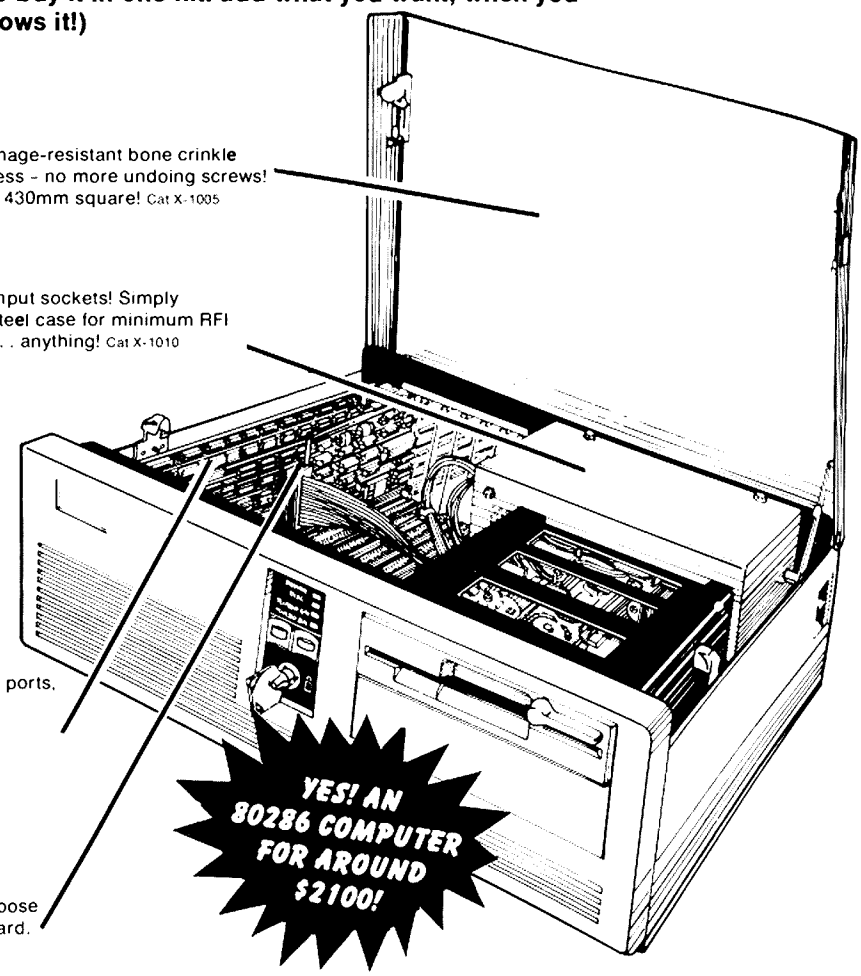
200W POWER SUPPLY

Completely pre-assembled - even to the on/off switch and input sockets! Simply slots into place in cutouts provided in case. Heavily plated steel case for minimum RFI with integral whisper-quiet fan. 200W capacity is ready for . . . anything! Cat X-1010

ONLY $275

"BABY AT" MOTHERBOARD

Again, completely pre-assembled. No risk of dry joints - you just connect appropriate cables (as described in detailed manual included). On-board capacity for 1Mb RAM and 8 slots for expansion in true"AT" format. Offers 6, 8, 10 & 12MHz speed (switch & software selectable) giving outstanding software compatability PLUS blinding speed when you need it, and time & date memory with battery back-up. Cat X-1000 **JUST $995**



PLUG-IN CARDS

Cards for the various graphic standards, printer ports, serial ports, etc etc. Choose the one that suits your requirements - and remember, you can always upgrade later!

CGA plus Parallel Printer Card Cat X-2010 **$129**
MGA plus Parallel Printer Card Cat X-8141 **$149**
EGA Card with Hercules compatability Cat X-2013 **$399**
Serial/Parallel/Game Card Cat X-2012 **$139**

DISK CONTROLLERS

Your choice of hard/floppy or floppy disk controller card: choose the one that suits your needs best. Both plug in to motherboard.

Floppy Controller (2 disk drives) Cat X-2014 **$129**

Hard/Floppy Controller (2 of each) Cat X-2008 **$399**

DISK DRIVES

Also include appropriate cables.

1.2Mb Floppy Disk Drive Cat X-2014 **$269**

20Mb Hard Disk Drive Cat X-2201 **$795**

(Other higher capacity Hard Disks available if required)

KEYBOARDS

Two types available:
84 Keys with top quality "Alps" keyswitches Cat X-3820 **$129.00**
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Amateur Radio

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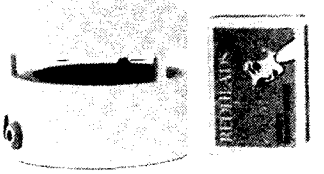
Special Features

Technical Features

Amateur crosses the Tasman to receive award (see page 49).

New Minister (see page 14).



Practical CW Resonator (see page 24).

Regular Features

DEADLINE

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Amateur Radio

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Acknowledgment may not be made unless specifically requested. All important items should be sent by Certified Mail. The Editor reserves the right to edit all material, including Letters to the Editor and Hamads, and reserves the right to refuse acceptance of any material, without specifying a reason.

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Editor's Comment

YE OLDE HOME-BREW

This month, for a change, let us get away from one consequence of an apparent lack of money and discuss what may often be another. Specifically, why should one build one's own radio equipment?

Before I move on to this topic (a personal favourite for 40 years!) I would like to say how heartening it is to see all the messages of support coming in for us to restore and improve the presentation of AR, although unavoidably at increased cost. See particularly the plea from George Brzostowski VK1GB, on the adjacent page. All we need is a little more money!

Now, to home-brew. It was only last November that I had a few words to say about home-brew's possible resurgence. Since then, beginning in May, we have been publishing the new "Building Blocks" series by VK3s AFQ and ZJF. Not only does this series show you how to put the bits together, but the alleged problem of "You can't get the parts any more!" has been solved. Even if you do value your spare time in dollars per minute it may still be cost-effective to build equipment this way rather than buy commercial gear.

By far the most satisfying home-brew, though, is to build something of your own design, and get it to work as required. Not many reach this happy stage, although more should be able to. Anyone who has passed the Full or Limited theory exam should have learned enough to know where to learn whatever else is needed!

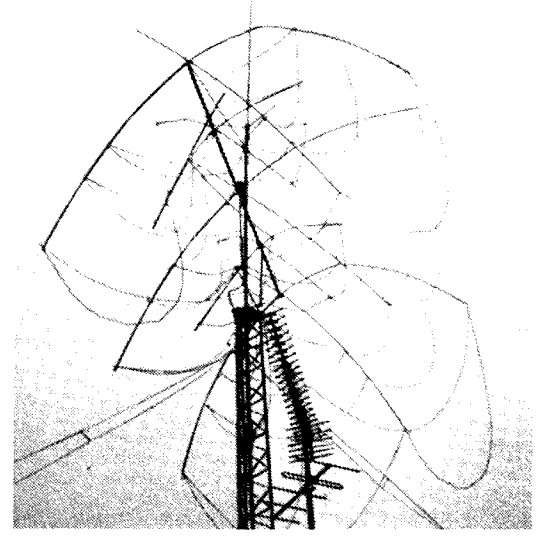
But there is a disadvantage to such a unique one-off device. It has no resale value! You are the only one who can fix it when (if) it "blows up". You CAN fix it, can't you? You can't take it back to the dealer. You ARE the dealer! So perhaps you save on repair bills what you don't make on resale. Of course, if your engineering is good enough the device will keep going for ever, and even you will forget what's in it. So, for your own future reference, you must "write your own handbook" while the design and construction progresses.

The kit-set, building-block approach fits in between the extremes (of "black-box" or "own design"). You get the dual satisfaction of personal construction and saving money, and because the design is well-known you may be able to resell it later. The magazine description (or kit-set manual) serves also as a maintenance handbook, which you don't have to write!

One other point is very important. We in the Amateur Service have a unique privilege in being permitted by international law to build our own radio equipment as well as operate it. Unused privileges tend to disappear. Our predecessors earned them, and we have an obligation to maintain these privileges by making good use of them. In the process, few things can exceed the satisfaction of being able to say "It works well, and I built it all myself!".

Another related theme. Predecessors (old-timers), home-brew, the evolution of amateur radio from the beginning. It's all in "HALCYON DAYS", the book just published by our good friend and colleague Al Shawsmith VK4SS, the VK4 Historian and sponsor of the Al Shawsmith Journalistic Award. It is history seen through Queensland eyes, but I am sure it interests us all. Check the announcement on page 58 of the August issue for full details. The concession price offer has been extended to September 30, so you may just be in time.

73 Bill Rice VK3ABP Editor



What would the FB Ratio be? ? ?
—Contributed by Allan VK4KAL from *Oz* magazine.

QUO VADIS?

George Brzostowski VK1GB
VK1 FEDERAL COUNCILLOR

The threat in 1987 is from commercial interests demanding space.

While some see amateur radio, and the WIA specifically, as being in a form of recession, it is vital that we interpret the current situation as a challenge to be met head-on, rather than as an excuse for wholesale surrender. What follows in this and subsequent parts, should wake up a few timid souls, and if it does not, then maybe we do need to have a good look at ourselves.

You see, I am actually writing out of concern for what is happening to the WIA, but I don't like giving up — nor should you. I must confess that until I saw what passed as the August issue of AR, I suppose I was minded to keep on biting my own keyboard.

August sees the 25th anniversary since passing my full call under the guidance of Ken Mattei VK1KM/VK2KR. The WIA seemed to be a revered body then, and I promised myself that after my studies, when I could afford it, I would join.

It seemed important to join the WIA. We needed strength after losing some band space at the 1959 WARC, and relations with the PMG were not as good as they are between the WIA and DOC. The 1959 WARC had reminded us of the 1912 era when it was popular to think of placing amateurs "above 200 metres, they will not be a problem there". The "problem" in 1912 was interference with emergency services. For the 1959 WARC, the threat was from political pressure, as national administrations scrambled for broadcast space.

In fact, how many of you realise that in 1959 the Australian government delegation went with specific anti-amateur proposals, which were kept secret from amateurs until just before that conference? We owe John Moyle VK2JU, a great deal of gratitude for the band space which members and *non-members* use today.

In 1987, the threat is from commercial interests demanding space in what are seen to be unprofitably administered sections of the spectrum, coupled with a government struggling with budgetary and trade deficits.

Yes, *your* bands are still under threat, whether you are an on/off mode, a CW, satellite or phone devotee; a contestant, ragchewer, experimenter or black-box operator. It does not matter whether you are an EME bouncer, purist, or just a spectrum-filler, you are under threat unless the WIA is well-supported, and capable of representing you in negotiations with our government, and through it, with other administrations.

Remember that the WIA does not exist just for its own sake. No one in their right mind would put up with the drivel and personal abuse thrown at the Federal Executive unless there was a crying need for someone to wear it, and despite the contempt, represent amateurs as "responsible" and, dare I say it unless it applied to the elusive silent majority, "mature, innovative and intelligent".

If you do not think that is true, then ask "Why?", and then ask yourself the question, what have you done?

People seem to forget that the WIA is what you, the members, make it. Calls for some new organisation, are a little like calls for someone to re-invent the wheel. If you think that the WIA could be improved, then why not use the existing mechanisms to make it better? If you think that the burden of providing the properly qualified people to form the Federal Executive is excessive for any one Division to bear, then why not investigate structural and administrative reform.

After all, anyone thinking of a better organisation will have to think of something new.

Back to the good old uncomplicated days, when men were men, quality was quality, and amateurs were self-funded electronic frontiers-men.

We needed an organisation to disseminate our ideas and our experiments, and we needed similar organisations in other parts of the world to learn what was happening there. We needed a QSL Bureau. We needed somebody to represent us nationally and internationally. We needed co-ordination of course. We needed to teach and learn. We had a sense of pride. We also had a sense of humility which taught us that we were not, as individuals, smart alecks capable of taking on the might of bureaucracy, power politics, and big business under the myth of such catch cries as "individual rights", "democracy", "freedom of communication" or some other cliche seeping from the compost of wishful classics and political philosophy.

In short, we needed a union, and our union was the WIA. There was no question about it.

Every now and again, some issue would erupt — CB, novices, third party rights, band plans, repeaters, narrow and wideband modes, — but generally we seemed to be gaining something. The WIA worked out the details, and few others had to bother to find out what was really at stake. Life was good. Barbeques were hot, and the beer was cold. Pay was rising, super was reasonable, and pensions were indexed. Even the Holden could be upgraded, and the Vietnam War was, well, not exactly lost, but we disengaged from it. We were safe, as someone was bound to look after us.

Like the rest of the community, radio amateurs became complacent about all sorts of matters. We have stopped caring. As with the rest of the community, we saw that apart from adversity, self-interest and downright greed, there is now little left which draws people together. We do not even want to know what services our organisations provide for us. We take them for granted.

And, in this "good life", we started to push our own barrels. We saw an emergence of a common expectation: "Give us more, but ask us for less. Oh, and don't tell us your troubles, we really don't want to know!" Does that sound familiar?

As anyone knows, it takes two to tango. The problems do not all come from one side.

The fact that some people seem prepared to say that the WIA has done a lot in the past, but does not seem to be doing much now, is indicative of a failure to tell people what is, in fact, being achieved — even by the simple fact that the WIA is there.

An organisation may be an achiever even though it does not boast new acquisitions of privileges. The fact that existing privileges are preserved is also an achievement in the present politico-economic environment. The fact that we are still sitting on an asset worth millions of dollars in licence fees if someone was minded to sell it to commercial interests, is an achievement of immense value.

Do not for one minute think that the WIA does nothing for you. Of more recent currency is the fact that someone is gearing up to conduct exams for new aspirants. And don't forget the reinstatement of six-metre privileges, ever contentious issue of band plans, orderly frequency planning for repeaters, and now, bulletin board services. And don't forget the work done on standards, as the recent standards for video transmitters exemplifies.

In fact it seems to be more vital now than in the past to have a strong Wireless Institute of Australia.

That is what I think, what do you think?

SOME COMMENTS ON AR

I will now turn to some suggestions for saving AR.

I start by looking back over the last convention.

it is remarkable how the news of budgetary deficit was met with the response: "Where can we cut costs?" Well, maybe if we had the opportunity to view the budget in time for Divisional membership to give directions, this might not have happened. In fairness, this is not a problem which happens every year.

But, in any event, why did we shrink? Why did we not show some readiness to meet a challenge, and show some strength instead? I suppose the answer lies in the short-term view that we were representing an organisation which has members who expect to receive services, but who are determined to pay less and less in comparison with costs imposed on us from outside.

It took an individual member to ask what right had we, as Councillors, to reduce the quality of his AR without asking if people like himself might be prepared to pay what is reasonably necessary to maintain quality. I must say, in a personal capacity, I endorse his sentiments.

It is really amazing how myopic so many of us have become.

We now have what we deserve. The current product reminds me of cheap publications from the third world or from behind the iron curtain. When will we bring out the old gestetner® ?

How can one expect an advertiser to see merit in placing advertisements in a publication which has no appeal about it? We must remember that from a vendor's point of view, an Institute full of penny-wise members is unlikely to contain many purchasers of his equipment.

We are already behind ARA in advertising. Comparing the two, we see approximately 3 816 square centimetres of paying advertisements in AR (including 72 square-centimetres from VK2) and 4 304 square-centimetres in ARA. One gets a feel for personal preferences when one looks at where people, ie those without the corporate dollar, for to place their private ads. There is a markedly greater number of private classifieds in ARA than in AR, and I suggest this is indicative of where people think they will get better coverage or exposure.

We must first get a firm grasp of relativities. Do you know that, in order to maintain the previous level of presentation as well as service, the annual federal component needed to be raised by the equivalent price of a bottle of kitchen olive oil, or a fistful of cigarettes? Yes, $3 or $4 per annum is all that is missing!

There are a number of ways of tackling the problem. One is to place AR on a commercial footing, by expanding it, and selling it publicly. When I suggested this during a VK1 meeting in 1977, I recall the cynical cry, "And will you have pretty coloured photos of girls on the front?"

In those days, *Electronics Australia* and *Electronics Today* were established. There has since been the emergence of other magazines, including ARA, and the appearance of the British publication using our magazine's name — *Amateur Radio*. Did I hear anyone ask about copyright, or passing off? No, because our *Amateur Radio* was not being displaced from the news stands.

AR must be brushed up and go initially into every school and public library in Australia. The

school exposure is what will be of interest to those placing advertisements for the Defence forces and other careers — and that means dollars for AR.

That is one example. In 1985, I prepared an item with suggestions of how a professional advertising agent could be engaged, and where he/she should go looking for advertisements. There may have been reasons for not adopting some of those suggestions in 1985, but they should be re-evaluated when the present contract for the production of AR is renewed in early 1988.

An alternative approach is to increase federal subscriptions to say, $35 per annum, (less than two cases of beer) but then to allow social security pensioners, students and impecunious retirees a concession rate of $28. Yes, it does mean that some of us will subsidise others, but that is a small price to pay for self-induced redundancy.

We cannot forget the members who have a financial struggle on their hands, and we should try to accommodate them, but the proper and positive response should be to rise above the limitations of those who are our weakest, and instead aim at what we, as a whole, can achieve.

As it is time for massive lateral thinking, may I suggest that thought be given to combining AR and ARA? Advertisers would love it. Quality of the combined magazine would be higher than that of its individual precursors. Sale to the public would probably remove some of the burden from WIA members — who knows, it may even become self-funding!

Do I hear "Horrors!"? What do you suggest instead?

Acknowledging that we cannot realistically expect to have our budget reviewed in the immediate future, but at the same time wanting to see a return to former quality of production, I suggest the creation of a voluntary "SAVE AR FUND", for which I enclose my donation. (A checque for $100 received. Ed.) We had a shortfall of about $25 000, and if there are not at least 1 000 members who can raise $25, or 2 000 members who can raise $12.50 each, then maybe we should give up.

If 4 000 members respond, the target would be reached by individual contributions of a mere $6.25 — yes, a box of biscuits costs more!

I hope that FE will accept my suggestion for an appeal to save our magazine, and I hope others will follow and send in donations in the immediate future.

That is what I think. What do you think?

ATTITUDE

Attitude is one of the least understood, and sometimes totally unrecognised, causes of decay — decay in not just voluntary organisations, but also in whole nations; in the decay of standards; in the decay of rights and privileges; in the virtual abolition of rights of privacy, and even the erosion of the fundamental rights of not being punished until proved guilty. If Thomas Payne was researching material for his *Rights of Man* in today's society, he might be confused between the Spanish Inquisition and the workings of modern government.

We should wake up to the fact that the attitude of amateurs is, in fact, the first threat we face. If we were anybody other than amateurs, we would be uniting and responding to meet an adverse situation — particularly one which is clearly within our own means to defeat. If we are united, we may be able to withstand the external threats to our bands and our privileges.

The WIA has had its share of internal disputes. They have been fanned by selfishness, sectional interests, bigotry, personality clashes, and far too frequently, by a total lack of diplomacy, consideration and/or maturity. Just because one passed theory, does not mean one is wise, tolerant, a good listener, or a good judge of character and personality.

These rumblings have revealed weaknesses, and encouraged some to embark on criticism, which criticism has been taken destructively, and from within, we seem to have evolved a siege mentality. I gather that the WIA is seen by too many as embattled.

If we keep bowing to the siege mentality, by repeatedly surrendering and withdrawing, we will end up having no pride, no strength, and ultimately, no influence. When that happens, the WIA will be truly redundant.

Costs are not the only problem. Membership is vitally important. We cannot expect people to want to join unless they see for themselves what the WIA does for them. In this regard we must engage in well-directed public relations. Ultimately, it is up to individuals to appreciate that without a union, amateur radio will be a shrinking service.

On the other hand, WIA executives at all levels, should at all times let the members know what is being done by the WIA. This is as much a matter of presentation as well as content — and I think there has been some improvement, particularly with the use of the Telememo network set up by Peter Gamble VK3YRP. Ironically, Federal does not have its own terminal, and relies on Peter physically conveying his printouts or keying in releases!

As with other media elements, the truly significant achievements should be presented with a degree of headline emphasis — stopping short of outright sensation.

But, in addition to that, the consequences which would have flowed from a failure, if the WIA had failed in its endeavours in relation to a particular achievement, should also be emphasised, as not everyone has the time, inclination or readiness to think through all the issues and consequences.

That does not alter the fact that the executive, the editorial committee, and all other organs of the WIA are as good as you, the members, have the capacity to contribute. It means that it is up to you, as individuals to rally to the WIA, and to realise that if you allow it to become weak, fragmented, or shrunk, then ordinary amateurs, and not WIA functionaries, will be the biggest losers. In fact, the WIA functionaries will probably enjoy a well-earned, even if not a well-understood, rest.

Accepting that there are things which we cannot control, and accepting that we are diversly minded persons sharing diverse facets of a hobby, we must meet head-on the challenge from rising costs, the challenge from apathy, the challenge from myopia, the challenge from non-constructive criticism. I have given some suggestions, but where are yours?

Come on now, it is time for some positive thought. With apologies to Descartes, "Think and you will be".

Let us hoist up the sun, and make a new day for the Institute and our hobby. It is up to you to make sure it is a day forward. If you wait for the day to come naturally, it will be just another day closer to the end.

Those of you who admired Kennedy, will forgive me if I say, "Ask not what the Institute can do for you. Ask what you can do for the Institute, and through it, for your hobby."

Eventually, I hope that we will be able to do justice to Henry VK8HA, and have a repeat photo which will show his true colours in the near future! I wonder how many people know Henry as "Hacksaw", which probably relates to his CW operation while mobile on Northern Territory roads.

ar

FEDERAL NEWS

The following items are published with a view to bringing members up to date with the work of the Federal Office, and the Federal Executive in particular.

During August there was an Executive Meeting on Tuesday 25th, at the Registered Office of the Institute, as well as a Joint Meeting of representatives of the Institute and representatives of the Department of Communications, Canberra Office, held on Wednesday, August 19, also at the Registered Office.

REPORT ON EXECUTIVE MEETINGS

Some of the agenda items for this Meeting were:

Minutes of last Meeting
Matters Arising
Call Signs for 1988 Bicentenary
Future of Amateur Radio
Amateur Radio Magazine
Review of progress of Novices on Two-Metres
Reports — Joint Meeting, FTAC, Standards, Finance, IARU

Due to illness, or business interstate, only three Executive members could be present at the Meeting on August 25. This is a most unusual occurrence, as all members of the Executive make every effort to attend all Meetings, as shown by Attendance Record.

However, present were David Wardlaw VK3ADW, Federal President in the Chair; Bill Rice VK3ABP, and Peter Gamble VK3YRP. Apologies were received from Ron Henderson VK1RH, Michael Owen VK3KI, Allan Foxcroft VK3AE, Ross Burstall VK3CRB, Steve Phillips VK3JY, and Bill Roper VK3ARZ. In attendance was Mrs Ann McCurdy, Secretary.

Minutes of the Meeting held on July 28, were read and confirmed.

The passing of G Maxwell Hull VK3ZS, was noted with regret. The Executive recognises Max's 37 years of genuine service to the Federal body of the Wireless Institute of Australia.

Finance

In the absence of the Treasurer, David Wardlaw presented the accounts for payment, and noted the debtors at the end of July.

Peter Gamble reported on his visit to Sydney to have discussions with advertisers.

Future of Amateur Radio Working Party

Report that the Fourth Paper is being prepared.

Report on Joint Meeting WIA/DOC

The Executive are resigned to the fact that it appears there will not be a 1987 Call Book.

Reorganisation of the Department of Communications in Canberra reported on — now Department of Transport and Communications, with a new Minister, Senator Gareth Evans. (See page 14, for career resume of Senator Evans).

A note of interest is that, last year, in 1986, 12 percent of ministerials dealt with amateur radio. This year, so far, 40 percent of ministerials have dealt with amateur radio! As reported in an extract from the Annual Report from the Department, examinations are at present being conducted at a considerable loss; eg cost of one month's examinations — $68 000, and $11 000 was collected in fees.

FTAC — Phone Patch Line Isolation Unit

Peter Gamble reported that an article was finalised and published in September AR — letters forwarded to Federal Councillors to notify members regarding inspection and approval of Line Isolation Units.

IARU

David Wardlaw reported receiving accounts from IARU Region 3 Association — they have a surplus this year, even though a considerable amount of money was spent on travel.

REPORT ON JOINT DOTC/WIA MEETING HELD ON AUGUST 19, 1987

The following are highlights of action taken at the above Meeting:

Call Signs

Proposals for special call signs for events associated with the Bicentenary and Expo 88 were discussed in detail. A final DOTC check will be made before issue, since some call signs will require co-ordination with the ITU. The group VI88A to VI88Z is likely to be allocated for major special events.

WIA proposals for general conditions covering re-issue of call signs were reiterated. Special computer programming routines have been introduced by DOTC to meet our requests for adequate intervals on death or non-renewal.

Examinations

Further studies by DOTC on examination standards, pass rates, etc were introduced and will be followed up by Brenda Edmonds VK3KT, Federal Education Co-ordinator, at regular examination co-ordination meetings with the Department.

No major developments were reported on the examination devolvement issue. A special meeting with DOTC has been scheduled on this subject for late September.

Revision of *Amateur Operators Handbook*

DOTC is issuing a number of separate brochures covering subjects at present grouped in the one handbook. Drafts are provided to the Institute for comment. *Operating Conditions for Amateur Stations* is almost ready for issue.

Fees

The Institute has continued to press for special consideration in the determination of Licence and Examination fees, bearing in mind the general government policy of "the user pays".

Amateur Radio Call Book

The WIA proposals are with DOTC (who control material incorporated in the Call Book). Further delays are expected.

Wireless Video Transmitters

Written WIA proposals and comment on the handling of possible EMC problems following the issue of a DOTC Standard on these devices, was further discussed. We are seeking to ensure, in particular, that ATV operations in the 576-585 MHz band are adequately protected. Further detailed proposals will be submitted by the Institute (see August AR for initial material).

Retention of the 576-585 MHz Band

Further discussion of arrangements for the medium to long term retention of this band were held and DOTC will ensure that agreements already reached are widely promulgated to their State Offices if this has not already been done.

GENERAL

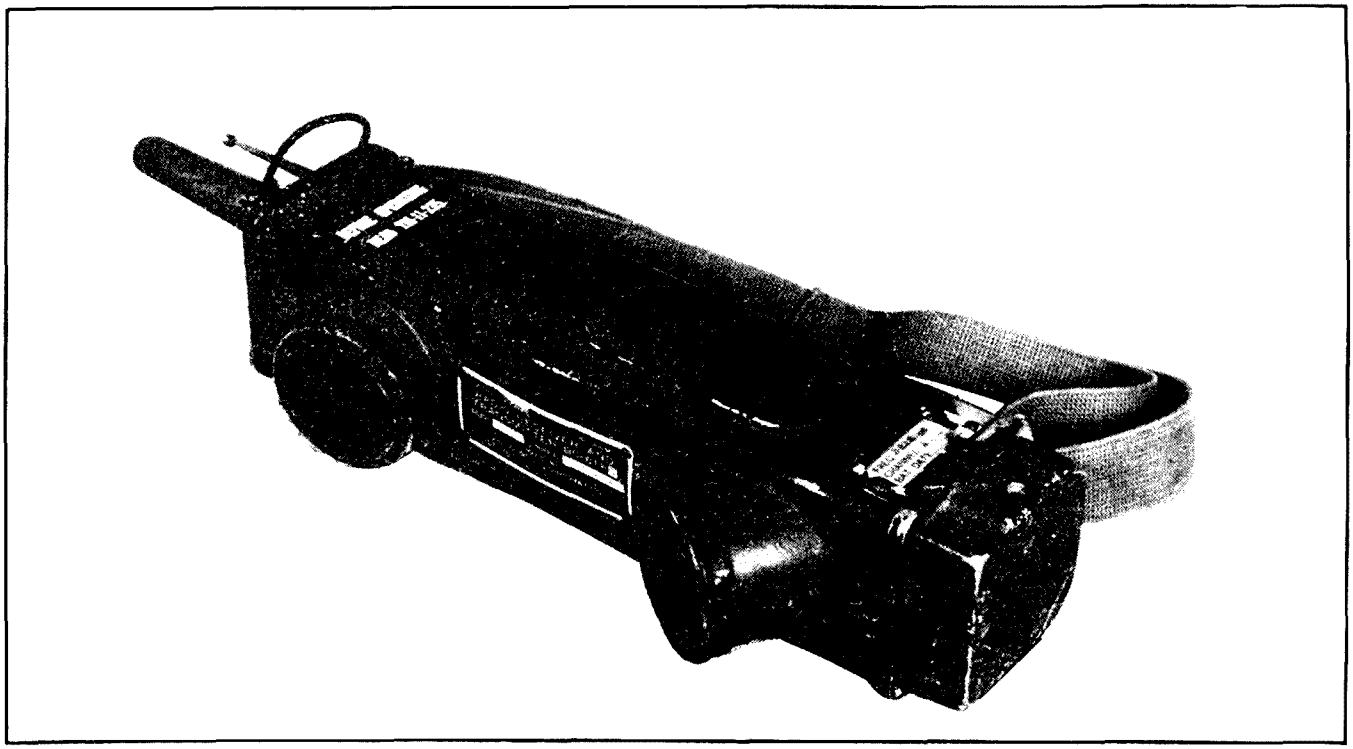
It should be noted that members of your Executive are all hard-working amateurs, endeavouring to make the Institute work for you. Each has a special task whilst on the Executive, by being a member of a Committee, and attending extra meetings of these committees, as well as the Executive meetings. Of the nine members of Executive, only two have retired from regular employment, which may give them a few more hours to work for you!

If you find two fly-sheets within the plastic wrapper when receiving your *Amateur Radio* magazine, please contact your Divisional Office, or the Federal Office, to advise the name and address on the extra fly-sheet. This will enable members to receive *Amateur Radio* as promptly as possible.

Cover Story:

RECEIVER — TRANSMITTER BC-611

Nick Watling VK4YT
42 Hibiscus Lane, Holloway Beach, Qld. 4871



A hand-held transceiver weighing five and a half pounds (2.5 kg)!

I have followed, with much interest, the series of articles by various authors on World War II radio equipment. As a 13-year-old when WWII ended, I was fascinated by the seemingly endless array of communication equipment which was released on to the surplus markets; first as a trickle then into the 1950s, a veritable flood.

Like most amateurs of that post-war era, I cut my teeth on a series of converted military surplus transmitters and receivers all of which are now only memories, or occasionally preserved in a museum.

One of the more intriguing little devices which became available through disposal outlets in the late 1950s and early 60s was the US Army Signal Corps Receiver-Transmitter, type SCR536 or BC-611, known as the "walkie-talkie". In 1941, battle experience showed a need for a reliable short range hand-held, two-way voice (R/T) communications system for use in the thick of a battle at section and platoon level. The Galvin Manufacturing Corporation of Chicago, Illinois, developed a transmitter-receiver which was hand-held in the manner similar to a telephone handset, weighed only 5.5 pounds (2.5 kg) and employed the newly developed miniature seven pin, 1.5 volt battery operated valves of the IT4, IR5, 1S5 and 3S4 series. It was designed to operate over ranges from 100 feet to a mile or so, in open terrain.

The set was housed in a rectangular case which was divided into three-compartments. One accepted the transmitter-receiver chassis and telescopic antenna. The second the radical new layer construction BA-38 103.5 volt 'B' battery and the third, the BA-37 1.5 volt 'A' battery for the valve filaments. A dynamic ear-piece and microphone were positioned similar to a telephone handset and a "knuckle" type send-receive switch was positioned for left-handed operation, leaving the right hand free for taking notes, etc.

The set was switched on by extending the lowest section of the telescopic antenna which operated a double-pole tumbler switch. The antenna extended to a maximum of 39 inches (one metre), at which length the radio was working in its most efficient manner. No receiver volume control was fitted, it being only necessary to telescope some of the upper sections of the antenna to reduce transmitter output and receiver efficiency for close communication.

The radio must have been one of the first true transceivers in that the same valves and circuit components were used for both reception and transmission. Change over between receive and transmit was affected by the "knuckle" type mechanical press-to-talk switch which operated 14 sections of a spring loaded wafer slider switch.

Table 1 shows the valve line-up functions.

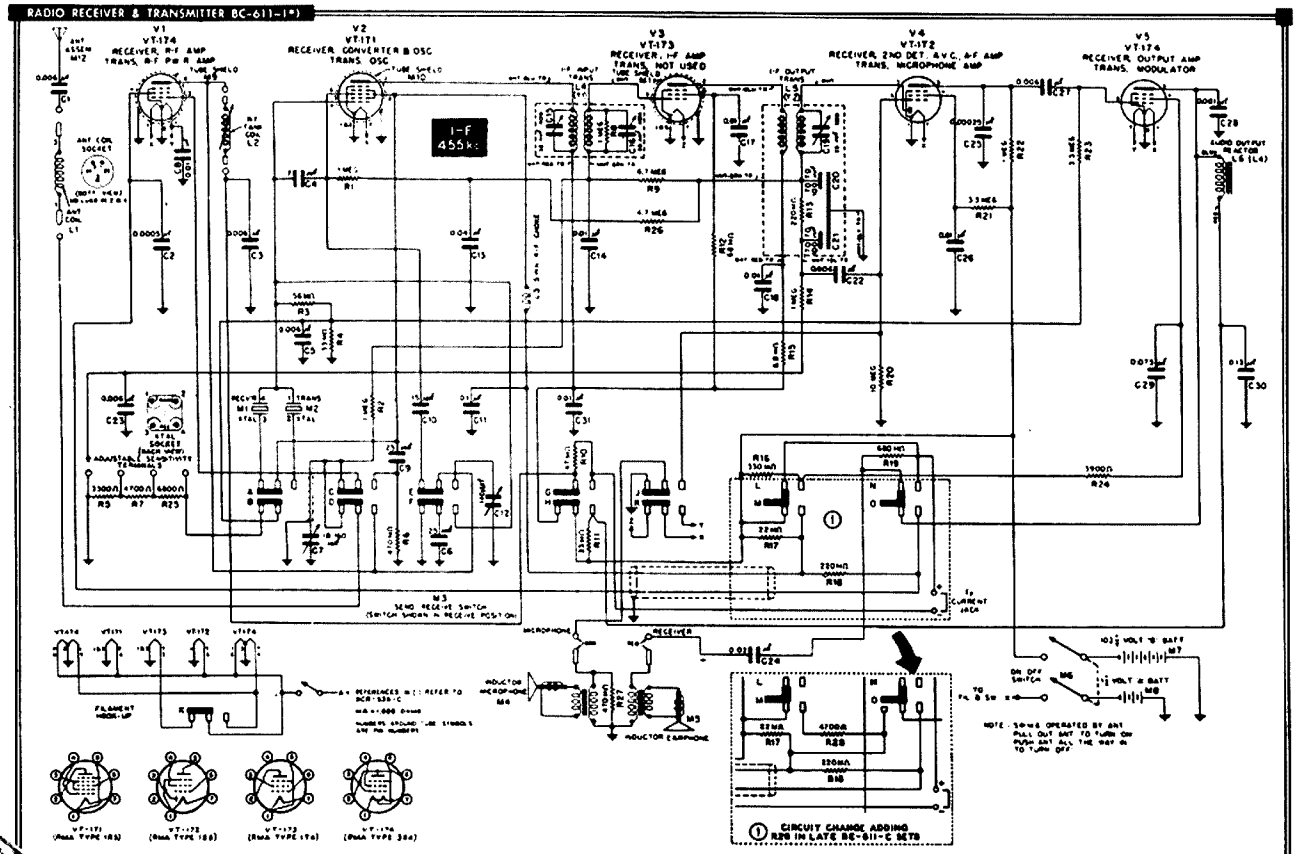
Table 1.

SIGNAL CORPS DESIG-NATION	COMMER-CIAL TYPE	RX FUNCTION	TC FUNCTION
VT-174	3S4	RF Amplifier	RF Power Amplifier
VT-171	1R5	Converter	TX Crystal Oscillator
VT-173	IT4	IF Amplifier	Not used
VT-172	1S5	Det AVC 1st Audio	Microphone Amplifier
VT-174	3S4	Audio Power Amplifier	TX Modulator

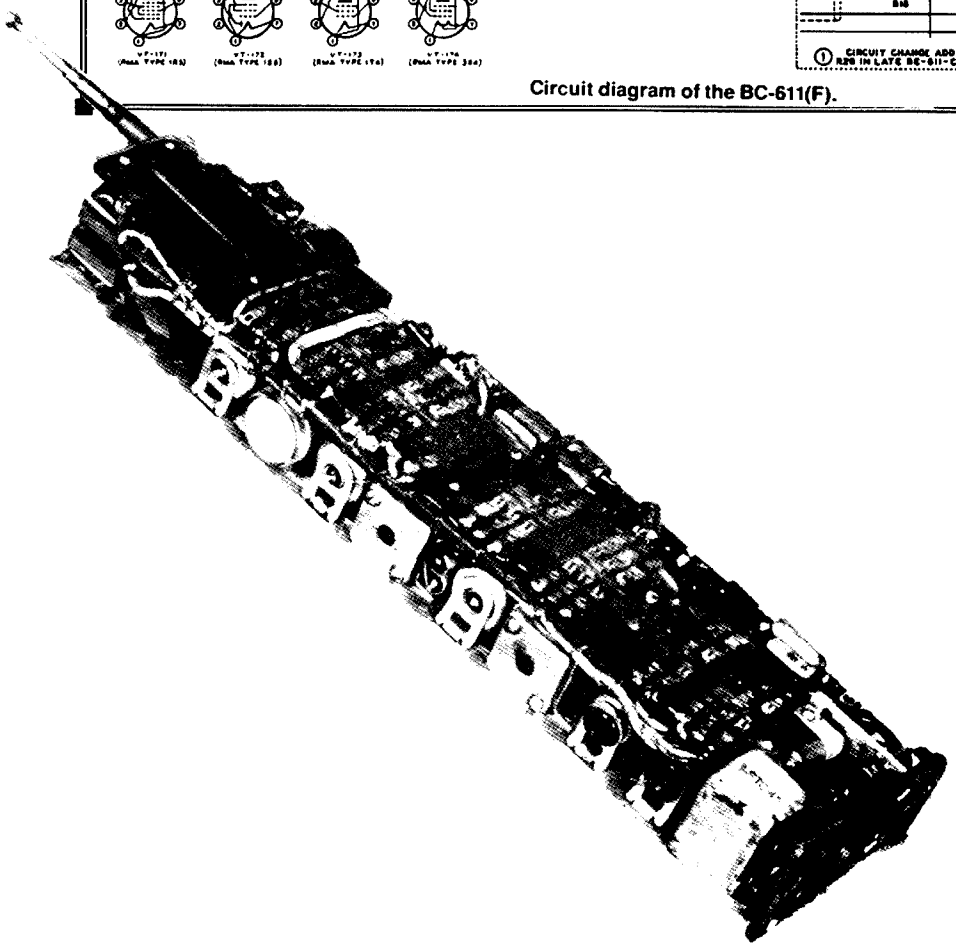
In order to preserve the life of the 'A' battery, only one half of the 3S4 filaments were used during reception. and the IT4 IF amplifier filament was open circuited on transmit. Single ended choke coupled "Heising" modulation was employed and the power input to the 3S4 RF power amplifier was approximately 1.5 watts. Frequency range was 3.5 to 6.0 MHz in 50 crystal controlled channels. For amateur use, the trick was to purchase sets from the disposals dealer which had coils and crystals for the 80 metre band. This was realised by the dealer fraternity and, of course, the price went up for those sets. The other way was to be lucky enough to purchase the boxes of complete coil and crystal sets. These, however, were not all that plentiful and commanded an appropriate price. Batteries were still available on special order through a well-known dry battery company, up until the early 1960s. It would be a real challenge to construct a 103.5 volt 'B' battery these days!

When viewed in the context of 1941 technology, the BC-611 can only be regarded as an ingenious device and a very successful exercise in miniaturisation. When one contemplates the abundance of hand-held amateur, CB and commercial transceivers available today, I can only wonder if the Galvin Corporation realised what they were starting!

It is interesting to note that after the war the Galvin Company became the well-known Motorola organisation.



Circuit diagram of the BC-611(F).



Receiver/Transmitter BC-611(F) Chassis.

Computer Control of Aerial Rotators with IBM-PC Type Computers

David Hryckiewicz VK2ZDE
&
Ken Watson VK2TKW

Computers take the strain out of tracking satellites.

A number of years ago, I became addicted to the more unusual side of amateur radio — that of tracking space-craft and satellites. I soon discovered that the average amateur would require at least three pairs of hands to operate aerial control boxes, uplink and downlink transceiver controls and the microphone push-to-talk, etc.

Everything was relatively easy with satellites like OSCAR-10, but it was a different matter when trying to work the fast-moving satellites like RS, UO9, UO11 and OSCAR-12.

Many hours were spent searching through many back-issues of Australian and overseas magazines for projects that would make tracking satellites much easier. I frequently wished I could make use of one of the computers in the shack for controlling the satellite aerial tracking system. As I listened to the Sunday weekly AMSAT-Australia broadcast on 80 metres I heard Graham VK5AGR, mention that he had received an article written by Geoff VK2ZAZ, called *Antenna Controller*. I immediately contacted AMSAT-Australia and received a copy of the article. Upon reading the article I realised that this was the project I had been searching for.

My satellite antennas were already controlled by KR400 and KR500 rotators, and these were the type of rotators mentioned in the article. The only problem was that the software required to control the interface was not suitable for an IBM-PC type of computer, but was compatible with a KAYPRO 4/84 or similar structured Z80 machine. After wondering how to solve the problem of converting the program to run from an 8-bit machine to a 16-bit machine, I decide to consult a local computer wizard, Ken VK2TKW.

After many weeks of badgering Ken, he finally created a miracle and assured me that if I built up the computer interface my problems would be solved.

Finally the big moment arrived, software and hardware were merged producing very good results. After a few teething problems hardware and software wise, the simple program Ken had rewritten to test the controller were finally working perfectly.

For some time I had been using a satellite tracking program written by R D Welch W0SL, obtained from AMSAT-Australia. The features of this program allows the tracking of up to 20 satellites. Eight satellites can be visually tracked on the map in real-time output on a colour map of the world. Whilst tracking these satellites, data for each satellite, such as azimuth, elevation, range, height, etc, is shown on the screen.

I once again approached Ken to see if he could modify this program to incorporate the ability to select a satellite from real-time mode and have the antenna controller software control the satellite tracking aerials whilst viewing where the satellite is on the word map in real-time. He once again delivered, to my surprise. This program is user friendly and has been given a thorough workout and has proved faultless.

The software has been donated to AMSAT-Australia so that funds can be raised to assist the launching of future amateur satellites. A copy of the program can be obtained by writing to AMSAT-AUstralia, GPO Box 1234, Adelaide, SA. 5001 or by phoning (08) 297 5104.

For those not wishing to make their own circuit boards, Rudy VK2FIM, can supply the boards at a reasonable cost. He may be contacted at (049) 43 7548 or by writing to 1-6 Ida Street, Charlestown, NSW. 2290.

This idea could be interfaced to a data base program which contains other amateur station bearings. This would allow the operator to enter the call sign of the the other station and the antenna would automatically position to the bearing.

WHAT ROUTINE 1 ACTUALLY DOES

The commands for Azimuth or Elevation A/D check is poked from BASIC prior to calling this routine, into 9000 hex. The A/D value returned by this routine is stored in location 9001 hex. BASIC will peek this location at the completion of the conversion.

The actual routine starts at 9002 hex. On entry to this routine the counter is set to zero by clearing location "value." The ramp generator is turned off and any existing rotator commands are preserved by clearing only the most significant bits of location "Command." Next the ramp is turned on and the appropriate command issued to the rotator by storing it in the output port data register.

The "Busy" input to the centronics port is then tested, if this line is inactive then the counter is incremented at location "Value." The program loops back to once again test the "Busy" line, unless the count equals 255, in which case the routine will return to BASIC. When the "Busy" line is active indicating the ramp voltage = input voltage, the ramp is turned off and the routine return to BASIC with the count in location "Value."

ANALOGUE TO DIGITAL CONVERSION

The A/D converter may be divided into two parts; a ramp generator and the comparator. The ramp generator consists of TR1, TR2 and their associated components. TR1 is a switch that is controlled from the computer via D4, D5 and the 74LS03 gates IC2c/d TR2 and R1-3

ROUTINE 1.

```
Program....8080/8086 A/D routine converted by KEN VK2TKW.

Date.......26-Nov-86

Convertion of original article from AMSAT AUST by GEOFF VK2ZAZ.

          TITLE  ADC
CODE      SEGMENT
          ASSUME CS:CODE,DS:CODE
          ORG    9000H
COMAND    DB     01H                ;Az/El mask
VALUE     DB     01H                ;A/D count returned
START     PROC   FAR
          MOV    DX,0378H
          MOV    AL,[COMAND]
          AND    AL,0FH
          OUT    DX,AL              ;turn A/D off
          MOV    AL,00H
          MOV    [VALUE],AL         ;zero counter
          MOV    AL,[COMAND]
          OUT    DX,AL              ;turn A/D on
LOOP:     INC    DX
          IN     AL,DX
          DEC    DX
          TEST   AL,080H            ;test busy line
          JNZ    STOP               ;exit if active
          MOV    AL,[VALUE]
          INC    AL                 ;increment counter
          MOV    [VALUE],AL
          CMP    AL,0FFH
          JNE    LOOP               ;if >< 255 then repeat
STOP:     MOV    AL,[COMAND]
          AND    AL,0FH
          OUT    DX,AL              ;turn A/D off
          RET                       ;return to basic
START     ENDP
CODE      ENDS
          END
```

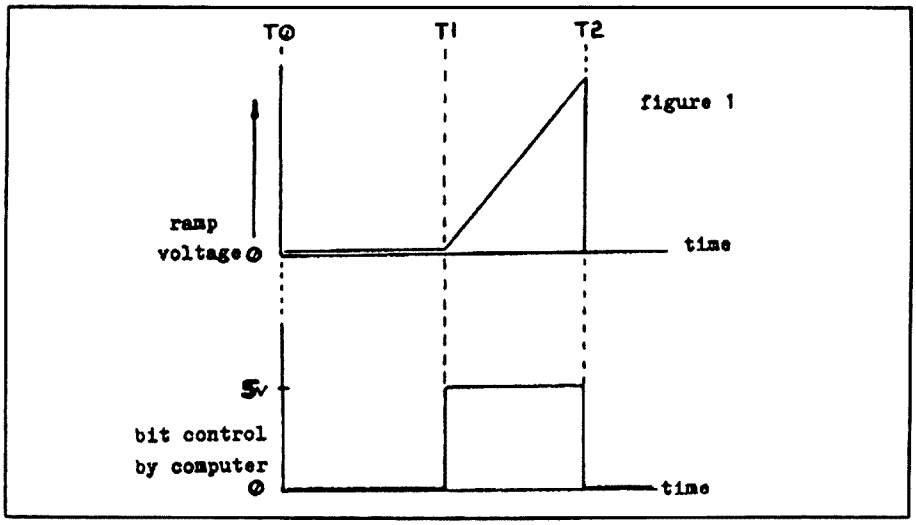


Figure 1.

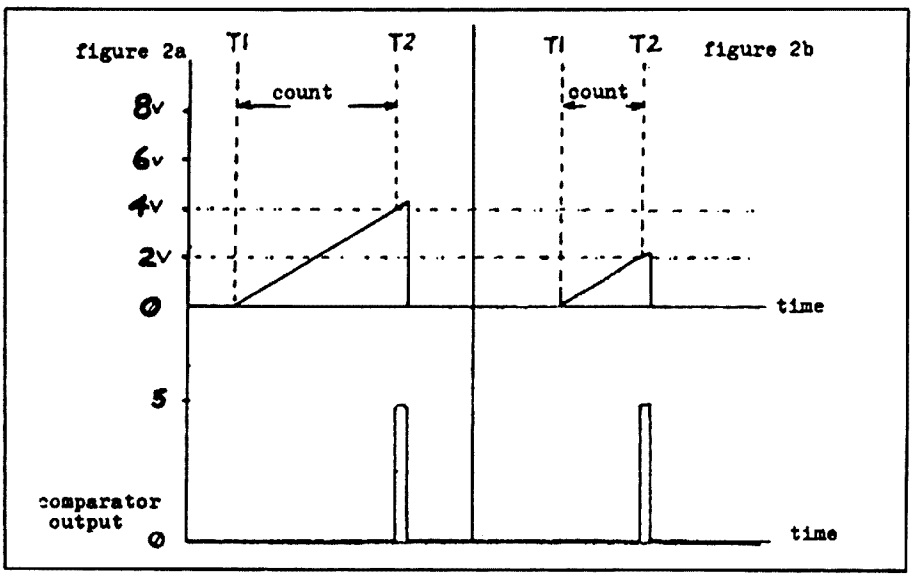


Figure 2.

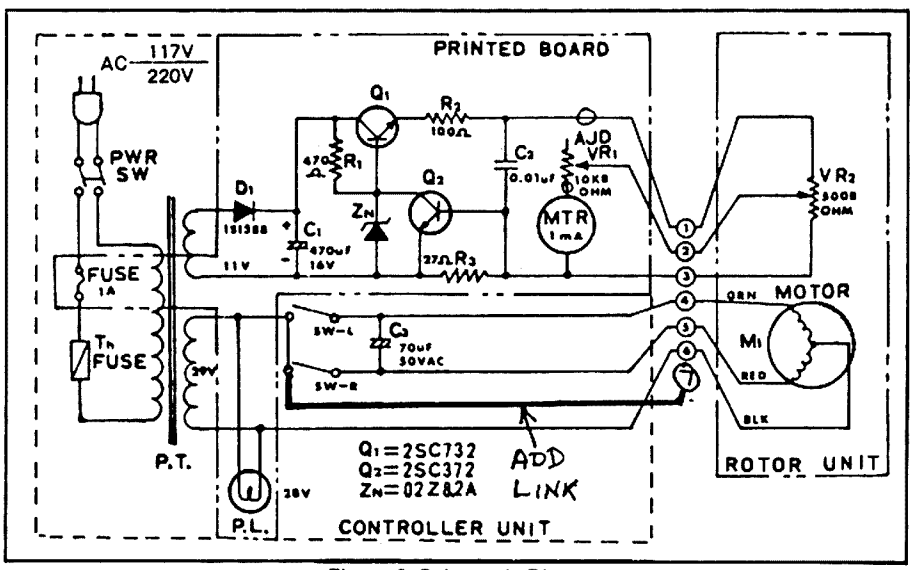


Figure 8: Schematic Diagram.

form a constant current source. This source attempts to change C1. With reference to Figure 1, at T0 the switch was closed acting as a short across C1. At T1 the computer "opened" the switch by placing a HIGH on D4 or D5 and thus a LOW on the base of TR1. The constant current source then began to charge C1 at a linear rate, producing a ramp. At T2 the computer "closed" the switch by pulling D4 or D5 LOW and thus a HIGH on the base of TR1.

R18 supplies the base current to TR1 as the 74LS03 is an open collector gate to allow for the "WIRED OR" configuration of IC2c/d. If the voltage on the plus input is greater than the voltage on the minus input of IC1 (LM339), then the output will be HIGH. If the voltages on the input were minus input higher than plus input then the output would be LOW. To convert the analogue input to a digital output the analogue input is applied to the minus input and the ramp is applied to the plus input. The computer records the time interval between the closure of the switch (TR1) and the transition of the output of the comparator.

The variable resistor R1 adjusts the charge rate of C1, ie the slope of the ramp. This is demonstrated in Figure 2a, where at T1 the computer "opened" the switch and commenced the counter. At T2 the ramp voltage equals the voltage from the rotator, in this case four volts being the equivalent of 90 degrees elevation or north Azimuth. You will notice at T2 that output of the comparator swings HIGH and then the software turns the ramp off.

The example in Figure 2b is for an elevation of 45 degrees or a west Azimuth, you will see quite clearly the difference in time and subsequent length of count. NAND gates IC2 a/b are used to differentiate between the Azimuth and Elevation outputs. A HIGH on either D4 or D5 will allow the logical output of the respective comparator to be passed to the BUSY input of the Centronics port. At the same time the HIGH on D4 or D5 will turn on the ramp via gates IC2c/d. Obviously D4 and D5 should not be allowed to both be HIGH at the same time if you wish to select between Azimuth and Elevation. R7 and R18 are required as IC2 comprises of open collector gates and incapable of supplying a high without passive pull-up. R19 and R20 lower the voltage of the Azimuth rotator signal in order that R1 may adjust for any minor difference between the voltages of Azimuth and Elevator.

ROTATOR CONTROL

The rotators are controlled by a TRIAC wired in parallel with the direction switches. The TRIACs are isolated from the computer via low current opto-coupled triac devices IC4-7. Each opto-triac has a LED wired in series via switch 1 to indicate the ON state. The purpose of switch 1 is to disconnect power from the opto-triacs to allow manual operation of the rotators without having to disconnect the controller board. A pair of NAND gates IC3 (74LS00) are wired in both the Elevator and Azimuth control lads from the computer D0-3, to prevent any rotator being commanded to operate in both directions at the same time, could be very nasty! The reason for using TRIACs in lieu of relays is to eliminate noise generator by arcing of contacts etc.

KENPRO KR-400 AND KR-500 ROTATOR MODIFICATION

Modifications tc each Kenpro rotator is very minimal and consist of just one wire connected from the common of the direction switches to terminal seven (spare). Geoff and I actually mounted a five-pin DIN socket on the back (top right) of each control box and wired in parallel with the terminal block, for connection to the controller board which also has two DIN sockets mounted on the back panel. (See Figure 8.)

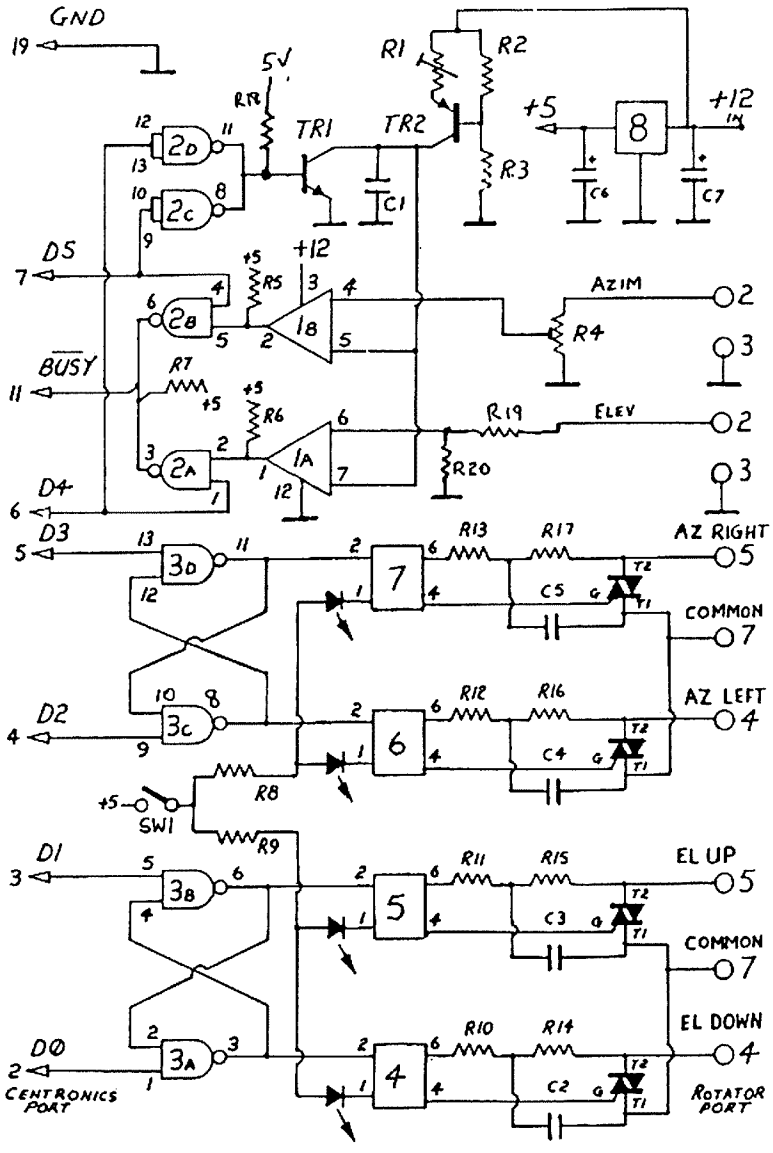


Figure 3.

NOTES

The interface requires a well regulated power supply of approximately 12 volts, the five volts is derived onboard by a 7805 regulator. Current consumption is less than 100 mA, so you could probably 'steal' it from the computer and feed it via a spare pin on the Centronics port. In my case I used a separate power supply. WARNING (well sort of!), because the analogue portion of the controller is not actually isolated from the external rotator unit ensure you disconnect the controller from the rotators during storms. This could also be isolated but not considered worth the required effort. If you wish to receive Telemetry, etc, on the same computer your tracking system is using then you will require more sophisticated software. With IBM units and their clones, there is a few multitasking programs which will allow you to run one program in foreground and the other (or, in fact, a number of programs) as background. Multilink is just one which comes to mind. Geoff has a program for Z80 based computers which will perform a similar task for that series.

FURTHER IDEAS

This idea could also be interfaced to a data base program which contains other amateur station bearings. This would allow you to enter the call sign of the party you want to contact and the antenna would automatically position to the bearing. If you do not require the use of the Elevation control then delete lines 40330, 40420-40540. The set-up adjustment differs in that you set R4 to maximum (fully clockwise) and adjust R1 for correct Azimuth reading of 128.

FURTHER NOTES

The software for this controller project could be modified to be used with other computers such as the TRS-80, System-80, Commodore, Apple, VZ200 and VZ300, Kaypro, etc.

BASIC PROGRAM AND SET-UP

The following BASIC program can be used as "stand alone" or included in your existing "ORBIT" type BASIC program as a subroutine. To use the program by itself to align the A/D converter and test the rotator controls, proceed as follows.

1. Turn SW1 OFF to remove power to the triacs.
2. Manually rotate the ELEVATION to 90 degrees (vertical).
3. Manually rotate the AZIMUTH to 0 degrees (north).
4. Run the BASIC program and input 45 degrees for Elevations and 90 degrees for the Azimuth. The program should now be displaying a count of between 0 and 255 for Elevation. Adjust R1 to give a count of 128. Turn on SW1 and the Elevation rotator should adjust itself to 45 degrees.
5. Turn SW1 off again and hit <RETURN> to proceed to Azimuth adjustment, which is carried out in the same way as for Elevation using the count of 128 and adjusting R4 this time. When you turn SW1 on the Azimuth should rotate to 90 degrees (east).
6. At the completion of the adjustment leave SW1 on and try several positions throughout the range of the rotators to check for linearity of tracking. Tweak R1 and R4 if required for best compromise (you should not have to alter them very much — if at all).

Prior to including this routine as a subroutine into your existing BASIC program, remove lines: 40300-40360, 40490, 40540, 40590.
NOTE: The machine code data and pokes in lines 40230, 40240, 40250 will have to suit your particular computer.

PARTS LIST FOR COMPUTER ANTENNA CONTROLLER

IC1	LM339	Quad Comparator
IC2	7LLS03	NAND Gate (open collector)
IC3	74LS00	NAND Gate
IC4-7	3010 or MOC3021	Opto-triac (Tandy or Dick Smith)
IC8	7805	5+ Volt Regulator
TR1	BC108	NPN Transistor
TR2	BC178	PNP Transistor
D1-5	ESBR5501	High Intensity LEDs (Dick Smith)
SCR1-4	SC141D	Triac
C1-5	0.1 uF	Capacitor (Greencap)
C6-7	1.0 uF	Capacitor (Tag Tantalum)
R19	22 kohm	Resistor
R1	50 kohm	10 turn Vertical Mount Trimpot
R2	10 kohm	Resistor
R3	100 kohm	Resistor
R4	50 kohm	10 turn Vertical Mount Trimpot
R5, 6, 14, 15, 16, 17	1.2 kohm	Resistor
R7, 18	4.7 kohm	Resistor
R8,9	470 ohm	Resistor
R10, 11, 12, 13	180 ohm	Resistor
R20	47 kohm	Resistor
R21	560 ohm	Resistor
SW1, 2	SPDT	Switch
1	H-3490	Heatsink (Dick Smith)
2	H-1700	Fuse-clips (Dick Smith)
1	2 amp	Fuse
1	H-2505	Case (Dick Smith)
Misc		Centronics Plug, DIN Connectors, etc

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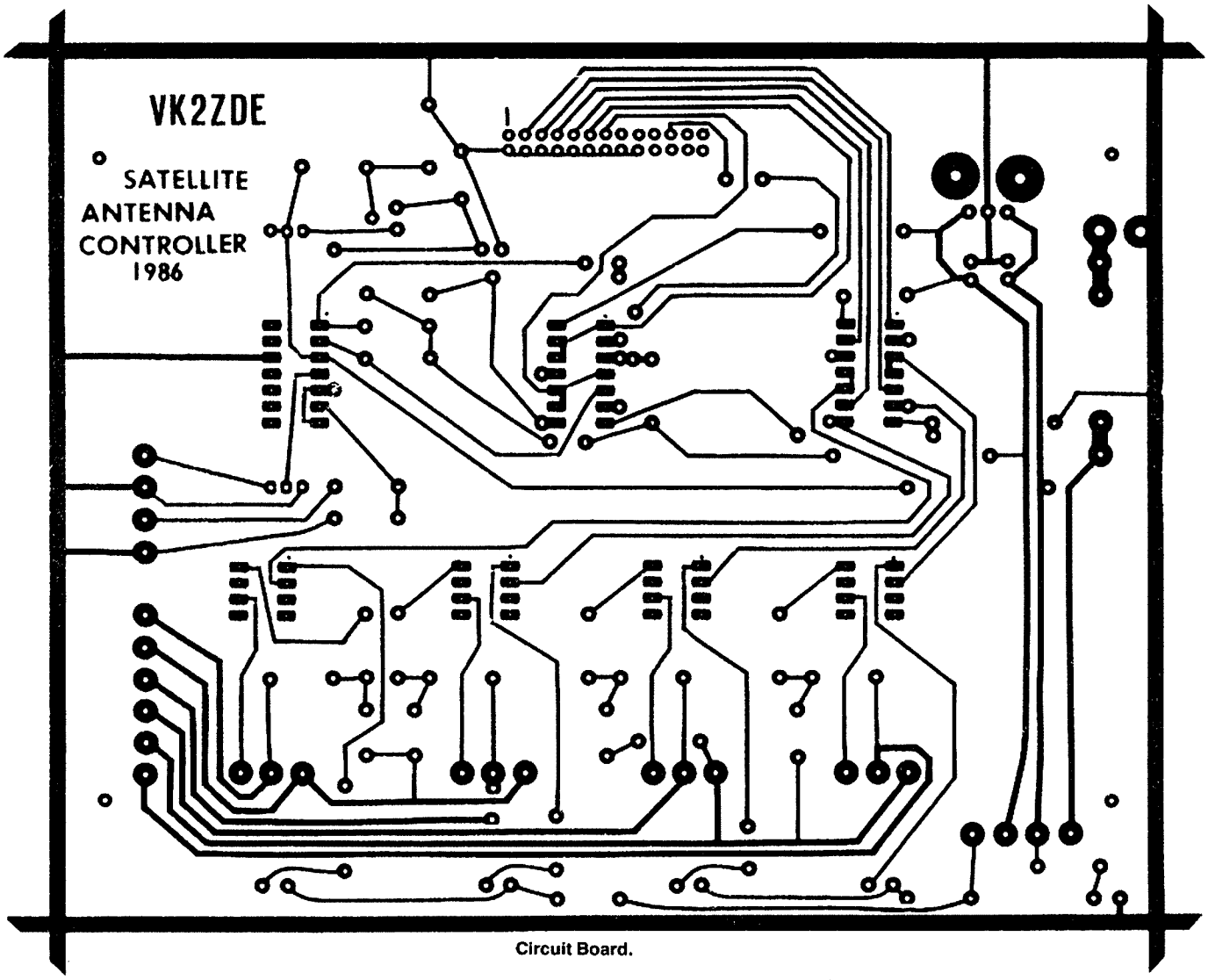
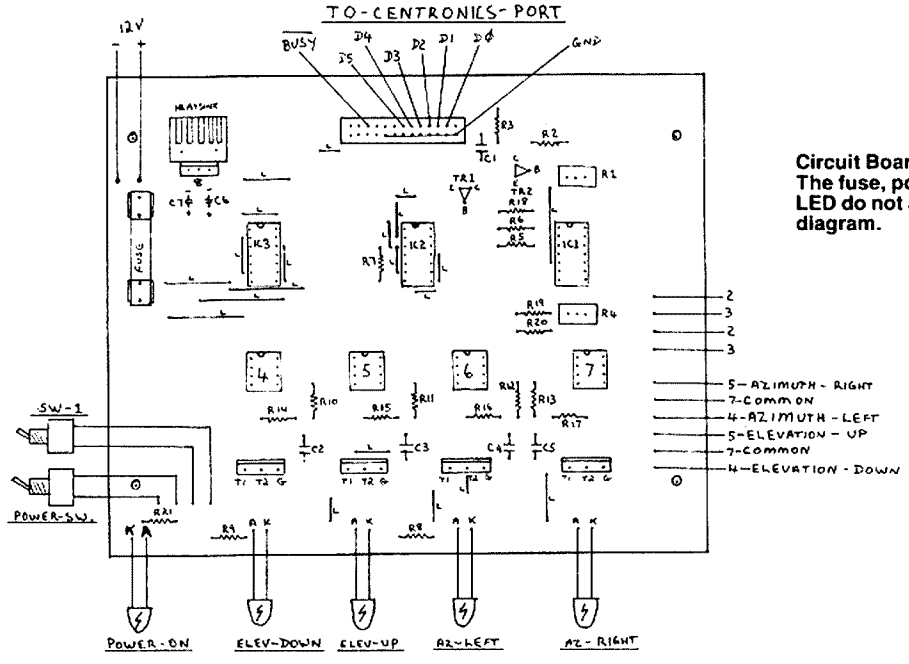


Circuit Board.



Circuit Board Layout.
The fuse, power switch R21 and "power on" LED do not appear on the schematic diagram.

```
40000 'PROGRAM ..... SUBROUTINE FOR ORBIT TO ACCESS A/D
40010 'DATE ........ 09-NOV-86
40020 'UPDATE ...... 26-NOV-86 to suit IBM style computers
40021 '
40030 'NOTES:
40040 '
40050 '              THIS PROGRAM IS  CALLED VIA GOSUB FROM ORBIT TYPE PROGRAM
40060 '              ON ENTRY TO THIS PROGRAM E = ELEVATION IN DEGREES 0 - 180
40070 '              ON ENTRY TO THIS PROGRAM A = AZIMUTH IN DEGREES   0 - 360
40080 '
40090 '
40100 '                              VARIABLES USED BY THIS PROGRAM
40110 '                      A = AZIMUTH (0 - 360)      E = ELEVATION (0 - 180)
40120 '                     AL = AZIMUTH LEFT          AR = AZIMUTH RIGHT
40130 '                     ED = ELEVATION DOWN        EU = ELEVATION UP
40140 '                     AC = AZIMUTH CHECK         EC = ELEVATION CHECK
40150 '                     CC = COUNTER, USED ONCE ONLY
40160 '
40170 '
40180 IF CC =1 THEN GOTO 40280 '                          NO NEED TO RE-INITIALISE
40185 DEF SEG
40190 COMMAND = &H9000 '                                COMMAND STORE IN A/D ROUTINE
40200 VALUE = &H9001 '                                LOCATION OF A/D CONVERSION VALUE
40210 DEF USR0 = &H9002 '                               USR SUBROUTINE IN HIGH MEMORY
40220 CC=1 '                                                  INDICATE INITIALISED
40230 FOR X=0 TO 45:READ Y:POKE &H9002+X,Y:NEXT X:GOTO 40260
40240 DATA 186,120,03,160,0,144,36,15,238,176,0,162,1,144,160,0,144,238
40245 DATA 66,236,74,168,128,117,12,160,1,144,254,192,162,1,144,60,255
40250 DATA 117,237,160,0,144,36,15,238,203,254,255
40260 EC=16:ED=1+EC:EU=2+EC '                          PRINTER PORT BITS FOR ELEVATION
40270 AC=32:AL=4+AC:AR=8+AC '                          PRINTER PORT BITS FOR AZIMUTH
40280 '                  INITIALISATION COMPLETED
40290 '
40300 '     ### THE NEXT 4 LINES ARE FOR TESTING PURPOSES ###
40310 '          REMOVE THEM AFTER TESTING COMPLETED.
40320 '-------------------------------------------------------
40330 INPUT "ELEVATION      (0 - 180) " ;E '                  I
40340 INPUT "AZIMUTH        (0 - 360) " ;A '                  I
40350 GOSUB 40390 '                                           I
40360 GOTO 40330 '                                            I
40370 '-------------------------------------------------------
40380 '
40390 IF A > 180 THEN A=A-180:GOTO 40410 '181 DEGREES IS ACTUALLY 1 ON ROTATOR
40400 IF A =< 180 THEN A=A+180 '             1 DEGREE IS ACTUALLY 180 ON ROTATOR
40401 IF E < 2 THEN E=1'                                 LIMIT ELEVATION TO 1 DEGREE
40402 IF E > 178 THEN E=179'                           LIMIT ELEVATION TO 179 DEGREES
40410 A = CINT (A*256/360) '                        CONVERT 0 - 360 DEGREES TO 0 - 255
40420 E = CINT (E*2*256/360) '                      CONVERT 0 - 180 DEGREES TO 0 - 255
40430 '
40440 '
40450 '                       ELEVATION ROUTINE
40460 POKE COMMAND,EC '                                  CHECK A/D WITH ROTATORS OFF
40470 X=USR0(Y) '                                                CALL A/D ROUTINE
40480 X=PEEK(VALUE)       '                                      GET A/D READING
40490 PRINT "EL COUNT =     ";X '                      ### REMOVE AFTER TESTING ###
40500 IF E < X THEN POKE COMMAND, ED '                COMMAND ELEVATION ROTATOR DOWN
40510 IF E > X THEN POKE COMMAND, EU '                  COMMAND ELEVATION ROTATOR UP
40520 IF E <> X THEN 40470
40530 POKE COMMAND,0:X=USR0(Y) '                                 TURN OFF THE ROTATORS
40540 INPUT " HIT RETURN TO CONTINUE ";XS '               ### REMOVE AFTER TEST ###
40550 '                      AZIMUTH ROUTINE
40560 POKE COMMAND,AC
40570 X=USR0(Y)
40580 X=PEEK(VALUE)
40590 PRINT "AZ COUNT =    ";X '                          ### REMOVE AFTER TESTING ###
40600 IF A < X THEN POKE COMMAND,AL
40610 IF A > X THEN POKE COMMAND,AR
40620 IF A <> X THEN 40570
40630 POKE COMMAND,0 '                                           TURN OFF THE ROTATORS
40648 X=USR0(Y)
40650 RETURN '       AT THIS POINT BOTH THE ELEVATION AND AZIMUTH ARE ON TRACK.
```

QSP

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NEW MINISTER FOR COMMUNICATIONS

Senator Gareth Evans

Senator Gareth Evans is the Minister for Transport and Communications in the third Hawke Government, elected in July 1987.

He was Attorney-General in the first Hawke Government, from March 1983 to December 1984, and Minister for Resources and Energy (and Minister Assisting both the Prime Minister and Foreign Minister) in the second Hawke Government, from December 1984 to July 1987.

He had been Deputy Leader of the Government and Manager of Government Business in the Senate since February 1987.

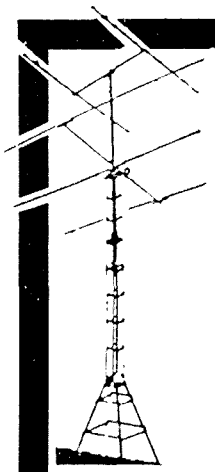
Aged 42. Gareth Evans has First Class Honours degrees in Law from Melbourne University, and in Politics, Philosophy and Economics from Oxford University, and became a Queens Counsel in 1983.

Before entering the Australian Parliament as a Senator for Victoria in 1978, he was a barrister specialising in industrial law, and before that, an academic lawyer at Melbourne University specialising in constitutional and civil liberties law.

He has written or edited six books, and has numerous published articles, on legal and constitutional reform and Labor Politics.

Senator Evan's main policy interests outside his portfolio are foreign affairs, law reform and public administration.

He is married with two young children to Dr Merran Evans, who lectures in econometrics at Monash University.



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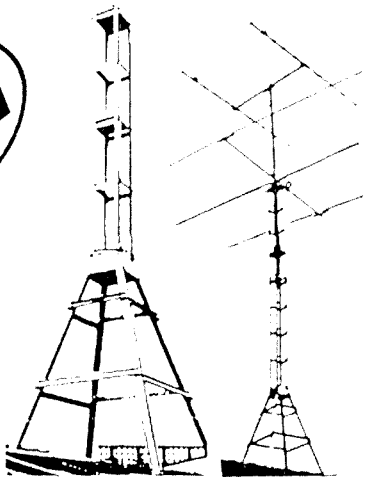

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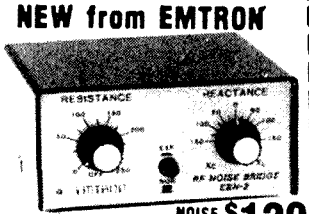

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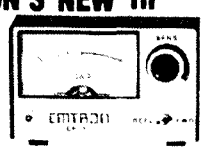

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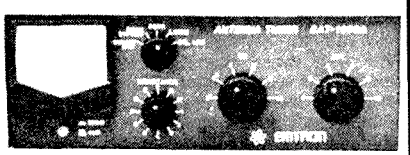

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MODULE E

Two Watt Two Metre Power Stage

In describing Module E, the two watt linear amplifier stage reference will be made to setting up the transmit converter and the switching arrangements.

Throughout this project so far emphasis has been placed on high levels of performance which is easy to duplicate. The two watt power amplifier is no exception, the circuit arrangement is classic, prototypes work every time, is economical and performs well.

In fact only the choice of transistor is unusual. The device is a Motorola MRF262 or New Tone Electronics NTE342. Packaged in a TO-220 flat plastic package, this device is rugged, easy to mount and economical. Bias for the transistor is provided by the combination of E1R1 and E1D1. Diode E1D1 must be in thermal contact with the transistor case when everything is mounted on the heat-sink, leave ED1 as the last component to go on and put a small blob of silicone thermal compound on top of the transistor and then push the diode into it for good thermal coupling.

Following the power amplifier stage proper is provision for a two section low pass filter, this can be included to ensure that harmonic output is reduced to a minimum when the PA is being used on its own. In the first instance the filter components should not be fitted, a bridge of tinned copper wire approximately 5 mm above the PCB should be soldered between the point where the upper end of L20 is shown to where the right hand end of L21 is shown. Once the initial alignment is complete, then the filter components can be fitted and adjusted for best output.

The last feature provided is a forward power output sensor. Module 1DC1 is a hybrid directional coupler in a package the same as the SBL-1 mixers used elsewhere. Rated for a maximum of three watts from 5 MHz to 500 MHz, this coupler is ideal for monitoring the output of the amplifier and later for use in an ALC setup if desired. The ALC output terminal on top edge of the board can be used as a tune-up power indicator if the output is terminated in a 50 ohm load.

If you do not have a 50 ohm load suitable for two metres then one can be built very simply with two 100 ohm, two watt metal oxide resistors on parallel. These are obtainable from Stewart Electronics in Melbourne and are known as type RA02-100 ohm.

CONSTRUCTION

These notes on the layout drawing should be followed carefully. All leads should be kept as short as possible. Whilst no heat-sink is specified for E1Q1, one will definitely be necessary. A suitably machined piece of aluminum will be available with the kit versions from the Frankston and Mornington Peninsula Amateur Radio Club. (Refer for complete address at the end of this article).

The heat-sink is mounted under the PCB and the two 4-40 screws supplied are used to hold the heat-sink in place, one through the transistor mounting hole and one in line with that on the bottom edge of the board. A nylon washer should be used under the head of the latter screw.

You will notice when looking at the lay-out drawings that each RF connection point has four extra holes around it. This allows for the use of SMB/SMC coaxial connectors on all RF lines. Pre-assembled cables and the appropriate sockets will be available from the club supplying the kits. Please request the special list of cables and connectors from them.

Despite the fact that there may seem to be an inordinate number of ground plane pin throughs marked on the layout drawing, it is a good VHF practice to ensure that the two ground plane sections are well connected. To ensure optimum performance, take the time to install all of them carefully.

ALIGNMENT

Connect the output of the amplifier to a dummy load rated for at least two watts. Set E1C1 and E1C8 to approximately mid point. Turn on the power and apply some drive, say 100 mW. Now adjust both trimmers for maximum drive.

SWITCHING

On the end of the receive converter board is provision for a relay to switch the IF signals and the power supply for these four modules. The pin labeled +12V Perm on the PA schematic should be connected to the 12V DC input on the LO module, likewise terminal PTT on the PA board should be connected to the same pin on the LO module. Module E1 is provided with a relay to switch the antenna side if needed. Schematic drawings of several possible connections are shown.

TRANSMIT IF ATTENUATORS

As mentioned in Part Two of this series, if your exciter puts out in excess of -10 dBm (100 uW), you will need to put an attenuator in the transmit converter input. The following tables of attenuator values show the values required for a variety of attenuators.

ATTENUATOR DESIGN TABLES AND SCHEMATICS

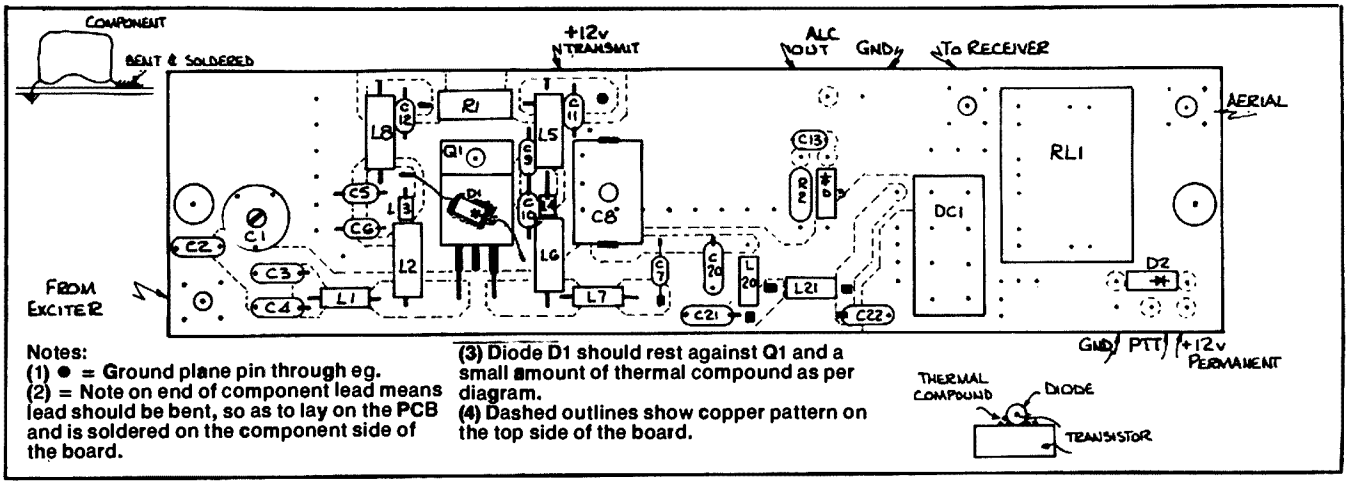
Table of Attenuator Values

This first attenuator table (Table 1) gives the calculated values for a range of attenuators and then the closest one percent resistor value readily available for constructing your attenuator.

Desired Attenuation	Calculated Value				Closest 1 percent value			
	R1	R2	R3	R4	R1	R2	R3	R4
1dB	2.9	433.3	5.8	869.5	3.00	430.0	5.6	866.0
2dB	5.7	215.2	11.6	436.2	5.62	215.0	11.0	432.0
3dB	8.5	141.9	17.6	292.4	8.45	143.0	174	294.0
4dB	11.3	104.8	23.8	221.0	11.0	105.0	23.7	221.0
5dB	14.0	82.2	304	178.5	14.0	82.5	30.1	178.0
6dB	16.6	66.9	374	150.5	16.5	66.5	374	150.0
7dB	19.1	55.8	44.8	130.7	19.1	56.0	45.3	130.0
8dB	21.5	47.3	52.8	116.1	21.5	47.5	52.3	115.0
9dB	23.8	40.6	61.6	105.0	23.7	40.2	62.0	105.0
10dB	26.0	35.1	71.2	96.2	26.1	34.8	71.5	95.3
20dB	40.9	10.1	247.5	61.1	41.2	10.0	249.0	62.0

Table derived in part from *The UHF Compendium* K Weiner DJ9HO, Verlag Rudolf Schmidt 1982. Available from WIA Magpubs.

Whilst the above table gives one percent values these are only readily available in 250 mW ratings. High performance one watt and two watt metal oxide resistors are readily available and can be used in conjunction with lower power attenuators to achieve the desired result. The following table gives the five



Notes:
(1) ● = Ground plane pin through eg.
(2) = Note on end of component lead means lead should be bent, so as to lay on the PCB and is soldered on the component side of the board.
(3) Diode D1 should rest against Q1 and a small amount of thermal compound as per diagram.
(4) Dashed outlines show copper pattern on the top side of the board.

percent preferred values for attenuators using these resistors.

Desired Atten	Closest 5 percent Value R1	R2	R3	R4
3dB	8.2	150	18	300
6dB	16.0	68	36	150
10dB	27.0	36	68	100

Inspection of the schematic above will reveal that the attenuator can be realised in two sections, the first, A2R20, A2R21, A2R22 is a pi section and the second, A2R23, A2R24, A2R25 is a 'T' section. Given the values in the table above one can then use various combinations to achieve the desired power level and attenuation values.

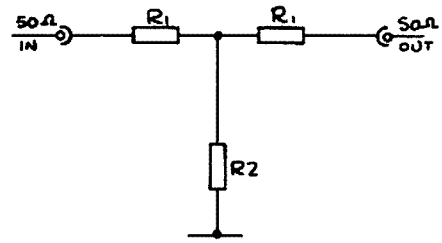
CONCLUSION

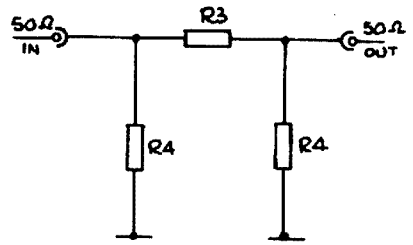
Technical Editor's Note: The drawings and layout guides should be easy to follow, if you have trouble please contact the writer, by mail, enclosing a stamped self addressed envelope. The author regrets that he cannot answer telephone queries due to business commitments, though his call can be often heard on the Melbourne VK3REC repeater (147.175 MHz +600 kHz) and written requests will be attended to in turn.

PARTS LIST — MODULE E: Sub-assembly 1 — TWO-WATT AMPLIFIER

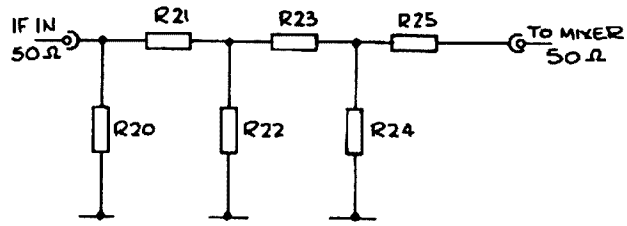
E1C1	40pF	Foil trimmer
E1C2	24pF	Dipped Mica
E1C3	30pF	Dipped Mica
E1C4	30pF	Dipped Mica
E1C5	1nF	Ceramic plate
E1C6	100nF	Monolithic Ceramic
E1C7	24pF	Dipped Mica
E1C8	40pF	Arco compression mica trimmer
E1C9	10nF	Ceramic
E1C10	100nF	Monolithic Ceramic
E1C11	10uF	25V Tantalum
E1C12	100nF	Monolithic Ceramic
E1C13	100nF	Monolithic Ceramic
E1C20	22pF	'Unelco' mica capacitor
E1C21	60pF	Teflon trimmer
E1C22	22pF	'Unelco' mica capacitor
E1D1	1N4001	or 1N4002 rectifier diode
E1D2	1N4002	or 1N4002 rectifier diode
E1D3		5082-2800 Schottky rectifier
E1DC1		PDC-10-1 Mini Circuits direction coupler
E1L1		2T 6mm ID 16SWG enamelled copper 5 mm long
E1L2	1.5uH	Moulded RFC
E1L3	FC540	Amidon ferrite bead on lead of L2
E1L4	FC540	Amidon ferrite bead on lead of L2
E1L5	FC97	44312-020-36630 Philips choke
E1L6	1.5uH	Moulded RFC
E1L7		2T 6mm ID 16SWG enamelled copper 5mm long
E1L20		3T 6mm ID 16SWG enamelled copper close wound
E1L21		3T 6mm ID 16SWG enamelled copper close wound
E1Q1	MRF262	or NTE340 RF Power transistor
E1R1	33R	2W Metal oxide 10% resistor
E1RL1	RG-1-12V	Relay

Attenuator design tables and schematics

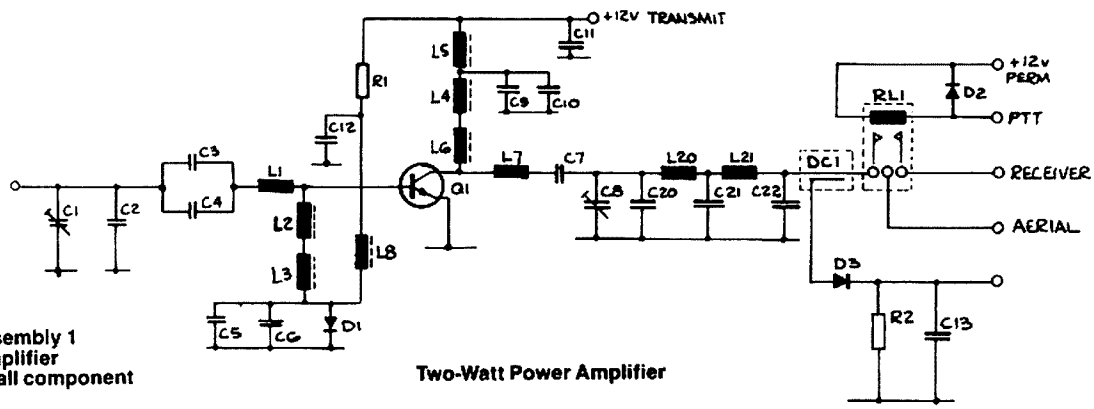




Schematics for attenuator tables



Transmit converter Input attenuation



Module E Sub-Assembly 1
2 Metre 2 Watt Amplifier
Note: E1 prefixes all component designations

Two-Watt Power Amplifier

A DIRECT READING CAPACITY METER

Ken Kimberley VK2PY
21 Nicoll Street, Lakemba, NSW. 2195

A full blown impedance bridge complete with *Bells and Whistles!*

A combination of deteriorating eyesight and a proliferation of different coding methods made it almost impossible for the author to decipher the value of the newer capacitor styles. Hence, some form of capacitance meter was needed.

Even though the writer is in a position to purchase something suitable, it goes against the grain to do so! Particularly after spending almost a lifetime in the instrument business. Besides, many other goodies could be purchased with the cash saved.

It therefore appeared that the *Murphy bit* would have to be endured again in order to design and construct something suitable. No, blow the pride, let us build to a published design because my so-called little jobs seem to escalate into major projects. Sometimes they go on for over a year, or so, and frankly we don't have too many left!

Out with a great pile of accumulated magazines, new and old. What would it be? A full blown impedance bridge complete with "Bells and Whistles." Such features include variable frequency and voltage excitation, tuned detectors, polarising potential, loss factor dials, etc. All of these are fine for the *laboratory*, but not really necessary for average amateur use.

The rationale here is, that if "C" can be ascertained, then most other parameters may be had from the manufacturer's specifications, etc.

Sure, this may appear to be the coward's way out, but sometimes it pays to use the KISS (Keep It Simple Stupid) method. Accordingly, a rather simple circuit was found in the October 1985 issue of *Practical Wireless*. This featured a "CR" type VCO, the output of which is applied to the Capacitor Under Test (CUT)) and the resulting current flow monitored by a moving coil meter.

Correct choice of frequency allows the original 0 to 100 (etc) markings to coincide with capacitance values (refer Table 1).

STATEMENT ONE

States that the current through a capacitor is directly proportional to its capacitance, given a fixed voltage and frequency.

STATEMENT TWO

Conversely, the current will also be directly proportional to the frequency providing that the "C" and applied "E" is constant.

MOCK UP

The concept seemed so unbelievably simple that it was decided to throw a "mock up" together. The junk box yielded the germanium diodes (not silicon) and the 1000 µF electrolytic. These were connected haywire fashion as per the dotted section of **Figure 1** with the station analogue multimeter serving as the detector. The 12 volt output level from the author's square wave generator (see AR, November 1986), was used as the excitation source.

Various capacitors were connected at "CX". Some made the pointer bang hard over and some did not move the meter. However, a few wondrously produced a scaleable reading which increased when some of the "non-reading" ones were added in parallel. Okay so far! Doubling the frequency increased the multimeter indication by two.

Apparently the basic idea was sound, and the measuring range could be varied by the applied frequency. In other words, it seemed "a goer."

CONSTRUCTION

Accordingly, an off-cut of one millimetre sheet bakelite was obtained and trimmed to 60 x 100 mm. This was then drilled so that it would mount neatly onto the back of the meter, being held by the terminal screws.

Next the few component parts required were obtained and placed onto a sheet of drawing paper. These were shuffled around until a neat and satisfactory layout was produced.

The next job is to transfer this to the bakelite, which is then drilled to take circuit pins, eyelets, etc (whatever takes your fancy) — the author chose to use a combination of the two. Circuit pins for those connections which may require changing; ie transistors, signal paths, adjust on test components, etc, whilst eyelets are good terminations for resistors, capacitors and wiring junctions, etc.

Neatly wire the components as per **Figure 1** then fix the board back onto the back of the meter, not forgetting to use lock washers under the nuts.

Now, obtain a suitable box and drill the necessary holes. Spray paint in your favourite colour. When dry, label the front panel with *Letraset*® or similar, and mount the hardware and meter. Run the remaining wiring, taking care to avoid unnecessary stray capacity around the "CX" circuitry, which would degrade the calibration on the lowest range.

COMMENT

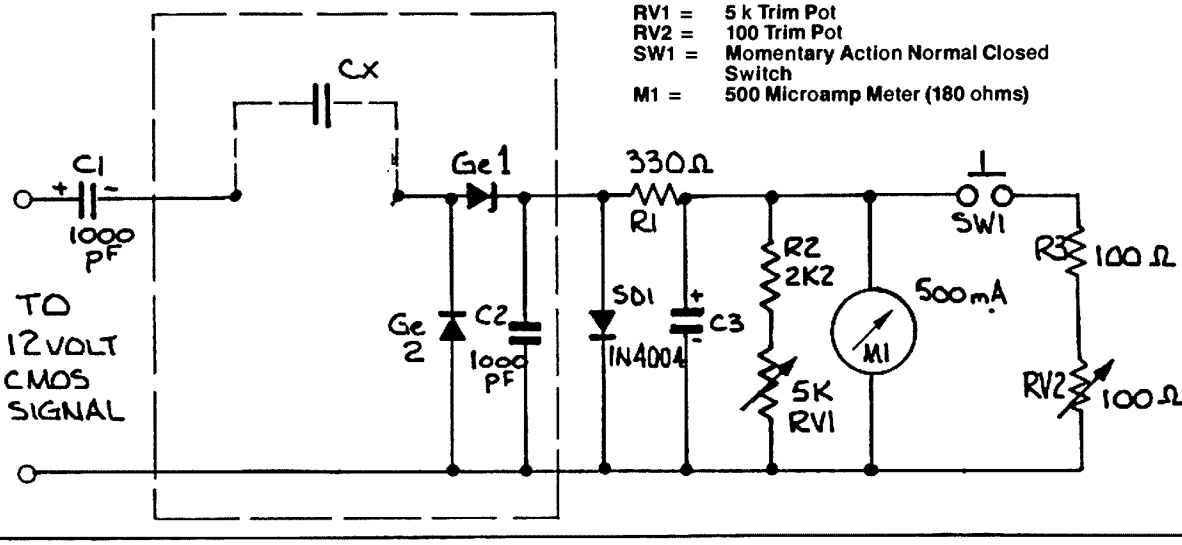
Your capacity meter is now ready for calibration; the construction was really a wet-day project, wasn't it!

NOTE that this accessory is entirely passive and as such does not require any power supply. The excitation requirement being a nine, or preferably 12 volt signal, the frequency of which should be adjustable in decade steps from 10 Hertz through to one megaHertz. The square wave generator mentioned earlier is an ideal source, the main attribute being that the crystal controlled switchable frequencies are precise and repeatable.

Figure 1: Circuit Diagram of Module.

C1 = 1000 µF 16 V Electrolytic
C2 = 1000 µF 6 V Electrolytic
C3 = Adjust on Test 1000 µF 6V Electrolytic

Ge1, Ge2 = Germanium Diodes
SD = Silicon Rectifier 1N4004 etc
R1 = 330 Ω Metal Film Resistor
R2 = 2.2 k Metal Film Resistor
R3 = 200 Metal Film Resistor
RV1 = 5 k Trim Pot
RV2 = 100 Trim Pot
SW1 = Momentary Action Normal Closed Switch
M1 = 500 Microamp Meter (180 ohms)



CALIBRATION REFERENCE

A capacitor of known value will be required for initial "set- up". Ideally it should be a 47 nF unit, however, an 0.47 or even 4.7 μF will be satisfactory. Three options are available to constructors —

1 Beg, borrow, buy or "otherwise obtain" a capacitor as above, having a stated tolerance of say $\pm$ one percent.
2 Obtain a "wider" tolerance unit and have it measured on a laboratory standard measuring instrument.
3 Educated "guess-work". More about this later.

SETTING UP PROCEDURE

This is quite simple and takes only a few minutes. It goes something like this —

a Plug "instrument under test" into the source.
b Connect the "reference C" across the "CX" terminals, assume the "CX" to be 47 nF. This makes for easier description.
c Set generator at one kiloHertz.
d With "SW1" depressed adjust "RV1" until the meter indicates 470 microamps; ie 94 percent of full scale deflection (FSD).
e Release "SW1" and adjust "RV2" until the meter reads 235 microamps (47 percent FSD).

Your capacitor measuring module is now ready for work on any range. Verify this if you wish, remember that a downwards frequency change of one decade will increase the range by a factor of 10 and vice- versa. See Table 1.

FREQUENCY	FSD
10 Hz	10 μF
100 Hz	1.0 μF
1.0 kHz	0.1 μF
10 kHz	10 nF
100 kHz	1.0 nF
1.0 MHz	100 pF

Table 1.

Of course other FSDs are available if required. Supposing the constructor prefers a full scale change of, say, two, then it will only require halving the frequency.

ie The application of 50 Hertz will result in a full scale reading when 2 μ F is presented to the instrument.

HELP! NO REFERENCE!

For those souls who cannot obtain the necessary "reference C" a little finessing will be required. Proceed as follows —

Obtain, say, six (the more the better) 47 nF capacitors is as many different types and manufacture as possible.
Number them for reference.
Connect sample "one" across the "CX" terminal.
With "SW1" operated adjust "RV1" as previously.
Record sample one as having an arbitrary value of 47 nF
Without moving "RV1" repeat step five for the remaining capacitors.
Study the recorded readings and establish the mean value.
The sample closest to the calculated mean value now becomes the "reference". Readjust "RV1" to give a reading of 47 nF for this sample.
Adjust "RV2" as previously explained.
It is recommended that this "reference" be kept against future use (or until something better is obtained). An ideal storage place would be inside the unit.

The rationale of this approach lies in that, hopefully, some of the 47 nF units will be high, whilst some will be low. Therefore some of the errors should cancel.

This method is the least recommended, but is better than nothing.

METER PROTECTION

The circuit as first envisaged had one minor flaw, in that short circuited or over range capacitors could be rather hard on the meter.

For those of you who are fortunate enough to have a well-damped instrument for this project, fine, life will be a little easier for the movement. However, it is recommended that the following protective measures be included anyway — after all, how much does one silicon rectifier and two electrolytics cost?

The functions of these components are explained below —

C1 1000 μF 16 volt Electrolytic Capacitor. The sole purpose of this component is to prevent a fairly heavy direct current flow down to "0" volts, which would occur if "CX" were to be short circuited. It is not really required in the module, but is certainly necessary in the free- standing unit to be described later. Hence, it is no great hardship to fit now.

C3 This is an "Adjust on Test" component and its purpose is to dampen the pointer so that it does not go *KLUNK* against the top stop on overloads. A bit of trial and error is required here. The idea is to arrive at a compromise between protection and pointer settling time. The author determined that his meter required a 1000 μF six volt electrolytic. It must be pointed out that, within reason, overloads of maybe up to around 1000 percent will not unduly overheat the coil. Usually it is the mechanical shock that does the real damage, hence the need for damping the meter response.

SD Almost any silicon rectifier will do here, however, if it must be purchased, a 1N4004 or similar, will do admirably. Its function is to limit the voltage across C2 caused by gross overload.

Refer Table 2.

2.0 μF RANGE		÷2 = 0.5 μF RANGE	
WITHOUT "SD1"	WITH "SD1"	WITHOUT "SD1"	WITH "SD1"
APPLIED "C"	RECOVERED "E"	APPLIED "C"	RECOVERED "E"
0.2 μF	92 mV	92 mV	0.1 μF	55.8 mV	55 mV
0.4 μF	180 mV	180 mV	0.2 μF	110 mV	110 mV
0.6 μF	266 mV	266 mV	0.3 μF	164 mV	163 mV
0.8 μF	350 mV	351 mV	0.4 μF	215 mV	214 mV
1.0 μF	0434 V*	0.428 V*	0.5 μF	266 mV*	265 mV*
2.0 μF	0.82 V	0.574 V	1.0 μF	0.515 V	0484 V
3.0 μF	1.18 V	0.611 V	1.5 μF	0.750 V	0.587 V
4.0 μF	1.49 V	0.631 V	2.0 μF	1.380 V	0.619 V
5.0 μF	1.70 V	0.645 V	4.0 μF	1.740 V	0.638 V
6.0 μF	1.99 V	0.655 V	5.0 μF	2.450* V	0.651* V
7.0 μF	2.25 V	0.663 V			
8.0 μF	2.44 V	0.689 V			
9.0 μF	2.607 V	0.674 V			
10.0 μF	2.752* V	0.678* V			

Table 2.

NOTE — a capacitor of 1.0 μF (on the 1 μF range) generates a potential of 0.0434 volts across C2, whilst 10.0 μF on the same setting produces 2.75 volts; ie a difference of about 640 percent.

Fitting the silicon diode reduces this to around 145 percent. In other words, a capacity over-range of 1000 percent overloads the meter by 45 percent. Quite an improvement isn't it?

The foregoing data clearly shows that meter M1 is well protected against accidental overloads in this module.

OPERATING INSTRUCTIONS

The operation of this device is quite simple and goes like this —

1 Set exciter frequency to 10 Hz.
2 Connect unknown capacitor across "CX" terminals.
3 If the meter indicator is below 10 percent of FSD adjust the frequency upwards in decade steps until meter provides a clear reading.
4 Sensitivity and accuracy may be doubled by pressing SW1.
CAUTION: **DO NOT** operate this control for readings above half scale.

The numerical reading so obtained represents the significant figures of the unknown capacitance value, and the multiplier factor may be obtained from **Table 1.**

The sheer simplicity of this device belies its performance and it was not long before a swag of nondescript capacitors had been checked. There were certainly some surprises among them.

Many thanks to my sister, Mrs B Brown, of Burrill Lake, for her excellent typing effort.

A LA CARTE

Readers are asked to take note of the dates (years not palms!).

YFs planning an evening dinners for their OMs as a group may be interested in this fascinating menu — a la carte — given below. It is taken from the *Wireless Weekly,* August 18, 1922, page 3.

"Among the most cherished possessions of Mr Phil Renshaw is a menu card of a farewell dinner tendered on November 20, 1911 by the Wireless Institute of New South Wales to Messrs W H Hannan and C Scandell, prior to their departure with the wireless section to the South Pole and Macquarie Island."

The card reads:

MENU (No Relays Allowed)

1. Hors D'Oeuvres (look out for 'pherics).
2. Croute au Caviare, Olive in transformer oil.
3. Macquarie Island Trout (caught with 1½ inch guy rope).
4. Suva Soup (so far got only by two members).
5. Tournedo de Boeuf Richelieu (CO, IMI, RU)
6. De Forest Turkey (really roast penguin).
7. High Potential Ham.
8. Shellaced Asparagus.
9. Converter Jellies Polar (Bamboo), Trifle and Cream.
10. 5 kW Cheese.
11. Singing Spark Cigarettes.
12. Electrolytic Wines — Helix, Hock, Condenser Claret, Silicon Chablis, Battery Beer, Aerial Waters, Terminal Coffee — in Leyden Jars to balance capacities. (Members must not overcharge their jars, otherwise they will get out of tune).

-Contributed by Alan Shawsmith VK4SS

VK7 MEMBERS PLEASE NOTE

In reference to page 4 of September's *Amateur Radio* Joe Gelston VK7JG, is no longer the VK7 Federal Councillor.

Peter Frith VK7PF, has assumed the role and consequently all correspondence should be sent to him at 181 Punchbowl Road, Launceston, Tas. 7250.

Microphone Repeater Reverse for the Azden PCS-4000

David Horsfall VK2KFU
PO Box 257, Wahroonga, NSW. 2076

A simple modification for the Azden PCS-4000 which provides repeater reverse control from the microphone.

One useful way of doing this without actually modifying the rig is to store the input frequency of your favourite repeater in the VFO with the output in memory 1. Selecting reverse is then a matter of pressing the DOWN button and returning to VFO mode. To get back again, M1 CALL on the PTT is pressed. The problem with this is that you are limited to one reverse repeater operation at a time. Also, the VFO is likely to contain a random value left over from previous band scanning or the like.

By adding an extra switch on the microphone connected to one of the scan lines all sorts of extra possibilities can be realised. Since this switch needs an extra wire the PTT return wire was used with PTT now returning through the microphone braid. Although this mixing of a low level signal with other things is frowned upon, no problems were observed.

There are two interesting possibilities. This extra switch can select between scan lines R2 and R3 providing REV, H/L and SHIFT with a two button access or it can connect via a diode to scan line K3 providing single button repeater reverse. See the table in Figure 1. Since I use repeater reverse frequently when mobile this was considered to be more important than remembering which two buttons to press and so only this is described.

First, the PTT return line has to be redefined. Remove the top and bottom covers and the front panel. The wire we require is the black one in the centre of the microphone socket. Move this wire from where it terminates on the microprocessor PCB on the grey wire near the corner — see Figure 2. This is the R3 scan line. It is also a good idea to take this opportunity to tighten all the screws attaching the PCB's to the frame. Loose screws can cause a variety of problems such as hum on receive and transmit, etc.

Now we turn our attention to the microphone. Pull it apart. Try not to lose the little PTT return spring. Remove the black wire from the PTT switch. Terminate this switch onto the microphone braid with a short length of wire inside the sleeve.

Attach a miniature momentary action switch to a convenient place. I used the place between the two buttons on the top! In this case, a lug has to be removed from the other microphone half. The wire recently removed from the PTT switch is now extended to this new switch. Use plastic sleeving over the extension joint to insulate it. The other side of the switch goes via a diode, 1N914, to the grey wire on the UP button. This is the K3 line. The cathode connects to the new switch. Note that the UP/DOWN buttons are two- pole switches hence a spare lug can be used. See Figure 3.

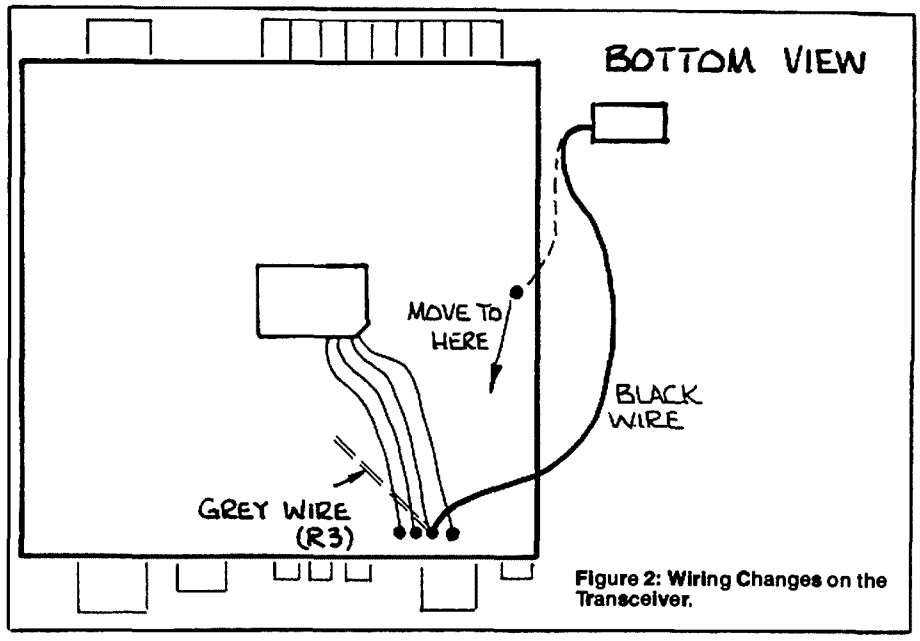


Figure 2: Wiring Changes on the Transceiver.

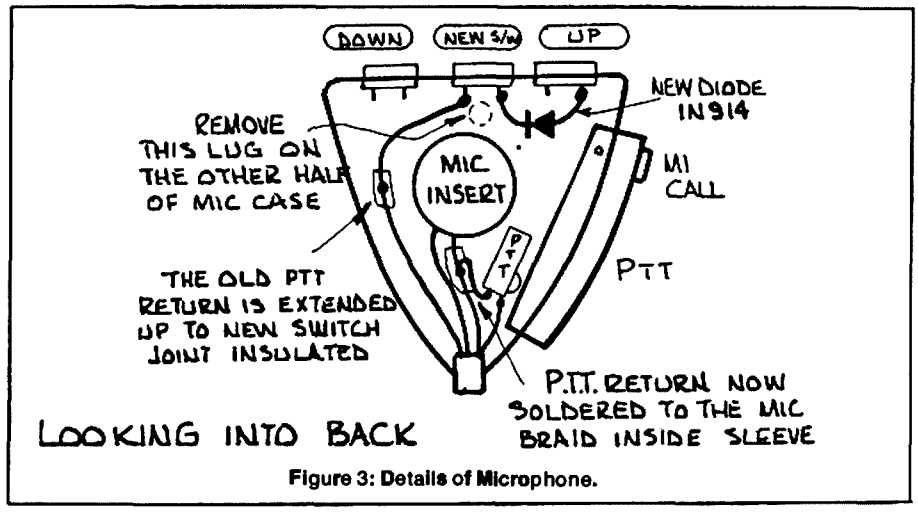


Figure 3: Details of Microphone.

	R0	R1	R2	R3
K3	MHz up	100 kHz up	*kHz up*	REV
K2	MHz on	100 kHz on	*kHz on*	H/L
K1	M scan	M addr	*M1A call*	Shift
K0	P scan	M call	M1B call	M write

The italic area is available on MIC.

Figure 1: Disposition of Scan Lines.

Everything can now be reassembled and tested although perhaps this is better performed in the reverse order. As usual take care to not lose any screws inside the rig. Seeing small sparks on the back of the microphone socket is a dead giveaway that something has gone astray! Note that decoupling may be necessary on the R3 line especially since it will be noted that the microphone socket is sprinkled with small capacitors that do not appear on the circuit diagram.

Finally, enjoy the convenience of repeater reverse from the microphone, as you drive around suburbia. It goes without saying of course that the microphone plug and socket are now incompatible with the rest of the world and that funny things will happen should a standard microphone be plugged in. One way to allay any fears is to re-wire anything that plugs into this socket, RTTY kits, etc, so that PTT return goes to MIC return.

HAMTENNA WITH THE LOT

Ron Holmes VK5VH
6 Keirana Avenue, Port Noarlunga, SA. 5167

As the good book says — "Of the making of antennas there is no end and much climbing of ladders is a weariness of the flesh." Nevertheless, some of us, like the Athenians, are always seeking some new thing, so have a look at this.

If your favourite antenna is the inverted Vee — this has a double helping. If you like phased verticals, there are four of them; and if you go for 80 metre loops, here is another version — all in the one antenna! What is more, it fits in a normal sized backyard, is under the height which would need council approval, and you feed it with 50 ohm coaxial cable.

Performance wise, a number of tests with a G5RV as reference antenna, and immediate switching facilities, are the basic of a claim that, on 80 metres, it is superior, on 40 it compares satisfactorily, being better in some directions and worse than others, while on 20 metres the great majority of reports surprised me by indicating two S-points improvement, even in directions favoured by the G5RV.

The "Hamtenna" is similar to the Stepped Loop Antenna of VK5XI (AR, June 1986), but has some significant differences. (See Figure 1). At each end is an inverted Vee, 10 metres high at the apex and three metres high at the ends. The Vees are approximately 14 metres apart. In my case, the distance between the pergola and the shed!

On the permapine poles, to which the bottom ends of the Vees are anchored, aluminium verticals 2.75 metres (9 feet) long are erected. The *tops* of these are joined with horizontal wires 14.5 metres long; ie the verticals are 14.5 metres apart. Without a calculator you can work out that 2.75 twice, plus 14.5, makes 20 metres: so that, along each side of the loop we have, on 20 metres, a pair of quarter wave vertical, of which the top 2.25 metres is bent over, joined to each other by 10 metres of wire. The ends of the Vees are joined to the bases of the verticals.

The total length of the loop is about 84 metres and it is fed at the top of the more convenient Vee. In my case, this is at the western end. My block runs approximately east-west, but the back of it is a little north of east. I use 70 ohm coaxial cable to a transmatch, but tried it with a 4:1 balun to 50 ohm coaxial cable, then with 50 ohm coaxial cable direct. Without a tuner the SWR on the direct 50 ohm coax was as good as with the 4:1 balun on the five regular bands. Also, it compared favourably with the G5RV SWR figures.

A word or two about the engineering. My back yard is 18 metres wide and about 16 metres deep. The rear Vee is a couple of metres in from the back fence to allow room for guying. I use aluminium poles which require only light guys and I can put them up and down on my own. The main guys are the legs of the inverted Vees which are tied to insulated screw eyes on the permapine posts, fixed to the fence. The light verticals need only "invisible" nylon fishing line to put a strain on the wire joining their tops.

The base of each vertical is insulated with PVC tubing and fixed to the post with a couple of saddle brackets. Wires are well tinned at the ends and fixed to the aluminium with PK screws. It might be noted that the whole antenna is fitted in a space which will take only one leg of the G5RV.

The exceptionally good results on 20 metres possibly stem from the fact that we have two pairs of 'in phase' vertical sections at the diagonal corners. (See Figure 2). The verticals are indicated by the heavy lines on the dotted circle, which represents the total loop. Note the end of each labelled 'base.' The *current* flow and direction at 20 metres indicates that the current is flowing 'up' in vertical sections one and three, while it is flowing 'down' in sections two and four. Note also that the vertical sections come at points of maximum current.

The radiation pattern of the antenna is, of course, very complicated, but on 80, 40 and 20 metres, it appears to have good all-round operational area. I have made comparatively few tests on 15 and 10, but it does work on those bands.

While this antenna may seem more complicated than the good old G5RV, it would appear to work as well, or better, and in many locations could be as easy to build, and easier to fit in the space available. Antennas are like motor cars — there is no best car. It is a question of what will best do what you want: what you can afford; and what will fit in your car port. For an all-band, omni-directional antenna, to fit the average backyard, the 'Hamtenna with the Lot' is worth trying.

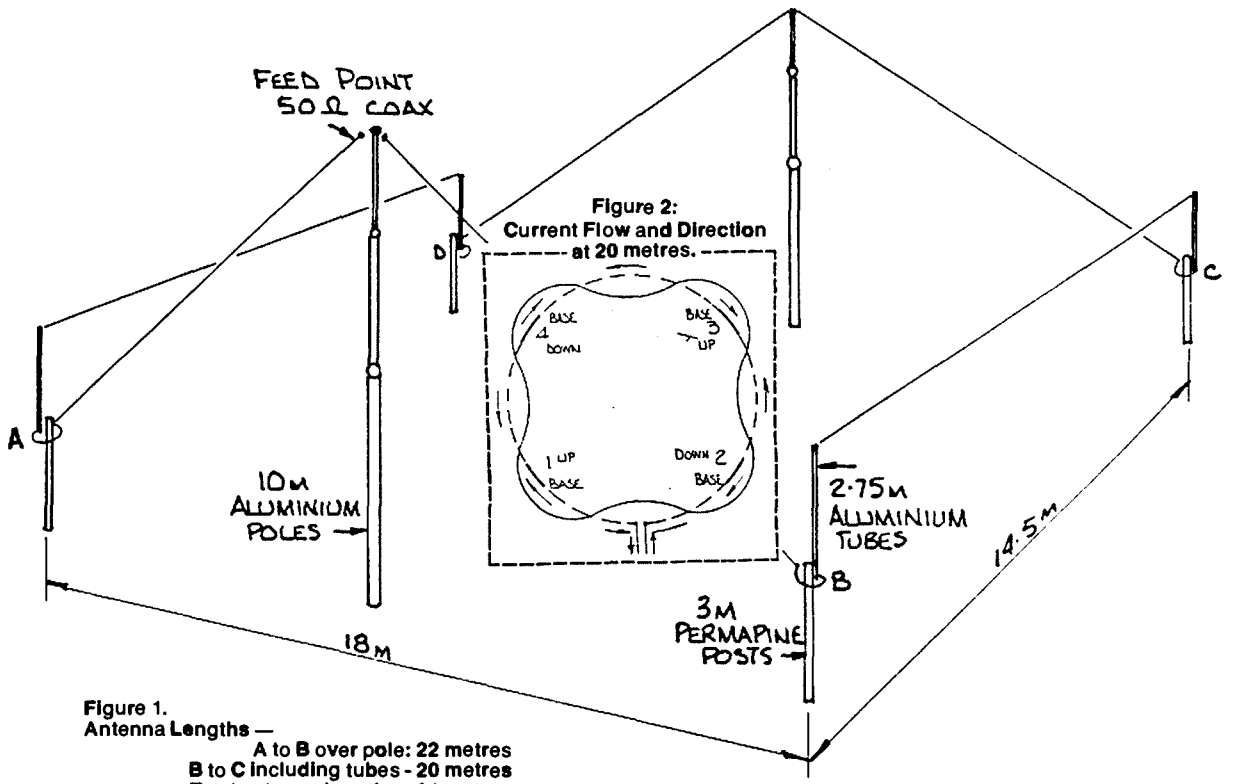


Figure 2:
Current Flow and Direction
at 20 metres.

Figure 1.
Antenna Lengths —
A to B over pole: 22 metres
B to C including tubes - 20 metres
Total antenna length — 84 metres

Multi-Band Single Untuned Feeder System

Clive Cooke VK4CC
160 Silver Shores Caravan Park, Toorabul Point, Qld. 4510

This antenna is now included in most antenna handbooks. It was originally published in* Amateur Radio *February 1957. Here is a reprint of the original article. It is a simple solution to a problem which is still with us.

For the 1956 Remembrance Day Contest the author was in need of an all-band antenna which, as far as possible, was to include the following features:

a Good performance for the distances involved.
b It must be capable of being used on all bands from 80 to 15 metres with the minimum effort.
c Be capable of suspension from a single 33 feet (10 metres) pole centrally placed in the backyard of a suburban allotment 45 feet (13 metres) wide.
d Use only one transmission line.

After experimenting with various types of antennas, they were discarded because of the lack of one of the desired features, the main one of which seemed to be that antenna tuning units were required.

Suddenly the thought occurred that a method employed for television multi- channel antenna systems could be borrowed. So, with the aid of two very capable assistants, an antenna (shown in Figure 1) was designed and erected within two hours.

On-air tests proved it to be the best multi-band antenna so far erected in a small backyard.

The experimentally-minded may be able to make the unused elements act as parasitic reflectors or directors. The antenna corresponding to the frequency in use is the only one which presents a correct low resistance load to the feed line. All others present a very high impedance with very little reactance as far as can be determined.

Although coaxial cable is specified, because it is suitable for connection to the output of a pi coupler final, there is no reason why 72 ohm ribbon could not be used if link coupling is used or if otherwise required. Certainly it would be more electrically balanced.

The first night of operation with this antenna included HP3FL and VK1IJ on both 20 and 40 metre phone with both station's antennas end-on to Panama. Commercial signals on 15 metres are very strong. At the time of writing, a Swiss broadcast station is S9 plus. *Where are the amateurs though?*

ar

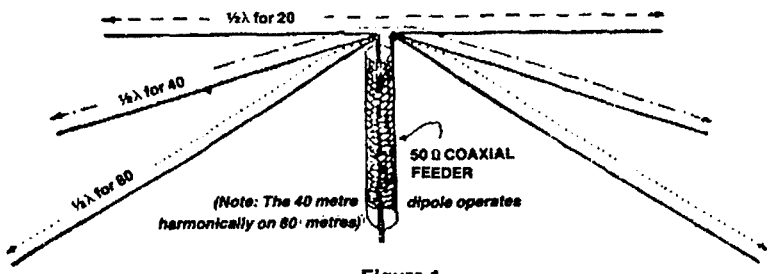


Figure 1.

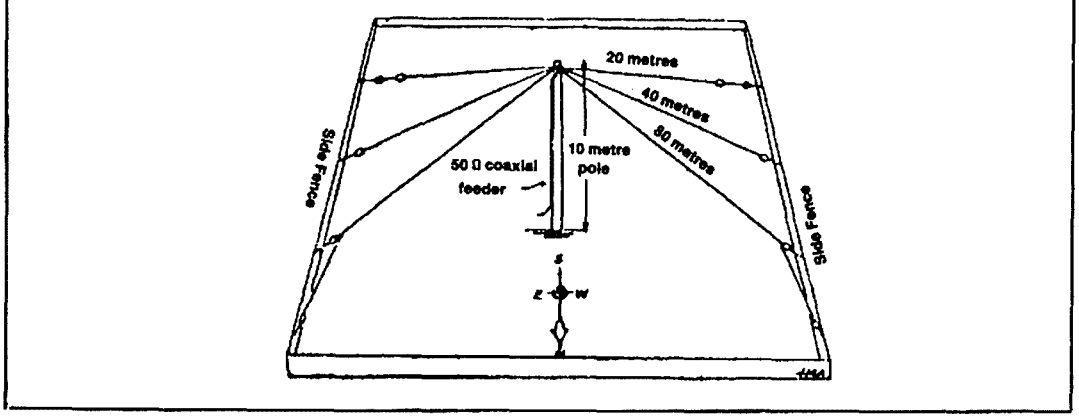


Figure 2.

"BUZZ" BLANKER FOR THE TS-430

Wayne Rhodes VK6AMS
10 Julianne Street, Busselton, WA

The standard noise blanker fitted to the Kenwood TS-430 performs well on impulse (eg ignition) noise, but is ineffective on radiated power line noise.

Other transceivers substantially reduced this type of noise so a comparison of noise blanker circuits was made and the following modifications were carried out to the TS-430.

1 Additional gain was provided between the Buffer and Noise Blanker Amplifier by fitting a broadband amplifier in place of C116.
2 The AGC threshold was raised and made adjustable by fitting a 100k trimpot in series with R81 (10k).

THEORY OF OPERATION

Due to the lower amplitude (but longer duration) of repetitive type power line noise when compared to impulse noise, additional gain must be provided to the noise amplifier so that noise peaks can be detected. (See Figure 3.).

The noise amp AGC amplifier is provided with adjustment to allow the "Blanking Point" to be set to a level that will reduce noise but not "clip" the required signal or cause cross-modulation from strong adjacent stations.

This adjustment is made to suit the particular situation and a trade off must be made between these two points.

Results obtained in the author's case were as follows:

	OFF	STANDARD NB	MODIFIED NB
Ignition Noise	S9	S0	S0
Power Line Noise	S7	S6.5	S1
Signal (no noise)	S9	S9	S9

Although the modified blanker introduces some problems (cross-modulation can be noticed from S9+++ signals) the benefit of being able to read stations previously lost in the noise would out-weigh this disadvantage in most cases.

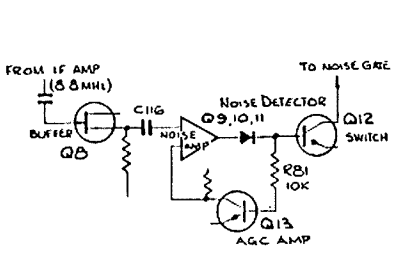


Figure 1: The Original Noise Blanker.

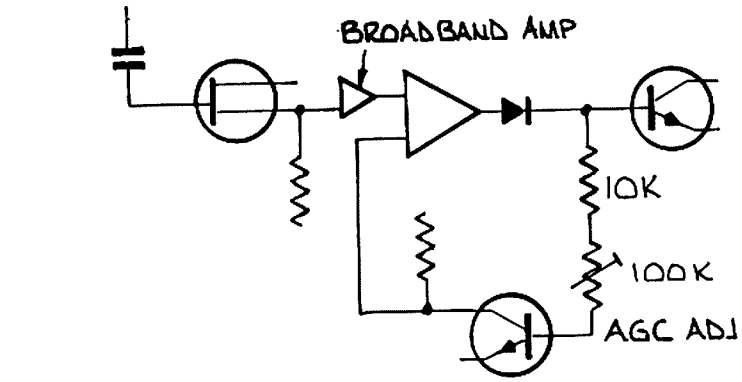


Figure 2: The Modified Noise Blanker.

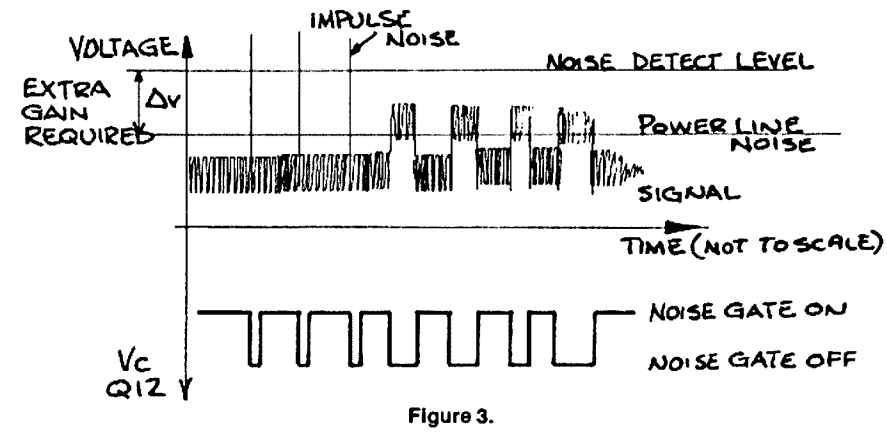


Figure 3.

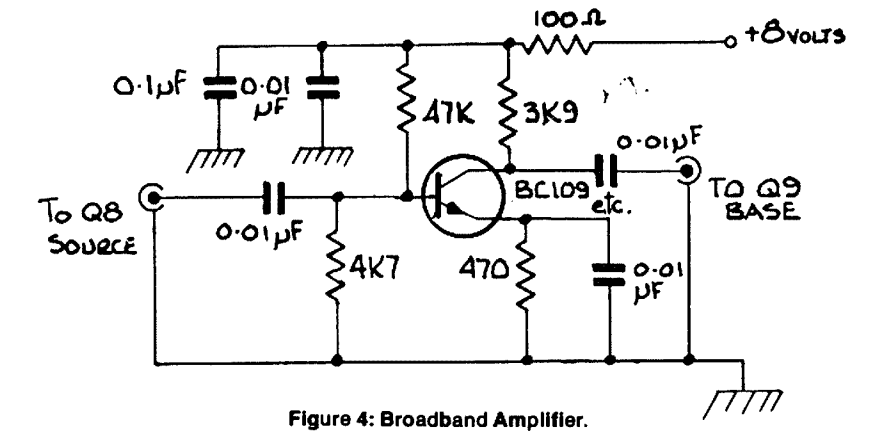
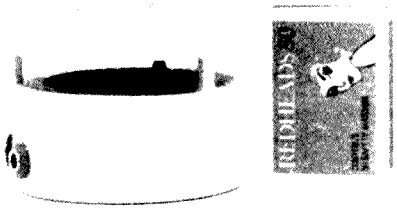


Figure 4: Broadband Amplifier.

PRACTICAL CW RESONATOR

Ivan Huser VK5QV
7 Bond Street, Mount Gambier, SA. 5290



I wonder how many readers tried the Beverage CW Resonator described in the April issue of *Amateur Radio*? No doubt with varying degrees of 'success'.

THE RESONATOR DESCRIBED in this article, is the result of some experimentation with acoustic resonance in pipes. Although it is not claimed to be perfect, the resonator does dramatically improve the readability of CW signals and, hopefully, will produce a spate of experimentation among CW operators to produce a more effective version.

THEORY[1]

We have all, at some time or other, blown across the open top of a bottle to produce a tone. The frequency of the tone so produced, depends on the length of the air column and the velocity of sound propagation in much the same way as the resonant frequency of an antenna depends on its length and the velocity of propagation of electromagnetic waves.

The velocity of sound at room temperature (20 degrees Celsius) is approximately 344 metres per second. Assuming that the received CW tone is 830 Hz, the wavelength may be determined thus:

$$\text{Wavelength} = \frac{v}{f} = \frac{344}{830}$$

$$= 0.414 \text{ m}$$
$$= 414 \text{ mm}$$

As with antennas, the smallest resonant length of a pipe open at each end is one half wavelength as shown in Figure 1a. Due to end correction (similar to end effect in antennas), this length will be slightly less than the acoustic half wavelength and depends on the diameter of the pipe.

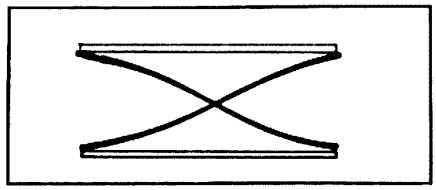


Figure 1a: Standing waves in a half wavelength pipe open at each end.

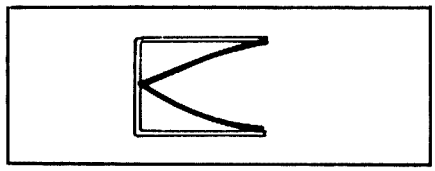


Figure 1b: Standing waves in a quarter wavelength pipe closed at one end.

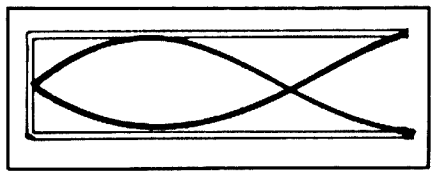


Figure 1c: Standing waves in a three-quarter wavelength pipe closed at one end.

Since our resonant pipe will be closed at one end, a quarter wavelength can be used. This may be calculated as approximately 103 mm for resonance at 830 Hz. In fact, any *odd* quarter wavelength may be used. The resultant standing waves in a quarter wavelength pipe and a three-quarter wavelength pipe are shown in Figure 1b and Figure 1c respectively.

The behaviour of a column of air at resonance is quite complex with the end correction generally being determined experimentally. However, as a rule of thumb, the end correction can be taken as three-fifths of the pipe radius. This means that for a 65 mm diameter pipe, the end correction at the open end will be approximately 19 to 20 mm. This is the distance that the speaker should be placed from the end of the pipe.

Since the cone of the speaker is, in fact, cone shaped, this becomes somewhat problematical. However, if the distance is measured from the end of the pipe to the *centre* of the cone, the error will be minimum.

CONSTRUCTION

The unit is built around a 50 mm speaker and a short length of 65 mm plastic water pipe. Start with about 500 mm of pipe and carefully cut three slots near one end as shown in Figure 2. The slots should be about 10 mm wide and of sufficient length to remove most of the plastic from around the circumference of the pipe, allowing about 3 mm of plastic between the end of one slot and the start of the next.

Make a baffle to suit your particular speaker from 6 mm bakelite, plastic or whatever. The baffle should be a 'tight' sliding fit inside the pipe. Although access to a lathe will be found useful, an acceptable baffle can be made using basic hand tools and just a little patience.

Mount the speaker on the baffle and insert it into the pipe from the slot end, so that the 'front' edge of the baffle is level with the 'first' edge of the slots and facing the longer open end section of the pipe. This should place the centre of the speaker cone at about the correct distance from the lip of the pipe.

Connect the speaker with long leads to an audio signal generator or your rig and obtain a tone of about 830 Hz.

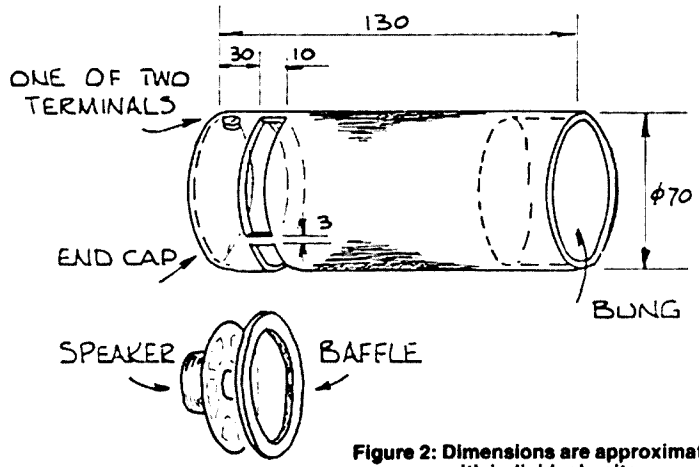


Figure 2: Dimensions are approximate and may vary with individual units.

To find the approximate position of the bung that is needed to close off the end of the pipe, immerse the open end of the pipe in a tall container of water such as a tall bucket or a small plastic rubbish bin. As the pipe is lowered into the water, two points of resonance should be found — one approximately 310 mm or so from the centre of the speaker cone and the second approximately 105 mm from the centre of the cone. The first point is the three-quarter wavelength point and the second the quarter wavelength point. It probably matters little which length is used for the resonator, but it would appear that the three-quarter wavelength results in a slightly sharper resonance[2]. I opted to use a quarter wavelength — that is, the shorter length of pipe.

Cut the pipe somewhat longer than required and insert a close-fitting wooden bung about 20 mm thick into the pipe and carefully adjust it to the position of resonance. A single PK screw is sufficient to hold the bung in place. It is suggested that if the bung is made using hand tools, it should be 'glued' into position using a universal silicone rubber sealant to make it air-tight.

The ends of the resonator can now be finished off using a lathe or file. In the prototype, I sealed *both* ends and then covered each end with green 'felt' contact plastic. This allows the resonator to be used with the speaker facing upwards or downwards as desired.

FINALE

Running a frequency test on the resonator showed it to have a sharper cut-off on the high frequency side of resonance than on the low frequency side. This appears to be due to the fact that the intrinsic speaker resonance is in the order of 450 Hz. An approximate response curve is shown in Figure 3.

In practice, the resonator substantially reduces the high frequency noise such as atmospherics and power leak and, of course, 'peaks' the required tone.

If you did not try the Beverage CW Resonator, I suggest that you try it before embarking on this project — you may be pleasantly surprised.

Notes

1 A layman's attempt to explain what is happening.
2 This effect may perhaps be explained by the fact that the movement of the cone is a smaller percentage of the overall length of the longer pipe.

References

1 Try This — A Beverage CW Resonator — *Amateur Radio*, April 1987
2 Chambers Encyclopedia
3 Encyclopedia Britannica

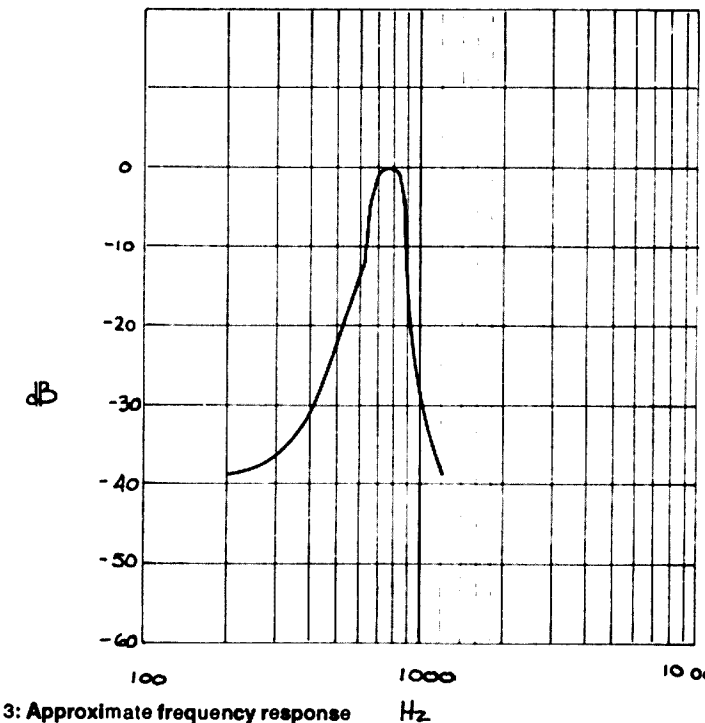


Figure 3: Approximate frequency response of resonator.

DEMAND FORCES MDS SQUEEZE

Due to demand for multi-point distribution service (MDS) licences, engineers from the Department of Communications are investigating a cross-polarised transmission technique to fit more B-MAC channels in the available bandwidth.

So far the Department has received 168 applications for MDS-TV licences in capital cities and regional areas since it called for applications last October.

The services — which will use terrestrial microwave transmitters to distribute video, audio or data to virtually any location except the private home — have been allocated two frequency bands:

Band A: 2076-2111 MHz
Band B: 2300-2414 MHz

Band A will contain five 7 MHz channels, suitable for the PAL format. Due to the nature of the services planned for this band no encryption standard has been imposed by the government. (AAP has had a data service operating in this band for a number of years).

However, Band B is designated for the video and audio entertainment and information services (VAEIS), which will be encrypted by use of the B-MAC format.

Band Capacity

The problem faced by DOC engineers is to maximise the number of channels available in Band B to provide as many services as possible.

As one B-MAC signal occupies 8.75 MHz of bandwidth (including spacing), the DOC should theoretically be limited to allocating 13 channels for VAEIS licences in the 114 MHz-wide band.

But the DOC is attempting to boost the capacity of the bands by overlapping adjacent signals. This can be achieved by transmitting the adjacent signals on lower and upper sidebands with a 90 degree cross-polarisation, said Colin Langtree of the DOC.

Using this technique, the department has achieved two-channel separation of 13 MHz. The engineers are thus confident of fitting 15 channels into Band B, he said.

But in the field, problems could arise. Apart from multipath propagation (ghosting), the DOC engineers are concerned about another multipath effect that could be caused by overlapping the signals.

The reflection of signals off buildings and landmarks could cause "a reduction in the discrimination between the orthogonally polarised transmissions," he said.

The DOC were conducting field tests in Sydney this April to assess the degree of multipath. If the tests prove negative — or if there is potential for further overlapping — the DOC will modify its spacing arrangement.

If signal reflection is significant, the number of data or audio channels in the B-MAC signal may have to be reduced from Level 4 (six channels) to Level 2 (three channels).

Apart from the doubt surrounding the degree of overlap, the DOC has determined the other engineering parameters, including:

transmitter stability requirements
maximum EIRP (23 dBW)
service area radius 30 km from transmitter site
typical receive dish size of 0.6m (parabolic antenna or grid-pack) and a noise figure of 6 dB.

The MDS parameters are quite distinct from a typical broadcast service, Mr Langtree said, as they are designed to only provide adequate signals for receivers with a clear radio line-of-sight path.

Manufacturing

For testing purposes, the DOC will use its in-house equipment but due to the unique nature of MDS in Australia, opportunities exist for local manufacturers.

Mr Langtree said the DOC plans to discuss its requirements with electronics companies within the next month. One particular area of concern is providing adequate filtering of the sideband components.

The DOC intends to ask manufacturers for their solutions to finding "the best way to realise the desired result," he said.

Optimistic

However, a senior engineer with one of MDS licence applicants said the DOC was being too optimistic if it expected to cram in extra B-MAC channels.

He believed the effects of multipath interference in an operational environment would require wider margins. This had been the case in the US, where MDS had been operating for many years, he said.

However, it is impossible to accurately predict the outcome until field tests are carried out, as Australia is breaking new ground in this area.

MDS in Band B will be the first use of the B-MAC satellite standard in a terrestrial broadcast environment, so the data the DOC produces could be quite useful to other broadcasting administrations throughout the world.

—From *Broadcast Engineering News*, February 1987

KEY FOR SUCCESS

John Hawkins VK6HQ
39 Glyde Road, Lesmurdie, WA. 6076

What you see at VK4XA is what you get!

Amateurs tend to polarise over contests. They either love them or hate them. Maybe it is the risk of getting hooked on those split- second decisions, the smell of hot transformers, ears ringing with serial numbers and the frenzy of those 15, final torturing minutes!

I was weaned on CW. In the annual Remembrance Day Contest for VK, ZL and P29 call areas, I monitor my contest progress by periodical references to the scores of one special CW operator in Queensland. Hold steady the ratio of my serial numbers to his and I can count on a good Western Australia position.

Imagine, then, how nice it was to be in Brisbane with the opportunity to meet this most consistent and successful CW contester, Russ VK4XA.

If one expects, on entering Russ's shack, to see a vast array of apparatus and an unbleached oblong of bench-top where a kilowatt linear had just been removed out of sight to the linen cupboard one would be totally out of luck. What you see at VK4XA is what you get! Even the bug key is home-brewed. Two TS520s, one a little unwell in the tuning capacitor department and sporting a paper warning label, together with a delightful old AR88 receiver matched with an FL200B for 80 metres transmit/receive backup complete the station. Outside, the antennas are confined to a suburban block and the tri-bander tip-toes to see over adjacent roof tops.

From whence, then, one ponders, does the magic come?

Russ agrees without reservation that tactics and perseverance are but two essentials in the contest and award struggle. Select the right band for the time of day. Choose whether to call or to risk precious seconds by listening. Decide when to sweep the special band segments for stragglers. Chance a nap. Miss a meal or two. All options in the overall strategy. Even a loudspeaker with a director lessens fatigue and aims the action at the ear, not to the neighbours!

Somehow, chatting over a glass of wine and some Chinese food, Russ's gentleness of character is enigmatic, concealing a latent power-house, ready to spring into action once the gates go up.

Russ's introduction to shortwave came in 1926 at Warrnambool Technical School in Victoria. Through the influence of one Les Kermond, (later to be VK3DX and still active now), self-taught Morse code operator and owner of a UX199 valve receiver, Russ soon had a similar receiver working on 32 metres, listening to the fist of commercial station KEL and practicing his own Morse on a home-brew buzzer.

Just prior to WWII. The receiver on the bench at left is an Emmco Vernier dial! Transmitter bottom — telephone condensers at front, adjacent and behind condensers — the HT transformer, hand-cut laminations etc, and wooden clamps. Second shelf houses the home-brew filament transformer. Third shelf, CO FD. Top: PA UX210 about 10 watts. Right: Home-brew multimeter which is still working! (Note the operator's chair!).

In 1929, 10 metres was launched. Russ soon heard two OZ prefix stations from New Zealand, OZ1AO calling CQ and OZ3AR working VK3BQ and VK6SA for a VK/ZL first. Actually, at that time, Australia held the OA prefix and England was EG.

January 1929 saw Russ leave home to become a trainee telephone mechanic and at the age of 16 was stationed in Melbourne. "There were still some magneto phones around," smiled Russ. "Especially in Brunswick and Footscray."

The old UX199 receiver continued working and eventually Russ sat for the technical regulations and 12 WPM Morse examinations, passing at his first attempt. On February 4, 1931, he worked VK3RJ, 86 when he became a Silent Key in May 1987, but even then a veteran of eight years amateur radio. Initially, Russ recalled, 32 metres was the go, then 80, 40 and 20 metres. There was also 200 metres where, at the weekend, one was permitted to play music; but Russ gave that one a miss.

Russ's first call was VK3XK and the transmitter a one valve self-excited oscillator. "It was an experimental license," Russ explained. "And every now and then the Department would write, asking what experiments had been done!"

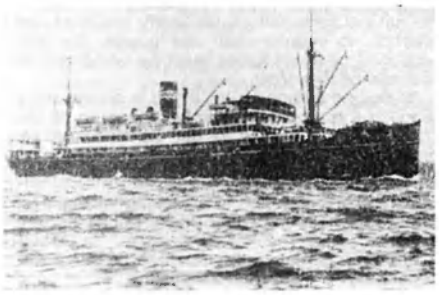
A new *Arcturas* UX126 valve, with about one watt input helped raise the first VK4 and Russ's QSO score to 100. By February 23, 1931, he had worked ZL3CC on 20 metres and begun to receive "pure DC" reports on his CW. From then on, the availability of components improved somewhat. Some laminations were trimmed and pressed into service as a power transformer. A three-lead rectifier from Raytheon using helium, and some 75 volts 2 uF telephone condensers did not last too long! Coils were wound from quarter inch copper tuning buffed up with dirt and a cloth and then wrapped round a bottle. Glass photographic negative plates and tin foil was used for fixed capacitors and a jar of water with two copper wire electrodes provided the grid leak resistor.

After the war, components became far easier to get but Russ's pre-war equipment limited his best DX to AC8JS (now BY), whilst his contemporaries were working up to 50 US stations a night.

The first contest appearing in Russ's log books was a "Relay Contest" run by the WIA. It started on April 11, 1931 and ended on April 25, 1931. One has to compose 15 20-word messages and pass these, together with messages received, to stations in another State. Each message has to be relayed through six different States after which it became invalid for further relay. The top six scorers were VK3RH, VK4BS, VK7CH (still very active), VK2KJ, VK6CB and Russ VK3XK.

Russ had, by then, taken on some unusual saltmining, maintaining lighthouses, and extensive travelling tended to keep him off the air. However, he improved his power and reports by making a CO/FD. On August 27, 1939, he had his final contact with VK3IL (QSO number 2453) and handed in his equipment for the duration of WWII. Reminiscing, Russ mentioned how the rig, including the Morse key, all had to go, at a time when 10 metres was the main band and DX was hard to find. "But going back to those days of OA, 32 metres was the band, especially in the afternoons, after school. I often heard EG5ML, EG2NM and other UK stations, all on 10 watts or less, but the band was, of course, free of noise. Max VK3BQ, was a pioneer then in crystals for frequency control. We used to rub down pebble spectacle lenses and, by trial and error, get them to oscillate on 80 metres."

Like so many amateur radio operators, Russ joined the Air Force when hostilities commenced, bringing with him valuable expertise. It was no accident that, whilst declining an instructor's job, he mustered as a wireless electrical mechanic, securing top spot in theory and second top in Morse. "A professional telegraphist," Russ added, "took first place!"



The *Macdhui.*

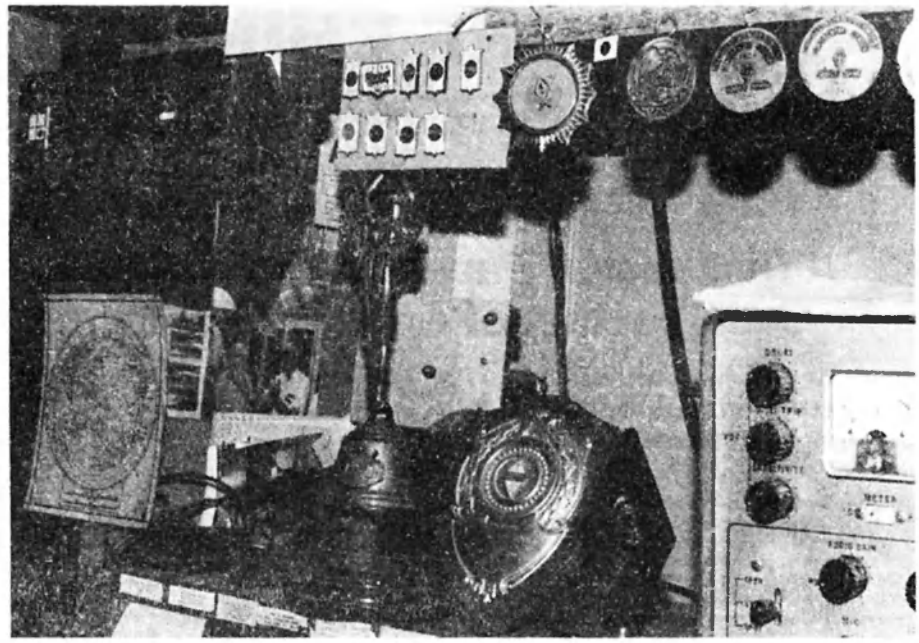
June 1941, found Russ married, posted to Port Moresby, PNG, promoted on the spot to corporal and "thrown in the deep end!" But he survived. An old coastal vessel, the *Macdhui,* which had transported a contingent of 50 RAAF personnel, including Russ to Port Moresby, was not so fortunate. Bombs were soon being thrown around and a year later, 10 people lost their lives in a bombing run and the *Macdhui,* with three direct hits, burned for five weeks, providing an excellent marker for subsequent night bombing, before she finally sank to the bottom of the harbour.

On January 17, 1946, the earliest opportunity possible after WWII, Russ was back on air, 28.512 MHz CW, with a 6V6/807 transmitter and a home-brew copy of an AR7 receiver with plug-in coils. On February 2, 1946, (per Russ's impeccable logs) another 807 was added and the newly-found 45 watts soon produced a contact with W9QMD/KE6. The log then shows an ever-increasing number of W, ZS, VE and other DX QSOs.

By August 13, 1948, 4876 post-war contacts had been notched-up and came the very first Remembrance Day Contest. "The exchange," Russ explained, "consisted of a six digit number, comprising three digits of your own choice followed by the first three digits of the previous number received. Scoring, one point per completed exchange."

That first year VK2 won ahead of VK6. Russ, still as VK3XK, took top CW for VK3 with 228 points. VK3MC was on 191 and Ivor VK3XB (another very active station today) was in there too. VK6RU took top honours for Western Australia with 284 points. "Funnily enough," Russ said, "I've only ever missed two RDs. Last year we had visitors. VK4 won!"

In the 1950s. Russ moved twice for business



Some of Russ's Awards Cabinet.

reasons to VK9XK, finally finishing with VK3XK, which was exchanged in July 1974, for his present call, VK4XA.

Russ now has thousand upon thousand of neatly sorted QSL cards, a mass of awards and 151 243 post-war QSOs in the logs.

He considers his four favourite contests to be the BERU, the VK/ZL, the RD and WPX. The award he most enjoys working for is the German DLD and proudly shows the basic DLD100 certificate from DARC, together with the DLD500. Russ is now awaiting receipt of the DLD600 sticker. The ultimate is DLD1000.

In these days, when cheating in contests seems to go on, Russ is the first to agree that anyone who bends the rules, wins and still gets satisfation, must have some sort of a personal problem!

How this quietly spoken, gentle giant of contests does it, and does it so fairly, I still really don't know. But, since VK4XA does not even own a microphone I guess he concentrates on what he does best and gives it his best shot, every time. . .

ar

Russ VK4XA. The loudspeaker director can be seen in the background.

THE MORE THINGS CHANGE, THE MORE THEY STAY THE SAME

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A Discussion Paper on the Future Organisation of Amateur Radio

Historically amateur radio has been an experimental activity with many successes to its credit.

I have read with interest most of the debate that has raged in the pages of AR and ARA over the Linton/Harrison proposals and have become painfully aware of a similarity to the arguments put forward to every change faced by amateur radio in the 30 years that I have been licenced. All the old saws about encouraging youth, about incentives, populating the bands and defending privileges are there. In all this debate I wonder whether the fundamental issues are being overlooked and whether they have really changed at all.

Historically, amateur radio has been an experimental activity with many successes to its credit. The development of modes of transmission, of antennas and of the value and use of the radio spectrum are well-known. But as the professional development of radio communications in particular and of electronics in general has overtaken the amateur, the Amateur Service has lost its sense of direction. The onslaught of technology, and with it, the availability of ready made equipment, has left many with the idea that there is nothing left to do. Others have lapsed into standard attitudes of resistance to change, both within the amateur ranks and within the Government bureaucracies. This is hardly surprising since, as has been noted with scientists, most of the amateur operators who have ever lived are alive today and a significant proportion of these can still vividly remember the "good old days".

In spite of the massive rate of technological development there is still a place for amateur investigation and contribution. Look at computer games and software. Look at the discovery of trans-equatorial scatter, of aircraft enhancement, of gray-line propagation and the recent theories of propagation by conduction. Speculative? Certainly. Scientific? Perhaps not rigorously, but important contributions they certainly are. Readers can no doubt think of other examples.

High technology does not only mean complexity. . .

The age of experimentation is far from dead. Only the emphasis (and I stress the word emphasis) has shifted from the transmission apparatus to the handling of the transmitted and received signal; ie .) inputs and outputs. Even so, there is still room for applying the advances of technology to simplifying the apparatus so that the tyro (of any age) can build high performance equipment for himself. High technology does not only mean complexity, it can also lead to simplicity if one is thinking clearly.

Recently I took one of my own circuits to a local educational institution for advice, where the professor told me they did not do much with RF these days and referred me to his resident guru. Said guru remarked; "I don't really know why you have come to us. I often think you amateur fellows know more about these things than we do." Experts with a historical bent, like Alan Shawsmith, might like to reflect on the full import of these comments.

Experimentation is not limited simply to the development of apparatus. The application of computers to new modes of transmission is as valid as was the development of SSB. There are still wide open fields in antenna design, propagation research, and ORP activity. And there is the simple development of operating skills — pure communication — as a worthy objective in its own right, a point not lost on the Russian and Chinese authorities. In these activities, the question of whether equipment is home-constructed or purchased, is quite irrelevant.

Looked at in this way, the essential experimental characteristic amateur radio has not changed — only the means of experimentation are different. The truly basic aim of effective communication by radio has remained unsullied throughout amateur history, whether by CW, by voice or by computer aided systems. In this sense, what is really different in the 1980s compared with the 1900s.

Similarly, people have not changed. We all still aim to be healthy, secure and able to do our own thing. However, the economic environment and the processes of Government have changed and continue to change with increasing rapidity and groups within society must be prepared to adapt to these changes if they are to survive. Of particular current interest to amateur radio is this regard are the questions of our licensing system and the qualifying examinations. Later I will propose a way in which these may be reorganised, but first a few basic concepts must be examined.

1. The Aims of the Amateur Service

All the various listings of aims and objectives fall into four categories:

(a) to advance the state-of-the-art of radio technology and radio communications.

(b) to make full use of the allocated radio spectrum.

(c) to communicate.

(d) inherent in these — to educate, whether by formal classes or by self-education, as a spin-off from the other objectives.

These basic aims and objectives have never changed throughout the whole history of amateur radio.

2. The Nature of the Amateur Operator

Amateurs themselves fall into four groups:

(a) New entrants into the Service (who may be young or old), who have limited skills, knowledge and experience.

(b) The Communicators. These range from those who are attracted by the convenience of "wire-less" communications who are satisfied with limited power and channelised frequencies; eg the CB enthusiast, through the rag-chewer to the DX hounds. The technical intricacies of the radio apparatus does not rate highly with this group — it is a means to an end.

(c) The High-Tech Whiz-Kids whose interests lie in modes of transmission and/or propagation and for whom the transceiver is merely one element of a chain of apparatus which will often include a large computing component. This is the group which will be operating at the leading edge of technology, particularly with new modes of transmission.

(d) The traditional amateur experimenter who likes to have at least part of his station home-built and who will be continually or spasmodically tinkering with it, and, who at various times, will be interested in some or all aspects of radio communications.

3. The Nature of Administration

Herein lies one of the major problems themselves, and particularly their representative body, the WIA, which I will discuss later.

Every large organisation, be it industry or government, runs the risk of becoming a slave to its bureaucracy with all the regulations and resistance to change that goes with it. The WIA and DOC are no exceptions, although, to be fair, steps are being taken to deal with these problems.

In this regard, I propose two principles:

(a) by analogy with thermodynamics, disorder is the natural state and consequently the more one attempts to impose order, the greater the proportion of ones resources must be committed to maintaining that order.

(b) Human nature is such that it is always more productive to make it easier for people to do the right thing than it is to get up and operate procedures for stopping them from doing the wrong thing.

Our taxation system is a striking example of what can happen when these principles are ignored.

Too often bureaucracies take the negative role of controllers rather than the positive role of good administration, which aims to facilitate and guide correct actions. Being positive according to my two principles leads to simpler administration, something which is long overdue in our licensing and examination systems.

Good administration requires a judgment between the costs involved in the first principle and the risks inherent in the second. I believe it is just such a judgment that has led the DOC to propose the devolution of the examination system.

Our present system is cumbersome, costly and time-consuming both for the candidate and the DOC. It is only the conservative wish to control that, in the past, has kept the examination system in DOC hands. The Department of Agriculture does not examine its Field Officers, Treasury does not examine its economists nor Telecom its engineers. So why this need for DOC to examine amateur operators?

The DOC must certainly set standards and supervise their application, as must every user of qualified people. But there is no reason why they should be so deeply involved in the education and examination processes. This should be left to people in the WIA and the education system. I will discuss the means of doing this later.

4. The Nature of Regulations

As with any limited resource, regulations are required to ensure that those resources are used to the best advantage of the community. In the radio field, regulations are needed for the following reasons:

(a) to minimise interference
- (i) from overcrowding; eg by frequency allocation
- (ii) from mutual interference between users; eg by spectrum planning
- (iii) from general interference (BCI, TVI, QRM); eg again by spectrum planning

(b) to ensure adherence to technical standards;

eg SSB, RTTY, TV, etc. These are aimed at making communications easier by preventing a plethora of emission systems. It does not matter

what the standards are as long as they exist and as long as it is possible to add to them or change them as technology advances.

(c) to ensure that people know what they are doing. Licence testing is essential in managing interference and standards regulations.

5. The Levels of Competency Required

There are many activities in or society where licensing by examination apply. The most familiar is the driving licence where one must show a knowledge of the rules of the road and demonstrate competency in handling the class of vehicle one is to drive. Similarly, in aviation one obtains a basic licence as for driving with endorsements for aircraft type and for activities such as night flying or instrument rating. More complex aircraft require more exacting tests.

The point is that there are well accepted principles of graded licences with endorsement for special activities that could well be applied to the amateur service. The key is that people must prove that they know what they are doing.

Bearing in mind the discussion so far, a consideration of the amateur service shows that a range of skills is involved.

(a) **Appliance Operation.** All that is needed here is sufficient knowledge to be able to assemble a station from a selection of commercial apparatus. This group is typified by the CB enthusiast but could include aspects of amateur radio such as the social communicator and those interested in digital modes. Licensing would be characterised by

— use of commercial channelised equipment
— limited power and frequencies
— endorsements showing an appropriate knowledge of characteristics of the bands and modes in use

(b) **Limited Experimental.** This is covered by the present novice licence. Note that the novice examination is such that it would allow for basic appliance operation as described above. Extended privileges could be gained by endorsement, for example

— mode and band characteristics as per the appliance operator
— 12 WPM CW allowing full use of the 80, 15 and 10 metre bands at novice power levels
— general theory for AOLCP privileges

(c) **General Experimental.**

(i) current AOCP (all frequencies)
(ii) current AOLCP (VHF/UHF frequencies)

One important endorsement here for the AOLCP is five words-per-minute CW allowing access to the novice bands plus the 28.880 MHz VHF liaison channel.

NOTE: It is vital that the AOCP be of internationally interchangeable standard.

(d) **Advanced Experimental.** This can be similar to the USA Extra Class with high power privileges and the lifting of all restrictions other than those imposed by international agreements. A high level examination would be required.

Some general points needed to be made at this stage.

The above classification recognises what is actually happening on the amateur bands and has the seeds of a revised licensing system. With the exception of a question bank for the advanced category the examination system can remain unchanged, since the endorsement proposals would require passing sections of current examination papers. A full set of endorsements would then be equivalent to AOCP

The endorsement system should create some incentive to upgrade by giving people a taste of what is possible under restricted conditions. Further, as a full set of endorsements is equal to AOCP, people can upgrade their licences at their own pace as their interests develop.

CW has not been mentioned so far. Paradoxically, while CW is the simplest mode technically and is the most efficient form of transmission, it is also the mode requiring the greatest skill. This will remain so until computers can match the complexity of the human brain. Because of these dual characteristics of simplicity and skill, CW should remain a requirement for full amateur privileges.

Amateurs have access to a wider range of frequencies and power levels than do most professional experimenters. Indeed only the Defence Forces have wider privileges. This places a great responsibility on the amateur service to use their allocations for the best purposes possible — including, but not necessarily requiring, experimentation. A reasonable level of proven competency underlines the value of our privileges and this should not be reduced below the present novice level, except for pure appliance operation.

6. The WIA

We live in a complex age in which the use of lobby groups is a virtual necessity. Ministers and their Departments simply do not have the time to gain an assessment of public opinion in any other way. For amateurs, this process of contact can only be through the WIA if it is not to be fragmented, but effectiveness of the WIA is limited by the fact that only half the amateur fraternity are financial members.

Why is this so? Journals such as ARA have suggested many reasons but I feel they miss one basic fact. That is, the WIA as an organisation does not pay attention to that item in the Amateur Code which states; "The amateur is friendly". In three of the four States in which I have lived and attended meetings, I have had to look carefully at myself to see whether I was visible. Nobody spoke to me — nobody. From time to time I have made various offers and suggestions and have received prompt and courteous replies — followed by silence. If I followed up I have been met with a latent hostility which gives the impression "We are looking into it — we know best!"

These experiences, together with a reading of everything published on WIA activities, leads me to the conclusion that the WIA is typical of most active voluntary organisations. For those who are "in" the WIA is a marvelously friendly, active and effective body. Those who join seeking acceptance are faced with all the barriers of a closed shop. One of these barriers is the expectation, first to be well-known and secondly to become totally involved, an excessive commitment which scares people off. So, until now, I have kept my peace, and paid my dues, as I believe that the WIA is essential to the survival of amateur radio.

Survival is not a word I use lightly. Governments everywhere are under the dual pressures of commercial lobbying for additional frequencies and the revenue attractions of the amateur allocations. The USA amateurs have just lost two megahertz of their 220 MHz band and UK amateurs have seen a report go to Whitehall stating that nowadays there is no justification for the amateur service and recommending that the UK Government work through WARC to eliminate it. Closer to home it is being said that the 70 centimetre band alone is worth $1 million in licensing revenue.

Against these pressures, tradition and altruism count for little. Governments will only listen to strong, effective and united voices from community interests. United we stand — divided we fall. The ease with which the ALP in the 1950s and the Opposition parties in the 1980s have been reduced to impotence is an object lesson. Formation of a second amateur body is a recipe for disaster. The answer to dissatisfaction with the WIA is not to replace it but to reform it from within, to make it more attractive to potential members, to make use of the talents of its membership and to develop policies and submissions based on present realities as well as on traditional opinions.

What the WIA must do now is to review its approach to what is termed these days as "Human Resource Management". As it now operates, the WIA has a very limited knowledge of its membership and, as a result, makes poor use of its full potential. Amateur radio is no ordinary hobby. Those prepared to go through the examination and licensing system have an above average level of knowledge, dedication and enthusiasm. Also, amateurs come from all sections of the community. Thus, the potential range of skills and networks of contacts that can be drawn on is immense. What could be done if this resource was fully utilised makes the mind 'boggle'.

Specifically, the WIA must consider the following moves:

(a) Adopting a fully professional, responsible and effective approach that can confront purely commercial interests on their own ground and can accept challenges such as examination devolution as they arise.

(b) Making new members feel wanted by personal welcome and on-going personal contact, both on and off the air. Initially, at least, this must involve Divisional Committee members. They are the leaders and must set the example.

(c) Getting to know the membership and their capabilities. In addition to general calls for help, members with specific skills should be sought out and invited to take part in WIA activities in a less onerous fashion than at present. This move is an essential aspect of the licensing and examination systems I propose later.

(d) Ensuring that all offers of assistance and ideas are obviously welcomed and personally followed through to completion. Ideas and initiatives arise from individuals throughout any organisation and this resource must be carefully cultivated if the organisation is to remain healthy.

7. Examinations

The normal system for qualification in any field is for a student to study in, and graduate from, an institution whose course standards are approved and monitored by some regulatory body. For trades courses this process is carried out by the Apprentice Commission. For professional qualifications; eg in Accounting, Engineering, Law, Medicine, etc, the standards are set and maintained by the relevant body representing that profession.

The detail of the administrative processes varies considerably, but the key points in common are that there is extensive cosulation in the process of course design by educational institutions and, that the professional body is involved at all stages and has definitive, say on standards. Also, it should be noted that, in the vast majority of cases, this control of standards is carried out by the voluntary effort of members of the profession concerned.

Now, the WIA prides itself on being a self-regulating body representing the amateur service. If this claim is to be credible then the WIA must accept the same responsibilities as every other professional body, in particular, that of regulating the standards of qualification of its members. This is the challenge presented to us by the DOC.

The arguments thrown up against accepting this challenge come in three forms:

— that since the WIA is a voluntary organisation it could never provide the manpower required,
— that the WIA does not have the expertise, and
— that the self-interest of educational institutions would lead to a lowering of standards.

The first objection does not stand inspection as all current WIA activities are run by voluntary labour and, in the past as each new activity has arisen, people interested in them have come forward. AMSAT, Region 3, Repeaters, Customs Bylaw Inspections, and so on, have all attracted those with that particular interest. Certainly, the WIA could do more to identify and encourage the talents of its members, but experience has shown it is there and properly handled, it is willing and able.

The second objection is frankly insulting. The WIA membership represents all sections of the community with a very wide range of qualifications. The expertise is there and can be called upon to do what is required.

The third objection has some superficial merit, but in practice, where proper accreditation and monitoring systems, are in place it does not occur.

Further, educational institutions jealously guard their regulations which they are unlikely to compromise by turning out inferior graduates. Indeed, the problem normally is preventing standards from becoming too high, which has already happened with the novice examination.

So, the question is not whether the WIA, the clubs and TAFE or other colleges can handle the devolution of examinations, but how the process should be handled.

At present, the system is purely regulatory. The DOC, after consultation with the WIA, details the course requirements, sets and administers the examinations. DOC now proposes an accreditation system where teaching/examining bodies are vetted and thereafter their results are accepted. While this is an improvement, it still in an area of

expertise which it is not really equipped to handle, viz education.

Before outlining an alternative solution, some terms need to be defined.

Accreditation: the process for checking that staff and teaching facilities are adequate and that the detailed curriculum meets requirements.
Monitoring: the process of checking that standards are maintained and that any changes made are in line with approved policies.

The proposed system is based on the following assumptions:

(a) That by analogy with general professional practice the WIA assumes responsibility for the accreditation and monitoring the teaching and examination of amateur operators.
(b) That the DOC, as the regulatory body, has the definitive say in licensing arrangements and qualification requirements.
(c) That the operation of the system be through the Divisions, their clubs and educational bodies such as State TAFE colleges.
(d) That overall control be through the central WIA organisation of the examination question bank, and
(e) That once the system is in place the DOC would issue licences "on presentation of evidence of standing satisfactory to the WIA as approved by DOC".

The organisational structure that I propose is as follows:

1. Australian Amateur Radio Service Council
FUNCTION: POLICY DETERMINATION
MEMBERSHIP: DOC and WIA. As regulatory authority under its Act, DOC would necessarily have the final say either by casting vote or right of veto.

The council would operate through a system of subcommittees and consultants which would allow for specialist input; eg education, and interested opinion; eg from Linton and Harrison. It would need to meet infrequently, say, once or twice per year and would formalise all DOC/WIA/Amateur contacts that currently exist.

2. WIA Licence Committee
FUNCTION: TO MANAGE THE SYSTEM
MEMBERSHIP: Federal Education Officer, Federal DOC Liaison Officer and Divisional Representatives.

The full committee would meet once per year prior to the Federal Convention and operate generally through a Headquarter Executive Committee. Subcommittees would handle the maintenance of the prime examination question bank, cross-check accreditation procedures and spot check examination papers in order to monitor standards. This committee would also be the body through which proposals for change to the system are channeled to the amateur service council.

3. Divisional Education Committees
FUNCTION: TO ADMINISTER THE SYSTEM
These committees would have the responsibility of carrying out the detail of accreditation, monitoring and issue of examination papers to colleges, clubs and individuals as required. They would only cross-check the marking of a random selection of papers and forward samples of these and doubtful accreditation cases to headquarters. The only situations where these committees would actually run examinations are in remote areas where clubs and colleges are not available. They would issue certificates in the name of the WIA for presentation to DOC for licence application. Further, the committee chairman would be the Divisional Education Officer as well as being the local WIA/DOC Liaison Officer.

This system as I propose it does a number of things.

(a) it allows the WIA to become a more responsible, professional organisation
(b) it frees DOC from the albatros of running an education system
(c) it frees the examination process to the benefit of potential entrants to the amateur service
(d) it parallels and formalises relationships which already exist between the WIA and the DOC
(e) it provides a framework in which the structure of the amateur service can evolve with future changes, both in technology and society.

Initially, because this proposed system is built on existing arrangements, the only visible changes would be that the examination system would be more accessible and the process of licensing would become more rapid.

In the longer term, because of the inextricable relation between licensing and examinations, some very important changes become possible of vital importance to both the DOC and the amateur service as I will now discuss.

8. An Integrated Licensing and Examination System

In the earlier sections of this paper I have reasoned that the range of amateur service licences should be extended and the WIA should take over responsibility for the examination system. Both are made necessary and are possible by changes in society, governments policy and technology.

However, it should be noted that two aspects of the current system, which are also central to my proposals, remain unchanged. They are:

(a) the present novice, limited or full licence levels
(b) the current examination papers in their multiple-choice question form.

Now, by freeing the examination system from all the inherent (and justifiable) restrictions of a government department, the WIA, through its network of accredited organisations and individuals, will be able to provide candidates with examinations at any reasonable time and location that may be required.

Further, such a more flexible system will enable the present examinations to be offered in sections as required by an extended range of licence options. As these sections are accumulated by candidates they will progress through the licence structure at their own pace as their interests develop.

The integrity and security of this arrangement would be maintained by having a large and evolving question bank with randomly selected questions for each paper sent out. Only the actual papers set require attention to standard processes of security and confidentiality.

Looking at the discussion on licensing, there appears to be a need for a low level of entry to the amateur service, provision for those interested only in digital modes and for those who could usefully use higher power. Under the structure of licensing and examination, I have proposed these can readily be accommodated as in the following example. Here, it is assumed that a novice level set of questions relevant to VHF propagation, TVI, etc is added to the current question bank, as well as a set covering high power and high speed CW. Questions relating to digital modes to be a separate section of the current AOCP theory examination.

1. Communicator — Low power, limited range of frequencies embedded in an active section of one VHF band along the lines of the current HF novice segments.

It may be seen from Figure 1 that there is a natural progression in the arrangements. It is possible to follow ones own interests without sitting more examinations than is necessary. Further instructional courses can be arranged so that candidates can get on the air at an early stage. This gives the practical experience of radio communications that is an essential part of generating the incentive and enthusiasm to proceed to a full licence. The advanced class gives the serious amateur the opportunity to carry out work of genuine scientific value.

There is an advantage to the DOC too in this system if the letter given in the last column of Figure 1 is added to the amateur call sign, either to the prefix or to the call letters. A call sign would be allocated on the first application which would remain with licensees for as long as they remain licenced in that State. At that time, and revised as each examination section is passed, DOC would notify the licensee of his current privileges and the letter or letters he must use in addition to his call sign for the mode or bands used. This system can be readily computerised and would reduce the administrative work required considerably.

I have not gone into great detail here, but enough, I trust, to illustrate that if the framework of licensing and its interrelated examination system is properly constructed, it can cope with changes to the licence structure and the needs of the amateur service as society changes and as technology advances. If the structure is right now it will carry us through to the next century.

10. Conclusion

In this paper I have set out to analyse the Amateur Radio Service as it now stands and, what changes are necessary to modernise its activities. I have done this because I am concerned that we will only get the one opportunity that is given us now to firmly and permanently establish our rights and responsibilities as a valuable and professional activity in radio communications. I fear that if we do not take up the challenge, commercial and political opportunism will take its course and the amateur radio will eventually cease to exist. The ominous signs are already appearing in the US and the UK, but strangely not in China or Russia

LICENCE	EXAMINATION									
	NOVICE				AOCP		ADVANCED			
	REGS	THEORY			THEORY			THEORY		DESIG
		VHF	GEN	CW 5 WPM	DIGI	GEN	CW 10 WPM		CW 15 WPM	
Communicator	X	X								C
Digi Endors	X	X			X					D
Novice	X		X	X						N
VHF Endors	X	X	X	X						V
Digi Endors	X	X	X	X	X					B
Limited	X				X	X				L (VHF)
Novice Endors	X			X	X	X				N (HF)
Full	X				X	X	X			—
CW Endors	X				X	X	X		X	—
Advanced	X				X	X	X	X	X	A

Figure 1: Possible Amateur Licensing System.

where the contribution of the amateur service to the community is well recognised (but, perhaps not for the reasons we would like).

I have examined changes which are desirable in the licensing system, changes which are necessary in the examination system as a consequence, and changes within the WIA which must occur to make these possible. In this I am reminded of the old adage:

Give us the courage to change what needs to be changed,
the patience to accept what cannot be changed,
and the wisdom to know the difference.

With respect to the amateur service, most of what is required to revise the system is already there. It only needs a fresh way of looking at things and a more open approach in the organisational field to achieve what is wanted at any particular time.

Given this, some goodwill and remembering the Amateur Code of Ethics, I am sure the amateur service will not only survive but become a real force for good in our community.

Change is inevitable. But, if the basic foundations of philosophy and organisation are sound, most changes are only superficial. Then, the more things change, the more they really do stay the same!

ar

Improved HF Broadband Wire Antenna

We are indebted to Gerry McCulloch VK2BMZ, for bringing to our notice an article in "Electronics Letters" of May 12, 1987. It reports on work done by A P C Fourie and B A Austin at the Witwatersrand University, Johannesburg, South Africa.

Briefly, they based their work on the type of loaded broadband dipole described in a number of references, of which "Amateur Radio" for April 1962, is one. This earlier antenna uses lumped units of parallel L and R for loading (16 μH and 330 ohms) at about ⅔ of the distance from the centre feed point to each tip of a multi-wire dipole, 40.6 metres in overall length. Its worst SWR is about 2.6 at around 18 MHz, worse than 2.0 between 12 and 23 MHz, but better than 2.0 from 3 to 12 MHz and above 23 MHz.

Fourie and Austin realised that as the element lengths change (in terms of wavelength) each side of the loading units, there will be unwanted resonances at some frequencies (notably 18 MHz) which cannot be controlled fully by the loading resistors.

Effectively splitting the antenna into two parallel dipoles in X formation (using single wire, much simpler construction) with four loading units (each 32 μH parallelling 600 ohms) they made it possible to "stagger" the loading and resonance effects by placing one set of loading units at a different distance from the feed point than the other set.

Whereas in the earlier antenna the distance to the loading units is about 13.5 metres, the improved antenna uses one pair at this distance, and the other pair further out, at 17 metres.

This results in SWR exceeding 2.0 only over a narrow range (about 22 to 26 MHz, and above 28 MHz) which is considerably better than the earlier version. It is also found to have rather better efficiency over most of the spectrum. The only segment where the earlier type is more efficient is the region in which the SWR is worst!

The angle at which the dipoles intersect is not very critical, but has a small effect on the average impedance at the feed-point. If intersecting at 90 degrees the optimum feed-line Zo is about 400 ohms. This rises to about 500 ohms when the dipoles are nearly parallel at 5 degrees.

All the tests and measurements were carried out at an antenna height above ground (at the centre) of 8 metres. An inverted-V type of configuration is indicated, but end heights above ground are not stated in the report.

WHY NOT?

Alan Shawsmith VK4SS
35 Whynot Street, West End, Qld. 4101

Roy VK3XY, was intrigued by the street name of Alan VK4SS, a regular contributor to AR. Roy wrote to Alan and asked if he knew how WHYNOT Street got its name. Following is Alan's reply to him.

There is no doubt that certain place names evoke the imagination. The street in which I've lived for so long certainly does — and well it might, for some of the happenings in it are recorded in both early and contemporary Brisbane history.

Being a lover of rhetoric (the "fair-dinkum" variety of course), I have had a lot of fun with those inquiring souls who ask, "*Whynot* Street, that's funny, how'd it get that name?"

The most recent query and catalyst for what follows here came in the form of a letter, dated February 24, 1987. Quoted verbatim it says:
'. . .also, I feel sure an article by you as to how your street came to be called *Whynot* — written in your unique humorous vein — could be of great interest to your many fans, including yours truly. *Why Not!* 73, Roy VK3XY.' I wonder . . .

Anyway, at the risk of boring one and all, let me start where it all began. My maternal grandfather arrived in Brisbane town (circa 1880s). Climbing a hill not far from the Southbank, he gazed back to where the city now stands and exclaimed, "This would be a fine site for a home!"

"Well, *Why Not*," was the reply of his young bride, "you're in the sawmilling business and we have the timber — so *Why Not* build here."

At the first available land auction he stood with a handful of others and bought a block of his choice. At the end of business the auctioneer is alleged to have pointed down the dusty track and said, "We'd better give the road a name. Any suggestions, folks?"

"*Why Not* call it this, *Why Not* call it that," came various replies.

"Well, *Why Not WHYNOT* Street," the official said. None dissented.

Little did the 'Old Boy' know just what a magnificent site for working DX he would bestow upon his grandson (VK4SS). The modern beam has reduced this advantage — but in early days (1930s), it was possible to *Work the World* from *Whynot* Street, on the proverbial piece of string.

The connotation that goes with the words 'Why Not' is one of casting caution aside, taking a little risk even for a moment. In the female vernacular it's "letting one's hair down," when used in light conversation it is anticipatory.

I ran my own business for many years. Naturally, this brought me into contact via the twin with the office girls of other business men. Sooner or later the familiar question would arise, "*Whynot*, that's a funny name for a street."

"Yes," I'd say, "and there are some funny people in it. Want to hear a story?" Few resisted. Many years later I'd hear my sons chatting up their young ladies with the same old spiel.

In the 1960s, the USA was convulsed by race riots. Here in *Whynot* Street, two groups of different ethnic origin fell into disagreement over the location and use of a building. Journalists beat up the "storm in a teacup" into a racial conflict. The story came out in USA newspapers under the heading "Little Rock Arkansas transported to *Whynot* Street, Brisbane." So, for a few days at least, the residents basked in the glory of international focus.

Some years ago a Canadian Mountie informed me he'd seen a street named *Whynot* somewhere on his beat of 1000 square miles — he'd check it out and let me know. I'm still waiting. In VK there must be streets or places called *Whynot* (anyone who knows of one might to care to drop me a line); however, there is only one in the Brisbane Refidex. Also, mail posted from overseas to *Whynot, Brisbane* finds me.

An end of an era is now at hand. Developers have their eyes on this small hill with its city views. The Council is about to declare it no longer 'Urban' but 'City Zone.' Parking meters slowly approach *Whynot* Street, EXPO 88 is rising nearby and so are other building complexes.

Man-made QRN is now almost constant. Power lines that were once quiet now carry sizzle and crackle from HT leaks. Sensitive, unshielded electronic gear in surrounding houses and flats are beginning to pose a TVI and RI problem. *Whynot* Street is no longer an ideal site for DXing. Soon VK4SS will have to hang up his "fones" and put away the key — but in the meantime, *Why Not* put the *Whynot* Hill to good use and keep on working DX. Give me a good reason *Why Not*.

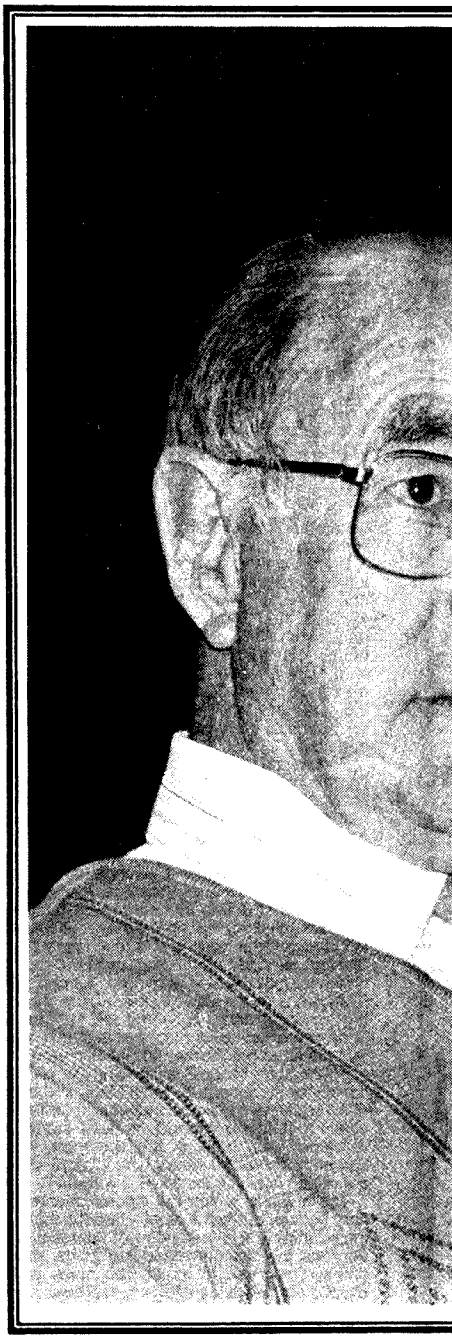
ar

View from the Sundeck at 35 Whynot Street, Brisbane City with Hot-Air Balloons above taken at 6 am, November 1986. (It may not look high but there is a sweeping panoramic view from Mount Cootha in the west to EXPO 86.

VALE

MAX HUL

Passed away



In excess of 160 people from all walks of life assembled in a small crematorium chapel to pay their final tribute to G Maxwell Hull, an esteemed friend of long standing, with whom they had shared many varied interests. Some of the gathering had known this gentleman for over half a century.

Those present were led through an account of Max's life by Brian MacInerney, a Funeral Celebrant, who, although unknown to each other, spent three decades in an allied profession to Max as an announcer, copywriter and later a producer with the Australian Broadcasting Commission.

In the opening remarks of the service Brian said "I hope Max is aware that we're recording this service on the best portable gear we could find. I hope he agrees that we think it appropriate to record it all for posterity. After all Max was a great recorder of events. I don't mean simply as an Audio Engineer. In that field he was tops, sparing no expense and effort in the pursuit of perfection."

Max was born at Moonee Ponds, an inner Melbourne suburb, on July 24, 1916. The precise time is not known, but his twin brother Lloyd followed one minute later. Max and Lloyd grew up sharing a happy childhood with their brother and sister, Graham and Noel. Max's childhood and adolescence was a happy balance of urban and country life. A well renowned Guest House in the mountain holiday resort of Marysville, was built and owned by the boy's grandfather and this is where they discovered the pleasures of hiking, fishing for trout and even wagging school for a swim in the cool waters of the Taggerty River, a local mountain stream.

However, it was not all play for Max as, at an early age, he learned work was necessary to achieve his goals and he financed the building of his first one valve set by selling vegetables from his personally nurtured back garden. The experience gained on the one valve set was expanded whilst attending suburban Box Hill High School where he selected wireless for the mid-week hobby group and undertook the successful construction of a Shortwave Receiver, jubilantly hearing his first overseas phone station.

Upon leaving school, Max was employed as a Copy Boy with the *Argus* newspaper and Australasian Newspaper's evening publication *The Star* when he was 17. It was here he met the late Ron Williams VK3ZD, who encouraged him to study for the Amateur Operators Certificate of Proficiency.

The evening newspaper was withdrawn from publication and new employment was gained with Arthur J Veall and Company, as Manager of the Mail Order Department. During these duties this studious and enterprising young man commenced a course in Radio Engineering at the Melbourne Technical College. After two years of studies his qualification enabled him the privilege of obtaining an amateur station licence.

A better position was sought and gained at Healing's in 1938, however this was short-lived as hostilities commenced in 1939. Max joined the Army and served a term as a Wireless Operator in Third Divisional Signals later transferring to the Royal Australian Air Force where he was initially mustered to train as a Wireless Operator (Air). On the completion of the course, promotion was imminent as was the posting as an instructor in Morse code at the RAAF Wireless Airgunners' School, situated at Parkes, New South Wales. This posting lasted for two and a half years, the school was phased out and Max was posted to the RAAF Marine Section as a Wireless Operator on the ketch *0159 Myrtle Burgess*, operational in the waters of Papua New Guinea. One year at sea in such waters is idyllic by todays standards but highly dangerous during that period. His last war service posting before discharge, with the rank of Flight Sergeant, was to the Albert Park Barracks in Victoria.

It was during a Services dance in October 1945, that Max met Gwenda, a lady who was to become his wife. Brian succintly relayed to the mourners in the words ". . .he met Gwenda. It must have been love at first sight. They became engaged in July 1946 and then on September 27, of the next year, *Grey Dove* married *Blue Bird* and so consolidated a deep and loving relationship that spanned close to 40-years. For all that time they were good companions, good friends who worked hard to make a good life for themselves and a better one for their children, Diane and Malcolm. He relished their presence, their skills, their achievements. His only regret, in later years was that he didn't spend enough time with them. But he made up for that with his grandchildren, Adam, Kym and Andrew. They were the collective apple of his eye and he loved them more than he could say. Earlier he had rejoiced when Diane married Gary and Malcolm married Cheryl. Max truly felt that he had gained a son and a daughter."

Upon discharge, this young but experienced engineer, returned to his pre-war employer, A G Healing Pty Ltd. One year later, he joined William Willis and Company, a family company established in the 1860s, located in the centre of the city of Melbourne, which was renowned for impeccable trading as Locksmiths and for the manufacture of fireproof safes and strongroom doors. Previously this company had been managed by Wallace George Hull, Max's father and before that, George Edward Hull, Max's grandfather. A hard act to follow but this young perceptive man, with a love of history and a pride with links of the past, diversified, and introduced new lines to the retail outlet, electronics, in Bourke Street and later Elizabeth Street, Melbourne.

David VK3ADW, the WIA Federal President's, association with Max goes back to those days when, as a student during lunch hours, he could be found on many occasions browsing through the store. Little was he to know then how much involvement they would have together, and with others, in the shaping of the world's oldest amateur radio society's futurel

Max was first licenced in 1937 as VK3ZS but this call was not used until amateur radio was permitted again after the cessation of hostilities.

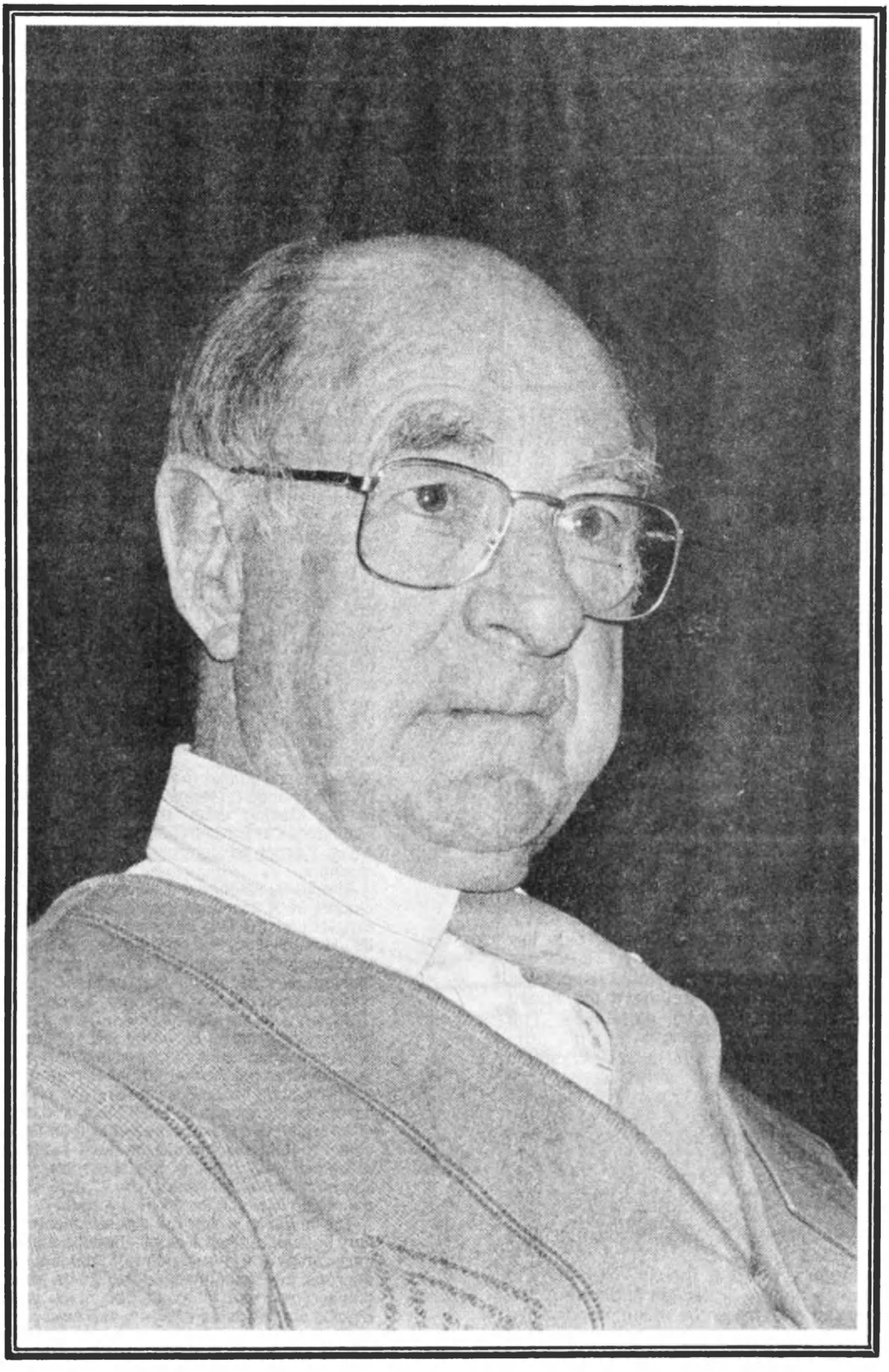
This amateur was more interested in 'home-brewing' than chatting and with the trait of perfection and an inquisitive nature, his homemade equipment was a sight to behold and listen to, at all times being broadcast quality plus. Some of Max's equipment won first prize at the All Models Exhibition, held at the Exhibition Buildings, Melbourne, in 1955.

Involvement with the Wireless Institute of Australia, commenced a much earlier than his appointment as Federal Secretary in April 1950, an office he held for four years. This appointment commenced 37 years of continuous honorary involvement in the Federal sphere of our society. Relinquishing the Secretary's position he accepted the appointment of Federal Vice-President and Federal Publicity Officer. From 1958 to 1961 and 1965 to 1967, Max was Federal President, retiring after the Sydney Federal Convention, held over Easter

VALE MAX

MAX HULL VK3ZS

Passed away July 28, 1987



MAX

LL VK3ZS

y July 28, 1987

1968. In 1962, Honorary Life Membership was conferred on Max for his service to the Institute and the hobby he dearly loved.

Not one to rest on his laurels, and with his interest in history and to preserve and make a record of our hobby he assisted the then Historian, the late George Glover VK3AG, and in 1970 took over the role as Federal Historian, a post he held continuously until his death.

Max was a "great recorder of events", not only in the audio field, but he was also a master at recording events on film and making notes of anything that "attracted his attention." His meticulous eye for detail and interest in history certainly assisted him in his Historian role.

During his 37 years involvement with the WIA, he, with other Executive members, represented the WIA on the Royal Commission of Television, which set the standards, before its introduction in Australia during 1956. Also during his presidency, due to his tenacity, a number of major events occurred in our Society's history, such as the late John Moyle VK2JU, being appointed an observer in the Australian Delegation to the 1959 ITU World Administrative Radio Conference (WARC 59) — a time when pressure was being exerted to release amateur frequencies for commercial enterprise. He was a driving force in the campaign for justice in Frequency Allocations for the amateur service in Australia, culminating in the Huxley Inquiry.

This perceptive amateur was one of the delegation who headed the initiative of the WIA, for the formation of a IARU Region 3 Association. All society's within the boundary were extended an invitation to attend a meeting to be held in conjunction with the 1968 Federal Convention. It was fitting that Max was a member of the initial Secretariat of the newly formed Region 3 Association, which until it found its feet, was assisted under the 'umbrella' of the WIA.

Max, was a thorough researcher. All of his information was initially kept on neatly typed cards until he recently acquired a small computer, which he initially found harder to tame than his boxes of catalogue carded notations, which had grown progressively through the years and contained a wealth of knowledge. Never daunted, he did tame that computer and taught himself a new language. However, the cards were still used as a resource for a vision that he had nurtured for the WIA. That vision was a world-wide recognition of the Society's 75th Anniversary and no better vehicle could have been chosen than the 75th Commemorative envelope, issued by Australia post.

This quiet achiever was a stalwart to the Anniversary Committee from its inception. Max compiled biographies of the WIA for publication in *Amateur Radio* and ably presided over the WIA's 75th Anniversary Dinner in the role of MC.

Versatility was a part of his life, and if there was a job to be done he would do it. He wrote the *History of Amateur Radio and the Wireless Institute of Australia* (Refer p21 *Amateur Radio* March 1970) to commemorate the Cook Bi-Centenary, sowed the seeds for the formation of The Radio Amateurs Old Timers Club, becoming a founding member, a Past Chairman and Co-Editor of its journal *OTC* at the time of his death. Max was also a popular Master of Ceremonies at most of the RAOTC social functions.

Max was a business man with forethought and he decided to move the business of William Willis and Company closer to his home so that his premises and customers would benefit from a 'village-atmosphere' way of life rather than a busy 'concrete' jungle of the city. The move occurred in 1970 and he built up a clientele of people that liked service combined with a chat. He thrived on being able to assist anyone or everyone with a 'thing-a-me-jig', generally underestimating the price and making a sale at a loss. Brian, in his eulogy remarked "but he didn't mind that, did he? Because joy in fellowship and being kind, compassionate and willing to serve, was the name of the Game played by Max Hull".

Unknown to many was the fact that, Max with his inquiring mind and quest for all forms of knowledge, had a deep interest in Genealogy. He was proud to have validated attachment to the past and his family links with the pioneers of our country, including the convicts.

This man of many talents, had strong ties with Festival Hall, built on the site which was formerly known as the West Melbourne Stadium. Max's interest in electronics encompassed the audio field and he became Sound Engineer at Festival Hall in 1956. He also built his own sound system for the Olympics. Since that period he has served and worked with such performers as Frank Sinatra, Sammy Davis Junior, Judy Garland, Vera Lynne, Peter, Paul and Mary — to mention but a few.

Max was still working at Festival Hall until his death, and in many ways it was appropriate that he should die doing the job he loved — at Festival Hall providing the sound systems for a *Crowded House* concert.

He was also the owner of the East Recording Company and an associate of Jazznote Records.

David VK3ADW, as Federal President of the WIA and Bill VK3WG, Chairman of the Radio Old Timers Association, during the service, spoke of the dedication, time and assistance their fellow amateur had given to the hobby, which concisely expressed the sentiments of all amateurs and shortwave listeners.

Brian eloquently completed his Eulogy with the following "Max made his mark on us, did he not? As a husband, father, grandfather, as a family man who loved the stuff that Christmas, birthdays and anniversaries are made of. As Committeeman, Secretary, President of the WIA and the Hardware Club. As a member of Lodge Combermere where his father was a Grand Master; as foundation and Life Member of the Master Locksmith's Association; past Melbourne Chapter Committee Member of the International Audio Engineering Society. Max's activities and involvements with people, with ideas and concepts, with words, were close to being passionate. He threw himself into causes that he cared for. He was always there when he was needed, and would drop everything, reschedule his whole week, if necessary, if there were no other way to give help to a loved one or friend. And there we come to the crux, the very centre of the forces that moved 'Kind Hearted Max.' He knew the Great Secret — that Giving is a kind of Receiving. And so he gave and gave — and so he received and was filled with the Joy of Doing, the Joy of Living. Now he has gone and all our lives are diminished.

"People like Max Hull are the Salt of the Earth and isn't that the way we feel about him, too?"

Sincere condolences to his loving wife Gwenda, daughter Diane and son-in-law Gary, son Malcolm and daughter-in-law Cheryl, his grandchildren and immediate family.

Compiled by Ken McLachlan VK3AH, from information kindly supplied by Peter Gamble VK3YRP, Mrs Ann McCurdy, Mr Brian MacInerney, Bill Rice VK3ABP and David Wardlaw VK3ADW.

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Novice Notes

A CRYSTAL CALIBRATOR AND SIGNAL SOURCE

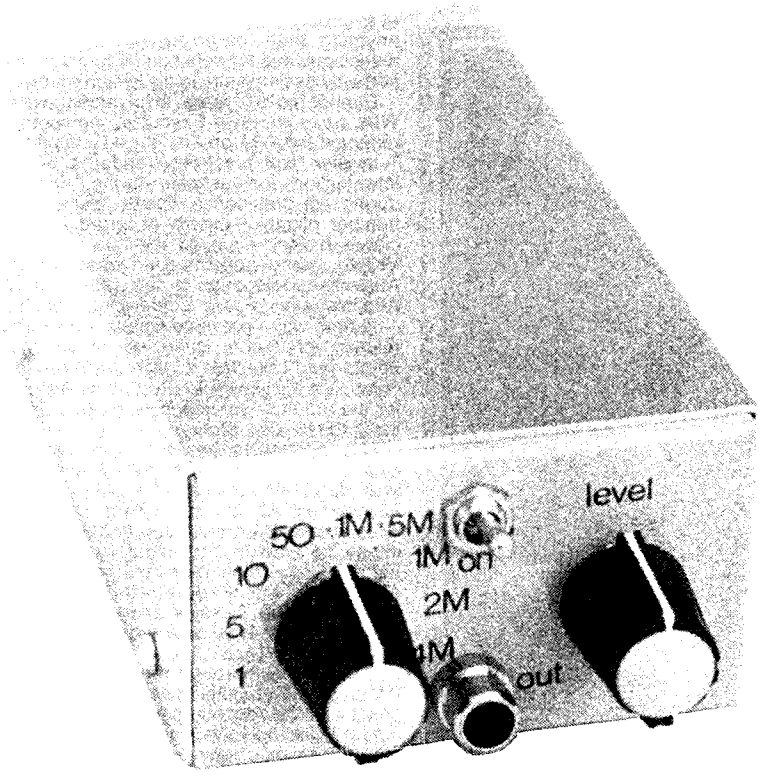
Drew Diamond VK3XU
Lot 2, Gatters Road, Wonga Park, Vic. 3115

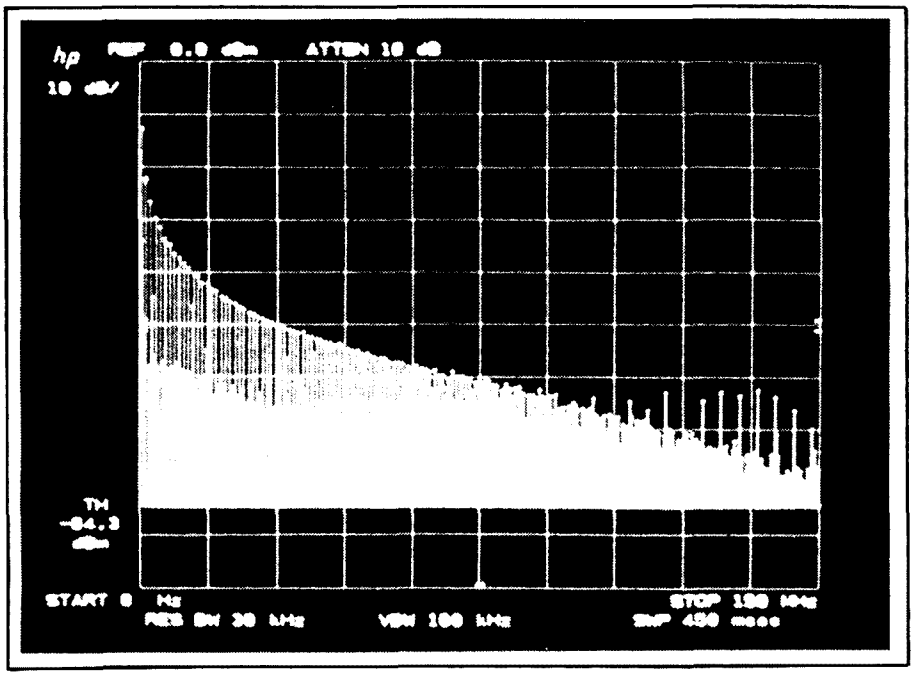
A stand-alone calibrator has great flexibility.

The crystal calibrator has been around for a long time. More than 30 years ago, some receiver manufacturers were installing 100 kHz calibrators in their products so that the accuracy of the frequency dial could be easily and regularly checked. Today most transceivers have some means of checking the frequency display accuracy. However, a stand-alone calibrator has greater flexibility. Let me list some of the perceived uses:

- As a device to check that all transmissions are confined to authorised bands, so satisfying DOC licence requirements.
- To check existing receiver frequency dial accuracy and for calibrating new receivers.
- A weak adjustable signal source for receiver sensitivity checks.
- An accurate marked generator to check timebase calibration of oscilloscopes.
- Signal tracer/audio signal generator.

There are probably many more uses that I have not been able to think of. This calibrator can be made cheaply with a readily available clock crystal and fast ICs. Intervals or increments of 4000, 2000, 1000, 500, 100, 50, 10, 5 and 1 kHz are supplied. As the output is a harmonically rich squarewave, pips or marks at least into the VHF region are produced. The photograph shows a spectrum analyser (amplitude versus frequency) display of 500 kHz harmonics with good strength to 150 MHz. For example, if we wanted to check the frequency accuracy of a two-metre receiver at 146 MHz, we should find the 73rd harmonic of 2 MHz (2000 kHz), or the 146th harmonic of 1 MHz, nicely centred on that channel. The 36th harmonic of 4 MHz would provide a mark at 144 MHz. Similarly, the bottom edge of the 80-metre band would be accurately confirmed by looking for the seventh harmonic of 500 kHz at 3500 kHz, and so on. More about this later.





CIRCUIT

For speed and harmonic richness, plus low battery drain, low- power Schottky TTL devices are used throughout (CMOS would have lower battery drain, but does not have the speed required to produce lots of harmonics). The circuit is all pretty standard — straight from applications notes. The 4 MHz clock crystal is maintained in oscillation by two series connected 74LS04 inverters. The 4 MHz signal is made available as an output, and also applied to U2, a 74LS73 wired to divide by two and then two again, yielding 2 MHz and 1 MHz output. This 1 MHz signal is sequentially divided by two and five (U3), two and five (U4), two and five (U5), giving us 500, 100, 10, 5 and 1 kHz outputs. These divide by two and five functions are provided by 74LS90 ICs. A diode is connected in series with the six volt battery to give reverse battery protection and to drop the supply voltage to nearer the recommended five volts required for TTL 74LS series devices.

CONSTRUCTION

A single-sided PWB accommodates all components except C8 and R3. Be careful to install

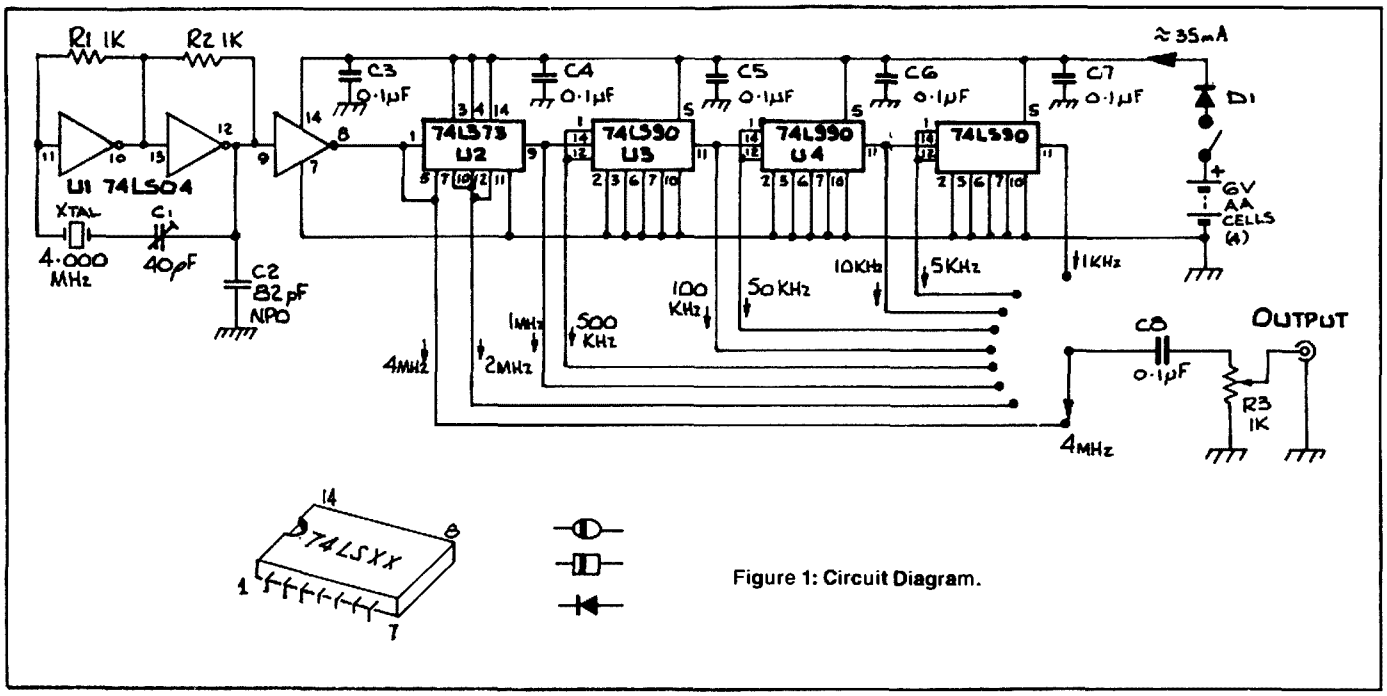
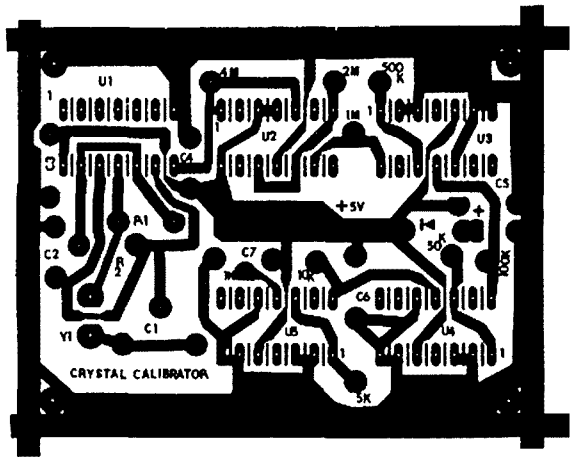


Figure 1: Circuit Diagram.



PWB Artwork.

all ICs correctly. Note that U4 and U5 are orientated differently from U1-U3. A fine pointed soldering iron will be required. When soldering is complete, check that no solder bridges exist.

If smaller signal receiver work is planned, the calibrator must be housed in a totally metal box to keep stray fields from reaching the receiver input. Mine is housed in an "off-the-shelf" box measuring 70 x 40 x 125 mm (WHD). There are nine intervals to be switched to the output connector. Unfortunately, I could not buy a nine-position switch, so a 12-position switch was used, leaving three positions spare. The choice of connector type must be left to the individual. I prefer BNC connectors for test equipment, but they are rather expensive, and an ordinary RCA type would be just as good in this application.

The front panel should be lettered in some manner. One of the easiest and most effective methods for the amateur is to use Letraset® or similar press-on letters. Sheets of these can be obtained from stationers, graphic suppliers and some newsagencies. When the panel is lettered, a coat of clear lacquer spray will prevent them from being rubbed off in use. If you have not used this method before, I suggest that you practice on a scrap of material before attempting the final product. Remember to burnish (rub down) each letter by overlaying the special semi-transparent paper provided and applying moderate pressure with your swizzle stick.

CALIBRATING YOUR CALIBRATOR

The precise oscillating frequency of the crystal must be adjusted to as near 4.000 MHz as is possible with the techniques available to you. There are two perceived methods that we may employ. If you have access to an accurate frequency counter; connect the 4 MHz calibrator output to the input of the counter and adjust C1 so that 4000.000 kHz is indicated. Let the calibrator run for a few minutes to check the stability of the crystal. The counter timebase period should be set to the longest available (usually 10s).

The second, and more popular method makes use of a receiver which can be tuned to one of the time and frequency standard signals. VNG, Lyndhurst, Victoria (future operation in doubt at time of writing) transmits on 4.5, 7.5 and 12 MHz. WWV/WWVH, USA/Hawaii transmits on 2.5, 5, 10, 15, 20 and 25 MHz. In addition, there are several SW broadcast signals available. The BBC usually puts in a good signal each afternoon on 7.150 MHz. Connect about one metre of wire (eg a clip lead), to the output of the calibrator to act as a small radiator and turn the calibrator output to maximum. If, for example, your receiver is tuned to WWV on 10 MHz AM (good signal most afternoons and evenings), you should hear an audible beat note caused by the difference in frequency between that of the calibrator and the standard signal. Adjustment of C1 should vary the frequency of the beat note. Set C1 for 'zero beat' ie where the note is so low in frequency that a slow "whoosh-whoosh" is all that can be heard. A more accurate setting can usually be obtained by switching the receiver BFO on, and adjusting C1 so that no warble or burble is heard. The crystal frequency will now be within a few Hertz of that of the standard signal.

In use, the calibrator must be set to deliver an output which puts a harmonic upon the frequency of the standard. For example, 10 MHz WWV would require the calibrator to be set 2 MHz, 1 MHz or 0.5 MHz, etc, whereas for the BBC on 7.150 MHz, 50 kHz would be required from the calibrator. The higher the frequency of the known standard; the better the result.

Whenever any receiver work is performed, it may or may not be necessary to directly connect the calibrator to the receiver input. It will generally be found at HF that sufficient signal strength can be obtained with the set-up previously mentioned for receiving the standard signal.

APPLICATIONS

The most traditional application has already been mentioned, that of receiver frequency

calibration. The dial of a new or repaired receiver can be readily calibrated by first using large increments to find 1 MHz points. For example, a receiver which is expected to cover 3 to 4 MHz can first be calibrated for the 4 MHz mark by applying just 4 MHz. Then the 3 MHz mark could be found by applying 1 MHz (third harmonic). Next, apply 500 kHz pips and note these, then 100 kHz pips and so one, down to the smallest increments required.

Whenever any work is performed where great frequency precision is required, the calibrator should first be checked for accuracy as previously described.

Some idea of receiver sensitivity can be obtained if the calibrator is housed in an RF-tight box. It should be possible to reduce the calibrator signal amplitude to equivalent sub-microvolt level with R3. Experience and use will soon tell the user how healthy the receiver sensitivity is by applying appropriate signals from the calibrator (eg 500 kHz pips).

There are a number of oscilloscopes on the market now for around $200 — but they generally do not have an accurately calibrated horizontal time-base in terms of time/division, which is the norm for the more expensive 'scopes. The calibrator can be simply applied to the 'scope vertical input and the time-base adjusted so that more accurate time domain measurements can be made upon the horizontal axis.

Similarly, very accurate audio frequency measurements can be performed with Lissajous figures — by applying an adjustable but not accurately known frequency to the vertical input of an oscilloscope, and a known frequency from the calibrator to the horizontal input. Most radio handbooks have details of how to apply this technique.

By the nature of its output, the calibrator may also be used as a broadband signal source or signal tracer for receiver work, using the 1 kHz output, and applying this to the various stages of a receiver, from antenna input right through to the audio end and observing the results. A small capacitor (say 100 pF) should be connected in series with the calibrator output to prevent a DC path when working on some circuitry. It is suggested that a suitable probe could be made up for this application.

If you plan to make many accurate long-term frequency measurements and want a really first-rate local frequency standard, the crystal should be 'ovenised'. Details of how to do this were provided recently in references 1, 4 and 5 below.

PROBLEMS

Do not be tempted to mix IC types, but stick to the LS series specified. Please, if you cannot get your calibrator to work satisfactorily, write to me about it and I shall extend any reasonable amount of help necessary. (An SASE would be appreciated).

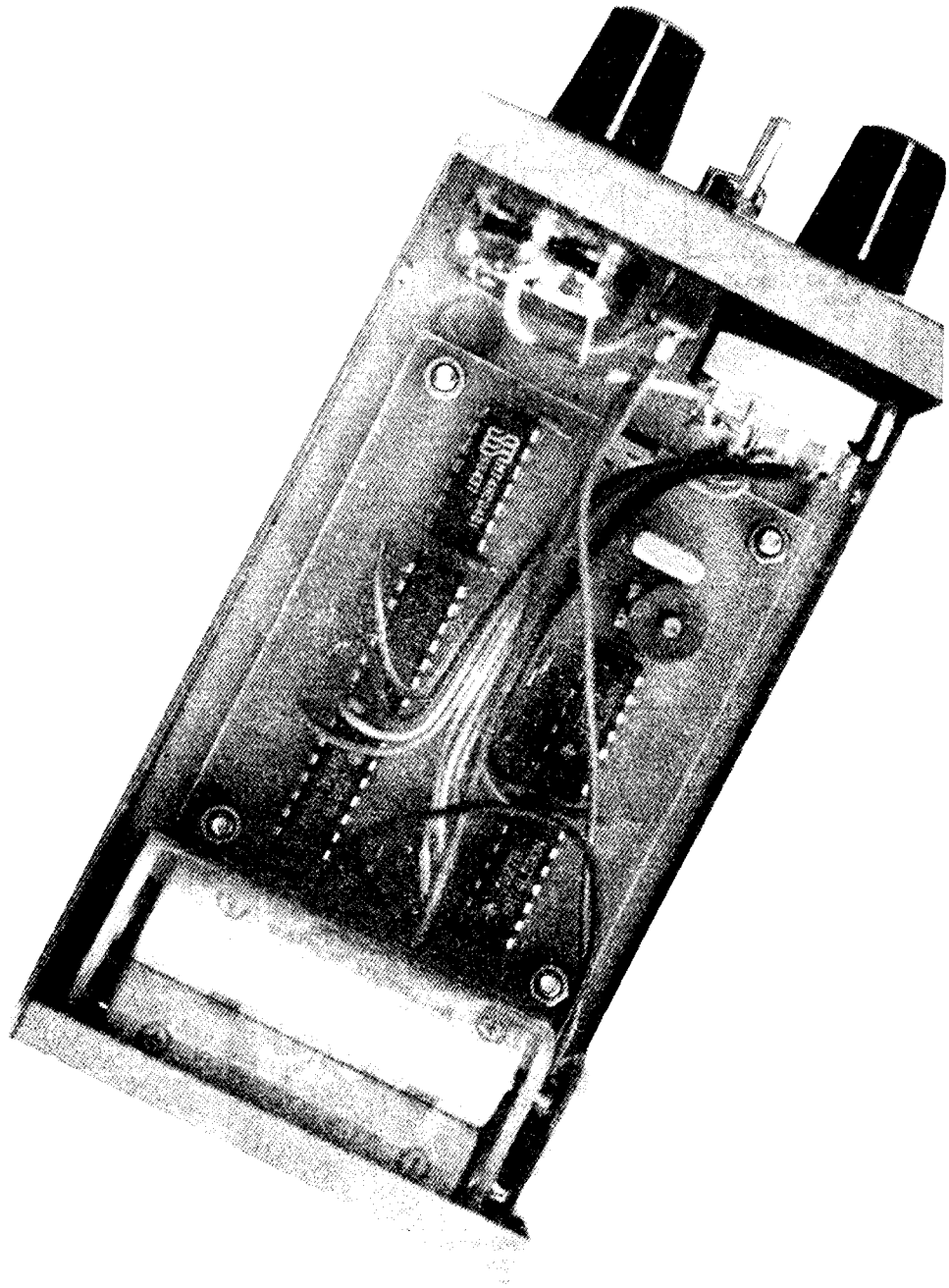
PARTS

All the components for this project are common and readily obtainable. If you wish to obtain all your parts from one source, the following supplier can oblige. A kit of parts can be obtained for $30, including postage, but excluding the case.

Ian J Truscott's Electronic World
30 Lacey Street
Croydon, Vic. 3136

REFERENCES AND FURTHER READING

1 POGSON. A Simple Temperature Controlled Crystal Oven, *Electronics Australia*, April 1987.
2 RULE. Digital Calibrator, *Practical Wireless*, October 1983.
3 MIMS. Electronic Engineers Notebook II, Tandy Publication.
4 KIMBERLEY, VK2PY. 10 MHz Frequency Reference (Part 1), *Amateur Radio*, September 1986.
5 KIMBERLEY, VK2PY. 10 MHz Frequency Reference (Part 2), *Amateur Radio*, October 1986.
6 *Fairchild TTL Data Book*.



Internal View.

PARTS LIST

Capacitors	
40 pF max Philips Trimmer	C1
82 pF NPO Ceramic	C2
0.1 uF Monolythic	C3, C4, C5, C6, C7
0.1 uF Disc Ceramic	C8
Resistors	
1 kohm, ¼ watt or ⅛ watt, 5%	R1, R2
1 kohm, log or lin variable	R3
Semiconductors	
74LS04 IC	U1
74LS73 IC	U2
74LS90 IC	U3, U4, U5
Diode, 1A, greater than 100 volt	D1
Crystal	
4.0 MHz Parallel Mode, 30 pF M-TRON	Y1

Miscellaneous
Metal box, not smaller than 70 x 40 x 125 mm (WHD), 9 or 12 position rotary switch, RCA female connector, 10 colours of wire (rainbow ribbon), battery holder for four size AA cells, battery connector, on/off switch, two knobs with pointer, Letraset or similar, solder, screws, nuts, spacers, rubber feet.

Coaxial Cable Specials

Low Loss VHF/UHF Cables

Description	Trade & U L Type Number	AWG (Stranding) Dia. in In Nom. D.C.R.	Insulation & Nominal Core O.D. Inch	Insulation & Nominal Core O.D. mm	No. of Shields & Material Nom. D.C.R.	Nom Imp Ω	Nom Vel of Prop	Nominal Capacitance pF/ft	Nominal Capacitance pF/m	Nominal Attenuation MHz	Nominal Attenuation db/100 ft	Nominal Attenuation db/100 m
	**9913** 80C	9½ (Solid) .108 bare copper 90Ω/M' 2.95Ω/km	Semi-solid Poly-ethylene .285	7.24	Duobond II* + 88% tinned copper braid 1.8 Ω/M' 6.0Ω/km 100% shield coverage	50	84%	24	78.7	50 100 200 400 700 900 1000 4000	0.9 1.4 1.8 2.6 3.6 4.2 4.5 11.0	3.0 4.6 5.9 8.5 11.8 13.8 14.8 36.1
						Black PVC jacket.						

BELDEN 9913 low-loss VHF/UHF coaxial cable is designed to fill the gap between RG-8 to RG-213 coaxial cables and half-inch semi-rigid coaxial cable. Although it has the same O.D. as RG8/U coaxial, it has substantially lower loss, therefore providing a low-cost alternative to hard-line coaxial cable. Your special price from ACME Electronics is only $4.84 per metre.

BELDEN Broadcast Cable RG-213/U MIL-C-17D is only $5.23 per metre, or BELDEN 22385 YR Commercial Version RG213, the same specification as 8267, for only $2.14 per metre. *Prices do not include Sales Tax.

For more information about the above, or any other BELDEN cable, simply contact our resident amateur radio operator, Colin Middleton (VK3LO) or our sales department.

Coaxial Cables

Description	Trade & U L Type Number	AWG (Stranding) Dia. in In. Nom. D.C.R.	Insulation & Nominal Core O.D. Inch	Insulation & Nominal Core O.D. mm	No. of Shields & Material Nom. D.C.R.	Nom Imp Ω	Nom Vel of Prop	Nominal Capacitance pF/ft	Nominal Capacitance pF/m	Nominal Attenuation MHz	Nominal Attenuation db/100 ft	Nominal Attenuation db/100 m
	**8267†** 1354 60C	13 (7x21) .089 bare copper 1.87Ω/M' 6.1Ω/km	Poly-ethylene .285	7.24	Bare copper 1.2Ω/M' 3.9Ω/km 97% shield coverage	50	66%	30.8	101.0	50 100 200 400 700 900 1000 4000	1.6 2.2 3.2 4.7 6.9 8.0 8.9 21.5	5.2 7.2 10.5 15.4 22.6 26.3 29.2 70.5
						Black non-contaminating PVC jacket.						

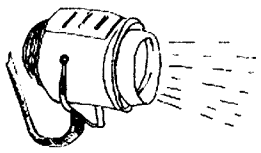
RG-213/U
MIL-C-17D

ACME Electronics

205 Middleborough Rd, Box Hill. Vic. 3128.
Ph: (03) 890 0900.
Fax: (03) 899 0819

SYDNEY (02) 648 2255
ADELAIDE: (08) 211 8499
BRISBANE: (07) 854 1911
LAUNCESTON: (003) 31 5545
DARWIN: (089) 81 5411
PERTH: (09) 272 7122
HOBART: (002) 34 2811

ACME 709



Spotlight on SWLing

Robin Harwood VK7RH
52 Connaught Crescent, West
Launceston, Tas. 7250

Well, Spring has certainly arrived and HF conditions have been improving gradually. I have been following the daily propagational reports and forecasts from IPS and Space Services, in Sydney, via Radio Australia. The sunspot count has been steadily increasing, although the number of geomagnetic disturbances have also increased. This service is aired from Monday to Saturday at 0425, 0825, 1225, 1625,and 2025 UTC, on the usual RA outlets. In addition, I also occasionally utilise the WWV propagational forecasts heard at 18 minutes past the hour. This has an added bonus of having an update of the K index every few hours.

October is also the month for the annual VK/ZL contest, plus the Jamboree on the Air (JOTA). At the end of the month, the world-wide "CQ" contest will be held, so there will be plenty of activity within the DX allocations, particularly in the VK/ZL and CQ contests. Both have sections, I think, for SWL participation. I am sure that details on these can be found in the Contest Column. (The VK/ZL rules were on page 45, August AR). JOTA is not a contest, but an occasion where amateur radio brings Scouts, Guides, Cubs and Brownies together. I have been involved over the past 14 years, but last year I did not participate as I was on my honeymoon. I expect that I shall again be involved with the Launceston Sea Scouts, either portable or from the home station.

A new broadcasting period commenced on September 27 and will last until November 1. This period is timed with Europe and the USSR returning to normal time from Summer Time. I suspect that we shall begin Summer Time on the third Sunday of this month. North America concludes Summer Time on October 31.

I have almost given up MW DXing ever since all ABC networks began continuous operation. Also, 7LA increased its power to 5 kW and there are a few spurs on my receiver, so I think I will refrain from serious DXing until I am able to go to Weymouth, about 40 kilometres north of here, away from RF over-loading. I am seriously considering having a MW loop constructed to null out some of the Australians. Incidentally, you have probably noticed that ABC Radio National is now replaying Radio Australia from midnight to dawn. Some of the regionals may also opt to relay them as well!

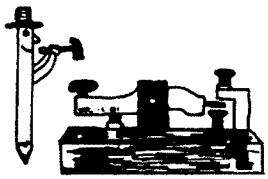
The Persian Gulf region continues to produce tension and it is very easy for us to keep abreast with what is happening via shortwave. United Arab Emirates Radio, in Dubai, has probably the best coverage of news from this trouble-spot and it is well heard on either 17.775, 15.435 or 21.700 MHz, at 0530 UTC, in English. The Voice of Islamic Iran, from Teheran can be sometimes heard in English at 1115 UTC, although their signal is extremely strong during the daylight hours here on 15.084 MHz. They broadcast in Persian, Arabic (which is heavily jammed by Iraq), Spanish and French.

Other Middle Eastern stations can be easily heard, but most broadcast in Arabic. Kuwait is on 15.495 and 15.345 MHz, from 0300 UTC, and Baghdad is on 15.100 MHz. Damascus is on 15.020 MHz around 0800 UTC in Arabic. Saudi Arabia can be heard at 0400 UTC when they are broadcasting in Turkish on 15.060 MHz and, I believe, they broadcast in Indonesian later in the day on that channel.

I occasionally wish I could understand Arabic and know what is being said, but I am reliably informed that it is very difficult, if not impossible to master, studying at home. I did learn French and German when I was at Scotch College in Launceston, but that was 25 years ago, and I am rusty now! I surprise myself sometimes when I speak a little fractured snippets to French or German tourists visiting Tasmania, but I have certainly forgotten much. Maybe I should consider doing a refresher course next year?

Good listening and 73 de VK7RH

ar



Pounding Brass

Gilbert Griffith VK3CQ
7 Church Street, Bright, Vic. 3741

It is my sad duty to report the death of Clive Burns VK3COL, who became a Silent Key on July 23, 1987.

It has been suggested by Bill VK3NRV, that we take up a collection for a perpetual trophy to remember Clive by, and Bill has pledged $30 himself.

I would like to recommend a trophy for the Novice Contest CW Section winner each year, mainly because of Clive's great interest in helping novices and budding Morse enthusiasts with his excellent sending.

Many people have remarked on the readability of his signals and the great help he was in teaching good operating techniques. My own interest in Morse was sparked by Clive and I chatted with him daily for my first year or so on air. In fact, we QSOed so often that I did not log most calls — he was always "there". So, I, especially, will miss his familiar fist.

Should you wish to send a donation I will be pleased to arrange with the Victorian Division for a suitable trophy.

I have been in touch with the *Amateur Radio Telegrafie High Speed Club, eV,* in Germany, through Max DL6AN, and have received a copy of a letter he had published in their newsletter, I-IV 1986. The letter is rather long and so will not be reprinted here. Essentially it describes the problems being faced by a number of High Speed Code Clubs in West Germany. Some of their members feel that their interests are not getting the support they would like from the DARC. Obviously this is not an argument in which we should participate, but if any reader would like more information, a copy of DL6AN's letter can be obtained from the Federal Office, PO Box 300, Caulfield South, Vic. 3162, on request, accompanied by a SASE.

From Max's letter, it seems we may be fortunate in having our WIA, if we decide to use it as 'Morse Operators' should.

I wonder if the following operators could contact me with any information they may have about the HSCeV? The call signs are VK4SS, VK4ANY, VK5LG and VK5BY.

Max DL6AN, has pointed out to me that many people, including the above, are interested in continuing the tradition of 'Knights of the Key'.

73 Gil VK3CQ

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COMPUTER PROGRAMS

Due to the length and quality of some computer program printouts, it is frequently impossible to reproduce them effectively for others to copy. Members interested in particular programs are advised to contact the author for an original copy of the relevant program. (Please include an SASE).

Intruder Watch

Bill Martin VK2COP
FEDERAL INTRUDER WATCH CO-ORDINATOR
33 Somerville Road, Hornsby Heights, NSW. 2077

The authorities in Indonesia have had a recent clamp down on illegal transmissions. Between 400 and 500 sets of equipment have been confiscated, according to Indonesian sources. Most of the problem was on the two-metre band. A pity some other administrations would not follow their example.

Reports on intruders continue to be fairly static, and we look for ward to more reports when conditions improve. Of course, this means that the incidence of intruders will also rise.

Reports were received for the month of June 1987, from:
VK2s DEJ, PLL, QL, Arthur Bradford; VK4s AKX, BG, BHJ, BTW, DA, KHQ; VK5TL; VK6JQ; VK7RH and VK8s HA and JF

There were 92 intruders reported using the broadcast (A3E) mode; 145 using CW (A1A); 79 using RTTY (F1B) and 39 using other modes. Of these, 37 intruder stations supplied us with their call signs. More reports have been coming in regarding fishing boats using the 80 metre band, which is not necessarily illegal — it depends on where they are and, who knows where they are?

I am not too happy personally at the moment, as my computer/word processor has finally 'crashed'! I picked it up today from the manufacturers after parting with a $100 repair fee, and the miserable thing is just as dead as when I took it to be repaired! *Guess where I am going in the morning?* So, the column must be a little shorter than usual this month, as I am struggling with the old-fashioned typewriter system. (How we get spoiled).

Please keep the reports coming, and thanks to those who give continuing support to the Intruder Watch.

73 and good DX.

ar

Know your Second-hand Equipment

Ron Fisher VK3OM
3 Fairview Avenue, Glen Waverley, Vic. 3150

Again this month we will look at a variety of equipment which will include a few transceivers that are not so well-known. They do, however, appear on the secondhand market from time to time and could represent an economical introduction to HF operation.

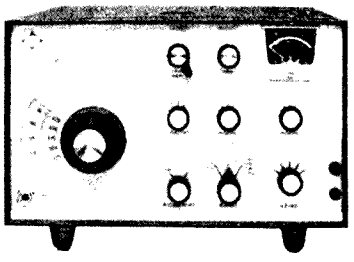
GALAXY TRANSCEIVERS

Galaxy equipment was produced in the United States by World Radio of Iowa. There were five different models produced over the period 1963 to about 1973. In the latter years, Galaxy was taken over by Hy-Gain Electronics, who, of course, were well-known for their amateur antennas.

The first two models were tribanders, which covered the 80, 40 and 20 metre bands. Actually, at this time, most American manufacturers produced tribanders which suited the poor conditions being experienced due to the sunspot minima. With SSB just starting to become really popular, it was also an economically sound way to get into the new mode.

GALAXY 300

Released in early 1963, the 300 was an SSB only transceiver for the 80, 40 and 20 metre bands. However, coverage was limited to the American phone bands and so some modification was required for use in this country. Circuitry was all tubes with a pair of 6HF5s in the final running at about 300 watts PEP input. Very few 300s found their way to Australia, but if you do find one, beware, as some of the tubes used were compactrons with three or more functions in the one tube (early ICs) and would be next to impossible to replace. The original price is not known, but secondhand value with AC power supply would be about $100.



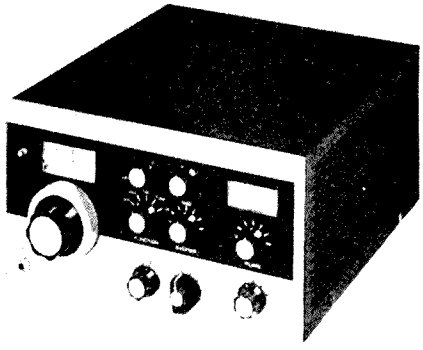
GALAXY 111

This was the first Galaxy to be imported into Australia in reasonable quantities. They were sold here by Sideband Electronics of Springwood, NSW. Whereas the 300 was rather large, the 111 was, for the time, very compact. Although coverage was still 80, 40 and 20 metres, a full 500 kHz was now provided and CW operation was also included. The circuit was very similar to the 300, but the compactron tubes were replaced with more conventional types. A single conversion set-up was used with a 9 MHz IF and a 5 to 5.5 MHz VFO was mixed to give output on 80 and 20 metres and was heterodyned with a crystal mixer for 40 metres. 6HF5s were used in the final to give about 150 watts output. Overall performance was, for the time, rather better than most contemporary rigs with excellent stability and selectivity. At the time many were used mobile with very good results. Problems to look for include the crystal filter (this is very prone to trouble). This often shows as low transmitter output, poor audio quality on both transmit and receive, and very different quality when changing from upper to lower sideband.

The receiver audio and AGC circuits were transistorised and, after many years, the electrolytic capacitors are prone to failure. If you acquire a Galaxy it is often easier to replace all of these capacitors. Price new in 1964, with AC power supply, was $520. Secondhand value today would be about $150.

GALAXY V

Within a few months of the Galaxy 111 arriving on the market, the five-band version was released. Apart from the addition of the 15 and 10 metre bands, everything remained the same — including the problems. With transceivers of this age many other age-related problems can often be found. Perhaps one of the most persistent problem is VFO instability. While the Galaxy had quite good stability when new, after 20 years use, a cure to instability is often difficult to locate. Another age related problem with the Galaxy and other transceivers, is the dial drive mechanism. Easy to obtain a few year ago, the English Jackson drives are now difficult to find. The new price of the Galaxy V, with AC power supply, was $600 in 1965. Secondhand value today would be about $200.

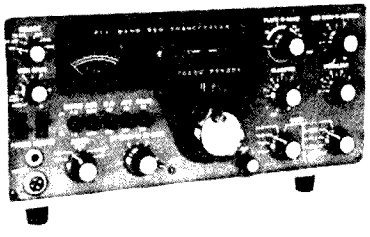


GALAXY GT-550

While the Galaxy V went through a couple of face-lifts during its life-span, the GT-550 was a major change. The dial scale was moved from the side to the top of the tuning knob. The cabinet styling was also modernised. More transistors were used with the VFO and heterodyne oscillator now using solid-state devices.

Power was now up to 550 watts PEP input with a claimed 300 watts PEP output. I am somewhat sceptical about this claim, but these are the figures specified! Dial calibration on all Galaxy models was in 5 kHz divisions. Options on all models included: External VFO, VOX unit, crystal calibrator unit, AC and 12 volt DC power supplies.

New price of the GT-550, with AC power supply in 1969 was $630. Secondhand value today would be about $225.



YAESU FT-201 HF TRANSCEIVER

It is now back to Yaesu and one of their lesser known HF transceivers. Rumour has it that the FT-201 was developed as a replacement for the FT-200. Another says that it was a low-priced alternative to the FT-101 series. Whatever, the 201 did not stay on the market for very long despite some excellent and interesting features.

The unit was fully self-contained with built-in AC and 12 volt DC power supply. It covered amateur bands from 80 to 10 metres, with a 15 MHz receive facility for WWV. The circuit was all solid-state except for the transmit driver and final stages which used a 12BY7 and two 6JS6s.

Construction was on a more economical plain than the FT-101, and there were no plug-in circuit boards used. However, it did have a much better dial with the kilohertz scale set behind the panel which was rear illuminated. The S-meter was also larger than the 101 and the rear illumination was much improved.

The transceiver was supplied with a standard SSB filter, but both a CW and AM filter were available as optional extras. Transmitter power output was the same as the 101, about 125 watts. Receiver performance was generally reasonable, but the AGC action left a little to be desired, as did the strong-signal handling.

However, if you can find one on the secondhand market in good condition, you should find it a useful standby rig. Price new was $498 in 1974. Today, secondhand value would be about $300.

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Thought for the Month

Solutions can be achieved when a minority with all the answers becomes the majority.

VHF UHF — an expanding world

Eric Jamieson VK5LP
8 West Terrace, Meningie, SA. 5264

All times are Universal Co-ordinated Time and indicated as UTC

AMATEUR BANDS BEACONS

FREQUENCY	CALL SIGN	LOCATION
50.010	JA2IGY	*Mie (Near Nagoya)*
50.075	VS6SIX	*Hong Kong*
50.090	KH6EQI	*Honolulu*
52.013	P29BPL	*Loloata Island*
52.020	FK8AB	*Noumea*
52.100	ZK2SIX	*Niue*
52.200	VK8VF	*Darwin*
52.250	ZL2VHM	*Manawatu*
52.310	ZL3MHF	*Hornby*
52.320	VK6RTT	*Wickham*
52.325	VK2RHV	*Newcastle*
52.345	VK4ABP	*Longreach*
52.350	VK6RTU	*Kalgoorlie*
52.370	VK7RST	*Hobart*
52.418	VK0MA	*Mawson*
52.420	VK2RSY	*Sydney*
52.425	VK2RG8	*Gunnedah*
52.435	VK3RMV	*Hamilton*
52.440	VK4RTL	*Townsville*
52.450	VK5VF	*Mount Lofty*
52.460	VK6RPH	*Perth*
52.465	VK6RTW	*Albany*
52.470	VK7RNT	*Launceston*
52.485	VK8RAS	*Alice Springs*
144.019	VK6RBS	*Busselton*
144.400	VK4RTT	*Mount Mowbullan*
144.410	VK1RCC	*Canberra*
144.420	VK2RSY	*Sydney*
144.430	VK3RTG	*Glen Waverley*
144.445	VK4RTL	*Townsville* [1]
144.465	VK6RTW	*Albany*
144.470	VK7RMC	*Launceston*
144.480	VK8VF	*Darwin*
144.485	VK8RAS	*Alice Springs*
144.550	VK5RSE	*Mount Gambier*
144.565	VK6RPB	*Port Hedland*
144.600	VK6RTT	*Wickham*
144.800	VK5VF	*Mount Lofty*
144.950	VK2RCW	*Sydney*
145.000	VK6RPH	*Perth*
432.057	VK6RBS	*Busselton*
432.160	VK6RPR	*Nedlands*
432.410	VK6RTT	*Wickham*
432.420	VK2RSY	*Sydney*
432.435	VK3RMV	*Hamilton* [2]
432.440	VK4RBB	*Brisbane*
432.445	VK4HIK	*Cairns*
432.445	VK4RTL	*Townsville*
432.450	VK3RAI	*MacLeod*
432.535	VK3RMB	*Mount Buninyong*
432.540	VK4RAR	*Rockhampton*
1296.171	VK6RBS	*Busselton*
1296.420	VK2RSY	*Sydney*
1296.445	VK4RIK	*Cairns* [1]
1296.480	VK6RPR	*Nedlands*
10300.000	VK6RVF	*Roleystone*
10445.000	VK4RIK	*Cairns* [1]

1. These are beacons which are listed for the first time as the result of information received this month.
2. Steve VK3OT, advises VK3RMV, on 432.435 MHz is an experimental beacon and confirms VK3RMV is not operational on 144.435 MHz.

BEACON INFORMATION REQUEST

As the result of my recent requests for updating and confirmation of operation of beacons in the Australian network, I am pleased to report information has been sent in from the Townsville Amateur Radio Club (VK4RTL), the Queensland Tropical Region VHF Association, at Cairns (VK4RIK), Steve VK3OT (VK3RMV), the NSW Division of the WIA (VK2RSY), and the VK5 Division of the WIA (VK5WI). Thank you for taking the time to write to me.

The request goes out once again for those beacon officers who have not sent in their details to please do so. Eventually, those beacons not confirmed will be shown in the list as "status unknown" as I am determined to get the listing accurate over the next few months. Even if your beacons are listed accurately, would you please confirm this so I can be sure. My list is not confined to Australian usage, it is listed in other publications overseas from time to time, so we might as well have it accurate.

Beacons on 10 metres are also being sent to me. They are useful indicators of a rising MUF Those sent so far are:

28.260 VK5WI; 28.262 VK2RSY; 28.270 VK4RTL.

It appears no sorting out of frequencies has taken place yet between Townsville and Cairns. I suspect that, given terrain between the two areas and the distance, there will be very little mutual interference anyway, particularly on 70 centimetres and above. It will simply mean that VHF operators will have to learn CW to sort out the call signs if one or both are being heard!

Later on, after more information has arrived, I would like to list the various technical details of the various beacons for your interest, as most are sending in antenna types, power levels, height ASL, etc, as well as location.

It would also be an advantage if beacon co-ordinators were to send a copy of the beacon information to the FTAC Beacon Co-ordinator, so he is up-to-date too.

SIX METRE STANDINGS

My apologies to John VK4TL, for omitting his update on the beacon listing. John's original letter, in May, has been ticked as indicating the update had been made but, in the transfer to the new list, was obviously missed. On the present list John VK4TL, should now immediately follow VK3XQ, as he now has 19 countries confirmed, the latest added being YJ8RG and VK0SJ. Sorry John, corrections will be made next February.

Incidentally, John also said the Cairns Group hope to have VK4RIK, also on six metres soon, operating from a remote site which they hope will allay former problems of having a television Channel 10 locally and fourth harmonic interference.

John also indicated that John VK4FNQ, would appear to have made the most distant contact with Sojo VK0SJ, on Macquarie Island.

NEWS FROM ALICE SPRINGS

Peter VK8ZLX, keeps me informed of happenings from Alice Springs, where he is becoming known as *The Voice from the Red Centre!* Here are some extracts from his latest letter.

Both Jeff VK8GF and Peter VK8ZLX, are considering new six metre Yagis being eight elements on 10.6 metre (35 feet) booms!

Peter is somewhat worried about the new big amplifier constructed by Mike VK8ZMA, for six metres as Mike lives north-west of Peter and mostly fires across Peter's antenna at a distance of 1.5 kilometres! Peter has his transceiver "flattened" for up to 100 kHz either side of 52.050, so expects to be concentrating more on 144 and 432 MHz this coming summer, although he will operate on six when possible.

Peter would also like to hear from anyone having an old 144 to 432 varactor tripler which he could set up as a 432 MHz beacon; he has a 144 MHz exciter for the job. Peter believes there must be quite a few of these objects lying around in cupboards and is prepared to pay a fair price for such an object or a suitable varactor diode on its own.

VK8ZLX, is still running meteor scatter scheds with Lionel VK3NM, on two metres. Some success is being had with strong pings from each end. Later information says they almost made it on 29/7 at 2118 UTC, when a five-second burst of VK3NM call signs were heard at S3, but rain static at Lionel's QTH prevented a contact. Latest news was an excited phone call from Peter on 13/8, when he confirmed a two-way contact via MS had been made with Roger VK5NY, at 1946 plus 34 seconds, on two metres that morning, but VK3NM was not heard. Congratulations Peter, your efforts have paid off.

Peter advises known call areas worked on two metres from Alice Springs are:
VK8TM: VK6, VK5, VK3, VK2, VK4 and VK7;
VK8GF: VK6, VK5, VK3, VK2 and VK4; VK8ZLX: VK6, VK5, VK3, VK2, VK4 and VK1; VK8KTM: VK6, VK3, VK2 and VK4.

The status of VK8ZMA and VK8TJ is not known.

Anyone interested in MS scheds may contact Peter at his home address of 1-35 Head Street, Alice Springs, NT. 5750, or PO Box 2953.

With the DX season rapidly coming up, Peter advises he will be using a keyer from his home address on 144 (and 432 if varactor available), the two metre source being a simple design using about five common ICs plus a PROM, similar to that used in the VK8RAS beacons.

Not content with all these happenings, Peter is looking to EME contacts and is aiming towards eight Yagis on 20 feet booms for January/February 1988. In the meantime, he could be trying four Yagis of the same design (DL6WU), to see if any impact can be made on the moon or terrestrial 432 MHz! He would appreciate any advice from others already in the game on EME.

The equipment for VK8ZLX at the moment on six metres consists of either a TS670 or IC551, each with BF981 FET preamplifier to a converted FL2100 amplifier running 300 watts PEP with either an 11 element or eight element Yagi. On two metres, an IC271 with internal BF981 preamplifier to a home-brew 8874 amplifier with 350 watts PEP to a pair of 12 element NBS Yagis, with a Dressler masthead preamplifier. On 70 centimetres, an IC471A and preamplifier, single 4CX250B in a cavity to a 15 element NBS Yagi and Dressier masthead amplifier, using a 3SK97. All coaxial cables are Andrews LDF4-50 heliax.

Peter's Es contacts for the winter include 13/7 0728 to 0740 VK2XJ, VK2ZKD, VK2ZZT, VK5RO and VK5ZTS; 19/7 0245 to 0253 VK3LK, VK3AIH and VK5NY; 20/7 0732 VK4ACG, 0734 VK4WL; 27/7 0825 VK2QF, 0837 VK3XQ and 0840 VK3ZAT. All contacts were around 52.050.

Peter says there is no news from Darwin where most stations appear to be running low power and small antennas on two metres. Best hope is Andy VK8AH.

NEWS FROM NEW CALEDONIA

Phillip Hardstaff FK1TS, (formerly VK3XGK), has sent a postcard to say he will be on New Caledonia for another year. He has just bought an FT690 MKII, and is currently active on six metres running barefoot. He plans to build a linear and log Yagi soon. He expects to be on ZK1 during 1988 and plans to operate on six metres from there. On 22/7 around 0800 UTC, he received Australian television on 51.750 and New Zealand television on 50.740 MHz, at levels to S9+. Despite frantic calling he got no response from either country. FK8EB was also calling.

The possibility exists, therefore, of contacts during late 1987 with FK1TS and then, in 1988, as ZK1, and both countries will be within Es range to Australia.

JAPANESE CONTACTS

Graham VK6RO, sends news from the Japanese *CQ ham radio* magazine for July 1987 showing that, during the period from the end of April through May, many contacts were being made by Japanese stations on six metres. On 23/5, an unknown VK5 was listed at 1720; On 2/5 VK4TUB and VK4ALM at 1728; these being the only VK contacts listed. Other stations worked included HL1, 2, 4, and 5; VS6, BY5, KG6DX, BY4AA, and

COMMON MOON WINDOW for Saturday 17/10/1987

HOME STATION	Winter Time	DX STATION
VK3IM	Chirnside Park,	WB... Charleston
37:45 S	145:19 E	38:23 N 81:40 W

UTC Local	EL	AZ	DEC	GHA	HM-HM Local	EL	AZ	HM-DX	POL	dB	T K
1745 +0345	2.8	66.9	15.7	142.2	1056	1245	31.8	264.4	97	5	-1.8	15
1800 +0400	5.5	64.6	15.6	145.9	1035	1300	28.9	266.7	71	6	-1.8	15
1815 +0415	8.1	62.3	15.5	149.5	1010	1315	26.0	269.0	45	8	-1.8	15
1830 +0430	10.6	59.8	15.5	153.2	981	1330	23.1	271.2	19	9	-1.8	16
1845 +0445	13.1	57.3	15.4	156.8	948	1345	20.2	273.4	-5	11	-1.8	16
1900 +0500	15.6	54.7	15.4	160.4	911	1400	17.3	275.5	-31	12	-1.8	16
1915 +0515	17.9	51.9	15.3	164.1	871	1415	14.4	277.6	-56	13	-1.8	16
1930 +0530	20.2	49.1	15.3	167.7	827	1430	11.6	279.8	-81	15	-1.8	16
1945 +0545	22.4	46.1	15.2	171.4	780	1445	8.7	281.9	-106	16	-1.8	16
2000 +0600	24.5	43.0	15.2	175.0	731	1500	5.9	284.0	-129	18	-1.8	16
2015 +0615	26.4	39.7	15.1	178.7	678	1515	3.1	286.1	-152	20	-1.8	16
2030 +0630	28.3	36.3	15.1	182.3	623	1530	0.3	288.3	-175	21	-1.8	16

COMMON MOON WINDOW for Sunday 18/10/1987

HOME STATION	Winter Time	DX STATION
VK3IM	Chirnside Park,	WB... Charleston
37:45 S	145:19 E	38:23 N 81:40 W

UTC Local	EL	AZ	DEC	GHA	HM-HM Local	EL	AZ	HM-DX	POL	dB	T K
1800 +0400	1.3	75.1	10.4	135.7	1138	1300	33.6	254.7	176	-1	-1.7	17
1815 +0415	4.1	72.8	10.3	139.3	1124	1315	30.8	257.4	150	1	-1.7	17
1830 +0430	6.9	70.5	10.3	143.0	1105	1330	27.9	259.9	124	2	-1.7	17
1845 +0445	9.6	68.2	10.2	146.6	1083	1345	25.0	262.4	97	4	-1.7	17
1900 +0500	12.3	65.8	10.1	150.3	1056	1400	22.1	264.7	71	5	-1.7	17
1915 +0515	15.0	63.3	10.1	153.9	1025	1415	19.3	267.0	44	7	-1.7	17
1930 +0530	17.6	60.6	10.0	157.6	990	1430	16.3	269.3	18	8	-1.7	17
1945 +0545	20.1	57.9	10.0	161.2	952	1445	13.4	271.5	-7	10	-1.7	17
2000 +0600	22.6	55.1	9.9	164.9	910	1500	10.5	273.6	-33	11	-1.7	17
2015 +0615	25.0	52.1	9.8	168.5	865	1515	7.7	275.8	-58	13	-1.7	17
2030 +0630	27.3	49.0	9.8	172.2	816	1530	4.8	278.0	-83	15	-1.7	17
2045 +0645	29.4	45.7	9.7	175.8	765	1545	1.9	280.2	-107	16	-1.7	17

COMMON MOON WINDOW for Saturday 17/10/1987

HOME STATION	Winter Time	DX STATION
VK1...	Canberra	WB... Charleston
35:17 S	149:13 E	38:23 N 81:40 W

UTC Local	EL	AZ	DEC	GHA	HM-HM Local	EL	AZ	HM-DX	POL	dB	T K
1715 +0315	1.4	69.0	15.8	134.9	1105	1215	37.6	259.4	157	1	-1.8	15
1730 +0330	3.9	66.9	15.7	138.6	1087	1230	34.7	261.9	130	2	-1.8	15
1745 +0345	6.7	64.7	15.7	142.2	1065	1245	31.8	264.4	101	4	-1.8	15
1800 +0400	9.4	62.4	15.6	145.9	1038	1300	28.9	266.7	73	6	-1.8	15
1815 +0415	12.0	60.1	15.5	149.5	1008	1315	26.0	269.0	44	7	-1.8	15
1830 +0430	14.6	57.6	15.5	153.2	974	1330	23.1	271.2	16	9	-1.8	16
1845 +0445	17.1	55.1	15.4	156.8	935	1345	20.2	273.4	-12	10	-1.8	16
1900 +0500	19.6	52.4	15.4	160.4	894	1400	17.3	275.5	-40	12	-1.8	16
1915 +0515	21.9	49.6	15.3	164.1	849	1415	14.4	277.6	-67	14	-1.8	16
1930 +0530	24.2	46.6	15.3	167.7	800	1430	11.6	279.8	-95	15	-1.8	16
1945 +0545	26.4	43.5	15.2	171.4	749	1445	8.7	281.9	-122	17	-1.8	16
2000 +0600	28.4	40.3	15.2	175.0	694	1500	5.9	284.0	-148	19	-1.8	16
2015 +0615	30.3	36.8	15.1	178.7	637	1515	3.1	286.1	-173	21	-1.8	16
2030 +0630	32.1	33.3	15.1	182.3	577	1530	0.3	288.3	-197	23	-1.8	16

COMMON MOON WINDOW for Sunday 18/10/1987

HOME STATION	Winter Time	DX STATION
VK1...	Canberra	WB... Charleston
35:17 S	149:13 E	38:23 N 81:40 W

UTC Local	EL	AZ	DEC	GHA	HM-HM Local	EL	AZ	HM-DX	POL	dB	T K
1745 +0345	2.1	75.0	10.4	132.1	1171	1245	36.4	251.9	213	-4	-1.7	17
1800 +0400	5.0	72.9	10.4	135.7	1156	1300	33.6	254.7	185	-2	-1.7	17
1815 +0415	7.9	70.7	10.3	139.3	1137	1315	30.8	257.4	157	1	-1.7	17
1830 +0430	10.7	68.4	10.3	143.0	1113	1330	27.9	259.9	128	1	-1.7	17
1845 +0445	13.5	66.1	10.2	146.6	1085	1345	25.0	262.4	98	3	-1.7	17
1900 +0500	16.2	63.7	10.1	150.3	1053	1400	22.1	264.7	69	4	-1.7	17
1915 +0515	18.9	61.2	10.1	153.9	1017	1415	19.3	267.0	40	6	-1.7	17
1930 +0530	21.6	58.5	10.0	157.6	977	1430	16.3	269.3	11	8	-1.7	17
1945 +0545	24.1	55.8	10.0	161.2	933	1445	13.4	271.5	-17	9	-1.7	17
2000 +0600	26.6	52.8	9.9	164.9	886	1500	10.5	273.6	-45	11	-1.7	17
2015 +0615	29.0	49.8	9.8	168.5	836	1515	7.7	275.8	-73	13	-1.7	17
2030 +0630	31.3	46.5	9.8	172.2	782	1530	4.8	278.0	-100	15	-1.7	17
2045 +0645	33.4	43.1	9.7	175.8	726	1545	1.9	280.2	-127	17	-1.7	17

COMMON MOON WINDOW for Saturday 17/10/1987

HOME STATION	Winter Time	DX STATION
VK2...	Sydney	WB... Charleston
33:53 S	151:13 E	38:23 N 81:40 W

UTC Local	EL	AZ	DEC	GHA	HM-HM Local	EL	AZ	HM-DX	POL	dB	T K
1700 +0300	0.3	70.0	15.8	131.3	1129	1200	40.4	256.7	190	-2	-1.8	15
1715 +0315	3.2	67.9	15.8	134.9	1113	1215	37.6	259.4	162	0	-1.8	15
1730 +0330	6.0	65.8	15.7	138.6	1092	1230	34.7	261.9	132	2	-1.8	15
1745 +0345	8.8	63.6	15.7	142.2	1067	1245	31.8	264.4	103	4	-1.8	15
1800 +0400	11.5	61.4	15.6	145.9	1038	1300	28.9	266.7	73	5	-1.8	15
1815 +0415	14.2	59.0	15.5	149.5	1005	1315	26.0	269.0	43	7	-1.8	15
1830 +0430	16.8	56.6	15.5	153.2	968	1330	23.1	271.2	13	8	-1.8	16
1845 +0445	19.3	54.0	15.4	156.8	927	1345	20.2	273.4	-16	10	-1.8	16
1900 +0500	21.8	51.3	15.4	160.4	883	1400	17.3	275.5	-45	12	-1.8	16
1915 +0515	24.1	48.4	15.3	164.1	835	1415	14.4	277.6	-74	14	-1.8	16
1930 +0530	26.4	45.4	15.3	167.7	784	1430	11.6	279.8	-103	15	-1.8	16
1945 +0545	28.5	42.3	15.2	171.4	730	1445	8.7	281.9	-131	17	-1.8	16
2000 +0600	30.6	38.9	15.2	175.0	673	1500	5.9	284.0	-158	19	-1.8	16
2015 +0615	32.5	35.4	15.1	178.7	614	1515	3.1	286.1	-185	21	-1.8	16
2030 +0630	34.2	31.7	15.1	182.3	552	1530	0.3	288.3	-210	24	-1.8	16

COMMON MOON WINDOW for Sunday 18/10/1987

HOME STATION	Winter Time	DX STATION
VK2...	Sydney	WB... Charleston
33:53 S	151:13 E	38:23 N 81:40 W

UTC Local	EL	AZ	DEC	GHA	HM-HM Local	EL	AZ	HM-DX	POL	dB	T K
1730 +0330	1.1	76.0	10.5	128.4	1195	1230	39.2	248.9	248	7	-1.7	17
1745 +0345	4.1	73.9	10.4	132.1	1182	1245	36.4	251.9	219	5	-1.7	17
1800 +0400	7.0	71.8	10.4	135.7	1164	1300	33.6	254.7	189	3	-1.7	17
1815 +0415	9.9	69.7	10.3	139.3	1142	1315	30.8	257.4	159	1	-1.7	17
1830 +0430	12.8	67.5	10.3	143.0	1115	1330	27.9	259.9	129	0	-1.7	17
1845 +0445	15.6	65.1	10.2	146.6	1084	1345	25.0	262.4	98	2	-1.7	17
1900 +0500	18.4	62.7	10.1	150.3	1050	1400	22.1	264.7	68	4	-1.7	17
1915 +0515	21.1	60.2	10.1	153.9	1011	1415	19.3	267.0	37	6	-1.7	17
1930 +0530	23.7	57.5	10.0	157.6	968	1430	16.3	269.3	7	7	-1.7	17
1945 +0545	26.3	54.7	10.0	161.2	922	1445	13.4	271.5	-22	9	-1.7	17
2000 +0600	28.8	51.8	9.9	164.9	872	1500	10.5	273.6	-52	11	-1.7	17
2015 +0615	31.1	48.6	9.8	168.5	819	1515	7.7	275.8	-81	13	-1.7	17
2030 +0630	33.4	45.3	9.8	172.2	763	1530	4.8	278.0	-110	15	-1.7	17
2045 +0645	35.6	41.7	9.7	175.8	704	1545	1.9	280.2	-138	17	-1.7	17

COMMON MOON WINDOW for Saturday 17/10/1987

HOME STATION	Winter Time	DX STATION
VK4...	Brisbane	WB... Charleston
27:28 S	153:8 E	38:23 N 81:40 W

UTC Local	EL	AZ	DEC	GHA	HM-HM Local	EL	AZ	HM-DX	POL	dB	T K
1645 +0245	1.0	71.0	15.8	127.7	1210	1145	43.3	253.8	253	-9	-1.8	15
1700 +0300	4.1	69.3	15.8	131.3	1195	1200	40.4	256.7	223	-7	-1.8	15
1715 +0315	7.1	67.5	15.8	134.9	1175	1215	37.6	259.4	193	5	-1.8	15
1730 +0330	10.1	65.7	15.7	138.6	1151	1230	34.7	261.9	161	3	-1.8	15
1745 +0345	13.1	63.7	15.7	142.2	1122	1245	31.8	264.4	130	-2	-1.8	15
1800 +0400	16.0	61.7	15.6	145.9	1088	1300	28.9	266.7	98	0	-1.8	15
1815 +0415	18.9	59.5	15.5	149.5	1051	1315	26.0	269.0	66	2	-1.8	15
1830 +0430	21.7	57.2	15.5	153.2	1009	1330	23.1	271.2	34	4	-1.8	16
1845 +0445	24.4	54.8	15.4	156.8	963	1345	20.2	273.4	1	5	-1.8	16
1900 +0500	27.1	52.2	15.4	160.4	914	1400	17.3	275.5	-30	7	-1.8	16
1915 +0515	29.6	49.4	15.3	164.1	861	1415	14.4	277.6	-61	9	-1.8	16
1930 +0530	32.1	46.4	15.3	167.7	805	1430	11.6	279.8	-93	11	-1.8	16
1945 +0545	34.4	43.3	15.2	171.4	745	1445	8.7	281.9	-123	14	-1.8	16
2000 +0600	36.6	39.8	15.2	175.0	683	1500	5.9	284.0	-153	16	-1.8	16
2015 +0615	38.7	36.2	15.1	178.7	618	1515	3.1	286.1	-183	18	-1.8	16
2030 +0630	40.6	32.3	15.1	182.3	551	1530	0.3	288.3	-211	21	-1.8	16

COMMON MOON WINDOW for Sunday 18/10/1987

HOME STATION	Winter Time	DX STATION
VK4...	Brisbane	WB... Charleston
27:28 S	153:8 E	38:23 N 81:40 W

UTC Local	EL	AZ	DEC	GHA	HM-HM Local	EL	AZ	HM-DX	POL	dB	T K
1715 +0315	1.1	77.0	10.5	124.8	1277	1215	41.9	245.8	312	-15	-1.7	17
1730 +0330	4.3	75.3	10.5	128.4	1265	1230	39.2	248.9	282	-13	-1.7	17
1745 +0345	7.5	73.6	10.4	132.1	1248	1245	36.4	251.9	252	-11	-1.7	17
1800 +0400	10.6	71.8	10.4	135.7	1226	1300	33.6	254.7	220	-9	-1.7	17
1815 +0415	13.7	69.9	10.3	139.3	1200	1315	30.8	257.4	188	7	-1.7	17
1830 +0430	16.7	68.0	10.3	143.0	1170	1330	27.9	259.9	156	-5	-1.7	17
1845 +0445	19.8	65.9	10.2	146.6	1134	1345	25.0	262.4	123	-3	-1.7	17
1900 +0500	22.7	63.7	10.1	150.3	1095	1400	22.1	264.7	90	-1	-1.7	17
1915 +0515	25.7	61.4	10.1	153.9	1051	1415	19.3	267.0	57	0	-1.7	17
1930 +0530	28.5	58.9	10.0	157.6	1004	1430	16.3	269.3	24	2	-1.7	17
1945 +0545	31.3	56.2	10.0	161.2	952	1445	13.4	271.5	-7	4	-1.7	17
2000 +0600	34.0	53.4	9.9	164.9	897	1500	10.5	273.6	-40	6	-1.7	17
2015 +0615	36.6	50.3	9.8	168.5	839	1515	7.7	275.8	-72	8	-1.7	17
2030 +0630	39.1	46.9	9.8	172.2	777	1530	4.8	278.0	-103	11	-1.7	17
2045 +0645	41.5	43.3	9.7	175.8	713	1545	1.9	280.2	-133	13	-1.7	17

COMMON MOON WINDOW for Saturday 17/10/1987

HOME STATION	Winter Time	DX STATION
VK5...	Adelaide	WB... Charleston
34:56 S	138:36 E	38:23 N 81:40 W

UTC Local	EL	AZ	DEC	GHA	HM-HM Local	EL	AZ	HM-DX	POL	dB	T K
1800 +0330	1.6	69.0	15.6	145.9	1110	1300	28.9	266.7	109	2	-1.8	15
1815 +0345	4.4	66.9	15.5	149.5	1091	1315	26.0	269.0	86	3	-1.8	15
1830 +0400	7.1	64.7	15.5	153.2	1069	1330	23.1	271.2	63	4	-1.8	16
1845 +0415	9.9	62.4	15.4	156.8	1042	1345	20.2	273.4	41	5	-1.8	16
1900 +0430	12.5	60.1	15.4	160.4	1011	1400	17.3	275.5	18	7	-1.8	16
1915 +0445	15.1	57.6	15.3	164.1	976	1415	14.4	277.6	-4	8	-1.8	16
1930 +0500	17.6	55.0	15.3	167.7	937	1430	11.6	279.8	-26	9	-1.8	16
1945 +0515	20.1	52.4	15.2	171.4	895	1445	8.7	281.9	-48	10	-1.8	16
2000 +0530	22.5	49.5	15.2	175.0	849	1500	5.9	284.0	-70	12	-1.8	16
2015 +0545	24.8	46.6	15.1	178.7	800	1515	3.1	286.1	-91	13	-1.8	16
2030 +0600	26.9	43.5	15.1	182.3	748	1530	0.3	288.3	-112	15	-1.8	16

COMMON MOON WINDOW for Sunday 18/10/1987

HOME STATION	Winter Time	DX STATION
VK5...	Adelaide	WB... Charleston
34:56 S	138:36 E	38:23 N 81:40 W

UTC Local	EL	AZ	DEC	GHA	HM-HM Local	EL	AZ	HM-DX	POL	dB	T K
1830 +0400	2.5	75.0	10.3	143.0	1176	1330	27.9	259.9	159	-2	-1.7	17
1845 +0415	5.5	72.8	10.2	146.6	1161	1345	25.0	262.4	136	-1	-1.7	17
1900 +0430	8.3	70.7	10.1	150.3	1141	1400	22.1	264.7	113	1	-1.7	17
1915 +0445	11.2	68.4	10.1	153.9	1116	1415	19.3	267.0	90	2	-1.7	17
1930 +0500	14.0	66.1	10.0	157.6	1088	1430	16.3	269.3	67	3	-1.7	17
1945 +0515	16.7	63.7	10.0	161.2	1055	1445	13.4	271.5	43	4	-1.7	17
2000 +0530	19.4	61.2	9.9	164.9	1019	1500	10.5	273.6	20	6	-1.7	17
2015 +0545	22.1	58.5	9.8	168.5	978	1515	7.7	275.8	-2	7	-1.7	17
2030 +0600	24.7	55.8	9.8	172.2	934	1530	4.8	278.0	-24	9	-1.7	17
2045 +0615	27.1	52.9	9.7	175.8	887	1545	1.9	280.2	-46	10	-1.7	17

COMMON MOON WINDOW for Saturday 17/10/1987

HOME STATION	Winter Time		DX STATION	
VK6...	Perth	WB...	Charleston	
31:57 S	115:51 E		38:23 N	81:40 W

UTC	Local	EL	AZ	DEC	GHA	HH:MM	Local	EL	AZ	HH:DX	POL	dB	T K
1930	+0330	2.1	69.9	15.3	167.7	1155	1430	11.6	279.8	82	-2	-1.8	16
1945	+0345	5.0	67.9	15.2	171.4	1137	1445	8.7	281.9	72	-2	-1.8	16
2000	+0400	7.9	65.9	15.2	175.0	1114	1500	5.9	284.0	61	-1	-1.8	16
2015	+0415	10.7	63.7	15.1	178.7	1087	1515	3.1	286.1	51	-1	-1.8	16
2030	+0430	13.5	61.5	15.1	182.3	1056	1530	0.3	288.3	41	-0	-1.8	16

COMMON MOON WINDOW for Sunday 18/10/1987

HOME STATION	Winter Time		DX STATION	
VK6...	Perth	WB...	Charleston	
31:57 S	115:51 E		38:23 N	81:40 W

UTC	Local	EL	AZ	DEC	GHA	HH:MM	Local	EL	AZ	HH:DX	POL	dB	T K
2000	+0400	2.8	75.9	9.9	164.9	1221	1500	10.5	273.6	121	-4	-1.7	17
2015	+0415	5.8	74.0	9.8	168.5	1206	1515	7.7	275.8	111	-4	-1.7	17
2030	+0430	8.8	72.0	9.8	172.2	1186	1530	4.8	278.0	101	-3	-1.7	17
2045	+0445	11.8	69.9	9.7	175.8	1162	1545	1.9	280.2	90	-2	-1.7	17

COMMON MOON WINDOW for Saturday 17/10/1987

HOME STATION	Winter Time		DX STATION	
VK7...	Hobart	WB...	Charleston	
42:53 S	147:19 E		38:23 N	81:40 W

UTC	Local	EL	AZ	DEC	GHA	HH:MM	Local	EL	AZ	HH:DX	POL	dB	T K
1745	+0345	2.1	65.3	15.7	142.2	912	1245	31.8	264.4	55	10	-1.8	15
1800	+0400	4.5	62.8	15.6	145.9	950	1300	28.9	266.7	29	12	-1.8	15
1815	+0415	6.9	60.2	15.5	149.5	925	1315	26.0	269.0	3	13	-1.8	15
1830	+0430	9.3	57.5	15.5	153.2	896	1330	23.1	271.2	-22	14	-1.8	16
1845	+0445	11.5	54.8	15.4	156.8	863	1345	20.2	271.4	-48	16	-1.8	16
1900	+0500	13.7	52.0	15.4	160.4	827	1400	17.3	275.5	-73	17	-1.8	16
1915	+0515	15.8	49.0	15.3	164.1	788	1415	14.4	277.6	-98	19	-1.8	16
1930	+0530	17.9	46.0	15.3	167.7	746	1430	11.6	279.8	-122	20	-1.8	16
1945	+0545	19.8	42.9	15.2	171.4	702	1445	8.7	281.9	-145	22	-1.8	16
2000	+0600	21.6	39.6	15.2	175.0	654	1500	5.9	284.0	-168	23	-1.8	16
2015	+0615	23.3	36.3	15.1	178.7	604	1515	3.1	286.1	-189	25	-1.8	16
2030	+0630	24.9	32.8	15.1	182.3	552	1530	0.3	288.3	-210	26	-1.8	16

COMMON MOON WINDOW for Sunday 18/10/1987

HOME STATION	Winter Time		DX STATION	
VK7...	Hobart	WB...	Charleston	
42:53 S	147:19 E		38:23 N	81:40 W

UTC	Local	EL	AZ	DEC	GHA	HH:MM	Local	EL	AZ	HH:DX	POL	dB	T K
1800	+0400	1.4	73.6	10.4	135.7	1054	1300	33.6	254.7	134	5	-1.7	17
1815	+0415	4.0	71.1	10.3	139.3	1038	1315	30.8	257.4	107	6	-1.7	17
1830	+0430	6.5	68.5	10.3	143.0	1019	1330	27.9	259.9	81	8	-1.7	17
1845	+0445	9.0	65.9	10.2	146.6	996	1345	25.0	262.4	54	9	-1.7	17
1900	+0500	11.5	63.3	10.1	150.3	969	1400	22.1	264.7	27	11	-1.7	17
1915	+0515	13.9	60.5	10.1	153.9	938	1415	19.3	267.0	1	12	-1.7	17
1930	+0530	16.3	57.7	10.0	157.6	904	1430	16.3	269.3	-24	14	-1.7	17
1945	+0545	18.5	54.8	10.0	161.2	867	1445	13.4	271.5	-50	15	-1.7	17
2000	+0600	20.7	51.7	9.9	164.9	826	1500	10.5	273.6	-75	17	-1.7	17
2015	+0615	22.8	48.6	9.8	168.5	783	1515	7.7	275.8	-100	18	-1.7	17
2030	+0630	24.9	45.3	9.8	172.2	736	1530	4.8	278.0	-123	20	-1.7	17
2045	+0645	26.8	41.9	9.7	175.8	687	1545	1.9	280.2	-146	22	-1.7	17

COMMON MOON WINDOW for Saturday 17/10/1987

HOME STATION	Winter Time		DX STATION	
VK8...	Alice Springs	WB...	Charleston	
23:42 S	133:52 E		38:23 N	81:40 W

UTC	Local	EL	AZ	DEC	GHA	HH:MM	Local	EL	AZ	HH:DX	POL	dB	T K
1800	+0330	1.4	71.8	15.6	145.9	1255	1300	28.9	266.7	181	-10	-1.8	15
1815	+0345	4.6	70.3	15.5	149.5	1240	1315	26.0	269.0	161	-9	-1.8	15
1830	+0400	7.8	68.8	15.5	153.2	1221	1330	23.1	271.2	140	-8	-1.8	16
1845	+0415	10.9	67.1	15.4	156.8	1197	1345	20.2	273.4	118	-7	-1.8	16
1900	+0430	14.0	65.4	15.4	160.4	1168	1400	17.3	275.5	97	-6	-1.8	16
1915	+0445	17.1	63.5	15.3	164.1	1135	1415	14.4	277.6	75	-5	-1.8	16
1930	+0500	20.1	61.6	15.3	167.7	1098	1430	11.6	279.8	53	-3	-1.8	16
1945	+0515	23.0	59.5	15.2	171.4	1056	1445	8.7	281.9	31	-2	-1.8	16
2000	+0530	25.9	57.3	15.2	175.0	1010	1500	5.9	284.0	9	-1	-1.8	16
2015	+0545	28.7	54.8	15.1	178.7	960	1515	3.1	286.1	-12	0	-1.8	16
2030	+0600	31.5	52.2	15.1	182.3	906	1530	0.3	288.3	-33	2	-1.8	16

COMMON MOON WINDOW for Sunday 18/10/1987

HOME STATION	Winter Time		DX STATION	
VK8...	Alice Springs	WB...	Charleston	
23:42 S	133:52 E		38:23 N	81:40 W

UTC	Local	EL	AZ	DEC	GHA	HH:MM	Local	EL	AZ	HH:DX	POL	dB	T K
1830	+0400	1.2	77.9	10.3	143.0	1320	1330	27.9	259.9	231	-14	-1.7	17
1845	+0415	4.5	76.4	10.2	146.6	1309	1345	25.0	262.4	211	-13	-1.7	17
1900	+0430	7.7	74.9	10.1	150.3	1294	1400	22.1	264.7	190	-11	-1.7	17
1915	+0445	11.0	73.3	10.1	153.9	1273	1415	19.3	267.0	168	-10	-1.7	17
1930	+0500	14.2	71.7	10.0	157.6	1247	1430	16.3	269.3	146	-9	-1.7	17
1945	+0515	17.4	69.9	10.0	161.2	1217	1445	13.4	271.5	124	-8	-1.7	17
2000	+0530	20.5	68.1	9.9	164.9	1182	1500	10.5	273.6	102	-7	-1.7	17
2015	+0545	23.7	66.1	9.8	168.5	1142	1515	7.7	275.8	79	-6	-1.7	17
2030	+0600	26.7	64.0	9.8	172.2	1098	1530	4.8	278.0	57	-5	-1.7	17
2045	+0615	29.8	61.8	9.7	175.8	1050	1545	1.9	280.2	34	-3	-1.7	17

COMMON MOON WINDOW for Saturday 17/10/1987

HOME STATION	Winter Time		DX STATION	
VK8...	Darwin	WB...	Charleston	
12:27 S	130:50 E		38:23 N	81:40 W

UTC	Local	EL	AZ	DEC	GHA	HH:MM	Local	EL	AZ	HH:DX	POL	dB	T K
1800	+0330	2.1	73.3	15.6	145.9	1345	1300	28.9	266.7	226	-22	-1.8	15
1815	+0345	5.5	72.5	15.5	149.5	1334	1315	26.0	269.0	207	-21	-1.8	15
1830	+0400	8.9	71.6	15.5	153.2	1317	1330	23.1	271.2	188	-20	-1.8	16
1845	+0415	12.3	70.6	15.4	156.8	1296	1345	20.2	273.4	168	-19	-1.8	16
1900	+0430	15.7	69.6	15.4	160.4	1270	1400	17.3	275.5	147	-18	-1.8	16
1915	+0445	19.0	68.4	15.3	164.1	1238	1415	14.4	277.6	126	-17	-1.8	16
1930	+0500	22.3	67.2	15.3	167.7	1202	1430	11.6	279.8	105	-16	-1.8	16
1945	+0515	25.6	65.8	15.2	171.4	1161	1445	8.7	281.9	84	-15	-1.8	16
2000	+0530	28.9	64.2	15.2	175.0	1116	1500	5.9	284.0	62	-14	-1.8	16
2015	+0545	32.1	62.5	15.1	178.7	1066	1515	3.1	286.1	40	-13	-1.8	16
2030	+0600	35.3	60.6	15.1	182.3	1012	1530	0.3	288.3	19	-11	-1.8	16

COMMON MOON WINDOW for Sunday 18/10/1987

HOME STATION	Winter Time		DX STATION	
VK8...	Darwin	WB...	Charleston	
12:27 S	130:50 E		38:23 N	81:40 W

UTC	Local	EL	AZ	DEC	GHA	HH:MM	Local	EL	AZ	HH:DX	POL	dB	T K
1830	+0400	0.6	79.2	10.3	143.0	1409	1330	27.9	259.9	276	-25	-1.7	17
1845	+0415	4.1	78.4	10.2	146.6	1402	1345	25.0	262.4	257	-24	-1.7	17
1900	+0430	7.6	77.6	10.1	150.3	1389	1400	22.1	264.7	238	-23	-1.7	17
1915	+0445	11.1	76.7	10.1	153.9	1372	1415	19.3	267.0	218	-22	-1.7	17
1930	+0500	14.6	75.8	10.0	157.6	1349	1430	16.3	269.3	197	-21	-1.7	17
1945	+0515	18.0	74.8	10.0	161.2	1320	1445	13.4	271.5	176	-20	-1.7	17
2000	+0530	21.5	73.7	9.9	164.9	1287	1500	10.5	273.6	154	-19	-1.7	17
2015	+0545	24.9	72.5	9.8	168.5	1249	1515	7.7	275.8	133	-19	-1.7	17
2030	+0600	28.4	71.2	9.8	172.2	1206	1530	4.8	278.0	111	-18	-1.7	17
2045	+0615	31.8	69.7	9.7	175.8	1158	1545	1.9	280.2	88	-17	-1.7	17

television stations in BY, 9M2 and UA. In addition, YB1CK was also worked. The Chinese commercial XSG was also heard on 50.748 MHz, on 22/5.

THE ROSS HULL CONTEST

This contest discussion continues on, stirred, no doubt, by the comments from Gordon VK2ZAB. The views of another operator, Charlie VK3BRZ, are set out as follows:

"My personal preference is for the Contest to be held during summer when opportunities for DX contacts exists and the weather encourages portable operation which, for me, is very important.

"Considerable argument has taken place on the points scoring system; the only agreement being reached is that no system will ever be fair to everyone, this being fact of life we must accept.

"The key to the survival of the Contest is participation. Very few of us have the time or inclination to operate flat-out for the duration of the Contest, so we know we cannot win so don't enter a log, even though we are happy to give out numbers to the serious contestants. However, if the Contest were to be scored on a Divisional basis, similar to the RD Contest, each of us can contribute in our own way, no matter how small that contribution, and this encourages participation. By all means, give each Divisional top scorer a certificate for his efforts.

"Scoring on a Divisional basis allows the duration to be quite long since one can operate whenever convenient to do so, and still contribute to the Contest. Two or three weeks, as in the past, is realistic and, if warranted, a 24 or 48 hour event can be held during that period with emphasis on portable operation. I would favour the weekend between Christmas and New Year.

"Would I enter a log? If I had a chance of winning, or if my log contributed to the purpose of the Contest, I would. Like many others in the past, I have known I could not possibly win so did not submit a log. In fact, the very nature of the portable station with two or more operators made us ineligible under the rules which exclude multi-operation, even if each operator submitted a separate log.

"Whatever happens to the Ross Hull Contest, you can be assured I will be there to pick the eyes out of the DX. As in the past, I will be going out portable on the weekend between Christmas and New Year, from 26/12 through 29/12. Other operators will be VK3AEX, VK3XEX and probably VK3BCL and VK3VU. QTH will probably be Blue Mountain, near Trentham in Victoria."

Thanks for your views Charlie, maybe they will promote some answers.

I also have a letter on the same subject from Glen Scott VK2YVU, which I will hold until next month as my preparation time for these notes is very short this month!

MOVE TO MENINGIE

The big move from Forreston to Meningie takes place in a few days time, on August 24, after almost two months of furious packing. The amount of material one accumulates after 30 years in the one house and a lifetime in the area, is quite remarkable!

Thanks to David VK5KK, his brother Hans, and father Keith VK5AKM, all the antennas were safely lowered without incident recently. I was surprised to find how well they had survived the rigors of our hills weather. When laid out on the ground there is a lot of aluminium, with two eight-elements, one six-element and one four-element for six metres, two 13-elements, one eight-element, one 10-element for two metres, plus the six by six slot and the stacked Ringo for FM. Add to this five 16-element KLM Yagis for 70 centimetres and 27-element for 23 centimetres and there is considerable material on the ground.

Some of the early coaxial cable is showing

signs of weathering (some if over 25 years old), but all cables will be replaced for a fresh start. The heliax used on 70 centimetres is in good condition, as also is the one-inch heliax not yet used on 1296 MHz.

It seems the greatest toll taken by the weather is in the bolts used to hold the antennas to the mast. Several of these had to be cut with bolt cutters to get the system down, and it seems sensible when replacing the antennas, to use stainless steel bolts everywhere, including the actual antennas themselves. As I will be much closer to the coast (15 kilometres), than I am now (50 kilometres), I expect there will be more chance of salt spray problems during storms and this will need careful consideration. The silicon rubber material I used to cover bolts and fittings on the antennas did its job well and all such joints are still in good condition.

I will make every effort to be back on the air for the summer Es period, the main hold-up will be getting the antenna system up again. I will not be able to have such an elaborate system as previously, but then I probably will not need it due to the much better location. No more 30 and 60 dB hill problems! Water path all the way t Albany! Nothing in the way to Alice Springs or Tasmania. What a change for me!

NEW ADDRESS

Please note my new address will be 8 West Terrace, Meningle, SA. 5264. The telephone number will probably be (085) 75 1531, but this will need to be confirmed after I arrive. I will advise you all later. Items which may have been sent to the old address around changeover time will get to me at Meningie, as I will maintain a redirection service for several months.

A BIG CHANCE

Doug VK3UM. has provided the following information for those interested in moon bounce.

Do you want the chance of working real DX? The Greenbank Radio Observatory's 36.5 metre dish will be activated under the calls of K3QCQ, K5TL and W3IFI during the first ARRL Contest weekend scheduled for the UTC date of October 17 and 18.

Activity will be confined to the 432, 1296 and possibly 2304 MHz bands. The operators will be working random (calling CQ) on 432.025 MHz and any operator with a four to five metre long Yagi and 100 watts should be able to hear and work them on CW, as the moon rises.

Doug VK3UM, has kindly supplied the common window times which will allow all VK amateurs to participate.

These times are shown in the accompanying tables.

Happy hunting on October 17 and 18!

KEY

UTC	Time per date above
Local	Local time (+ = day ahead)
EL	Elevation
A2	Azimuth
DEC	Declination
GHA	Greenwich Hour Angle
HM-HM	Doppler shift Home Station — Home Station
HM-DX	Doppler shift Home Station — DX Station
POL	Polarisation offset
dB	Path loss above minimum (perigee)
T^{bk}	Temperature of the sky behind the Moon

SIX-METRES CHRISTMAS TREAT

Following is an unexpected piece of news from Ken VK3AH, and it is certainly a bonus for six-metre operators.

No one is going to give you a six-metres transceiver, unless you are a very lucky person! However you will have the chance of working VK0HI actuated by the original owner of the call, Dave VK3DHF. Dave is doing a stint on Heard Island *again* and as you read this, he should be operational.

This is not a DXpedition, and it has to be stressed to all readers of this column that Dave is a Communications Officer with ANARE. Although he will be listening for and working DX, it is secondary to eating, sleeping and a stringent workload.

Dave hopes to operate a 'keyer' whilst he is in the 'shack', on 52.170 MHz, from a TS660 into an amplifier. The antenna, due to the high wind velocity, will be a simple ground plane. The keyer, amplifier and other ancillary equipment has been made and loaned by Gil VK3AUI, and his dedicated DX friends.

The keyer will give the call sign, then sign 'K' for a listening period. If no signal is detectable, it will recommence its transmission/listening cycle.

If you are lucky enough to work Dave, giving you a new country, log it, give your call sign and report, QSL the report and please VACATE the frequency to allow others to make use of the opportunity ot the opening. Tell your friends by all means, but please do not cause QRM to Dave.

The QSL information is as follows: Noel Shaw VK3EVN, 64 Orana Drive, Watsonia, Vic. 3087. An SASE for a return QSL would be appreciated and a SAE plus two IRCs are ample funds for overseas amateurs. Of course through the bureau is acceptable.

One should be warned that QSOs have to validated from the logs, and it is trusted that propagation will allow Dave and his father (his QSL Manager) to exchange log details. If propagation is erratic or non-existent, due to the remote area of Heard Island, the logs may not be returned until May 1988, so please be patient.

CLOSURE

As I am not on the air at the moment I cannot tell you much about band conditions. Hopefully, Meningie will allow me more operating time in the future and I will be able to keep you better informed of band happenings than in the past.

This months notes represent 18 years and nine months of writing from Forreston for your reading. These will be the last from the Forreston address.

Closing with two thoughts for the month: *We all live under the same sky, but we don't all have the same horizons* and *The fact that people are born with two eyes and two ears, but only one tongue, suggests they ought to look and listen twice as much as they speak!*

73 from *The Voice in the Hills* for the last time. New phrase next month.

ar

QSP

ANOTHER TOWER BATTLE

John Thernes WM4T, has turned down a proposed settlement with the City of Lakeside Park. He has been involved in a protracted legal battle with the City after it denied him a permit to erect a 21 metre tower and antenna. In January 1986, the US Court of Appeals, remanded the case for further consideration in hopes that WM4T and the City would come to a settlement. Finally, in December, the City did offer him the right to install a tower but refused to compensate him for his legal expenses.

John rejected that offer and the case was to go before a Federal District Court on February 13.

—Adapted from *The ARRL Letter* February 10, 1987

PACKET RADIO DX COUNTRIES LIST

It is now possible to work 78 different DXCC countries via the packet radio mode. The following list has been compiled by Harold Price NK6K, and is current as at July 12, 1987.

3D6, 4X, 5H3, 5N, 5V, 6W, 9K2, 9M, 9V, A4, BY, BV, CE, CN8, CP, CT1, C6, DL, DU, EA1, HA, HB, HC, HH, HI, HK, HL, HP, HT, I, JA, KH0, KH6, KG4, KL7, KP4, LA, LU, LX, OE, OH, ON, OX, OY, OZ, PA, PJ, PY, SM, ST, TG, TI, TF, T30, VE, VK, VP2M, VS6, W, XE, YB, YJ, YU, YV, ZF, ZK1, ZL, ZS.

It was also anticipated that OH0 would be operational in July but was not confirmed at the time of compilation.

—Compiled from *Gateway*, the ARRL Packet-Radio Newsletter, Vol 3, No 22

Education Notes

Brenda Edmonds VK3KT
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I have been trying further to explain some of the variations in examination pass rates from the statistics which DOC sends me after each examination.

These include a list of which papers were used at each centre, and the pass rates by State. There may be one, two or three papers used in any State, but pass rates by paper are not collated.

However, on a number of occasions over the last few years, the same question paper has been used in two to more States for all centres, except Post Offices.

If we assume that Post Office candidates would be a fairly insignificant fraction of the total candidates for a State, we should be able to draw some conclusions. But what?

I have said *previously that the* pass rates at both levels have been rising over the last couple of years. Does that mean that the papers are getting easier, or that the quality of the candidates is rising? Or does it just mean that, since the fees were raised, the examinations are being treated more seriously?

Look at the pass rates by State for the AOCP Theory (Section M).

May 1985	VK1/2 36%	VK3 46%	VK4 25%	VK5/8 30%	VK6 17%	VK7 57%
Aug 1985	VK1/2 33%	VK3 37%	VK4 24%	VK5/8 22%	VK6 67%	VK7 13%
Nov 1985	29	28	28	25	34	31
Feb 1986	31	26	26	31	40	55
May 1986	38	29	36	17	30	0
Aug 1986	38	48	29	46	39	60
Nov 1986	46	31	37	34	34	16
Feb 1987	60	54	56	41	35	36

Some of these, of course, are not statistically significant because of the small number of candidates in some States, but it does show a surprising variation between and within States.

This amount of variation cannot be due to the papers only. See what we get when we compare pass rates in States where the same paper was used.

AOCP/AOLCP

May 1985	VK3	46%	VK4	25%		
Aug 1985	VK3	38%	VK4	24%		
May 1986	VK3	29%	VK4	36%	VK5	17%

NAOCP

May 1985	VK3	48%	VK4	22%		
Aug 1985	VK3	33%	VK4	19%		
Feb 1986	VK2	47%	VK4	41%	VK5	17%
Aug 1986			VK4	65%	VK5	44%

This degree of variation does not always occur. On some occasions the pass rates for VKs 3 and 4 on the same paper have been practically identical. But it does suggest that there are factors other than those associated with the examination paper itself involved.

I cannot decide the implications for those who are concerned with helping newcomers to pass examinations.

There is no way of finding out which candidates attended classes or were assisted by other amateurs, and it would be difficult to determine the numbers of students who have made several attempts.

If the Institute becomes involved in running examinations, I hope that arrangements can be made to collect as much information as possible relating to examinations and candidates, so that analysis of results and trends can be used as a guide to improving the efficiency of classes and instructional material.

This may increase the work load at first, but it should soon become apparent what data are of value.

73 Brenda VK3KT

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Contests

Frank Beech VK7BC
FEDERAL CONTEST MANAGER
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CONTEST CALENDAR

OCTOBER

3 — 4 VK/ZL/Oceania Contest Phone Section (Rules August issue)
10 — 11 VK/ZL/Oceania Contest CW Section (Rules August issue)
— 11 RSGB 21/28 MHz SSB Contest (Rules September issue)
— 18 RSGB 21 MHz CW Contest (Rules September issue)
24 — 25 CQ WW DX, Phone Section
28 — 30 YLRL Anniversary SSB QSO Party

NOVEMBER

14 Australian Ladies' Amateur Radio Association Contest (Rules this issue)
14 — 15 European DX Contest, RTTY Section (Rules September issue)
28 — 29 CQ WW DX Contest, CW Section

To date, no contest information has been received by your scribe so the column for this month will be brief. By the time you are reading this issue of AR, I will hopefully be well into the final stages of processing the Remembrance Day Contest logs for 1987, and the results should be published about the same time as last year.

Although it is not a contest, the Scout Jamboree on the Air (JOTA) activity, that will be heard around the bands during the period 0001 UTC, October 17, until 2359 UTC, October 18, deserves a mention. I am sure that the Scouts, Guides, etc, who will be active from the numerous stations that *will be* operating for them from around the world are, at the end of the day, very much aware of the hobby d could quite likely turn into good contest operators in future years. The 15 metre band would be a good place to look for them as this would enable us to gauge the openings for the RSGB 21 MHz CW Contest, which will be running on the 18th.

ALARA CONTEST

ELIGIBILITY — All licenced amateurs throughout the world are invited to participate. The Contest is also open to SWLs.

OBJECT — The object of the contest is participation! YL works everyone, OM works YLs only. One contest (combined phone and CW) run over 24 hours.

STARTS — 0001 UTC, Saturday, November 14, 1987

ENDS — 2359 UTC, Saturday, November 14, 1987.

SUGGESTED FREQUENCIES — bands to be used are: 3.5, 7, 14, 21 and 28 MHz only. The following are suggested frequencies for easier location of contacts.

3.525 to 3.590 MHz
7.100 to 7.120 MHz
14.060 to 14.235 MHz
21.100 to 21.200 MHz
21.350 to 21.370 MHz
28.100 to 28.350 MHz

OPERATION — Phone and CW operation. Each station may be counted twice on each band for credit — once on phone and once on CW. All contacts must be made in accordance with operator and station licence regulations. No net or list operation, no cross-mode contacts.

PROCEDURE — Phone: Call ***"CO ALARA CONTEST"***. CW: YLs Call ***"CQ TEST ALARA"*** OMs call ***"CO YL"***.

EXCHANGES — ALARA member: RS or RST, serial number, starting at 001, ALARA member, name. YL non-member or OM: RS or RST, serial number starting at 001, name.

SCORING —

Phone: Five points for each ALARA member contacted. Four points for a YL non-member contacted. Three points for OM contacted.

CW: Double all points for CW contacts.

SWL: Five points for ALARA members logged. Four points for YL non-members logged.

LOGS — Single log entry (but Australian YL Novices entering for the Mrs Florence McKenzie CW Trophy should indicate their CW score separately, also). Logs must show date/time UTC, band, mode, call sign worked, report and serial number sent, report and serial number received, name of operator of station worked, and points claimed.

SAMPLE LOG

Date Time UTC 14/11	Band MHz	Mode	Call Sign	RS/T & S/No Sent	RS/T & S/No Rec	Name	Pts
0135	28	SSB	VK3EBX	59001	58020	Joy	5
0141	21	CW	VK3KS	599002	590045	Mavis	10
0600	14	SSB	FK8FA	59025	59011	Aimee	5

LOGS MUST BE SIGNED — Logs to also show full name, call sign and address of operator, and show final score (points claimed). Logs must be legible. No carbon copies. No logs will be returned. Decision of the Contest Manager will be final. Logs must be received by the Contest Manager by December 31, 1987.

CONTEST MANAGER — Mrs Marlene Perry VK2KFQ, 31 Cadell Street, Wentworth, NSW. 2648.

A TROPHY — Will be awarded for the highest aggregate score over five years (commencing 1983) of a licenced YL operator (not necessarily Australian).

MRS FLORENCE MCKENZIE CW TROPHY — This will be awarded to the Australian YL Novice operator with the highest CW score (not necessarily an ALARA member). Minimum score 50 points. The actual trophy, because of the size and weight, will not be forwarded to the winner, but a certificate bearing a photograph depicting the trophy will be sent to the winner each year.

CERTIFICATES — Will be awarded for the following:

Top overall score
Top score Australian YL Novice CW (Mrs Florence McKenzie Certificate)
Top score ALARA member in each country and VK call area
Top score YL non-member in each continent
Top score OM in each continent
Top score SWL in each continent
Top score VK Novice
Top score overseas YL Novice — CW

(Mrs Florence Violet McKenzie, 1892-1982, was the first woman in Australia to take out a transmitting licence, in 1921. She passed the Amateur Operator's Certificate of Proficiency in 1925, and obtained the call sign 2GA, later VK2FV. Mrs Mac taught Morse code to thousands of people, particularly service personnel, during the 1939-45 war years. In 1984, the Townsville Amateur Radio Club kindly donated a trophy in her memory).

1987 CALIFORNIAN QSO PARTY

Sponsored by the Northern Californian Contest Club

The Contest is held from 1600 UTC, October 3, 1987 to 2200 UTC, October 4, 1987.

Single operator entries may operate only for 24 hours; off times must be clearly marked in your log and must be at least 15 minutes long.

Multi-operator entries may operate for the full 30 hours.

Stations may be worked once on CW and Phone on each band.

All contacts must be simplex, no MCW.

All CW contacts must be made in the CW subband, except for 160 metres.

Californian stations that change counties are considered to be new stations and may be contacted again for point credit.

OBJECT — Stations outside of California work as many Californian stations in as many Californian Counties as possible; stations in California work anyone.

EXCHANGE — Californian stations send a QSO number and county, stations outside California send QSO number and state/province/country.

QSO POINTS — Each complete phone contact is worth two QSO points. Each complete CW contact is worth three QSO points.

MULTIPLIERS — Stations use the number of different Californian Counties for a possible total of 58.

TOTAL SCORE — The total score is the number of QSO points multiplied by the total number of multipliers.

FREQUENCIES — 160 metres through to two metres, excluding 30 and 12 metres. CW on 1.805 and 50 kHz up from the band edge. Phone on 1.815, 3.850, 7.230, 14.250, 21.300 and 28.500 MHz. American novices will be 10 kHz up from the band edge and 28.490 MHz.

Try CW on the half hour.

Try 10 metres on the hour 1700-2000 UTC.

Try 160 metres at 0500 UTC and 80 metres at 0700 UTC.

DEADLINE FOR SCORE SUBMISSION — All logs and summary sheets must be sent to NCCC, c/- Gary Caldwell WA6VEF, 1830 Polk Street, Concord, CA. 94521, by November 15, 1987. Please include a business size SAE and postage for results. Entries of more than 200 QSOs must include duplicate sheets.

AWARDS — Certificates to the highest scoring single operator entry in each country and each station that scores 100 or more QSOs. Other special trophies will also be awarded to the top operators.

ar

Electro-Magnetic Compatibility Report

Hans Ruckert VK2AOU
EMC REPORTER
25 Berrille Road, Beverly Hills, NSW. 2209

I am grateful to DL1BU for permission to publish his EMC paper in Amateur Radio.

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Radio Interference, caused by Harmonics of Transmitters, Disturbances to Electronic Equipment caused by Fundamental.

INFLUENCE OF RADIO TRANSMITTERS FUNDAMENTAL AND HARMONICS TO ELECTRONIC EQUIPMENT

Receivers of any type of radio services may be disturbed In their function by electromagnetic fields or currents. — Direct interference may be caused by harmonic content of the radio frequency signal (mostly fault of the transmitter).

Disturbance or general impairment of operation could be caused by the fundamental RF power of the transmitter (mostly fault of the disturbed device).

This contribution shows the way of penetration and remedies by shielding, filtering and decoupling.

INTRODUCTION

The quick growth of the number and the variety of electronic equipment and the proximity to radio frequency sources causes severe problems of mutual interference and disturbance.

Decades ago it was merely the suppression of broadband interference caused by sparks of switching devices, commutators of AC-DC motors, and, later on, broadband hum of semiconductor controlled devices (SCR, Thyristors).

Today it is a problem of one electronic device or electrical appliance causing harm to some other device, receiver, computer, television, recorders, etc. This field of Electromagnetic Compatibility expands quickly. It deals with measurement of electromagnetic fields, voltages, currents, coupling, etc, and of course, suppression by shielding, filtering and decoupling.

This contribution deals with the problems of transmitter harmonics and the influence of the fundamental frequency power to other equipment, mainly radio receivers for broadcasting purposes, sound or television. The special case of disturbance to video cassette recorders has already been dealt with previously.[1,2]

It is advisable to keep the terms well apart: ***Interference*** is in most cases caused by the transmitting device by radiated or conducted transmission of harmonics or spurious frequency power. Interference of this type has to be suppressed at the transmitter.

Disturbance of the function of a radio receiver by the fundamental of the transmitter, operating on an entirely different frequency, is usually a fault of the receiver or any other electronic device not being able to withstand the electromagnetic field or conducted power transfer. This impairment of function due to fundamental influence must in most cases be overcome at the receiver by better shielding and filtering, and, in case of VHF/UHF receivers, by the use of highpass input filters that sufficiently suppress the transmitter fundamental. In some cases, currents on the outer conductor of coaxial cables must be reduced by using isolating transformers for the receiving frequency.

In some cases, increased attenuation between the transmitting antenna and the receiving antenna must be obtained by physically separating them.

INTERFERENCE BY TRANSMITTER HARMONICS

Harmonics of a Transmitter at the coaxial output

Every radio transmitter will generate harmonics and in some cases spurious frequencies. They are usually reduced by the Pi-network of a tube-equipped output stage or a lowpass filter in solid-state transmitters. Pi or Pi-L output and matching networks represent one complete section of a lowpass filter. Harmonic reduction is in the order of 40 dB to 50 dB in output stages with transmitting tubes and Pi networks, and 50 dB to 80 dB with solid-state transmitters with two-section lowpass filtering. PTT authorities usually demand a 40 dB reduction of harmonics with shortwave transmitters and 60 dB with VHF/UHF transmitting devices. This is a general rule as far as no harmonic interference is caused in a specific case. If there is evidence of this type of radio interference, a much higher reduction of harmonics is demanded, mostly down to one nano-watt at the transmitting antenna or a tuned halfwave dipole for the harmonic frequency that causes the interference. This, as will be shown later, is not easy to achieve due to leakage of the equipment for VHF/UHF harmonics.

The primary solution will be the introduction of a harmonic filter at the transmitter output. These lowpass filters are readily available and are equipped with the usual coaxial connectors. As the main aim is suppression of higher harmonics in the VHF/UHF range, they must make use of feed-through capacitors and shielded boxes for the inductors. Otherwise the high attenuation of usually 80 dB or 90 dB will fall off at higher harmonics where the parasitic inductance of the shunt-arm capacitors increases the reactance.

Figure 1 shows the attenuation curve of a 50 ohms lowpass filter of good design. The horizontal frequency scale is from zero to 1000 MHz, 100 MHz per division. The cut-off frequency (the steep slope) is at 50 MHz (left-hand side of Figure 1). Only a very small reduction of attenuation can be detected at 730 MHz with still 88 dB. If simple ceramic disc or mica capacitors are used in the shunt-arms, a multitude of resonances will occur at UHF with reduced attenuation in the expected stop band.

Figure 2 is the attenuation curve of such a "lowpass" filter. Beginning at 590 MHz the attenuation (or more accurate: the reflective rejection) is markedly reduced. Harmonics in this range might not be reduced sufficiently.

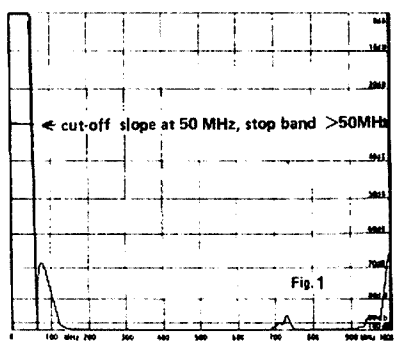

Figure 1: Attenuation of a well-designed Transmitter Lowpass Filter. Cut-off frequency 50 MHz, attenuation 90 dB to 100 dB, frequency range shown: 0-1 GHz.

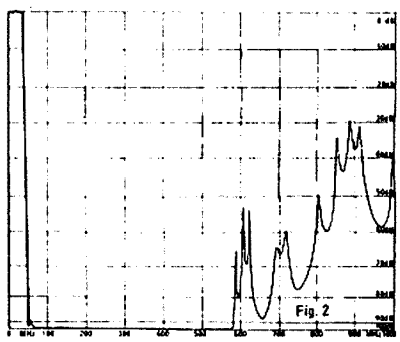

Figure 2: Attenuation of second-grade "Lowpass Filter" using ceramic disc capacitors instead of feed-through types (bad attenuation from 590 MHz upward). (10 dB/div).

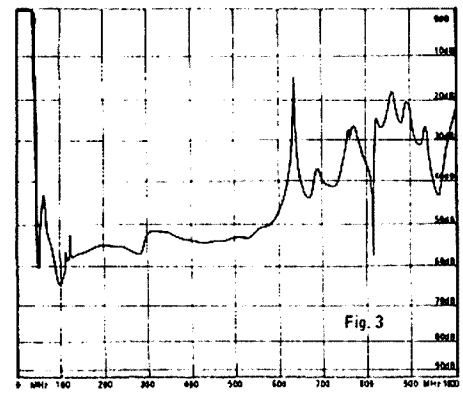

Figure 3: Bad design of a lowpass filter. Even at low frequencies only 50 dB to 55 dB of attenuation is obtained. Above 600 MHz the attenuation falls down to 14 dB at 630 MHz and 18 dB at 860 MHz. Reasons are the use of non-feed-through capacitors and lack of inductor shielding. Frequency: 0-1 GHz (100 MHz/div). Attenuation: 0-100 dB (10 dB/div). Measured in a 50 ohms system.

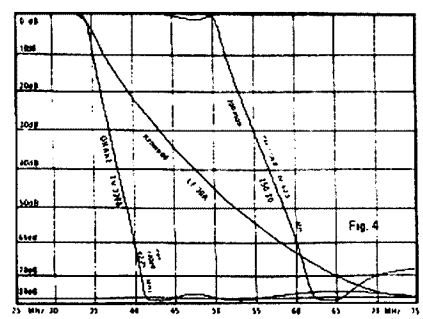

Figure 4: Different slopes in cut-off region of three lowpass filter designs. The third filter with the cut-off beginning at 50 MHz also has an attenuation peak at 63 MHz.

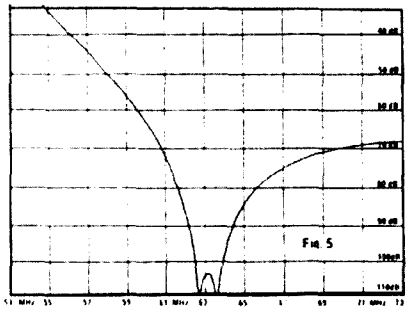

Figure 5: The third lowpass filter with the attenuation peak at 63 MHz. Maximum attenuation 110 dB by using a series resonant circuit in two of the shunt-arms (50 ohms system).

Figure 3 shows a very bad design of a lowpass filter. The maximum attenuation is only 55 dB in the VHF region and partially drops to 14 dB or 18 dB in the UHF band. In this filter, only simple disc capacitors and unshielded inductors were used.

In figure 4 the transition region between pass-band and stop-band is shown in expanded curves from 25 MHz to 75 MHz. All filters shown were designed to suppress harmonics beyond the maximum transmitting frequency of 30 MHz. Sometimes very high suppression of harmonics is required where the low VHF television frequency range around 60 MHz is still in use. The third harmonic of a 21 MHz transmitter falls to 63 MHz. With a simple lowpass filter the attenuation might not yet have reached a sufficiently low level. A series resonant circuit in one or two of the shunt-arms of the lowpass filter will provide very high attenuation near the transition frequency. If the inductor or capacitor is made variable, a sharp notch can be obtained at the critical frequency as shown in Figure 5 with 110 dB at 63 MHz and may be adjusted in the final set-up.

All curves shown so far were measured in a 50 ohms system. This comes close to most practical applications where 50 ohms coaxial cable is used together with 50 ohms antennas. The question might arise what happens in cases of mismatch. There will be no severe problems in the pass-band and stop-band. Some influence will occur in the transition region. In Figure 6, two cases of extreme mismatch are shown. The load was changed from 50 ohms to 0.5 ohm (upper curve) and 5000 ohms. Still 90 dB to 100 dB of attenuation are obtained in the filter notch with this 100:1 mismatch.

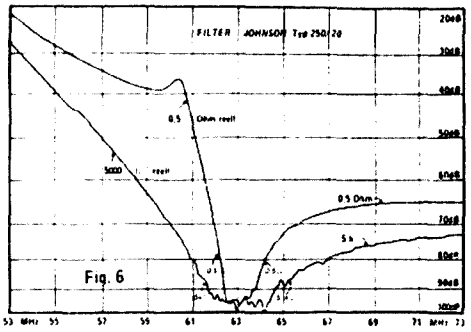

Figure 6: Shows the effect of severe resistive mismatch (SWR 100) to the antenna output of the filter that has been shown in Figure 5 with 50 ohms resistive load. The attenuation curve is changed in the transition region, but high attenuation is still achieved.

As mentioned above, some PTT authorities demand a dramatic reduction of harmonics if an actual case of harmonic interference has been reported. The question is if even higher harmonic rejection is possible by cascading two lowpass filters of standard design. To reduce the harmonic power of a one kilowatt transmitter to 1 nW (10^{-9}W) a total attenuation of 120 dB is required. Figure 7 shows the total attenuation of up to 130 dB of two filters in cascade. This, however, is a rather theoretical approach to the actual problem because leakage of the transmitter shielding and conducted transfer of harmonic power will radiate more than 1 nW in almost any case. This will become a matter of high-grade shielding and filtering of the transmitter modules.

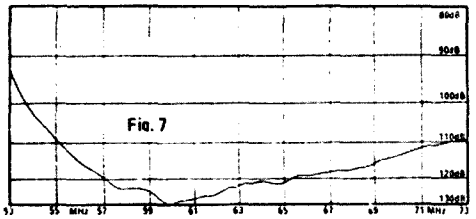

Figure 7: Indicates the total attenuation when two lowpass filters are used in cascade. A total stop-band attenuation of 130 dB or more can be obtained.

Leakage of Harmonic Power, Radiation from Transmitter and Cables

Unless extreme shielding efforts have been made and also perfect filtering of cables has been used, it is only of theoretical value to improve harmonic output filters at the coaxial connector of the transmitter on the way to the antenna. The usual 80 dB to 100 dB rejection of transmitter lowpass filters is sufficient, considering 40 dB to more than 80 dB reduction of the transmitter output network. Table 1 shows typical harmonic reductions of a one kilowatt tune-equipped power amplifier for the frequency range of 1.8 MHz to 30 MHz. The first row shows the harmonic reduction (dBc) from the maximum carrier power (or SSB single tone) for two tubes 3-500 Z, the second row for each fundamental frequency indicates the reduction with a pair of BBC T-510/1 (written in italics).

The figures marked with an asterisk * (-90 dBc*) are at the measuring limit. A very high input attenuation (or a highpass filter) must be used, as otherwise the measuring system generates harmonics by itself due to the much higher fundamental power.

P_{out}	f_s	Harm.: K_2	K_3	K_4	K_5	K_6	K_7	K_8	K_9	K_{10}	Remark Tubes
1 kW	1,85 MHz	-45dBc *-45dBc*	-62dBc *-63dBc*	-74dBc *-74dBc*	-90dBc* *-90dBc**	-90dBc* *-90dBc**	-90dBc* *-90dBc*	-90dBc* *-90dBc*	-90dBc* *-85dBc*	-90dBc* *-87dBc*	3 500 Z *T 510 1*
1 kW	3,6 MHz	-45dBc *-45dB*	-60dBc *-63dBc*	-70dBc *-73dBc*	-72dBc *-85dBc*	-85dBc *-83dBc*	-90dBc *-87dBc*	-90dBc* *-90dBc**	-85dBc *-87dBc*	-90dBc* *-90dBc**	3 500 Z *T 510 1*
1 kW	7,0 MHz	-61dBc *-51dBc*	-82dBc *-80dBc*	-90dBc *-90dB.**	-80dBc *-85dBc*	-90dBc* *-90dBc**	-90dBc* *-90dBc**	-89dBc *-90dBc**	-89dBc *-90dBc**	-88dBc *-90dBc**	3 500 Z *T 510 1*
1 kW	14 MHz	-58dBc *-54dB*	-80dBc *-77dBc*	-85dBc *-85dBc*	-75dBc *-76dBc*	-90dBc *-79dBc*	-35dBc *-44dBc*	-62dBc *-72dBc*	-80dBc *-76dBc*	-90dBc* *-85dBc*	3 500 Z *T 510 1*
1 kW	21 MHz	-63dBc *-64dBc*	-69dBc *-64dBc*	-75dBc *-70dBc*	-54dBc *-50dBc*	-74dBc *-77dBc*	-59dBc *-54dBc*	-71dBc *-54dBc*	-76dBc *-66dBc*	-85dBc *-90dBc*	3 500 Z *T 510 1*
1 kW	28 MHz	-73dBc *-74dBc*	-72dBc *-71dBc*	-49dBc *-48dBc*	-74dBc *-69dBc*	-90dBc* *-70dBc*	-82dBc *-77dBc*	-90dBc* *-85dBc*	-82dBc *-76dBc*	-90dBc* *-90dBc*	3 500 Z *T 510 1*

Table 1: Typical Harmonic Output of tube-equipped one kilowatt power amplifier, exciter solid-state 100 watts. Compares two different types of tubes. Generally good suppression of harmonics, with the exception of certain frequencies (seventh harmonic of 14 MHz) where parasitic resonances occur.

Values up to the 10th harmonic are shown. The reduction figures without external LP filtering are quite good — with a few exceptions, where parasitic resonances occur. The output capacity of the tubes comes into a series resonance with parts of the inductors, and the shunt-arm tuning and loading capacitors do not have the characteristics of feed-through capacitors. At higher harmonic (VHF/UHF) frequencies, they rather act as shunt-arm inductors, increasing their reactance to higher values. This makes additional external lowpass filtering necessary.

Transmitters do not generally use such a high degree of shielding as is used with signal generators where sub-microvolt levels have to be accurate for sensitivity measurement. They are sometimes *well* shielded for their transmitting frequency, but not for harmonics in the VHF/UHF range where slots between cabinet screws act as tuned slot antenna. Use of finger springs of beryllium-copper material or metal braided hose between cabinet and cover improve the UHF-shielding dramatically. The radiation of harmonics from the anode of a transmitting tube is extremely high, because at this point, no filtering for VHF/UHF harmonics has taken place.

Figure 8 shows the harmonic radiation of a 21 MHz transmitter signal (500 watts) received with a broadband antenna at one metre distance. The upper reference line represents a voltage of 107 dB (uV) or 0 dBm (one milliwatt) at the broadband antenna. Being pure near field it does not make sense to convert this into a field strength. The higher harmonic signals around 85 dB (uV) correspond to the transmitter cover removed, the lower signals around 60 dB (uV) are with the metal cover. It is quite obvious that extreme high-attenuation output lowpass filters will be of little use. The harmful radiation on broadcast and television frequencies in the VHF/UHF range do not derive from the transmitting antenna, they emanate from the transmitter cabinet.

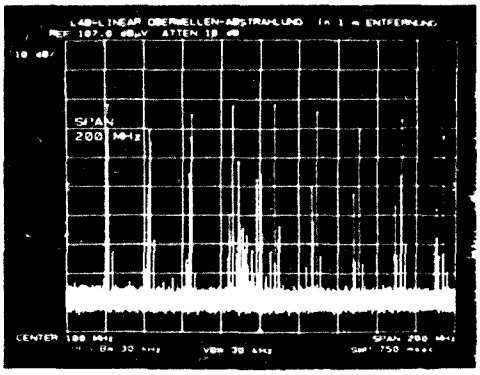

Figure 8: Harmonic Radiation from Transmitter Cabinet, fundamental frequency 21 MHz, display 0-200 MHz, reference level (upper horizontal line) 107 dB (uV) = 0 dBm at broadband antenna in one metre distance. High levels: cover removed (up to 85 dB (uV)). 10 dB/div, 20 MHz/div.

The severest leakage of harmonic power usually takes place from cables other than the RF output coaxial line. Transmitters with a separate power supply use many leads in the connecting cable that can not easily be filtered. For the heater lead high-current chokes must be used, for the plate supply high-voltage feed-through capacitors.

An alternative would be shielding of these cables, but if any improvement is expected, the shielding and the connection at both ends must be arranged according to microwave coaxial cables. Merely pin-connecting the braid on both ends will provide little reduction of radiation by leakage, as RF currents will flow on the outside of the shield to a certain percentage. Braid connections must be in a coaxial manner as with UHF coaxial cables. Figure 9 shows a screen spectrum display photograph of harmonic power on the connecting cable of a 500 watt transmitter to the power supply. The measurement has been made with an absorbing clamp 30 MHz-1 GHz, and the uppermost line

(reference) is 100 dB (pW). The transmit frequency is 28 MHz, the full display covers 0 to 500 MHz (50 MHz/div).

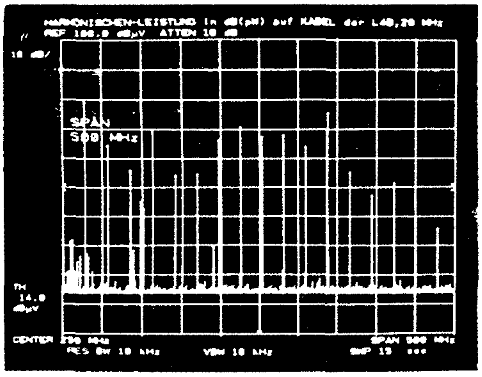

Figure 9: Harmonic Output Power on the connecting cable of a 500 watt transmitter with separate power supply. Reference line: 100 dB (pW) 10 dB/div. 50 MHz/div (total 500 MHz) (clamp measurement).

Shielding of the connecting cable will reduce this leakage radiation to some extent, but due to the coupling of this cable to the mains power cable through the power supply, filtering has to be used at the power cable to avoid further radiation by the mains power line. As the filtering of the connecting cable is difficult (high voltage, high current), the other solution of incorporating the power supply into the transmitter cabinet might be the better solution — in contrast to general opinion. In this case, only the two conductors of the mains power line cable have to be filtered. As VHF/UHF harmonics have to be considered, filters must be built with feed-through capacitors. Figure 10 shows the reason: the shunt-arm inductance of normal foil or disc capacitors with connecting wires provides a mutual impedance. Input RF current causes a voltage drop that appears at the filtered output conductor. This again means harmonic radiation. In addition to feed-through capacitors, ferrite beads help reduce UHF output.

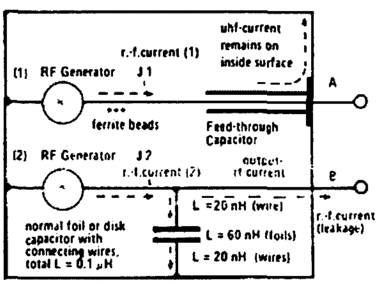

Figure 10: Upper half: the lead through the metal box leaves via a feed-through capacitor. All UHF-currents remain inside the box.
Lower half: a normal capacitor's inductance causes a division of RF currents, partly the current remains inside, another part leaks out.

Figure 11 proves a somewhat better reduction at least of the higher harmonics on the power line cable of a 500 watt, 14 MHz transmitter with the power supply built into the shielding cabinet. Unfortunately, no feed-through capacitors have been used.

DISTURBANCE TO ELECTRONIC EQUIPMENT BY EM FIELDS

There is an entirely different view on ***disturbance*** caused by receivers on other frequency bands or even to electronic entertainment or industrial equipment that has nothing to do with reception of

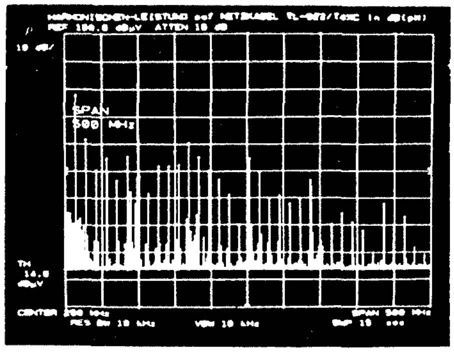

Figure 11: Harmonic Power on Mains Power Cable. 500 watt transmitter, 14 MHz. Reference line 100 dB (pW) 0-500 MHz, 10 dB/div, 500 MHz/div.

radio frequency signals. This disturbance is caused by the electromagnetic field of the fundamental transmitting frequency that *must* be radiated to perform the intended task. For that reason, only measures or remedies at the ***disturbed equipment*** will help. This should be the aim of a designer of electronic equipment to provide immunity to at least three volts per metre field strength, better 10 V/m. It is the evil of present entertainment equipment that deficiencies are discovered when already thousands, or even millions have been sold. The rules of the West German VDE-Standards (VDE 0872) were the first to demand certain immunity values for RF-fields and currents for entertainment equipment. It would be beyond the scope of this contribution to mention all measures of improvement, but of course shielding, use of antenna input isolating transformers, power line filtering with current-compensated ferrite toroidal chokes, ferrite chokes in input and output leads together with small disc capacitors will improve the situation of immunity ("Susceptibility"). Information on this matter will follow at a later time.

1. Schwarzbeck, G: Sensitivity of Television Video Recorders to RF Fields, EMC 84 Wroclaw Symposium
2. Schwarzbeck, G: Videorecorder-Beeintrachtigung durch Funksendeanlagen (TVI, VRI), cq-DL 11/84, S542

* Honorary Technical Officer of the DARC, Member of DIN & VDE EMC COmmittees. Specialist on Field-Strength Measurements and Equipment

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QSP

METALISED PAPER CAPACITORS

Wima MP 3X and Y metalised paper capacitors are vacuum- impregnated with epoxy resin to eliminate air contact and assure higher corona inception levels. They provide an operating range of 40 to +80 degrees Celsius.

They are available in values from .01 mfd to 0.47 mfd in both 250 and 275 volt AC ratings and 1000 pF to 4700 pF for 250 volt AC applications.

Adapted from *Electronics News*, p27 — April 1988

WICEN News

LATROBE VALLEY WICEN ASSISTS MOTOCROSS EVENT

The Latrobe Valley WICEN unit was activated on July 3, 1987. A Motocross motorcycle event was being held in the Traralgon South area and the Latrobe Valley Ambulance Service required communications between the event and a base station which had access to a telephone.

An ambulance had been required in the morning for an injured rider, but communications to the Ambulance Service necessitated being relayed by a number of different links. WICEN was activated at 1200 hours with VK3KBG providing the home station and VK3BLE attending the Motocross event as the local station. Their services were used in the afternoon, when again an ambulance was required at the site. Activation ceased at 1700 hours, with thanks going to VK3BLE and VK3KBG, for their prompt response to the call for assistance.

—Contributed by Col Pomroy, Co-ordinator for Region 9, 10, 11 WICEN

HORSE TRIAL — MOUNT DISAPPOINTMENT

Region 13 members, led by co-ordinator Roger VK3BKR, set off on Friday, July 3, for the Mount Disappointment State Forest, 45 kilometres north of Melbourne. The Horse Trial consisted of riders taking part in one of three endurance rides along tracks of the forest. Distances being covered were 160, 80 and 50 kilometres.

The event start time was at midnight, Friday. (WICEN members were informed the horses could see well enough in the dark, but members were not convinced of their map reading ability!). WICEN was to be used to check progress of the riders, ensure they avoided particular track hazards, report any major incidents and provide an increased measure of safety to the event.

Roo VK3YML and Glenn VK3KLW, had left early on Friday to establish a base station for the exercise, and upon arrival at 2300 hours, other WICEN members were pleased to see the billy was on the boil and cups lined up.

Consultation with the event organiser, and the map, gave enough information for members to leave the comfort of the base station and find their ways to obscure check-points in the Forest. This was where self-efficiency came to the fore as it was necessary to operate alone with any home comforts coming from the equipment.

Riders wore a coloured/numbered vest denoting the section they were competing in. The tracks were marked by similar coloured disks on the trees to ensure no one got lost. As the riders passed each check-point, their colour/numbers were radioed back to base for logging purposes.

The exercise was conducted completely on two-metres, with HF mobile only needed for a short time at a checkpoint near the forest boundary. Messages were of a routine nature with few queries as to course directions. All riders had returned safely to base by 1800 hours on Saturday.

The event was seen as a most successful exercise, with thanks going to those who participated, including Harry VK3KBA, Alan VK3DXF and Paul VK3PW.

These type of events provide excellent training for WICEN personnel with the chance to see other amateur's equipment and operating techniques.

If your are interested in participating in these types of events, why not get in touch with your WICEN co-ordinator. You will be made to feel very welcome.

—Contributed by Paul Walton VK3PW

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How's DX?

HEARD TO BE HEARD AGAIN

VK0HI, the much wanted DX call, that gave many thousands of DXers a new country is being heard through the ether again, and by the holder of its original user, Dave VK3DHF Dave's activity will be dictated by the workload ot his duties in the communication field during his stay until next year.

Dave left for Heard Island on the *Nella Dan*, early in September, for his assignment, this time in more comfort than his initial trip on the *Anaconda* where he, and all other aboard, took a share of all sailing duties, having a very memorable journey, and a 'ball' at the same time.

Australia, at the commencement of its Bicentennial year, with propagation being tipped to commence improving, will become the focus of amateurs world-wide when they have their beams pointed in the vicinity of this vast country.

Dave has chosen a very enthusiastic QSL Manager, his father, Noel VK3EVN, a constant listener on Dave's last trip to the island. When speaking to Noel, on a visit to this OTH, he told me that one day he would become an amateur, although, at that time, he had no electronic knowledge. With Dave's coaching, and lots of encouragement from his charming wife Lorna, and the rest of the family, Noel reached that goal, firstly as a novice and then gaining the privilege of a full licence. It will be a thrill to Noel and the family to wish Dave, and the other crew members on Heard Island, Season's Greetings, from his own QTH this year. It is believed that Noel is making considerable use of the key and the microphone during his well earned retirement. Congratulations Noel!

Noel's address for QSLing is 64 Orana Drive, Watsonia, Vic, 3087, or via the bureau. For direct cards from within Australia an SASE please. Overseas stations, for an airmail return, an SAE plus two IRCs are ample funds, or via the bureau.

Log entries are essential to validate cards and it is envisaged this will be done within the amateur spectrum as time and propagation permits. If this is not possible, all cards will be checked against the original log on its return to the mainland in May next year, so please be patient.

Dave will be using moderate power on phone into dipoles throughout his stay on the island. Operation is envisaged on the DX frequencies for 80, 40, 20 and 15 metres plus 21.195 MHz to assist the novices to partake. Net operation is not anticipated and it must be understood that Dave, during his stay, has the priorities of eating, sleeping and attending to the exacting duties as Radio Officer of the ANARE Expedition.

If you have Heard Island validated, please remember you are one of the lucky DXers in the world and please think of the innumeral amateurs from all continents that need this country to swell their DX score. The DX expeditions of 1983 did not satisfy the appetite of all DXers, including those who have been licenced since. If you have worked and confirmed this remote and rarely activated island please refrain from depriving another amateur of the privilege.

The QSL Manager would appreciate all cards to be written in UTC time and date.

Please refer to the VHF-UHF Column for the envisaged six-metre activity.

Dave VK3DHF with his father and QSL Manager Noel VK3EVN.

As previously noted in *Amateur Radio*, the VK6 Division of the WIA, due to a sum of money graciously bequeathed by the late Hugh Spence VK6FS, have created a DX Achievers Award. Will Dave be one of the first amateurs to obtain this prestigeous award?

If Dave does, it would be be quite fitting, as Hugh was on the top line of that historic VK0HI log. Hugh, with other members of the VK6 group was a driving force in getting it all together. Two members of that original group, Neil VK6NE and Don VK6DY, have greatly assisted in this present effort.

Dave to you and the crew, a safe and satisfying stay on the island is extended on behalf of all amateurs across six continents, and particularly from the DX fraternity.

—Contributed by Ken McLachlan VK3AH

VK9XI — CHRISTMAS ISLAND AMATEUR RADIO CLUB

Regrettably, due to the departure from the island of all the financial members, it has been decided to disband the radio club.

Some of the actions following the closure have been:

sharing of some of the radio equipment;
the old first original amateur station to be given to the Wireless Hill Museum, in Perth;
remaining funds, after paying freight charges, to be presented to the VK6 Division of the WIA.

Don Reed VK9DR (now VK4ADR), is to be made a life member of the WIA in recognition of his untiring efforts in encouraging many people to take an interest in amateur radio, not only on Christmas Island, but many other locations where he has worked.

The Christmas Island Amateur Radio Club members want to record their appreciation and thanks for the support and encouragement that Jim VK6RU, has provided during the years the club has been operating. Jim was Club Patron, 1963-1987.

The club members would also like to thank the WIA and, in particular, the WA Division, for their assistance. Without support of this kind from fellow amateurs and groups, the club would certainly have been very disadvantaged.

Any information or photographs that could add to the Wireless Hill Display would be appreciated in relation to amateur radio activity on Christmas Island. Such material should be sent to the VK6 Division.

—Written for, and on behalf of, VK9XI by Neil Penfold VK6NE from material supplied by Ron Ashley VK9XA

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Awards

Ken Hall VK5AKH
FEDERAL AWARDS MANAGER
St George's Rectory, Alberton, SA. 5014

AWARDS ISSUED IN JULY

WAVKCA

1546 Ray Dobson VK5DI
1547 Haruo Ishiba JE1REU
1548 Takuji Higo JA0EOK
1549 George Dimakis SV1YH
1550 Philip Marsh G4WFZ
1551 Kovacs Laszlo HA1SB

DXCC UPDATE IN JULY

VK5WO 310/335 phone 311/339 open
VK6LK 316/365 phone
VK6RU 316/365 phone 316/365 open
VK5BO 217/218 phone 263/297 open

TASMANIAN DEVIL AWARD

The Tasmanian Division of the WIA created the Tasmanian Devil Award some years ago to stimulate interest in, and as a reward for, making contact with VK7 stations.

The basic rules are quite simple. Radio amateurs are required to furnish proof, by way of a log extract, of having worked a specified number of VK7 stations on any band, using any mode according to location and within the terms of their license, since January 1, 1978.

Below 30 MHz, the number of contacts required are:

Australia (including Tasmania)	50 contacts
Oceania and Antarctica	30 contacts
Asia and South America	20 contacts
Europe and South America	10 contacts
South Africa	7 contacts

Above 30 MHz, 20 contacts are required, with at least one station located in each of the three WIA Branch areas (STD code areas: 002, 003, 004).

Self-adhesive upgrade stickers are available when sufficient additional contacts have been made. Details of these upgrades are available from the Awards Manager, or from the Net Controller of the regular Tuesday night net, which is held on 3.590 MHz, commencing at 1000 UTC.

Shortwave listeners are eligible to qualify by adding the call sign of the 'other' station engaged in the contact.

Claims for the award should be in the form of a log extract and must show your call sign, name and address, date/time in UTC of the contact, call sign of the station contacted, signal reports sent and received, mode and band used. The claim must be signed by the applicant as being a true and accurate extract from the station log. No QSL cards or counter-signatures are required.

A fee of $A3 should accompany the claim to cover printing and postage. The fee for upgrade stickers if $A1. Claims should only be sent to the Awards Manager, Bob Jackson VK7NBF, "Falmouth House", Falmouth, Tas, 7215.

—Contributed on behalf of Bob Jackson VK7NBF, by Bob Richards VK7NRR

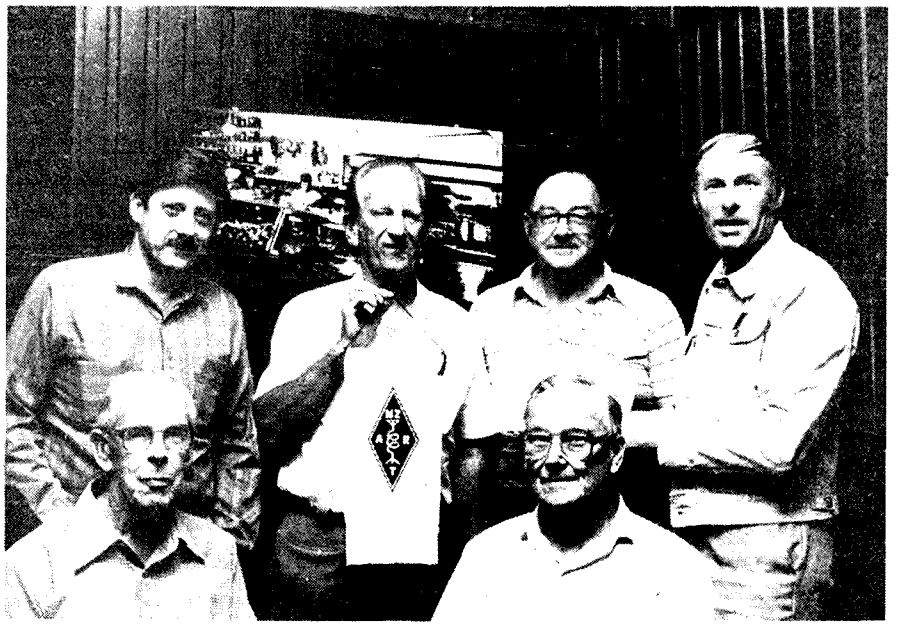
THE SOUTH EAST QUEENSLAND TELETYPE GROUP RTTY AWARD

This award is open to all transmitting and listening amateurs who gain award points in the following manner.

Australian amateurs must score five points
Overseas amateurs must score three points

(a) A transmitting amateur must work three member stations of the South East Queensland Teletype Group on RTTY (one point each). Log extracts and/or printouts are to be included with the award application, and each member station may be counted only once towards the award.

(b) Additionally, an Australian station must copy the official station of the South East Queensland Teletype Group, VK4TTY, during a news broadcast and, in the case of a transmitting amateur, participate in the call-back (two award points). A portion of the printout of the news broadcast, together with the date, time, and frequency are to accompany the request for the award.



Recently, Gary ZL1AKI, made the trip across the Tasman so he could receive his SEQTG Award in person. Gary is the first overseas award recipient. From left: Rob VK4KUG, Acting News and Broadcast Officer, Stan VK4BSD, Award Net Assistant, Gary ZL1AKI, First Overseas Award Recipient, David VK4AFA, Award Manager.

—Photograph courtesy Shaun Connolly VK4CO

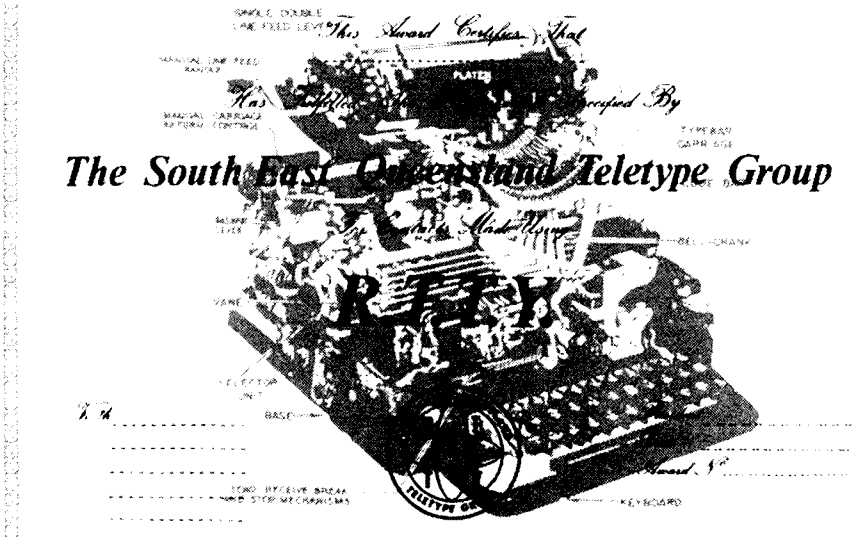
(c) Listening amateurs should, in lieu of (a), forward log extracts and/or printouts of three contacts involving different member stations of the South East Queensland Teletype Group (one point each).

Applicants for the award should forward the above information, together with $A1, or five IRCs, to cover postage and printing costs, to The Secretary, SEQTG, PO Box 184, Fortitude Valley, Qld. 4006.

The VK4TTY News Network transmits at 50 baud and 170 Hz shift via the groups repeater VK4RBT-1, 147.050/147.650 MHz, with relays on 3.630 and 7.045 MHz each Monday evening at 1000 UTC.

The first JA to receive the award is Yoshiaki Hasegawa JA1WVK, and the fist YL recipient is Josie Gleadhill VK4VG.

—Contributed by David Brownsey VK4AFA, Secretary, SEQTG



NEWPORT AMATEUR RADIO SOCIETY

Following are details of competitions which are being organised as part of the Royal National Eisteddfod of Wales, to be held at Newport from July 30 1988 to August 6, 1988.

The call sign, GB2EC, will be used by NARS as part of preparations for the Eisteddfod. Club members will hold GB2EC on a monthly rota from October 1987, until the beginning of the Eisteddfod in July — a total of 10 stations. GB2EC will be active on HF and VHF.

All contacts will receive a QSL card via the bureau. Awards can be claimed for working the call sign while it is held by different operators. Also, GW4EZW, the club call sign of NARS will qualify for one contact only.

Australian stations require three contacts on HF to claim the award.

Each OSO will have a serial number and it would be appreciated is applicants quoted this QSO number when applying for the award.

During Eisteddfod week, GB2EC will be active on all bands from the Eisteddfod sight in Newport. A distinctive QSL card will be available direct via PO Box 33, Newport, Gwent, (SAE and IRCs please) or via the bureau.

For further information contact NARS, via Box 33, Newport, Gwent.

A photographic competition, with the theme of "Amateur Radio", will also be conducted by the Newport Amateur Radio Society as part of the Eisteddfod.

The competition is open to all-comers with the best entries being displayed on the NARS amateur radio stand throughout the Eisteddfod.

Entries are invited for three categories, in two groups:

Group 1 — entrants over 18 years: Group 2 — entrants under 18 years.
Category A — Depicting amateur radio in Gwent
Category B — Depicting amateur radio in Wales
Category C — Depicting amateur radio in the world

A maximum of two entries allowed per entrant.

Three prizes will be awarded in each section.

Entries must be in the form of colour or black and white prints, maximum dimensions 10 x 8 inches.

Entries must be clearly marked on the reverse side with the name and address of the entrant, call sign (if applicable), Group and Category entered, and any other relevant information.

Prints to be returned must be so marked and be accompanied by an SAE and sufficient postage.

Entries will be judged by the joint committees of NARS and the Gwent Photographic Society, whose decision will be final.

Prize winners will be notified in July 1988, and prizes posted. For a list of prize winners, please enclose SAE and postage with entry.

Entries to be received by May 30, 1988 at PO Box 33, Newport, Gwent.

For further information contact NARS, via Box 33, Newport, Gwent.

—Contributed by R Keyes, GW4IED, Hon Secretary, NARS

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RADIODES

BASIC ELECTRONICS²

Pure resistance let's consider,
There's no need to write a tome,
If one Volt will pass one Ampere —
Then resistance is one Ohm.

Take a pair of like resistors,
Place them first in single file.
For the total of the circuit —
Simply add them with a smile.

Parallel, we now shall place them,
Total does not neatly come.
Multiply one by the other —
Then divide this by their sum.

There are many calculations,
Some would tie your brain in knots.
But, let's end with one for power —
Amperes squared, times Ohms is Watts.

—"Hambard" (Originally printed in the Nigerian ARS Newsletter 1970s)

Australian Ladies Amateur Radio Association

Joy Collis VK2EBX
PUBLICITY OFFICER, ALARA
Box 22, Yeoval, NSW. 2868

ALARA's 12th birthday on July 26 was celebrated with numerous activities.

BIRTHDAY ACTIVITY DAY

Was held on Saturday, July 25, with several groups of VK and DX YLs getting on air for a "natter." We all enjoyed it so much that the general comment was "We should do this more often." Perhaps as propagation improves it may be possible to "get-together" on a regular basis. After all, communication is what it is all about!

Our special *Birthday Net* was held on 80 metres on July 27, with five States represented, and reasonably good conditions. Several OMs "dropped in" to pass on birthday greetings. We must not forget to mention the listeners — SWLs who listen to us, some on a regular basis, and send their cards and good wishes for ALARA's future.

OTHER ACTIVITIES

Eight ALARA members were present at the VK6 Radio Ladies' Luncheon, at the end of June; a most enjoyable occasion.

The VK5 members held a "working lunch" at the home of David VK5OV and Meg VK5AOV, on July 19. Further details next month.

The VK3 Birthday Luncheon was held on July 26, hostess being Raedie Fowler, assisted by OM Ray VK3BHL, who able filled the onerous position of "waiter" for the day.

In attendance were: Gwen VK3DYL, Mavis VK3KS, Austine VK3YL, Bonnie VK3PBL, Liz VK3PSG, Jean Shaw, Valda VK3DVT and Pat, Bron VK3DYF and, of course, Raedie and Ray.

A very enjoyable day was had by all, and the pleasure of "face-to-face" communication was heartily approved of.

The weather was kind, food plentiful, and conversation likewise!

At the gathering a certificate was presented to Raedie to show her the appreciation of ALARA members for her efforts on behalf of ALARA in the early years, and her continuing interest.

(Thanks to Bron VK3DYF for this information)

ALARA CONTEST — November 14, 1987

After several "false starts" regarding the Alara Contest, I think we finally have it right — *Saturday, November 14,* is the date, your radio shack the venue, and my apologies for getting it wrong in September AR.

Last year we were very pleased to have the company of some of our DX members, and we are hoping for even more this year.

Our contest is not too long (24 hours), the rules are not unduly complicated, and since its inception it has been a friendly and enjoyable contest, open to YLs and OMs alike. Why not join us?

ALARA COMMITTEE

Further to the list of Committee members in September AR; Maria VK5BMT, has taken on the position of VK5 State Representative; and Josie VK4VG, is the VK4 State Representative.

UPGRADE OF CALL SIGN

Congratulations to Phyl, ex-VK4JFA, who is now VK4BPL. Looking forward to working the new call sign.

HOW I GOT STARTED IN AMATEUR RADIO

This is how Mimi ZS5YO began:

"I got my licence six years ago at the age of 60. My daughter Molly became an amateur when her fiancee, Gordon, a radio amateur, went to the Antarctic for 14 months. After his return and their marriage they started coaching me and, when they went to live in Cape Town, their young university friends very kindly took over. Once I had passed the examination my worst fears were realised, I had to start on CW. Oh well, I did manage to pass the required 12 WPM and, after the regulation one year on CW, I discarded the key and have forsaken it ever since."

It has often been said that we are a little sensitive when it comes to revealing our correct ages. Maybe this is true, particularly for those who are "getting on a bit."

One YL who has no qualms about her age is JoAnne VK4LCD. JoAnne says:

Sixteen years old, quite young, so I am told, for a licensed amateur. Well, that just allows me many, many more years to enjoy OUR wonderful hobby, doesn't it? I was introduced to amateur radio in the form of JOTA. The strange mystique of chatting with unseen persons gripped me and, after JOTA '85 (my second) I took up amateur radio as a hobby.

I am to (or attempt to) upgrade near Christmas, but for now I have promised my loving parents (who actually find amateur radio boring!!?) that I'll sit for no more examinations (of amateur nature) this year, in order to concentrate on my school studies. What a rash promise that was! I aim to meet as many amateurs as possible because you are such a great bunch of people."

JoAnne is a very busy young lady. Besides completing year 12, she is studying for her Basic Electronic Certificate by correspondence, and is involved with Ranger Guides, and fund raising for (and technical aspects of) a community FM radio station in her home-town of Caboolture.

We wish you every success with all your projects, JoAnne, and hope you will continue to find amateur radio an enjoyable hobby.

JOTA

October is Jamboree on the Air (JOTA) month, and many ALARA members become involved with this very worthwhile project.

JOTA is often the starting point of a life-long involvement with amateur radio (as it was with JoAnne), so if you can assist, contact your local Scout or Guide troop and see what can be done. It can be a lot of fun, too.

WARO SILVER JUBILEE AWARD

This very beautiful award, which was very easy to obtain, now graces the shacks of a number of VKs, including at least one SWL.

Other activities are planned to celebrate the Silver Jubilee of WARO, including:

NZ WARO CENTURY AWARD

This award is not so easy to obtain, but I am sure it will be well worth the effort!

The rules are s follows:

1 Applications to contain full log details of contacts with 100 New Zealand WARO members (DX members included), dating from June 1, 1987, and to be signed by one other licensed radio amateur.

2 Contacts may be made in any mode, any band or mixed, and from any QTH, but each YL claimed must be a financial member of NZ WARO at the time of the contact and may be counted only once.

3 Contacts made via repeaters and in nets will qualify, but contacts made during NZ WARO contests will not be accepted.

4 No QSLs required. Send list of full log details and $2 to the Custodian, Vicki Shaw ZL1OC, PO Box 2083, Whakatane, NZ.

Until next month.

73/33 Joy VK2EBX

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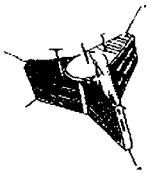

AMSAT Australia

Colin Hurst VK5HI
8 Arndell Road, Salisbury Park, SA. 5109

NATIONAL CO-ORDINATOR
Graham Ratcliff VK5AGR
INFORMATION NETS
AMSAT AUSTRALIA
Control: VK5AGR
Amateur Check-In: 0945 UTC Sunday
Bulletin Commences: 1000 UTC
Primary Frequency: 3.685 MHz
Secondary Frequency: 7.064 MHz
AMSAT SOUTH WEST PACIFIC
2200 UTC Saturday
14.282 MHz

Participating stations and listeners are able to obtain basic orbital data, including Kepierian Elements from the AMSAT Australia Net. *This information is also included in some WIA Divisional Broadcasts.*

ACKNOWLEDGMENTS

Contributions this month are from Bob VK3ZBB, VK5AGR BBS and UoSAT Bulletin Board.

UOSAT-OSCAR-11 BULLETIN-099 August 13, 1987
UOSAT MISSION CONTROL CENTRE
University of Surrey, Guildford, Surrey, England

AO-10 UNAVAILABLE FOR USE (ANS and DB2OS)

AMSAT-OSCAR-10 must not be used for communications for several months due to complete discharge of the on-board battery. The spacecraft initially went off the air on Tuesday, August 4, with the transponder off and the Engineering Beacon was discharging meaningless telemetry. The situation was corrected by Wednesday after the intervention of a command station to reset the IHU. The upset of transponder operations is likely to have been caused by a random glitch in the IHU output which commanded the transponder off. The IHU has been unusable since its memory has sustained massive radiation damage.

The sun angle is too low to allow adequate amounts of solar radiation to be absorbed by AO-10's solar panels — available power will be reduced to near-zero levels by late September. *The entire satellite will* then power down, the second episode in its life when complete power down has occurred. During these episodes, power levels are so low that no on-board electrical systems can be sustained.

Power down is inevitable since controllers no longer are able to maneouver the satellite's attitude in orbit. This ability was afforded by the IHU energising the magnetorquers in precise sequence and timing. Since the IHU is inoperative, the satellite's attitude stays fixed with regard to inertial space.

However, since the satellite and the earth move around the sun as a system, the attitude of AO-10's solar panels, with respect to the sun changes seasonally. We are now approaching the worst season for AO-10 sun angles.

Total abstinence is required for a long while, until the sun-angle will be again good enough for charging the battery. The next period of communication via AMSAT OSCAR-10 will start around November 20, when illumination is better than 75 percent.

Until further notice from AMSAT — Do Not Use OSCAR-10!!!

SOVIET EARTH RESOURCES SPACECRAFT LAUNCHED (ANS)

The Soviet Union has launched a 15 to 20 tonne Earth resources and ocean survey platform. It is the largest civilian survey spacecraft ever launched. Described as being the size of a school bus, the platform was orbited by a Proton booster on July 25, into an initial 175 by 105 mile orbit. This was later circularised to 147 by 154 miles. The object has been designated COSMOS 1870, object 87-064A, catalogue 18225. The spacecraft was launched from the Baikonur Cosmodrome at Tyuratam, about 0855 UTC, July 25. It should be an easy naked-eye object in the pre-dawn/post-dusk skies. The initial element set for COSMOS 1870 is given as follows:

Epoch	87214.85702392	
Element Set	24	
Inclination	71.9329	deg
RAAN	99.1022	deg
Eccentricity	0.00114670	
Arg of Perigee	260.9267	deg
Mean Anomaly	99.0415	deg
Mean Motion	16.08648753	rev/day
Drag	0.00061798	rev/day^2
Rev No	137	
SMA	6628.6	km
Period	89.52	min
Apogee	258.09	km
Perigee	242.89	km

FUJI MODE JD REPORT

The following item was posted on BBS Bulletin Boards, including VK5AGR, and makes very interesting reading. The report originated from Barry VE3JF.

On, for about five weeks.

Here are some observations and comments from one user of the BBS:

As of the end of July, approximately 40 stations in 11 countries have made use of the BBS. With the recent appearance of CE3XK, all continents are now represented. The list below shows the calls of the stations which have sent messages on the BBS. While the large number of JA calls is certainly not unexpected, the relatively small number of W/VE and G calls, and the total absence of others such as F, ZL, etc, is rather surprising.

CE3XK, DB2OS, DH4KAH, DL1CF, G3RUH, HB9MHM, HB9XJ, I0JX, JA1NVB, JA1QHQ, JA2BGX, JA2PKI, JA3XJK, JA4BLC, JA8ERE, JA8TCH, JE3MXU, JF3KTJ, JH1DWU, JJ1ZUT, JL3SHC, JR3FRF, JR4BRS, JR5EBL, K7PYK, KA9LNV, ON4DY, ON5PV, ON6CK, ON6UG, VE3JF, VK2ZDE, VK3DTO, VK5AGR, VK5ZK, WA4EJR, WA8EBM, WB5IPM, WB7QKK, ZS6IT.

Thus far, nearly all of the messages on the BBS have been short greetings between stations accessing the satellite. Very little traffic of the type that flows between the auto-forwarding terrestrial BBS stations is evident; this is probably due to uncertainties about the satellite's operating schedule and what stations are actually active on a regular basis, not to mention questions about third-party traffic legalities and the fact that most of the folks using the satellite are not also BBS operators. The incertainty surrounding the operating schedule has been dispelled recently with the posting of a schedule through to September 9. The limited access time, due to power budget problems and time allotted to mode JA operation, is something we will have to live with. To put this in perspective, consider that mode JD (ie the BBS), is scheduled to be operating on a total of seven days during the month of August, and during those days it will be cycled on/off at two-hour intervals. This gives a station on the ground a maximum of about six-hours access time for the whole month, or less than one percent of the time that a geostationary satellite would be available. Moreover, there are gaps of as long as nine days in the schedule, so the time delay in delivering a message can be considerable; also, it seems that the onboard computer is powered down during some of the off periods, and all of the messages on the BBS get dumped.

There is also no way of telling whether a destination station has actually received your message, unless he sends you a separate message of confirmation. In short, the limitations will make it challenging to use FO-12 for any sort of serious message forwarding. Nevertheless, it is an extremely useful test bed for packet linking by satellite; and, the limitations just mentioned aside, the FO-12 hardware and BBS software have been functioning superbly.

The satellite has been used for some fairly lengthy file transfers between the DF3AV and VE3JF BBSs, with no problems whatsoever encountered. Now that the first batch of TAPR PSK modem kits has been shipped, there should soon be a considerable increase in the number of FO-12 BBS users. Stay tuned!

73, Barry VE3JF
ar

SATELLITE ACTIVITY FOR THE MONTH OF MAY & JUNE1987

1 LAUNCHES

The following launching announcements have been received:

INTL NO	SATELLITE	DATE	NATION	PERIOD min	APG km	PRG km	INC deg
1987							
043E	USA 23	May 15	USA				
043F	USA 24	May 15	USA				
043H	USA 25	May 15	USA				
046A	Cosmos 8147	May 26	USSR	89.7	373	177	67.2
047A	Cosmos 1848	May 28	USSR	90.2	400	208	62.9
048A	Cosmos 1849	Jun 04	USSR	11h49m	39342	613	62.9
049A	Cosmos 1850	Jun 09	USSR	100.8	825	785	74.0
050A	Cosmos 1851	Jun 12	USSR	11h50m	39402	592	62.8
051A	Cosmos 1852	Jun 15	USSR	115.0	1507	1440	74.0
051B	Cosmos 1853	Jun 16	USSR	115.0	1507	1440	74.0
051C	Cosmos 1854	Jun 16	USSR	115.0	1507	1440	74.0
051D	Cosmos 1855	Jun 16	USSR	115.0	1507	1440	74.0
051E	Cosmos 1856	Jun 16	USSR	115.0	1507	1440	74.0
051F	Cosmos 1857	Jun 16	USSR	115.0	1507	1440	74.0
051G	Cosmos 1858	Jun 16	USSR	115.0	1507	1440	74.0
051H	Cosmos 1859	Jun 16	USSR	115.0	1507	1440	74.0
052A	Cosmos 1860	Jun 18	USSR	89.7	283	255	65.0
053A	USA 26	Jun 20	USA				
054A	Cosmos 1851	Jun 23	USSR	105.0	1014	995	83.0

2 RETURNS

During the period 32 objects decayed including the following satellites:

1976-074A	Molniya 1-35	May 29
1987-032A	Cosmos 1835	Jun 04
1987-042A	Cosmos 1845	May 27
1987-045A	Cosmos 1846	Jun 04
1987-047A	Cosmos 1848	Jun 11

3 NOTES

1987-054 Cosmos 1861 is equipped with scientific instruments for determining the position of the USSR's sea vessels at any point, world-wide, and also radio equipment to provide amateur radio links for scientific and educational experiments.

The amateur stations have been designated RS-10 and RS-11. They have equipment operating in the 21 MHz, 29 MHz and 145 MHz bands.

The following spacecraft have radio beacons on frequencies less than 150 MHz.

1967-111A	ATS 3	136.47, 137.35 MHz	105.2 deg W
1975-100A	GOES 1	136.38 MHz	81.3 deg W
1977-014A	ETS 2	136.11 MHz	130.0 deg W
1977-048A	GOES 2	136.38 MHz	113.4 deg W
1977-108A	Meteosat 1	136.74 MHz	123.8 deg W
1978-062A	GOES 3	136.38 137.19 MHz	135.6 deg W

—Contributed by Bob Arnold VK3ZBB
ar

BEACONS

Tim Mills VK2ZTM
PO Box 204, Willoughby, NSW. 2068

Work on the *Beacon Policy Paper* by FTAC is continuing and further input is required from members of the Amateur Radio Service, particularly in the microwave region. For example — *what are the most desirable frequencies? Where does the operation which would most benefit from a beacon take place in the respective band? What are the proposed satellite frequencies?* These are some of the questions FTAC would like from you, the user, as the formulation of any band plan is the general opinion and agreement of those who will make use of the finished product — the band plan.

Band planning for Australia has been conducted up to, and including, the 23 centimetre band. While this article is concentrating on the beacon contest of the microwave bands, input on the other modes within the band would be most welcome. In the microwave region, should the concept for a beacon be for an exact frequency, ending in the State identifier; eg VK2RSY. 2304.420 MHz or should a national common frequency be used? In most cases, with Australia's widely separated population centres, it could be expected that only a single beacon for the region would be established. However, what happens if an adjacent region wishes to develop a system, do they share the frequency, or plan for a second or third allocation?

Part of the present thinking behind microwave beacon frequencies is that the Amateur Radio Service is the secondary service in most allocations and it would enable either one or two channel listing to be included nationally in the DOC AMFAR records. This, in turn, would assist with commercial planning. As mentioned above, your thoughts would be most welcome. Please forward *your comments* to the address at the head of this column.

The following appear to be beacon/general operating frequencies as found in local and overseas publications. Are they correct?

13 Centimetres
2300-2450 MHz, amateur secondary with 2400-2450 MHz, amateur satellite service. VK at 2304; G at 2320.850 (.910 and .955) MHz.

9 Centimetres
3300-3600 MHz, amateur secondary with the amateur satellite service at 3400-3410 MHz. VK at 3456; G at 3456.00 (and .900) MHz.

5 Centimetres
5650-5850 MHz amateur secondary with the amateur satellite service at 5650-5670 MHz. Listing at 5760 MHz.

3 Centimetres
10.000-10.500 GHz amateur secondary with the amateur satellite service at 10.450-10.500. ZL at 10.250; VK6RUF at 10.300; G at 10.100, 10.368 and 10.400 GHz.

1.25 Centimetres
24.000-24.250 GHz amateur primary service with the amateur satellite service at 24.000-24.050 GHz (it is also an ISM allocation centred on 24.125 GHz). ZL at 24.150 and G at 24.100 GHz.

Other frequencies available to the amateur are at 47.000-47.200 GHz, primary and includes the amateur satellite service. 75.500 to 76.000 GHz primary are for both amateur and amateur satellite services. Secondary allocation is at 76 to 81 GHz. The next band is 142-144 GHz primary amateur service and amateur satellite service, and secondary 144-149 GHz. The last band before the spectrum allocation stops at 275 GHz and is a secondary segment at 241 to 248 with primary frequency at 248 to 250 GHz. The amateur population may be a little light in this part of the spectrum!

Now, for a comment about a much lower frequency — 10 metres. Some years ago the first beacons were established on 10 metres, centred on 28.200 MHz, and extending down towards 28.150 MHz. A couple of systems were arranged to frequency change for five minutes every hour to 28.200 MHz. The introduction of the North American Novice sub-band resulted in the existing beacons being frequency-changed to their mirror image above 28.200 MHz. In time, the allocation extended up to 28.300 MHz with a few above, as well as some below 28.200 MHz. About this time, the VK2 Division applied for a channel and were granted 28.2175 MHz.

The 28 MHz Beacon Project is sponsored and encouraged by IARU Region 1 — known as the International Beacon Project — and co-ordinated by Alan Taylor G3DME. Readers may ask what is the benefit of filling up so much spectrum space with systems which each occupy their own exclusive channel. Since the establishment of the various 10 metre beacons it has stimulated scientific interest in the propagation paths which are revealed by the reception of the beacons. In addition, they fulfill a practical role by providing signals on what, may otherwise be, a dead band.

Before VK2 established its beacon, it was decided that more benefit may be achieved by having several Australian beacons for the world to observe. A block allocation was requested and granted. The six channels were *meant* to have *five* located around the coast and one in the centre. However, it concluded with two in VK6. The systems are:

VK5WI, Adelaide — 28.260 MHz
VK2RSY, Sydney — 28.262 MHz
VK6RWA, Perth — 28.264 MHz
VK6RTW, Albany — 28.266 MHz
VK8VF, Darwin — 28.268 MHz
VK4RTL, Townsville — 28.270 MHz

Australia has more systems than any other part of the world.

A few years ago, the Southern Californian DX Association, developed the system which is located on 14,100 MHz. This approach uses a single frequency with time sharing between 10 systems which are located at various places throughout the world. Each beacon has a one minute time-slot, recurring every 10 minutes where it transmits, progressively reducing its power in steps of 10. Beginning at 100 watts it steps down to 10, then one and finally 100 milliwatts. At present there is no Australian system. VK2 did apply, but was rejected. It is believed that if developed, an Australian system would most likely be established in the VK6 region.

A similar allocation has been internationally planned for 15 metres — 21.150 MHz — (see letter from Neil VK6NE, in August AR).

At the Region 3 meeting held in late 1985, the subject of the growth of 10 metre beacons was raised, and discussed. It has been decided to reduce the occupied spectrum to a segment at, and below, 28.200 MHz, using time-shared channels. There would be a prime international — including one Australian — channel on 28.200 MHz, with a further frequency; eg 28.195 for either all Australia or shared with others from our part of the South Pacific. From about 28.190 to 28.200 MHz, there would be a beacon group on each one kilohertz, with 10 per channel. They would be squashed-in, to say the least, requiring good frequency stability and time *reference. January* 1, 1990 is the anticipated time for this change to be completed.

It is expected that each beacon, in addition to its RF and keying systems, would require a controller which is able to maintain a time-slot with accuracy better than one second. It would probably need to power-step during its operating period. These changes have been decided internationally.

NOW, is the time for existing Australian 10 metre beacon operators to register their interest in operating the new concept from 1990.

It is also time for any new groups to register interest. It is not known how many allocations will be available to Australia, but a list of all interested parties is required by the 1988 Federal Convention.

Please register with the FTAC Co-ordinator, PO Box 300, Caulfield South, Vic. 3162.

REGISTER NOW BEFORE YOU FORGET!!!

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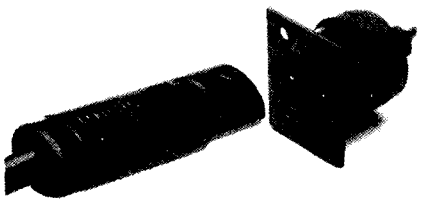
HIGH POWER AUDIO CONNECTOR SYSTEM

Over the past 20 years, audio amplifier output has gradually increased to todays high level, commonly exceeding 1000 watts and often reaching 3600 watts. Until now, amplifier output connectors have remained largely unchanged to the extent that powerful and sophisticated equipment had to cope with connector systems developed in the "low signal 60s."

These problems of amplifier to speaker connection carrying high output have been solved by Utilux Pty Ltd, who have developed the revolutionary high power audio connector UX101 and UX501 series, which has the ability to transmit signals with a range from microvolts through to 30 amperes. This modern high power audio connector system is unique in that its output now has characteristics of both low level electronic signals and AC power supplies. It overcomes problems of safety and signal impedance by meeting electrical safety standards for low level AC voltage and by coping with the high output currents of today's amplifiers. The UX series solves all problems of existing connectors where applications require the usage of currents up to 30 amps and has been designed to meet the specific requirements of the professional audio industry of today.

The UX series comprises the UX101 (cable end connector) and the UX501 (panel mount socket), both featuring a genderless coupling system. The UX101 is a simple and supremely effective connector capable of carrying 30 amps or power of 3000 watts and complies with IEC safety standards. The UX101 mates with another UX101 or the panel mount socket UX501. The UX501 features an acoustic compression seal for mounting into speaker boxes and panels. When panel mounted, the UX501 has the same profile as a standard XLR female socket.



To summarise, the UX series offers:

High current, large cable (8 x 14 mm) capacity with no risk of short circuit or shock. Terminated to 10 AWG cable, the connector temperature does not rise above the cable temperature even with continuous 30 ampere usage.

The system is easily assembled using a soldering iron and screw driver. Contacts are supplied separately for soldering to the cable first, then snapped into the connector body. This eliminates the problem of melting the insulator housing when soldering to heavy cables.

Fully assembled, the UX series provides the highest level of safety with total insulation between contacts and metal shell.

The unique genderless format of the coupling system ensures correct polarisation and impossibility of any mismatches so common with conventional connectors.

The UX series withstands up to 300 Newtons pull-out force before it releases, preventing equipment damage from accidental cable snags. A rugged diecast metal casing ensures superior durability that will withstand the rigours of field use.

The distinctive oval shape positively differentiates amplifier to speaker connections from microphone, lighting and mains connectors, eliminating potentially disastrous misconnection.

The UX series is made from high quality materials, eg copper alloy, silver plated contacts (gold plating optional), zinc alloy diecast outer shell and black thermoplastic rubber grommet to ensure a totally reliable performance. The UX series connectors have been extensively tested by the Utilux NATA registered laboratory and have the IEC flash symbol displayed. The series was awarded an Australian Design Award in recognition of the advanced design principles that make the UX series the system of the future and a new standard in amplifier to speaker connection today.

For further information please contact: Utilux Pty Ltd, 14 Commercial Road, Kingsgrove, NSW. 2208. Phone: (02) 50 0155.

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NEW MOBILE ANTENNA

Chirnside Antennas have recently released a new set of mobile antennas.

The new mobile antenna is a two piece helical whip, unlike their very successful two-metre long mobile helical (which will remain in production) can, at times, be hard to store in a motor vehicle, when not in use. This new helical has a base section which is approximately .9 metres long. A top section which contains the winding for the appropriate band is approximate 1.1 metres long, including an adjustable stainless steel tip. This section then screws neatly into the base section, giving a total length of two-metres, having a chromed male fitting with a thread of three-quarter by 24 TPI. It accepts a standard ball mount (female) of three-eighths by 24 TPI. Consequently, it is possible to have an efficient antenna system which is also easy to stow in the boot of a car or similar.

The new helical has been released as a kit of: one base section, plus five top sections (80, 40, 20, 15 and 10 metres), and currently sells for $169. They can also be purchased separately, one base section, plus one top section for $49, with the additional sections available for $35 each.

Special frequencies between two metres and 30 MHz can be made to order.

For further details contact: Chirnside Antennas, 26 Edwards Road, Chirnside Park, Vic. 3116. Phone: (03) 726 7353.

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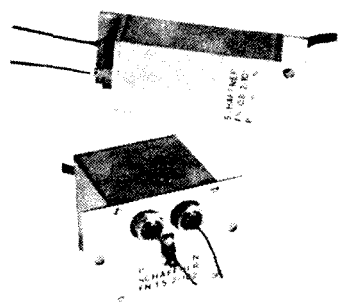

POWER LINE FILTERS

Instruments for telecommunication engineering and data processing can produce signals along the power cord, through which anyone not authorised can receive information.

The studies and limitation of such compromising signals are called TEMPEST.

The Sc' affner filters FN 0.8/1.5/. . . are power line filters for very high demands, that were originally developed for suppressing electromagnetic interferences on motors.

These filters are also very suitable for use in the TEMPEST sector and are used more frequently.

The new FN685 and FN686 two-stage power line filters, from Schaffner, have currents rated at 10, 25 and 30 amps (conservative ratings at 45 degrees Celsius, ambient temperature. They are especially suitable for applications such as central processors, industrial switchgear and industrial process control installations.

They have been designed for best attenuation characteristics in the frequency range of 10 kHz to 30 MHz.

The fully welded German silver cases and the several connection options allow these filters to be used in a wide range of applications.

For more information about the FN685 and FN686 power line filters, and TEMPEST filter types please contact: Westinghouse Systems, 80-86 Douglas Parade, Williamstown, Vic. 3016. Phone: (03) 397 1033.

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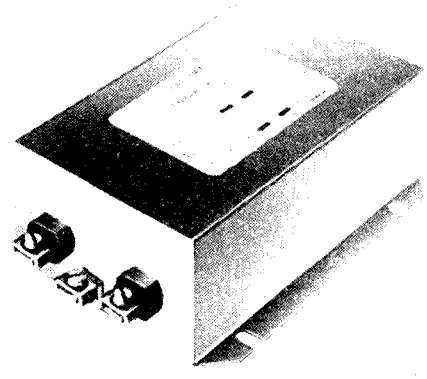

CURTIS 8044ABM KEYER CHIP

An enhancement of the popular 8044 keyer-on-a-chip has been introduced by Curtis Electro Devices. Called the 8044ABM, the CMOS device combines the functions of the 8044, 8044B, 8044M and 8044BM into one IC along with a new capability termed "negative weighting." Common keyer weighting circuits only add weight to dots and dashes by making them longer at the expense of spacing. By your switching a control on the 8044ABM, the weight control will either add or subtract from the code-element length. Negative weighting is useful in situations where the transmitter is adding unwanted weight that must be cancelled.

The new IC also has a control line to switch the iambic keying action between the "B" method used in some keyers and the usual Curtis "A" method, (The B method adds an opposite element when a squeeze-keyer paddle is released during the generation of a code element; the original Curtis method adds nothing.)

Although *not pin compatible* with earlier Curtis IC versions, the 8044ABM retains all other properties of the 8044 series, including dot and dash memories, key denouncing, self-completing code elements, an instant-starting clock, a built-in sidetone oscillator, an analogue speed indicator and extremely low power drain. Normally, the IC is operated from a five or nine volt DC source.

The 8044ABM is supplied in a 20-pin DIP plastic package and is priced arqund US$20. For further information contact Curtis Electro Devices Inc, Box 4090, Mountain View, CA 94040. Phone: (USA) 415 964 3846.

Contributed by Gil Griffith VK3CQ, *Pounding Brass* Columnist as per Curtis Advertising Leaflet

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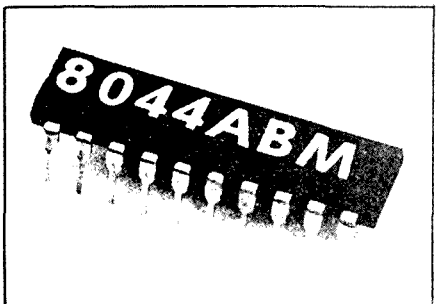

Club Corner

PACKET RADIO ENTHUSIASTS GROUP

The Packet Radio Enthusiasts Group (PEG) was recently formed to co-ordinate the installation of Packet Netrom repeaters at Grundies Mount, near Nowendoc, and Magistrates Mountain, near Deepwater, NSW.

All the preliminary surveys and tests have proven the two sites as being most suitable for the project to establish packet highways from Sydney, Newcastle to Brisbane, and at the same time, giving access to coastal and tableland amateurs.

The co-ordinators of this group are Arthur VK2ATM, of Port Macquarie, and John VK2YGV, of Tamworth.

Any readers interested in joining the group are invited to contact the co-ordinators or any member of the group.

It is anticipated the digital repeaters will be operational as soon as the necessary licensing arrangements are finalised.

—Contributed by Pete Alexander VK2PA

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Members of PEG from left: (back) Trev VK2YCB, Bruce VK2KBB, Gordon VK2ALM, Arthur VK2ATM, Les VK2BBD, Stewart VK2TNS, Bill VK2ZCV, Laurie VK2ALM. (Front) Pete VK2PA, Dick VK2KRA, Des VK2AGA, John VK2YGV and Norm VK2TOP. Missing from the photograph is Ian VK2XU.

DARWIN AMATEUR RADIO CLUB

The Darwin Amateur Radio Club Incorporated will be celebrating its 21st birthday this year. The club was formed at a gathering of interested amateurs, in Nightcliff, on November 7, 1966. The original club was named *The Darwin Radio Club.* This was changed in 1972 to *The Darwin Amateur Radio Club.* In those days there were not many permanent resident amateurs in Darwin, with a large proportion of the residents being Public Servants.

That, of course, is history now. The club membership sees people from all walks of life, with a common hobby, coming together to share ideas, ambitions and friendship.

Over the years, the club has operated from many locations around Darwin. Some recent locations have been the Emergency Services Bunker, at East Point in an old World War II Bunker, the Darwin Community College, Casuarina High School, the Old Police Headquarters in Parap, and most recently, from the "Sports House", a location, which in its heyday was "The Drugs Store"!

The current premises are part of the Department of Youth, Sport and Recreation's Sports House. Here the club has an airconditioned area set aside for their exclusive use. Part of the area is reserved for meetings, lectures and social gatherings with a separate area for the Club Station, VK8DA.

VK8DA comprises HF and VHF transceivers, also the two-metre (144.480 MHz) and six-metre (52.200 MHz) beacons, which use the call sign VK8VF There is also an 80-metre AM transmitter which is used to relay the VK5WI Sunday Morning Broadcast.

The club also conducts novice theory courses from time to time. Active groups of members are also involved in RTTY and Packet.

Over the years, the club has built and commissioned two VHF repeaters. These are Channel 7000, located at Palmerston, 23 kilometres south of Darwin (considered a long-range repeater) and Channel 6700 which is located at Karama, in the northern suburbs. A UHF repeater, recently donated to the club, will be installed shortly in the Darwin city area on Channel 8275.

Club meetings are held on the first Monday of the month — rain, snow or hail — at 8 pm, at the clubrooms, Sports House, Waratah Crescent, Fannie Bay.

A special celebration will be held over the weekend, November 6, 7, 8, and an invitation, on behalf of club members, is extended to all past members of the club to visit Darwin so they may take part in the celebrations. There will be a Formal Dinner on Friday, 6th. A barbeque/swim birthday party on Saturday, 7th, and a nostalgic tour of Darwin.

Also, as part of the celebrations, the club is offering a special award for all amateurs. This will be in the form of a large card suitable to hang on the shack wall. Requirements for the award are:
One contact with the club station, VK8DA, during the periods, Tuesday, October 6, to Thursday, November 5, 1987.

Cost of the award is $5.

VK8DA will be operational at the following times:
Monday to Friday — 1000 to 1200 UTC
Saturday — 0400 to 0800 UTC
Sunday — from after the VK5 Broadcast (which begins at 0900 Adelaide-time — beware of daylight saving) to at least 0230 UTC. There will also be RTTY operating on Sundays during this time, frequency 14.080 MHz.

Frequencies monitored will be:
3.580, 7.080, 10.125, 14.180, 21.165. 28.500 MHz. These frequencies will be plus/minus QRM.

For further information contact the President, Bill Murphy VK8ZWM, on (089) 27 1616, or QTHR.

—Contributed by Bill Murphy VK8ZWM, President, Darwin Amateur Radio Club Inc

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GOLD COAST AMATEUR RADIO SOCIETY

The 10th Anniversary of the well-known *Gold Coast Hamfest* is scheduled for Saturday, November 14, 1987, at the Albert Waterways Complex, Hooker Boulevard, Broadbeach, Surfers Paradise.

This year, to create even greater interest, it is proposed to incorporate other hobbies and displays, consequently it will be known and advertised as:

The Gold Coast Amateur Radio and Hobbies Festival

The change in concept will, it is felt, make a greater impact on the public and possibly encourage more interest in amateur radio as a hobby.

Further details, if required, may be obtained from the Gold Coast Amateur Radio Society Inc, Box 588, Southport, Qld. 4215, or telephone the organiser, (075) 58 2293.

—Contributed by Ken Ayers VK4KD, Organiser, Gold Coast Amateur Radio Society Inc

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RADIO AMATEURS TRS80 COLOUR COMPUTER GROUP (Aust)

Following is information concerning weather facsimile, facsimile and RTTY frequencies and other relative data of interest to users of home computers which are capable of receiving these modes.

The data is current and has been compiled by members of the Radio Amateurs TRS80 Colour Computer Group In Australia. The group meets each Friday evening, at 1130 UTC, on 3.605 MHz. The group welcome al computer users, especially users of the TRS80 Colour Computer.

See opposite page.

NOTATIONS:

X	= positive identification
?	= doubtful mode
Varies	= no strict time schedules observed
Possible	= not observed, but likely to be included

New agencies such as Reuters, Tass, UPI may, or may not, transmit clear teletype code or 170 Hz shifted TTY.

NAM	Norfolk Virginia, USA
NMC	Point Reyes, US Coast Guard, California, USA
AXI	Darwin, Schedules at 1200 hours for part (A)
NWS	National weather service, San Francisco, California
WWD	La Jolla, California, USA
NPM	Hawaii, relays to Guam
Tass	Russian Newsagency
AFP	Associated French Press
UPI VOA	United Press International, Voice of America relay
Kyodonews	Japanese Newsagency
CNA	Central Newsagency Taiwan

All times are in UTC and frequencies are plus/minus. Many stations transmit independent sideband signals (ISB). Interfering signals can usually be cleared by tuning to the opposite sideband and fine tuning for best results. Note that weather facsimile stations are very keen to have reception reports, along with facsimile printouts for verifications. Many will reply with handsome confirmation replies for your reports if correct, along with station details and schedules of transmission times and etc.

Many FAX stations transmit long printouts and thus it is not always possible to obtain positive identifications of their origin. If you have data on those stations listed above, a note to the author, with as much detail as possible, would be greatly appreciated. This information will help update the listings and will assist others greatly in the future. Happy listening!

—Contributed by Colin Stevenson VK2CS, PO Box 109, Mount Druitt, NSW. 2770

ar

WAGGA WAGGA AMATEUR RADIO CLUB

Due to unforseen circumstances, the Wagga Wagga Amateur Radio Club Convention adver-

tised to be held over the weekend, October 24 and 25, 1987 has been postponed indefinitely.
—Contributed by Peter Clee VK2KZZ, Wagga Wagga Amateur Radio Club
ar

BALLARAT AMATEUR RADIO GROUP

At the Annual General Meeting of the Ballarat Amateur Radio Group Inc, the following office bearers were elected for the year 1987/88.

President	Ron Watkins VK3XOA
Immediate Past President	Bob Terrill VK3BNC
Vice-President	John Hazledine VK3CFH
Secretary	Jim Wright VK3CFB
Ass Sec/Treasurer	Harry Hwkkema VK3KGL
Publicity Officer	Gordon Cornell VK3PUW
Education Officer	Ian McDonald VK3AXH
Net Co-ordinator	Reg Carter VK3CAZ
Technical Officer	Dick Forrester VK3VU
Members Representative	Neil Davidson VK3KQQ

The Group meets on the last Friday every month, except December, at the Ballarat Education Centre, Hopetoun Street, Ballarat, at 7.30 pm. New members and visitors are welcome.

The BARG net operates on Thursday nights, 0830 UTC, on 3.610 MHz, with three awards available.
—Contributed by Gordon Cornell VK3PUW, Publicity Officer
ar

WRISTWATCH PAGER

O The British electronics company Plessey, will make two custom-built chips to receive messages via radio and process them into a form that can be displayed on the watch face.

The technology is believed to be a bipolar for the the receiver and a CMOS to do the processing.

Industry sources see the breakthrough leading to production of a wristwatch containing a telephone pager.

RTTY and Facsimile Broadcast Frequencies

Prepared by Colin Stevenson VK2CS, courtesy the Radio Amateurs TRS80 Colour Computer Group. Continually updated — revised July 28, 1987

FREQ+-	WEFAX	RTTY	FOTOFAX	U.T.C.	SSB	SWEEP	CALL
3.357	X		-	VARIES	USB	VARIES	NAM VIRGINIA
3.523	X		-	1300	LSB	120	?
3.625	X		-	VARIES	LSB	120	RUSSIAN
3.636	X			1610	LSB	120	?
4.295	X		-	1345	USB	120	?
4.318	X		-	1400	LSB	120	?
4.346	X		-	VARIES	USB	120	NMC CALIFORNIA
4.904	X		-	1550	USB	120	?
4.975	X		X	24HRS	USB	120	NAM VIRGINIA
5.098	X		X	VARIES	USB	120	AXM CANBERRA
5.112	X		-	1350	USB	VARIES	?
5.402	X		-	1345	USB	120	?
5.607	X		-	24HRS	USB	120	ZKLF-N.Z.
5.755	X		-	VARIES	USB	120	AXI-DARWIN
5.764	X			1630	USB	VARIES	?
5.804	X		X	24HRS	USB	120	ZKLF-N.Z.
5.894	X		-	?	?	?	GUAM
6.356	X		-	1540	USB	120	?
6.845		X		.....			REUTERS
6.950		X		.....			TASS
7.449	X		-	1445	USB	120	POSSIBLY NPM GUAM
7.474	X		-	1220	USB	120	POSSIBLY AXM?
7.528	X		-	1400	USB	90	?
7.532	X		-	1305	USB	60	?
7.535	X		-	VARIES	USB	120	AXI DARWIN
7.748	X		-	1515	USB	60/120	MOSCOW
7.542		X		.....			APF HONG KONG
7.695		X		.....			CNA TAIWAN
7.760		X		.....			TASS
7.894	X		X	24HRS	USB	120	GUAM
8.027	X		-	24HRS	USB	120	NAM
8.078	X		-	0700	USB	120	NAM
8.457	X		-	1005	USB	120	?
8.465	-		X	1245	USB	120	KYODONEWS
8.646	X		?	?	USB	120	WWO CALIFORNIA
8.682	X		?	?	USB	120	NMC USCG CALIF
9.043	X		POSSIBLY	1545	USB	120	KENYA MET CTR.
9.058	X		-	1435	USB	120	RUSSIAN
9.110		X		.....			TASS
9.228	X		-	1430	USB	120	?
9.357	X		-	1645	USB	120	NO ID.
9.396	X		X	0715	USB	120	USA?
9.459	X		-	24HRS	USB	120	ZKLF-N.Z.
9.968	X		-	0900	USB	120	?
9.985		X		.....			UPI VOA
10.115	X		?	?	?	?	UNKNOWN
10.218	X		-	1225	USB	60	RUSSIAN
10.255	X		-	24HRS	USB	120	GUAM
10.248	X		-	0640	USB	120	?
10.270		X		.....			TASS
10.555	X		?	VARIES	USB	120	AXI DARWIN
10.960		X		.....			REUTERS
10.978	X		-	24HRS	USB	120+-	MOSCOW
11.007	X		-	1500	USB	VARIES	CHINA FAX NEWS
11.030	X		-	VARIES	USB	120	AXM SYDNEY
11.090	X		-	0630	USB	120	?
11.470		X		.....			TASS
12.085		X		.....			TASS
12.728	X		?	VARIES	USB	120	NMC
12.757	X		-	1700	USB	120	?
12.826	X		-	1700	USB	120	?
13.410		X		.....			TASS
13.468	X		-	1700	USB	120	?
13.550	X		?	2215	USB	120	ZKLF
13.595	X		-	0900	USB	60	CHINA FAX NEWS
13.563		X		.....			CNA TAIWAN
13.918	X		-	VARIES	USB	120+-	MELBOURNE
14.365	X		-	NO INFO AVAILABLE			
14.443	X		-	NO INFO AVAILABLE			
14.461	X			NO INFO AVAILABLE			
14.510		X		.....			TASS
14.515		X		.....			REUTERS
14.609	X		-	1800	USB	120	?
14.683	-		X	0930	USB	60	CHINANEWS
14.700			X	.....			TASS
14.823	X		-	VARIES	USB	120	NPM HAWAII
14.981	X		-	0200	USB	120	NO INFO
15.615	X		-	?	?	?	AXI DARWIN
15.990	X		X	24HRS	USB	120	GUAM
16.018	X		-	0200	USB	120	?
16.220	X		-	?	?	?	AUCKLAND NZ
16.232		X		.....			UPI VOA
16.340	X		-	24HRS	USB	120	ZKLF-N.Z.
16.410	X		?	?	?	?	NAM
16.902	-		X	?	?	?	CHINESE FAX
16.969	-		X	0100	USB	60	KYOTONEWS
17.058	X		-	0130	USB	?	RUSSIAN
17.068	X		-	0130	USB	60	JAPANESE
17.150	X		?	NO INFO AVAILABLE			NWS CALIFORNIA
17.411	X		?	NO INFO AVAILABLE			WWD CALIFORNIA
17.596		X		.....			KYODONEWS JAPAN
19.273	X			NO INFO AVAILABLE			?
19.520		X		.....			UPI VOA
19.527	X		?	WX SUMMARY N. HEMISPHERE			?
19.860	X		X	24HRS	USB	120	GUAM
20.015	X		-	NO INFO AVAILABLE			NAM
22.910	X		X	24HRS	USB	120	GUAM

VK2 Mini-Bulletin

Tim Mills VK2ZTM
VK2 MINI BULLETIN EDITOR
Box 1066, Parramatta, NSW. 2150

VK2BQK MUSEUM STATION FINDS NEW HOME IN NEWCASTLE

The station, which featured with a cover photograph and article in September 1985 *Amateur Radio* has been transferred to a new Newcastle Regional Museum, which is being established at an old brewery, in Hunter Street. A committee to assist with its re-establishment has been formed by the Hunter Branch Radio Group and Westlakes Amateur Radio Club. These clubs will be able to advise the progress of the station from time to time.

810s LOCATED

Thanks for the 810s. Following the requests in recent notes, several small donations have averted extra gray hairs for the Dural staff. However, more are required so please keep them coming.

DIVISIONAL PACKET BULLETIN BOARD — VK2AWI

Thanks to Andy VK2AAK, the Division is conducting a trial Bulletin Board on Channel 7600, in the Sydney region. A range of information, including some of the weekly VK2WI broadcast notes, may be found on this board. Arrangements are being made with other boards to exchange this information to enable it to be available in your area. Items for the Sunday broadcasts may be left — by Friday — addressed to VK2KFU.

SOME COMING EVENTS

A WICEN exercise will he held on October 10/11, in conjunction with the canoe classic on the Hawkesbury.

JOTA will be held on October 17/18.

The Wagga Field Day, to be held October 24/25. has been postponed. (See Club Corner for further details).

The Conference of Clubs, hosted by Westlakes, will be held on November 1.

A Trash and Treasure day will be held at Parramatta on November 29.

ODDS AND ENDS

Gladesville Amateur Radio Club, in conjunction with the Division, conducted a trial NAOCP and AOCP examination at *Amateur Radio House* on August 8. This proved to be a most successful operation, and it is anticipated another one will be held in early November. . .Some additional VHS tape formats of the 1984 Seminar are now available for borrowing from the Parramatta Office. . .Have you kept the QSL Bureau up to date with your requirements for handling your inwards cards? Advise the office or the Bureau direct of any change. . .Have clubs ever considered having details of their activities included in your regions tourist brochures and leaflets? Why not inquire, as most are now due for reprinting for 1988. . .Talking about 1988 — what will you or your club be doing special during the year? Advise the office so that a central register can be maintained.

NEW MEMBERS

Welcome to these new members who were in the August intake.

L W Adams Assoc	Toukley
J M Bogdanski VK2FEX	North Nowra
N F Fallshaw VK2XNF	Balgowlah Heights
J F Ferrington VK2VOX	Carlingford
M J Harvey VK2JMJ	Tamworth
N Jenjo VK2FHY	Pymble
S W Mulligan Assoc	Moree
T J Noonan Assoc	Whalan
B R Stiles Assoc	Ryde

ar

VK3 WIA Notes

WHAT TO DO WITH THOSE QSL CARDS

At its July meeting, the Council of the WIA (Victorian Division) approved a motion to establish a WIA QSL collection.

It is realised that, in the past, many QSLs, like old photographs, have been lost forever, but a start can be made now. The Collection is, at present, being arranged for display purposes and any WIA member may borrow the display (or part of it) by making arrangements through the Curator, Ken Matchett VK3TL, on telephone number (059) 64 3721, or by leaving a message at the WIA rooms in Brunswick Street, Fitzroy — Monday to Thursday, before 3 pm, phone (03) 417 3535.

The collection consists, not only of rare and historic QSLs, but also modern-day ones which have artistic appeal. The thematic collection, in particular, will be of use for display purposes in school radio clubs and radio exhibitions. The main aims, of course, apart from the historic one, is to try to make amateur radio appeal to young people, and to give the WIA more publicity.

Already there have been kind donations of QSLs from Ken Roberts VK3BXN and Ivor Stafford VK3XB. The son of the late Ray Jones VK3RJ, has also donated many of Ray's QSLs collected over the years.

The WIA asks its members to donate their unwanted QSLs, of any kind whatsoever, to its collection. These can be left at the WIA rooms in Brunswick Street, or you can simply leave a telephone message with the volunteer on duty at the WIA rooms, so that the QSLs can be collected from your home No collection is too small. *Can you help?*

—Contributed by Ken Matchett VK3TL. Curator

NEW MEMBERS

A warm welcome to the following new members.

Bernard Ferguson VK3FN	Glenroy
Laurence Hick VK3MAD	Williamstown
David Hull VK3KDL	Black Rock
Gary McWilliam	Mentone
Ken Matchett VK3TL	Seville
Michael Ryan VK3EMR	Montrose
Adam Williams	Bright

ar

MORSEWORD 7

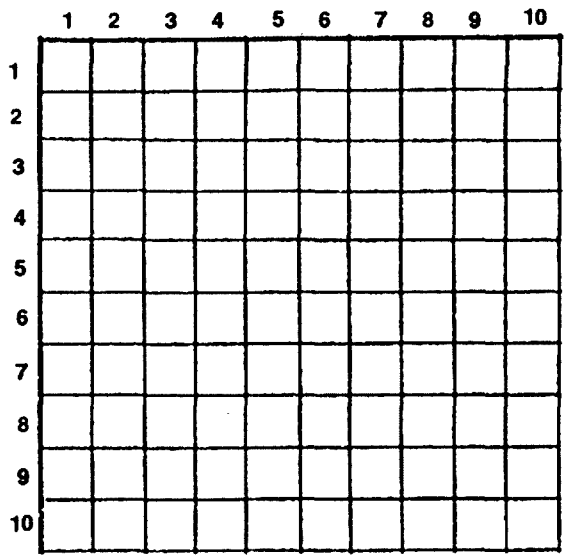
Compiled by **Audrey Ryan**
30 Starling Street, Montmorency, Vic. 3094

ACROSS

1. Jetty
2. Perceives
3. Bottom
4. Appointments
5. Tear apart
6. 'Come into the garden . . .'
7. Affirm
8. Gossip
9. Resin
10. Cleft

DOWN

1. Improve
2. Curve
3. Fail
4. True
5. Whole
6. Vessel
7. A set
8. Final
9. Daybreak
10. Exclamation to attract attention



Solution page 61.

Five-Eighth Wave

Jennifer Warrington VK5ANW
59 Albert Street, Clarence Gardens, SA. 5039

QUESTIONNAIRE

Here, at last, are the results of our questionnaire regarding novice privileges on two-metres. As you can see the answers were not as clear-cut as we imagined they would be, and I think our team at the Federal Convention could be forgiven for thinking that they had done the right thing! In fact, out of about 900 possible voting members, we only received 167 replies — which I think shows that many members do not care either way. On the original question, we would have to say that our Division is opposed to it, but only 34 of the 167 were totally against any extension of novice privileges, so the majority were in favour of some extension. However, there were no clear indications as to where this should be. Even those who favoured *part* of the two-metre band could not agree on which part. Some said that they should have access to satellites, some said 'no satellites'; some said yes to repeaters and some said no repeaters on any account! I think that we will all be interested to see the results of Questionnaires and votes taken in other Divisions to see if they get a clearer indication than we did!

QUESTIONNAIRE RESPONSE

1. Do you agree with the proposal put forward at the Federal Convention, namely that — two-metre privileges be extended to NAOCP licensees under the following conditions:

(a) use of NAOCP power restraints

(b) use of all current NAOCP modes plus FM telephony on the 144-148 MHz band only.

(c) access to the full band be granted, and

(d) no digital privileges be granted.

YES: 71
NO: 96

2. If NO, then:

(a) Do you oppose any extension of novice privileges?

YES: 34 NO: 71

(b) Would you agree to novices using PART of the two-metre band?

YES: 34 NO: 64

(c) If so, which part? (A range of frequencies and modes were given but no trend was evident).

(d) Would you prefer six-metres as the common band?

YES: 34 NO: 58

(e) Would you prefer 70 centimetres?

YES: 23 NO: 72

The VK5 Council appreciates your response and especially those who added written comments.

—Questionnaire Response prepared by Don McDonald, Hon Sec

SILENT KEYS

It is with regret that we mourn the passing of two well-known South Australian amateurs, Pete Bowman VK5FM, and Ray Foxwell VK5ZEF Death is never easy to bear but at Pete's age it is perhaps more acceptable. Ray's death at 46 was a tragic blow to his family and many friends, particularly in the ATV fraternity. I hope that someone who knew these amateurs better than I, will write up something for the magazine. Those of us who knew Max Hull VK3ZS, were also saddened to learn of his passing. You may remembers that Max, as Federal Historian, was our Guest of Honour at last years Clubs' Convention. Our sympathies are extended to the families of all the above.

DIARY DATES

OCTOBER 27 — Our speaker or speakers will be from the Ionospheric Prediction Service, in Sydney. They have offered their services for this night, but have asked that it be an open meeting for *all those interested in radio*, accordingly, we ask you, if you know of anyone outside the WIA who might be interested in coming along, to please extend an invitation to them. We will try and start the meeting at **7.30 pm** that night, so that it will not run too late.

OOOPs! ! ! (A correction & an apology)

Under the heading of *Where are they now?* (this column of April 1987), I relayed the information regarding the whereabouts of the former members of the Mount Gambier High School Radio Club. I also said that six of those members were unfortunately deceased. Seems I was wrong. My friend, Col Ferguson VK5CJ, from Mount Gambier, informs me that his long-time friend Rex 'Cutsy' Sullivan, is still very much alive and well and living in Adelaide. So, my apology for the mistake, and if Rex ever gets to see this, I hope he will forgive me!

AHARS GIANT RADIO TRASH AND TREASURE DAY

WHEN. . .Saturday, November 7, 1987. Starting time at 10 am.

WHERE. . .Westbourne Park Memorial Hall, 390 Goodwood Road, Westbourne Park, just south of 'Big W'.

Sellers can begin setting up from 9 am. AHARS will ask 10 percent of sales to cover the hire of the hall, etc, up to a maximum of $10 per item; ie for any item over $100, only $10 will be asked.

It is expected that it will finish around 2.30 pm.

I can personally recommend, that if it anything like last year, it will be worth a visit, both for the bargains and the number of amateurs to chat with, and Marshall VK5FN, will be pleased to sell you a pastie for lunch so that you don't even have to go home to eat! Tea and coffee are also provided. If you would like further information, ring Gordon Welsh VK5KGS, on 296 9278, or at work on 382 7777.

JUBILEE 150 AWARD RECIPIENTS

1398	VK6NKB
1399	DL9ZAL
1400	VK3YH
1401	YC1DOA
1402	UW3IN (First European Russia)
1403	VK3APH
1404	W5JDV
1405	VK2VMX
1406	JA2PGU
1407	UR2DL (First Estonia)
1408	UW3QT
1409	ZL3RH

ar

VK4 WIA Notes

Bud Pounsett VK4QY
Box 638, GPO, Brisbane, Qld. 4001

EXPO 88 UPDATE

There still is not very much more to update since our last report. John Aarsse VK4QA, and Theo Marks VK4MU, our spokesmen on the Queensland Division's Expo Committee, have had further meetings with the Authority. Some broad decisions have been made.

As a fore-runners to Expo 88, which runs for six months from next April, the Authority will provide some 200 000 QSL cards to publicise Expo 88 around the world. These will be available to all Divisions for distribution.

The major task will be the setting up of an amateur radio exhibit and station at the South Brisbane site. The object of this will be threefold:

to provide the public with an overview of amateur radio

to provide a meeting place for visiting local, interstate and overseas amateurs, and

it will give the Expo station, VI88EXPO, its proper location, right there on the spot.

Already negotiations are underway to procure equipment for this project. It is envisaged that all modes will be catered for. The Authority has already agreed to the erection of suitable antennas on the roof of whatever building houses our exhibit.

The exact location has, as yet, to be decided and it is hoped that the Queensland Building will be the one. The manning of our display has been the subject of much discussion and was voted the greatest problem. However, it now seems that our early fears may have been somewhat premature. Many clubs and individuals have promised support for this six-months long event, the biggest undertaking yet of the VK4 Division.

World Expo 88, in Brisbane, from April to October 1988, will be a grand affair, especially if you are an amateur. Make plans now to visit Brisbane in 88 during Expo.

73 Bud VK4QY

ar

PACKET RADIO WARNING

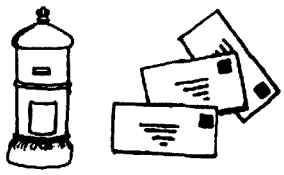
The introduction of packet radio as an easily-affordable medium for the amateur enthusiast has brought about an equally undesirable side-effect; the packet channels are being jammed for long periods because of faulty design in the hardware or software of the unit involved. This is somewhat equivalent to having the local repeater jammed with a constant carrier, and renders the channel unusable for other users.

All terminal node controllers (TNCs) are meant to be fitted with a "watch-dog timer", to prevent them from transmitting for longer than a certain period. The usual fault appears to be, that when the computer is switched off, the "PTT" line to the transceiver "floats" low, thereby keying up the transmitter. This timer will cut off the transmitter after a certain period, usually after a minute or so. Another problem is that the computer may "crash" in mid-transmit, leaving the rig keyed up.

However, in the interests of economy, certain commercial TNCs do not have this timer fitted. Various home-brew and kit designs may also have neglected this circuit. In the interests of all packet users, please check your TNC to ensure that a timer has been included. It is a simple matter to fit one, involving just a 555 timer chip, and also to make sure that the PTT line cannot float.

Contributed by Dave Horsfall VK2KFU

Over to You!



Any opinion expressed under this heading is the individual opinion of the writer and does not necessarily coincide with that of the publisher.

RESPONSE TO HOW'S DX?

I have been receiving *Amateur Radio* for about three months now, thanks to my friend Mark VK2FVL, and I enjoy it very much.

About QSLing, or the lack of it, I agree with Ken VK3AH, 100 percent. I have sent as many as three SASE, IRCs or cash, and have received no response. I also have had two returned marked *not in log* which indicates to me that the DX station is not keeping good records.

I think *Amateur Radio* and *QST* should publish this information. I know this would be very difficult as the information is by 'word of mouth' and may not be reliable.

I enjoy "How's DX?", "Over to You" and the stories, especially the one about the amateurs who recovered the stolen yacht.

73

Gene Goln ND5H,
2514 Manila Lane,
Houston, Texas, USA. 77043
ar

MANY THANKS

Many, many thanks for being so kind as to print my photographs in AR magazine. They look really great! Also, many thanks for the information about me. It is marvellous.

I began receiving some very nice comments about it on the air — everyone is so kind to me and I am very grateful indeed.

I will forward details about another DX-trip prior to my departure. I will also forward any interesting amateur radio information I may receive for publication in AR.

All the very best.

73

Zbig (Frank) Murdzia VK2EKY,
PO Box E450,
Sydney, NSW. 2000
ar

AMATEUR LICENSING SYSTEM

I would like to comment on the amateur licensing system operating in this country.

1. I believe in the retention of Morse code — both sending and receiving, as a prerequisite for operation below 30 MHz, as it is the simplest and most effective way of covering distance using low power in QRM and QRN. Modest QRP CW equipment for 80 metres can cover up to several hundred kilometres with interstate communication sometimes being achieved.
2. The extension of the novice CW sending time from two-and-a-half-minutes to five-minutes.
3. The cost of equipment is a deterrent to newcomers to amateur radio. Home-building is an attractive proposition, but the licensing system should be geared to it. I believe the novice licence should permit only home-assembled equipment on the bands as it is so inexpensive, especially for CW transmitters, as many of the parts can be salvaged from old television sets. Increased building of equipment would create a market for traditionally hard-to-get components; eg crystals, variable capacitors, vernier dials, valves, etc, which would benefit the whole amateur fraternity.
4. Novices be restricted to CW, AM, DSB and FM, on six and 10 metres. The loss of SSB for novices would not be a significant one (page 4, AR, April 1982). DSB equipment is much simpler than SSB transmitters (refer to Lo-Key Journal of CW Operators QRP Club, March 1987, for a two-valve DSB rig).
5. Novice power limits should stay the same.
6. 160 metres is under used and I believe making it a novice band will enhance the band and make it more occupied.
   Because of crowding I feel the 80 metre band should be given in whole to the novice operators. 10 metres could be a good band for local contacts and I feel novices should be allowed to use all the band, including FM privileges. The 52-54 MHz band would be ideal as a common band for all classes of licences because six-metre equipment is not as critical to construct as is two-metres and 70 centimetre equipment.
   New Zealand CB crystals could be used in six-metre equipment by using a third overtone oscillator to get 26 MHz, and a frequency doubler. This would enable the novice to construct a transmitter with crystals available on both the primary repeater channels and the simplex frequencies.
7. The examinations could be made more relevant; eg there could be more questions about things like direct conversion and regenerative receivers, instead of superhets, and CW, AM, and DSB theory instead of SSB theory. Also, less transistor and component theory.
   The prospective novices would learn more about the equipment that they will be building and using.

I believe that this new novice licence, particularly the compulsory home-brewing of ATUs, transmitters and antennas, would enrich the hobby greatly. I do not think commercial equipment advertisers would like this proposal, but I believe it is the best system for the hobby of amateur radio.

I also think allotting two-metres to novices is detrimental as this further raises the cost of amateur radio; eg an 80-metre regenerative receiver costs only a few dollars to construct, but I doubt you could build a two-metre receiver for the same amount. The same applies for transmitters. Two-metre equipment is not as easy to construct as 3.5 MHz equipment.

Yours faithfully,

Peter Parker VK6NNN,
C/- Post Office,
Witchcliffe, WA. 6286

Peter is aged 15, and has designed and supplied a series of easy, inexpensive to construct articles which will be published in Amateur Radio *shortly.*
ar

ATN NET

It was a real plus for amateur radio in Vanuatu, when we were able to make contact with the ATN Net, during Cyclone Uma, and I thank all for their fine assistance and the time given by all during our period of need.

The people of Vanuatu were very quick in showing appreciation for this community service.

Again many thanks for your concern about our welfare during our crisis.

Yours faithfully,

Tex Watson YJ8OK,
(Member of the WIA)
Box 683,
Port Vila, Vanuatu
ar

THE EQUAL TEMPERAMENT VFO?

A mind-bender?

The occasion whereby my Son's (VK2MRL), TS-130S transmits 100 or so Hertz higher than it receives (the correction details having been kindly supplied by Tod VK2EHT), coupled with the fact that many amateurs also enjoy music-playing, prompts me to share some recent interesting research which I have done regarding individual note frequencies of keyboard instruments.

It so happens that a single note melody becomes more pleasurable to our ears when additional notes, such as thirds and fifths; ie E and G added to the tonic C, are included to form a chord.

The 'open' strings of a violin are tuned with an interval of perfect fifths. That is to say, the third harmonic of a string is exactly the same frequency as the second harmonic of the string immediately above it. In addition, a violinist, whilst playing, naturally adjusts string lengths to produce perfect intervals.

Not so with say, the *piano*; the strings are preset by the tuner. Unfortunately, two important criteria which should be met are impossible to reconcile.

In the first place, octaves have to be related in the same manner that we double from 3.5 MHz to 7 MHz, and again to 14 MHz and secondly fifths, which have a ration of 3:2, or more correctly, 1.5:1 should follow the same rule.

Now, from bottom C to top C embraces seven octaves whilst the number of fifths included is 12. Two to the seventh power can be mentally deduced as 128 and a quick poke at the ever handy calculator shows that 1.5 to the 12th power is 129.74634. Since the frequency of bottom C is 27.5 Hz, it follows that top C must be 3520 Hz and 3568 Hz at the same time. This delicious and mysterious anomaly has been called a Pythagorian Comma and, whilst it is true that 50 odd-Hertz off net during SSB reception does not unduly detract from clarity, a much smaller error can make one wince when listening to music, particularly in the middle register. In fact, in early times, when keyboard tuning was in perfect thirds and fifths, there was one key in particular that had a note so far out that its disharmony was nicknamed 'The Wolf'. I suppose it seemed to howl!

After much argument and discussion between musicians and mathematicians, together with subjective experimentation, a compromise was eventually reached wherein the error was distributed over the whole keyboard in such a *manner* that the octave relationship is correct in all keys and the intermediate note errors are so small that all, but an experienced violinist, (for example) are unaware of them. This is done by making consecutive note intervals conform to the frequency ratio equal to the 12th root of 2:1.

$$(_{12}\sqrt{2}:1)$$

or $2^{1/12}:1$

The calculator sequence 2,y*,12,1/x= will produce 1.0594631 which, when stacked in the K function or memory, allows calculation of any note on the keyboard. (Or load the computer for total readout).

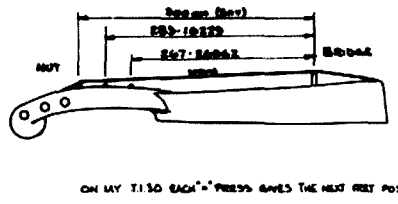
My musical friends of the air will be aware that the evolution of the Equal Temperament scale and an instrument so tuned, prompted the great composer Bach to write 24 preludes and 24 fugues (one in each of the major and minor keys) known as *The Well Tempered Clavier*. I sincerely hope readers will find the above account interesting and strive to net without a 'wolf'. Hi!

Incidentally, wonders will never cease. I have discovered that the inverse of 1.0594631; ie 0.9438743, poked in the K function (ie 0.94387431 x K) (then 300, =, =, =, =) allows calculation of fret positions on guitar-type instruments (from F = 1/f).

(On my TI30, each "=" press gives the next fret position).

Yours and 73,

Don Law VK2AIL,
RMB626 Adelong Road,
Tumblong, NSW. 2729
ar



ON MY TI 30 EACH "=" PRESS GIVES THE NEXT FRET POSITION

LOSING MEMBERSHIP!

May I add a small contribution for the reasons why the WIA is losing membership.

As a country member, as far as I know, I am the only amateur in my area who has remained in the Institute. At least 15 of my amateur friends have dropped out over the past few years. They all say that I am mad to remain a member and surely they all cannot be wrong.

Apart from the magazine and the use of the QSL Bureau, for those that use it, we get nothing else here in the bush. So why then should we have to fork out such a large sum when the city facilities are not available? Many of us, I am sure, can find better uses for our $40, or more, each year, than remaining in the WIA. Unless something changes in the way of reductions to country members, I will be another who becomes a non-member in 1988. I joined the Institute in 1947, and it will not be an easy decision for me to make.

Yours sincerely,

Ted Blackmore VK3TG,
2 Willow Court,
Kyabram, Vic. 3620

By now, Ted, you have read the September editorial about the other WIA services besides the magazine and the QSL Bureau. I joined the WIA in 1945, send few QSLs, due to little time on-air, spend about 40 unpaid hours a month on WIA business, and have never thought of dropping out! —Ed.

ar

INSERT AUGUST AR

This insert contains several erroneous statements and half-truths, a lack of knowledge of the obligations and responsibilities of a licensed radio operator and also ignorance of international and local radio regulations and DOC policies.

With reference to paragraph 2 of page 2:

(a) Limited and novice licensees are not and never have been constrained from operating in WICEN Emergency Networks for the following reasons:

ANY licensed amateur radio operator is obliged, under international and local regulations, to answer, if required, distress or urgency calls and to render assistance by all means at his/her disposal on any band and any mode.

This also means operating in WICEN Emergency Networks and, especially if the operator is in a disaster area.

As far as novice operators are concerned, this means, of course, that there is a genuine, not a "manufactured" emergency and the DOC is advised of the action as soon as possible.

This principle was clearly established as far back as 1969/70 by a State Superintendent, DOC, in Western Australia, while I was compiling a WICEN operational plan for that State and it is still accepted policy.

Therefore, I am surprised that Ron Henderson, as Federal WICEN Co-ordinator, should append his name to this erroneous insert since he should be aware of the above facts which are known to most experienced WICEN officers.

(b) WICEN Exercises, Club Stations and Broadcasts:

A limited or novice licensee can operate in WICEN exercises, for the purpose of training on any band, provided that a full licensee is present and supervising.

This also applies to club stations and broadcasts.

Another weak argument is evident in the 'twisted' phrasing of paragraph six, on page one:

The Department has already indicated in letters in AR, that it is not in favour of lowering the novice licence standard any further so the reciprocal agreement with Japan hinted at here is just another "red herring."

We should not lower our standards just to suit those of another country. If an Australian amateur wishes to obtain a reciprocal licence overseas then he must conform to the standards in that country.

Our 10 WPM Morse versus 12 WPM (International) is an example.

The only fair and logical solution to this very controversial question is for novice licensees top upgrade if they wish for the privileges that have been worked for by others before them.

Ted Gabriel VK4YG,
PO Box 245,
Ravenshoe, Qld. 4872

Novices at present would not have their own two-metre equipment which could be used for WICEN. —Ed.

ar

FUTURE OF AMATEUR RADIO

For several years I have been reading *Amateur Radio* and other publications of all sorts of problems concerning the future of amateur radio; ie its aging population, reducing numbers, licencing proposals and so forth.

The more I think about the overall structure and running of the amateur service, the more I am convinced that there is basically nothing wrong with our hobby. In fact, I predict it faces a very bright and, maybe, a re-vitalised future with the combining of other technologies into our hobby; ie computers.

But, the amateur service has suffered one major problem and this is the lack of a very effective public relations scheme.

Nobody outside the ranks of amateurs and prospective amateurs, has any knowledge of our hobby. The public impression of amateur radio is that of what Tony Hancock left behind in his television series in the 1950s. He portrayed us as a bunch of old men trying to talk to each other over crackly radios to various parts of the world. I would venture to say that not even many of our wives, children, parents, or whatever, know of the varied facets of our hobby. The above demonstrates the lack of knowledge outside the strict confines of our fraternity.

Do people know that amateurs are a group of people of all ages, sexes, professions, education levels, classes of society, different races, etc? Do people know that these same people have their own satellites, bounced signals off the moon, are involved in television, AMTOR, RTTY, packet radio, and on it goes? Packet radio has the ability to give amateurs the greatest communications network in the world that not even governments could rival. People are not aware that amateurs are involved in civil emergency organisations, radio education schemes, communications for public events, DXpeditions, and again the list goes on and on.

So, instead of talking about new licencing proposals and attracting young people, how about a public relations scheme to simply let people know what amateur radio is all about. The interest generated by such a scheme and, consequently the new converts to amateur radio, will automatically solve many of the problems that confront us.

I have not given any of my ideas for such a public relations scheme, as I am hoping that interest will be generated by this letter first.

Yours,

Tony Lewis VK2EHL,
52 George Street,
Avalon Beach. NSW. 2107

ar

ONLY REAL LINK BONDING US TOGETHER

I would like to comment on the problems with AR. I can easily see that they are serious and there will be no easy solution, and you can be sure someone will be unhappy.

For me? I will be happy if you and your helpers can still produce a publication, because I think its is the life-blood of the Institute. We are in the communication world, but really we do not communicate, now or in the past. We are single units, because we are situated all over the country and, even if we are active, we can only do so much, which is frequently not enough. So, it gets down to the fact that AR is the only real link bonding us together.

I well remember after the war, we had AR with a two colour cover and not very high quality pages, but, so what? The information was there and still is, as my copies are still in good condition.

When the better pages and covers came along, I was very happy about it, but if we have to change down a few revs, it will not matter, just as long as we get the good information. I would regret a reduction in the number of copies per year, but I would prefer that to no AR at all!

You have my tiny support to do whatever you think best, because it is easy for us, but not for those who have to make the decisions.

73

Arthur Mead VK2JM,
13 Salisbury Avenue,
Bexley, NSW. 2207

ar

NOVICES ON TWO-METRES

I have to agree with VK2XMM, and his comments in *Over to you!* AR, July 1987.

The right to operate on any band must be earned and not given as a gift.

Limited operators are "limited" to the bands 50 MHz and above because they do not possess sufficient skills in Morse code to enable them to pass the Morse test, and until they do they have no right there. Novices have relatively easy access to portions of the HF bands and rightly so, as this gives them a taste of what can be achieved. The reason why they are only given access to certain portions of the HF bands is because they have only a "limited" knowledge of the technical aspects of radio and electronics, and have only passed a five words-per-minute Morse test.

I am not suggesting that full and limited licensees know all there is to know about the technical aspects of radio but we did pass a more difficult examination.

If novices want access to the VHF/UHF bands then let them concentrate their studies on the technical aspects of the examination and forget their Morse practice for a while.

Amateur radio needs new blood to increase its ranks, but why lower the technical standards to attract it? Standards can only be lowered so far before chaos sets in; eg the CB band. How would we go about sorting out that mess? Would we hold examinations to sort out the capable operators from the incapable?

So, come on all you novice operators, you are at least halfway there in the technical paper of the examination. Push a little harder and the rewards will be a little sweeter.

George Christie VK3XEC,
19 Browns Road,
Montrose, Vic. 3765

ar

NOVICE PRIVILEGES ON TWO-METRES

At the last meeting of the Wagga Amateur Radio Club the question of Novice Privileges on two-metres, as discussed at the Federal Convention and the Sydney Forum, on May 22, 1987, was considered.

There were varying opinions as to the desirability of extending Novice Privileges to the two-metre band. However, it was resolved that the club support the proposal for a common band upon which all licensed amateurs may convene.

It was further decided that the WARC should support a concept of *two* common band allocations, 10 metres FM and 70 centimetres FM, for all licence classes.

The above decisions have been conveyed to the NSW Division of the WIA and the Department of Communications.

Yours faithfully,

W A Short VK2WAS,
Secretary,
Wagga Amateur Radio Club,
PO Box 294,
Wagga Wagga, NSW. 2650

ar

NOVICES ON TWO-METRES

I am writing to tell you that I wholeheartedly support the proposal to allocate to novice amateur operators part, or all of the two-metre amateur band.

Changes such as this are long overdue. Amateur radio must catch up with the times if this wonderful hobby is to survive. It is time to give novice operators some of the privileges that they

deserve, as the test is far too difficult when the meagre privileges that they are given are taken into account. The comments that have been made by a small outspoken number of the amateur population against this proposal are little more than foolish and very selfish. It is becoming very obvious through magazine editorials and letter columns that the general opinion of amateurs is that novices do deserve more, and this proposal has started to look at that.

Many ideas have arisen as to what should be done (please note that most of these have been suggested by full calls). It is time for some input as to what novices want, as little has been said by them.

Following are a few suggestions as to what could be done:

1. That novices be allocated part of the two-metre band for use of frequency modulated voice signals and repeater operation with a power output limit of five watts. Also, part or all of the 70-centimetre band be allocated for use of FM voice, packet radio and satellite operation, with a power output limit of 20 watts.
2. That the whole of two-metres be allocated to novices for the use of FM voice with repeater operation and packet radio, with a power output limit of five watts.
3. Finally, as a last resort, the whole of the 70-centimetre band be allocated to novices with FM voice and repeater operation, packet radio, satellite operation, Morse code operation, SSB operation and a power limit of no less than 50 watts.

Two-metres is a far superior band to 70-centimetres in many respects, therefore it is the preferential 'new' allocation for novices. It is also better as a common band as it is well used. Because of this, 70-centimetres is better for the other modes of communication such as packet and Morse. More secondhand equipment is available for two-metres, and it is cheaper, therefore making it easier for novices to 'get going'.

I believe that at least one mode of digital communication must be given to novices to attract computer users to the hobby, and therefore attract younger people. I am 15 years old and would like to see more people my age getting into amateur radio.

I am very interested in being able to operate hand-held radios — I like the concept. As an alternative, 10-metres FM has been suggested as an alternative to two-metres, or 70-centimetres, but this does not even interest me in the slightest. Little equipment is available for this band and mode, and, due to the length of antennas, it is not practical to use hand-held radios on this band. (I do not think there are any manufactured for this purpose anyway. If there are, I have not seen or heard of any), so please don't burden novices with another band that hardly anyone uses.

I trust that you will take these suggestions into account.

Yours faithfully,

Dwain Hill VK2MAX,
94 Camden Valley Way,
Narellan, NSW. 2567
ar

TEN-METRES AS A COMMON BAND?

An argument exists for provision of a band, or portion of a band, which can be common to all Australian amateurs. Ten-metres has much unused space which we are *also* in danger of losing if it is not utilised.

As I understand the situation in Japan, there are more amateurs who have *not qualified in Morse*, operating on HF, than there are amateurs operating *altogether* in Australia.

Would there not be more justification in the extension of privileges to the limited licence holders, who, having passed the full theory examination, are surely more qualified, to operate on a portion of the 10-metre band, (perhaps the same segment as that occupied by present novice licence holders).

This would give all Australian amateurs a common band, and would give the limited licence holders a band on which to practice their Morse code with a view to upgrading their licence.

Our *novice* licence holders have already *more* privileges than that of most overseas countries, so they cannot complain. My own incentive to upgrade from the novice licence was prompted by a desire to operate on my own choice of available band-space, which meant an AOCP or remain confined!

Passing the theory really widened my horizons, and the full Morse gave me that extra vista of spectrum.

As regards greater utilisation of the two-metre band, extension of these privileges to novices would, in city areas, probably result in cramped band-space, and have no noticeable effect in country areas.

Yours sincerely,

John Brennan VK4SZ,
10 Tulip Street,
Innisfail, Qld. 4860
ar

NON-PARTICIPATION

I read with regret of the decision of the Geelong Amateur Radio Club not to participate in the 1987 John Moyle Memorial Field Day Contest, AR, April 1987.

However, the club's claim that the 1987 rules gave little incentive to multi-operator stations to set up HF equipment hardly seems to be supported in the contest results published in AR, July 1987.

Of the 68 logs published (excluding SWL and check logs), 30 were from multi-operator field stations. The open section for these stations (section f) was the biggest category of entries, followed by the phone section (d).

Within the 24-hour category, multi-operator stations accounted for 22 of the 38 logs, that is, more than half.

This suggests that the rules were quite satisfactory to many clubs and other multi-operator groups, despite the GARC's decision to take its bat and ball home and not join in the game.

I also think the GARC is in error in its comments on the role of VHF in emergency situations. Certainly nobody assumes that "all emergency traffic" would be handled on VHF bands in an emergency situation, and to raise such a point is merely dragging a red herring across the path of debate. It is much more relevant to note that it is hard to conceive of a well-equipped, flexible emergency operation which did *not* include VHF among its resources, as an auxilliary to HF.

If, as the GARC claims, the scoring system is "ridiculous" and the multipliers for VHF contacts "disproportionately large" then the solution is to reduce the multipliers. It is not to be found in boycotting the contest, nor in removing the VHF component, as seems to be under consideration.

I predict that, if the VHF component is eliminated from the John Moyle Memorial Field Day Contest, there will be a fall in the number of individual amateurs taking part, both in multi-operator teams and in solo activity.

Ken Gott VK3AJU,
38A Lansdowne Road,
Saint Kilda, Vic. 3183
ar

HONOUR ROLL

I have just returned from a post-retirement coach tour of Northern Australia, and found my copy of July AR had arrived during my absence. I had intended to write to you in due course, but the Remembrance Day Contest notes prompted *me to* do it right now, in order to correct what I believe to be a long-standing error in the Honour Roll listing.

Having been the licensee of VK3PV since 1947, and with my predecessor having his name engraved on the Remembrance Day Contest Trophy, I have been curious for many years to learn something of the man himself, and have spoken to some of the contemporaries who knew Reginald P Veall. It was my understanding that he was a young Radio Officer in the Merchant Navy, and was killed in the first air raid on Darwin, in 1942, having unfortunately transferred from another vessel for that fateful voyage to Darwin.

In the early post-war years, the AR Remembrance Day Honour Roll listed him as being 'MN" but after some years this was changed to "AMF" and I wondered why the listing was altered. Perhaps it should now be corrected for posterity.

After leaving Darwin in the coach *on the* return trip home, we visited the Adelaide River War Cemetery, where the graves of the WWII Darwin air raid victims are located. Just inside the entrance archway is a Cenotaph on which many names are engraved, and it was there that I found the name of Merchant Navy Radio Officer R P Veall, among a short list of other "MN" Radio Officers.

Due to the very limited time that we could spend at the War Cemetery, I searched for, but was unable to find his grave or headstone plaque. It is possible that he is buried among a group of unnamed Merchant Navy personnel who were killed around February 19, 1942, and whose plaques bear only the Merchant Navy insignia, the date of death, and the Inscription "Known to God".

I *found* this to be a very moving experience in this beautifully kept lawn cemetery, where Reginald P Veall rests in peace.

Lest we forget!

73,

Don Shaw VK3PV/VK2BDS,
48 Thirteenth Street,
Warragamba, NSW. 2752.
ar

RE CALL BOOK ANNOTATIONS

I am surprised and puzzled that the WIA intends to cease the practice of indicating calls who are WIA members by an asterisk in the Call Book.

I am disappointed that the WIA is scrapping a very logical idea in deference some illogical complaints. Members of any organisation are entitled, indeed should be aware of who else are members of their organisation. This was a very simple way of achieving this.

I cannot understand why any member should be ashamed of being in the WIA that he should wish to keep it a secret. Like it or not, the WIA is the organisation representing amateurs to the authorities. It is not perfect, but no organisation is. Its work is done, in the main, by volunteers and so must be limited.

The WIA will not assist its cause by burying its head in the sand and hiding its identity. Those who are in the WIA should, at least, be prepared to stand up and be counted and not hide in shame. With ever increasing pressure on spectrum space, the WIA needs all the support it can get. It will be too late to whinge when the frequencies have gone out the gate.

I recognise that some people may be embarrassed by the lack of a * before their name. They should not be. If they feel that amateur radio is so secure that it does not need their support they should not mind standing by their opinion. I concur that anyone who wants particular details omitted should be able to have it done.

Equally, however, I feel that those who do wish to have their WIA membership signified should be given the option. This could be achieved quite simply. On the annual subscription renewal form could be included a yes/no check square to answer the question as to whether the member wants the signification or not. These forms are returned early in the year, in plenty of time for the wishes indicated to be included *in* the next Call Book.

Personally, I am not ashamed to be a member of the WIA and I do wish to have it signified in the Call Book.

73,

John Alcorn VK2JWA,
33 Spring Street,
Lismore, NSW. 2480
ar

INFORMING MEMBERS

The recent rejection (or deferment) by DOC of the WIA's recommendation to extend the use of two-metres to novices, brings to the fore the very unsatisfactory arrangement of deciding policy matters at annual conventions where WIA members have no hope of commenting on a subject before the vote is taken.

This matter has been fermenting amongst members for some time and it is about time that Federal Executive took notice of the situation. I have written to the Federal Office on two occasions (with follow-up letters) bringing the subject

to notice, but have yet to receive an acknowledgment or reply.

Some 20 to 25 years ago, it was possible to list in AR the subjects for discussion some two or three months before the Convention. This gave members a chance to know what was to be discussed, have an input to the Division, if necessary and to follow up the subjects of interest to learn of WIA policy. This procedure should be re-introduced.

At the present time, policy is decided and members never know.

Excuses such as:

(a) It would occupy too much space in AR, and

(b) there is not enough time

are not satisfactory or acceptable.

AR is the *Journal of the WIA* we are told and, as such, is the medium for the dissemination of proposed WIA policy. It has also been said that some agenda items some in "at the last moment". Is this any way to conduct a Conference for a Chairman to accept such items?

A cut off date for agenda items (for example, December 31, or a date to allow publication in February AR of each year) should be published and adhered to. This would allow member comment to the Federal Councillor prior to April.

Again this week (July 12, 1987), the broadcast suggested that members keep in touch with the Federal Councillor for Federal information. In the last 12 months or so, I have written to the Federal Councillor with follow-ups on each occasion, and I have yet to get a squeak out of him. So please, don't tell me to keep in touch with the FC.

While I very much appreciate the good work of VK3ARZ and VK3OM, with Federal tape broadcasts, this method is not an alternative to publication in AR.

So, to the Federal Executive, I say, notwithstanding T/T, facsimile, ATV, packet, etc, etc, go back 25 years and let all members have a look at what is to be discussed at the Annual Convention and you may get the member participation that you have been calling for.

Members just do not know what is going on and it is very hard to find out.

R Torrington VK3TJ,
4 Thistle Street,
Pascoe Vale South, Vic. 3044
ar

TRAILING ANTENNA — AERONAUTICAL MOBILE

In the August issue, Geoff Campbell is perfectly correct in his condemnation of Jeffrey Thornton's father for using half a house brick on the end of a trailing aerial from an aircraft.

As a pilot of over 33 years, I was appalled when I read the article in AR June 1987 and, as the story was included in ARA as well, the DOA may well investigate the matter.

When it comes to aircraft you cannot fool around. I am glad I was not flying beneath this aircraft as the thought of what a half brick could do to any aircraft, if it came loose, is too terrifying to contemplate.

A simple plastic funnel would have acted as a drogue, but as Geoff says, it must be DOA approved.

Yours faithfully,

Noel Abel VK3YUO,
Rowalfan Avenue,
Harkaway, Vic. 3806
ar

PROPOSED WWII RAAF REUNION

In times of conflict in which Australia was involved, amateurs were never slow in offering their services and skills to serve their country.

Even before WWII hostilities began, Bob Cunningham and others formed the RAAF Wireless Reserve to be ready when the time came.

In the past, many groups have held reunions but, I do not know of ex-RAAF Wireless Mechanics getting together and reliving the past for a short while.

The Signals Officers do so annually and have done so since the end of the war. Everyone knows it was the "indians" who actually did the work, so why don't we hold our reunion for all involved in RAAF radio during WWII?

Group-Captain (Bon) Hall said in his book, *A Saga of Achievement* that some 5000 wireless mechanics were trained at 1STT during the war years. On being asked about a reunion for "other ranks" he said he thought it would be terrific as there was a very close bond between us but warned that, unless it is arranged soon, it will be too late.

As this is not for amateurs exclusively, I shall also write to the service magazines to ascertain how many would be interested.

It is up to you! If you are interested and have suggestions or are willing to help arrange a reunion, please let me know.

Yours faithfully,

Noel Abel VK3YUO,
Rowallan Avenue,
Harkaway, Vic. 3806
ar

AMATEURS, LOOK AT YOURSELVES!

In reading and listening to all the ifs and buts of Bands, Licence Grades, Novices on Two-metres, Common Band for all Amateurs, and the incentive to Upgrade to Full Call, I have never heard so much snobbery and discrimination as exists in the hobby of amateur radio! I strongly suggest the time has arrived when we must all look at ourselves and put away our dog-in-the-manger attitudes. Despite whatever you may think, there is definitely class distinction in amateur radio. One has only to look at the allocation of band space for novice, limited or full call, to realise where class distinction lies.

We are all amateurs, no matter what grade of licence we may hold and I feel sure we would all love to hold a full call licence, but many of us do not and I stress do not have the capability to do CW at 10 WPM, etc. That is not to say we are not good amateur operators and, as such, we should be allowed to use all bands with, maybe, power restrictions for some classes of licence.

Let's face it, the spectrum is really public property, to be shared by all, so why can't all amateurs share all their allocated bands on an equal footing. We are all amateurs despite our class of licence. Once again, we cannot all have a full call due to the plain fact all things in this world of ours are not, and cannot be equal. We have the rich, and the poor. We have the sick and the healthy. We have the master and the slave. We also have the young and the old. But, despite all of this, no consideration is given to one's ability and, I am sure many a good budding amateur has given the hobby away because of not being equal to the task.

One often hears "If a thing is not earned it is not appreciated". What a lot of tripe! I know from my own experience, it took me five years to obtain my novice call and another two years for my limited, now, at 71 years of age I am still expected to study further to 10 WPM for a full call. But, after passing 10 WPM Morse, I know I would never use it again.

In no way whatever would it make me a better amateur. I am sure I home-brew in my field of antennas much more than most amateurs including full calls, and can operate with the best of them.

Yes, "amateurs look at yourselves". As for myself — the time is close to where this old horse has been whipped too much and I am now seriously considering giving the whole game away.

73 de,

Jim Thornton VK2KAX,
Box 80,
Umina, NSW. 2257
ar

NOTHING WORTHWHILE. . .

There is much being said regarding extension of two-metre privileges to novice operators, using as an argument, the "need" for a common band. Sounds reasonable, until one stops to remember that if only the Limited Certificate holders would get off their seats and do a simple Morse examination, there would be, no one, but three common bands at least. So, come on, you limited guys and gals. go for it!

The Novice operators have an excellent deal as it is. I was a novice once, and really appreciated the privileges I had. My earnest wish to operate on two-metres provided me with the incentive to upgrade, which, together with thousands of other novices, I managed, with just a little effort.

As I keep telling my youngsters, "Nothing worthwhile ever comes easy!". . .

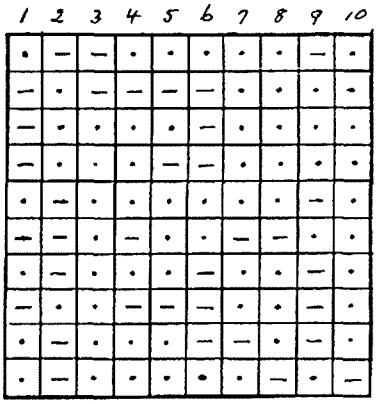
With thanks,

John Brennan VK4SZ,
10 Tulip Street,
Innisfail, Qld. 4860
ar

Solution to Morseword 7

Across: 1 pier 2 notes 3 base 4 dates 5 rive 6 Maud 7 aver 8 natter 9 lac 10 rift

Down: 1 amend 2 bow 3 miss 4 real 5 entire 6 jug 7 suite 8 hast 9 dawn 10 hist



Obituaries

CLIVE BURNS VK3CQL

With regret we announce the passing at the end of July, of Clive Burns VK3CQL. Clive was well-known on the bands, particularly to many of the 80-metre CW operators, both for his excellent sending and his happy disposition and eagerness to help others.

Clive passed away after a long illness at Myrtleford Hospital.

Deepest sympathy is extended to his wife and family.

—Contributed by B J Waldron VK3BNO

ar

ALBERT EDWARD ANDREWS VK2PKM

With very great sorrow I report the untimely death of "Andy" Andrews, aged 73, at Sutherland Hospital on July 31, 1987. Andy died as the result of a road accident.

Andy was born in London on October 3, 1913, and spent the Depression Years of his early working life employed in the Fleet Street newspaper industry.

The outbreak of World War II found him a member of the Welsh Guards, with whom he served until the end of hostilities. His particular duties were those of signaller which introduced him to many forms of communication including radio.

After the war Andy came to Australia with his wife Carol and daughters, Julie and Gillian, and settled first in Brisbane and later moving to the Sydney suburb of Oatley, where he established a delivery business.

Andy was a keen boat-builder and sailor, having had his first sailing experiences on the Norfolk Broads.

As the "weariness of age" crept up on him, Andy sold his yacht and concentrated his interest on radio, acquired his novice call and set up his shack from which he operated while studying for his full call.

Following an accident on his recently acquired motor cycle, Andy was under intensive care for several weeks in Sutherland Hospital and died on July 31, 1987.

Andy's funeral was held at the Woronora Cemetery, attended by his family and friends of both his sailing and radio days.

He was a generous, industrious, ever-helpful, trusty and trusting friend with whom I shared many happy experiences, the memories of which I shall always treasure.

He is survived by his wife Carol, daughters Julie and Gillian, son-in-law Graham and grandsons Christopher and Mark, whom together with his many friends, mourn his passing.

—Contributed by Oliver Sleeman VK2AOW

ar

H N (Pete) BOWMAN VK5FM

Pete Bowman died at his home in Bridgewater, SA, on July 19, aged 78. He will be greatly missed by all his friends.

Pete was first licenced as VK5FM in March 1932, and has held this call sign ever since. He held a first class operator's certificate, which he gained in 1940, and was a member of that distinguished group, the FOC.

From 1947 to 1954 Pete was a Councillor with the Royal Flying Doctor Service and acted as an intermediary between the council, in Adelaide, and Graham Pitts VK5RG, at the base station in Alice Springs. He was also Federal President of the WIA in 1934, Federal Traffic Manager from 1934 to 1936, and Vice-President of the VK5 Division in 1939.

Pete began his working life at Waymouth Motors, Adelaide, where he became their test driver. He joined the staff of 5AD in 1937, and told many amusing anecdotes of his encounters with radio personalities of the time and his experiences during recording sessions with them. He moved to 5PI, Crystal Brook, in 1959, and remained there until 1961 when he joined the staff of Channel 7 television. He worked at the transmitter site, on Mount Lofty, until his retirement.

VK5FM, was one of the most consistently active amateurs in the State. CW was his favourite mode of operation, but he also held regular SSB scheds with his friends in England and the USA, most of whom knew him personally. His immaculate fist will be greatly missed by his friends all over the world. He will also be sadly missed by his wife, Eunice.

—Contributed by Dave Robertson VK5RN

PROF J D McGEE

Professor James Dwyer McGee, who recently died in New Zealand aged 84, played a vital role in the development of high-definition television in the 1930s, and during the 1939-45 War pioneered infra-red sensitive image intensifiers for "seeing in the dark."

When the Professor accepted a post in the EMI Laboratories at Hayes in 1932 to work on the development of television, he was told by James Chadwick, under whom he had studied for his doctorate at the Cavendish Laboratory, Cambridge: "I don't tnink this television business will ever come to much, but it will keep you going until we can get you a proper job."

Television was then being implemented by mainly mechanical means, but at EMI the head of research, Isaac Schoenberg, had decided that the main effort should be the development of a cathode-ray tube receiver. McGee initially worked on this but he soon re lised that an electronic camera at the transmitter would be essential.

Schoenberg strongly disagreed, but McGee and his colleague W F Tedham, clandestinely built a rudimentary camera tube based on proposals originally made by the British physicist A A Campbell-Swinton in 1911. This worked well enough to persuade Schoenberg to go to his board for funds to develop what became the Marconi-EMI system, adopted by the BBC for the world's first public high-definition television service in 1936.

Professor McGee was responsible for the development of the camera tubes and produced fully operational ones in time for the opening of the television service in 1936 and the outside broadcast of the coronation in 1937.

There have been suggestions that EMI benefitted from technical information from RCA in the United States, where V K Zworykin had started camera tube development a few years previously, but even if this were true, McGee's achievement was a *tour de force* in view of the great technical difficulties involved.

James Dwyer McGee was born in Canberra, in 1903, and educated at Saint Patrick's College, Goulburn, and Saint John's College, Sydney University, graduating with a first-class degree in Physics and mathematics and staying on to research into the motion of electrons in gases.

In 1928, he was awarded an 1961 Exhibition Scholarship which took him to Clare College, Cambridge, UK.

In 1954, the physicist Professor Blackett of the Imperial College of Science and Technology, London University, persuaded him to accept the Chair of Instrument Technology (later Applied Physics) at the college.

Blackett's aim was to encourage the application of advanced photo-electronic techniques in physics research, and Professor McGee was brilliantly successful in achieving this: by setting up a group developing new photo-electronic detectors, by stimulating the interest of, for example, astronomers and nuclear physicists, and by encouraging industry to market devices.

His influence was international, particularly through the triennial symposia on photo-electronics he held at the college. Although many of the detectors developed by his group helped to make important observations in several fields of science, his most enduring achievement was in inspiring his colleagues and that many research students who have gone on to pursue successful careers in the universities and industry.

The Professor was bestowed with an OBE in 1952 and elected a Fellow of the Royal Society in 1966. He retired in 1971 as Emeritue Professor and Fellow of Imperial College, but continued to be scientifically active, and in 1980 he returned to live in Australia.

He had a warm personality and, although he ran his department somewhat autocratically, he was always approachable. His main recreation was listening to music and he was particularly fond of the operas of Wagner. In earlier years he was a keen skier.

In 1944 he married Hilda Winstone, of Auckland, New Zealand, who survives him.

From the *London Daily Telegraph*, July 1987. Contributed by E B Britton VK1BE

Magazine Review

Roy Hartkopf VK3AOH
34 Toolangi Road, Alphington, Vic. 3087

G General
C Constructional
P Practical without detailed constructional information
T Theoretical
N Of particular interest to the novice
X Computer program.

RADIO COMMUNICATION — July 1987. Versatile AF Active Filter. (P & N)

BREAK IN — June 1987. 25th Anniversary issue. WARO special issue. (G)

QST — June 1987. ARRL National Convention. (G) Two-metre Receiver and Scanner. (P) Rechargable Lithium Cell. (G & N) Lead Acid Charger Integrated Circuit. Voice Activated Squelch, 2 GHz Prescalers. (New product review) Build you own Mini-Circuit Modules. (P & N)

CQ — June 1987. VHF special issue. Classic Morse Keys. (G)

RADIO COMMUNICATION — August 1987. Crystal Calibrator. (C & N) Low Cost Keyer. (C & N) "Super-DC-Gainer" Front End. (T)

WORLDRADIO — July 1987. News of World-Wide Amateur Radio activity, DXpeditions, contests, etc.

VHF COMMUNICATIONS — 1/1987. Index for 1986. (G) 10 kHz to 30 MHz Receiver Front End. (C)

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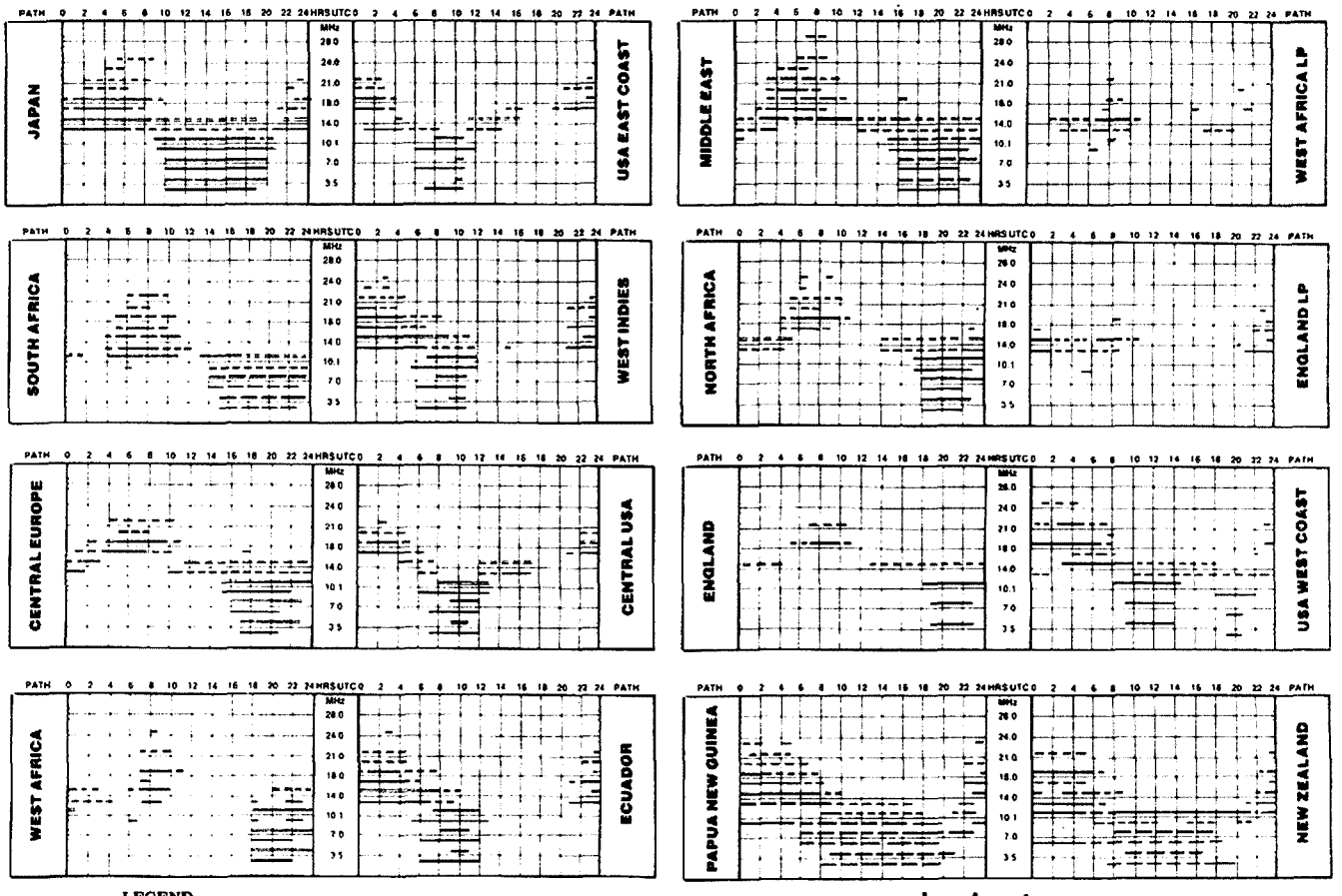
Ionospheric Predictions

Len Poynter VK3BYE
14 Esther Court, Fawkner, Vic. 3060



LEGEND
From Western Australia (Perth)
From Eastern Australia (Canberra)
Mixed mode dependent on angle of radiation (long broken lines).
Better than 50% of the month, but not every day (continuous lines)
Less than 50% of the month (short broken lines).
All paths unless otherwise indicated; (ie LP = Long Path) are Short Path.
Predictions are presented courtesy of the Department of Science, IPS Radio and Space Services, Sydney.

Solar Geophysical Summary

JUNE 1987

Solar activity was low during the month with no energetic flares being observed. There were a number of small solar regions visible on the solar disc for most of the month, although the sun was spotless during the periods 3, 4 and 6 to 10.

The 10 centimetre flux varied from 76 to a high of 86 on the 24th to a low of 68.

The monthly average sunspot number was down on the values for the last two months indicating the end of the recent burst of region growth. However, the yearly averaged sunspot number for December 1986, continued the upward trend since the solar minimum in September 1986.

Sunspot average for June	17.5
Sunspot yearly average 12/86	16.1
A average for June	8.6

GEOMAGNETIC ACTIVITY

The only significant disturbance during the month was on the 6th when the A-index reached 23.

—Compiled by Len Poynter VK3BYE, from data supplied by the Department of Science IPS Radio and Space Services — June 1987

ar

Silent Keys

MR A E (ANDY) ANDREWS	VK2PKM
MR A I K (BERT) CLARKE	VK2IC
MR G MAXWELL HULL	VK3ZS
MR HAROLD ALTON LEE	VK6AE
MR LYNTON JAMES PASSMORE	VK2ETE
MR L J SIMMONS	VK3LV

PROPAGATION REPORTS

There is now day-to-day information available for those wishing to check on solar and geomagnetic activity.

WWV, from Boulder Colorado, USA, on 5, 10, and 15 MHz, at 18 minutes past each hour, provide the previous UTC day's solar flux and estimated A-index, along with the present UTC day's K-index (changed three-hourly).

IPS Radio and Space Services provide a phone-in service on (02) 269 8614, basically the same as WWV, but without today's K-indices, but giving a summary of any "events" that would affect propagation in our portion of the globe.

A recently introduced service is now available from Radio Australia, five times each UTC day. At 0425, 0825, 1225, 1625, 2025 UTC, Monday to Saturday. Radio Australia has some 29 frequencies in use during each day.

A copy of Radio Australia's English Service Guide, which lists frequencies and times of their English programs, can be obtained from Radio Australia, GPO Box 428G, Melbourne, Vic. 3001.

—Contributed by Len Poynter VK3BYE

DEADLINE

All copy for inclusion in the **December 1987** issue of *Amateur Radio*, including regular columns and Hamads, must arrive at PO **Box 300, Caulfield South, Vic. 3162,** at the latest, by **9 am, October 19, 1987.**

Hamads

PLEASE NOTE: If you are advertising items FOR SALE and WANTED please write *each* on a separate sheet of paper, and include all details; eg Name, Address, Telephone Number, on both sheets. Please write copy for your Hamad as clearly as possible. ***Please do not use scraps of paper.***

- Please remember your STD code with telephone numbers
- Eight lines free to all WIA members. $9.00 per 10 words *minimum for non-members*
- Copy in typescript, or block letters — double-spaced to ***Box 300, Caulfield South, Vic.*** 3162
- Repeats may be charged at full rates
- QTHR means address is correct as set out in the WIA current Call Book

Ordinary Hamads submitted from members who are deemed to be in the general electronics retail and wholesale distributive trades should be certified as referring only to private articles not being re-sold for merchandising purposes.

Conditions for commercial advertising are as follows:
$22.50 for four lines, plus $2.00 per line (or part thereof)
Minimum charge — $22.50 pre-payable

Copy is required by the Deadline as indicated on page 1 of each issue.

TRADE ADS

AMIDON FERROMAGNETIC CORES: Large range for all receiver and Transmitting Applications. For data and price list send 105 x 220 mm SASE to: **RJ & US IMPORTS,** Box 157, Moridale, NSW. 2223. (No inquiries at office . . . 11 Macken Street, Oakley). Agencies at: Geoff Wood Electronics, Lane Cove, NSW. Webb Electronics, Albury, NSW. Truscott Electronics, Croydon, Vic. Willis Trading Co, Perth, WA. Electronic Components, Fishwick, Plaza. ACT.

WANTED TO SWAP — VIC

FT-200 WITH POWER SUPPLY & SPARE 6SJ6 FINALS: All in good condition. For rig equipped for 12 volt DC operation; eg FT-101 or similar, in good condition. Prepared to negotiate difference in cash value if necessary. Ron VK3QP. Ph: (03) 578 3393.

WANTED TO SWAP — OLD

TWO KINGSLEY COMMS REC: K/CR/II Mod AR7 power supplies, box of coils. Both need slight attention. Swap for vintage B/C rec or Morse gear. Galvano-meter, sounder, etc. Roland Clark VK4EG, 5 Tallaroon Street, Jindalee, Old. 4074. Ph: (07) 376 4772.

WANTED — ACT

HANDBOOK/CIRCUIT: for restoration of Pyrox Wire Recorder Type CWR Model 31, 1946 era. Will copy and return. Postage paid. Jock VK1LF, QTHR.

WANTED — NSW

DRAKE R7A, JRC NRD-515 RECEIVERS: KX-3, SX-3 Mizuho Antenna tuners. Tony. Ph: (042) 29 2573.

GOOD QUALITY MORSE KEY: Required by Oavid VK2XFV. Ph: (047) 51 1658.

ICOM IC-22A: or similar crystal-controlled transceiver. VK2SW, OTHR. Ph: (069) 22 6082 AH.

PAIR OF 572B: for FT-2100B. VK2AGA, QTHR. Ph: (065) 53 9607.

SOLID-STATE HF TRANSCEIVER: with manual, band-switching. Swan 100MX, Atlas 210X/215X. Others also considered. VK2EFM, PO Box J221, Coffs Harbour Jetty, NSW. 2451. Ph: (066) 53 2463.

WANTED — VIC

HF LINEAR AMP: In good condition & at a realistic price. John. Ph: (03) 743 9697.

TRIO GOO TYPE DM-108: with all coils & probes in good condition. Jim VK3YJ, QTHR. Ph: (03) 398 4192.

WANTED — QLD

DEAD OR ALIVE: Type 3 Mark 2, complete with parts, manual, WHY? Also require Drake AC3 DC4 PSU. VK4FUS. Ph: (077) 75 3816.

ICOM IC-745 HF TRANSCEIVER: with power supply. Would need to be in VGC. John VK4YX, QTHR. Ph: (076) 61 4877.

KENWOOD TS-130S, ICOM IC-730: or similar compact, modern, HF transceiver in top condition required. Also, Hustler HF vertical antenna. Details to John Brennan VK4SZ, QTHR. Ph: (070) 61 3286.

SELF-STANDING TOWER: Contact Henri. Ph: (07) 881 1125.

YAESU FV-707DM DIGITAL VFO: Must be in good condition. Steve VK4KHQ, QTHR. Ph: (077) 43 4508 (BH), (077) 44 3100 (AH).

WANTED — WA

CRYSTALS: for 3.525-3.540 MHz (any size). Also, large type with removable crystal such as FT-243 for 3-3.5 MHz. Also wanted — a crystal for 5, 10, 12.5, 15, 20 or 25 kHz. Write to Peter Parker VK6NNN, C/- PO Witchcliffe, WA. 6286.

QB3/300 CERAMIC VALVE BASE: & characteristics of this valve. Ken VK6ZA, QTHR. Ph: (09) 398 7829.

FOR SALE — ACT

DC200 12V POWER SUPPLY: for FT-200. $75. VK1BE, QTHR. Ph: (062) 61 3301.

GALAXY 5 MK3 HF TRANSCEIVER: + spare tubes. $400. Professional G4ZU Triband Mini-beam. $75. Pye 6 chnl transceiver. $30. FDK Multi 7 transceiver with gutter mount antenna. $150. Trio 9R59DE HF receiver. $75. Items of valve type test equipment & historic *equipment* lor negotiation. (Pre-war Hallicrafter). Miscellaneous AR equip. Too many to list. George Allen VK1AG, 16 Badcoe Street, Gowrie, ACT. 2904. Ph: (062) 92 3869.

FOR SALE — NSW

AS NEW: 70 cm equipment used only a few times on OSCAR. Icom IC-390 multi-mode transceiver & a similarly little used Tokyo HL60U 50 watt linear with GAasFET preamp. $820 for the units as a pair (cartons). Perfect for OSCAR. VK2SW, QTHR. Ph: (069) 22 6082 (AH).

CRANK-UP TOWER: Hills, 50 loot, c/w base plate, guys, bolts, etc. Must sell to meet other commitments. $350 ONO. Glen VK2AGM, QTHR. Ph: (02) 266 9152 (BH) or (02) 77 8407 (AH).

KENWOOD AT-250 FULL AUTOMATIC ANTENNA TUNER: four position ant switch 20/200 watt PEP PWR/SWR metre 240V or 13.8V. Very good condition. $480 or nearest offer. Mark Gorski VK2NMG. Ph: (02) 646 3711.

KENWOOD TS-430S HF TRANSCEIVER: all HF bands with mic. Rec 1.5-30 MHz. Mint condition with manuals. $1250. Dan VK2ABU, QTHR. Ph: (02) 212 3833 (AH) 328 1261.

PYE 10W VHF AM TRANSCEIVER: Consists of RG57 receiver & TG36 transmitter. Both in operational condition in a self-contained 19" rack cabinet. Crystal controlled & currently on 79.6 MHz. Offers to Mark VK2EMG. Ph: (02) 85 6870.

YAESU FT-77 HF RIG: with FC-700 ATU, $600. FT-7B HF mobile rig with digital readout. $550. FT-200 HF rig $200. FRG-7700 with preamp, $500. Swan 240 HF rig, $200. Swan TV2C 2m converter 240W SSB, $175. Tenko 2XA 2m rig FM mob/base, $150. Galaxy MKIII HF rig, $200. National *HRO rx*, 5 coil boxes 900 kHz/30MHz, $200. Handbooks for all except Swan 240, all with pwr supp except FT-7B. Estate VK2QC. Jack VK2APT, QTHR. Ph: (044) 76 7961.

YAESU FT-101 HF TRANSCEIVER & MATCHING FV-101 EXTERNAL VFO: Both in very good condition & operator manuals for both. $350 the pair. Bert VK2OW, QTHR. Ph: (02) 76 5730.

YAESU FT-101E: Some spares, $400. Yaesu YD-148 mic, new, $30. Katsumi Mk1024 programmable keyer, $100. Micronta 24 hr digital clock, $25. Multi-7 2m xcvr, AC supply, Xtals 4 channels, $150. Estate ol VK2IC. Stan VK2EL, QTHR. Ph: (02) 523 1293.

YAESU FT-102: AM/FM board & narrow SSB xtal fitted. Spare set PA tubes. *Oskerblock* power/SWR meter, manuals. $1200. Ph: (046) 77 1842.

YAESU FTDX-401 TRANSCEIVER: with mic, spare tubes, in carton. $340. Kenwood TR7200G 2m transceiver. $120. Hallicralters SX115 Ham Bands receiver, $100. Bendix frequency meter, $60. All original condition and with manuals. Ray VK2ARW, QTHR. Ph: (02) 44 7582.

FOR SALE — VIC

EDDYSTONE VHF COMMUNICATION RECEIVER: Mod 770R (MKII) as new. $400. FM/AM signal generator 1-220 MHz. Marconi Instruments Ltd. TF995A/5 as new. $160. Ph: (052) 48 1410 (AH).

HY-GAIN 244 HY-QUAO TRI-BANDER. Ph: (053) 32 8314.

KENWOOD TR-2600A TWO-METRE HAND-HELD TRANSCEIVER: as new. Recharged only three times. 2.5 watt, charger, book, carton, 10 memories. As purchased. $400. Geoff VK3GV, QTHR. Ph: (03) 560 3773.

FOR SALE — QLD

DICK SMITH HORNET CB: Converted to cover 28.245-28.685 MHz SSB. VGC. $150. Also Yaesu FL-110 linear amp in excellent condition. $200 plus freight. Steve VK4KHQ, QTHR. Ph: (077) 43 4508 (BH) or (077) 44 3100 (AH).

FULL COMPLIMENT OF PARTS FROM AWA TRANSMITTER: *Type* 13J *modified to* 17J. Includes solid-state rectifiers (IOR ST-10 8034 & IOR 1N2637-80Z), 30 tfmr 2250V, 2050V, CT, 833-A, 807 (quantity of each). Filament tfmrs (10V at 5A, 10V at 12.5A, 10V at 6A, etc). As well as various resistors, capacitors, contactors, inductors & chokes. Theo. Ph: (076) 97 6266.

GUYED MAST: 14.6m in 8 x 1.8m triangular galvanised sections. Tubular & heavy duty construction. Swap for self-supporting tower or sell for $280. Henri. Ph: (07) 881 1125.

QUANTITY OF MAINS TRANSFORMERS: ex equipment LT & HT. Phone for list. Copies ol *Radio Communication* (RSGB) 1969-1985. Free — to be collected. Belco RF LCR bridge, $50. Coilmaster coil winding machine. $25. Ph: (077) 72 5535.

STOLEN EQUIPMENT

Kenwood TM-221A, Serial number 8022541.
Kenwood TS-700A, Serial number 350-409.
Icom 502, Serial number 00618.
Icom 202, Serial number 03482.

The above equipment has been stolen from H Rider VK3ZJY. Any reader who may locate any or all of the above equipment is asked to contact their nearest police station or contact the Federal Office of the WIA.

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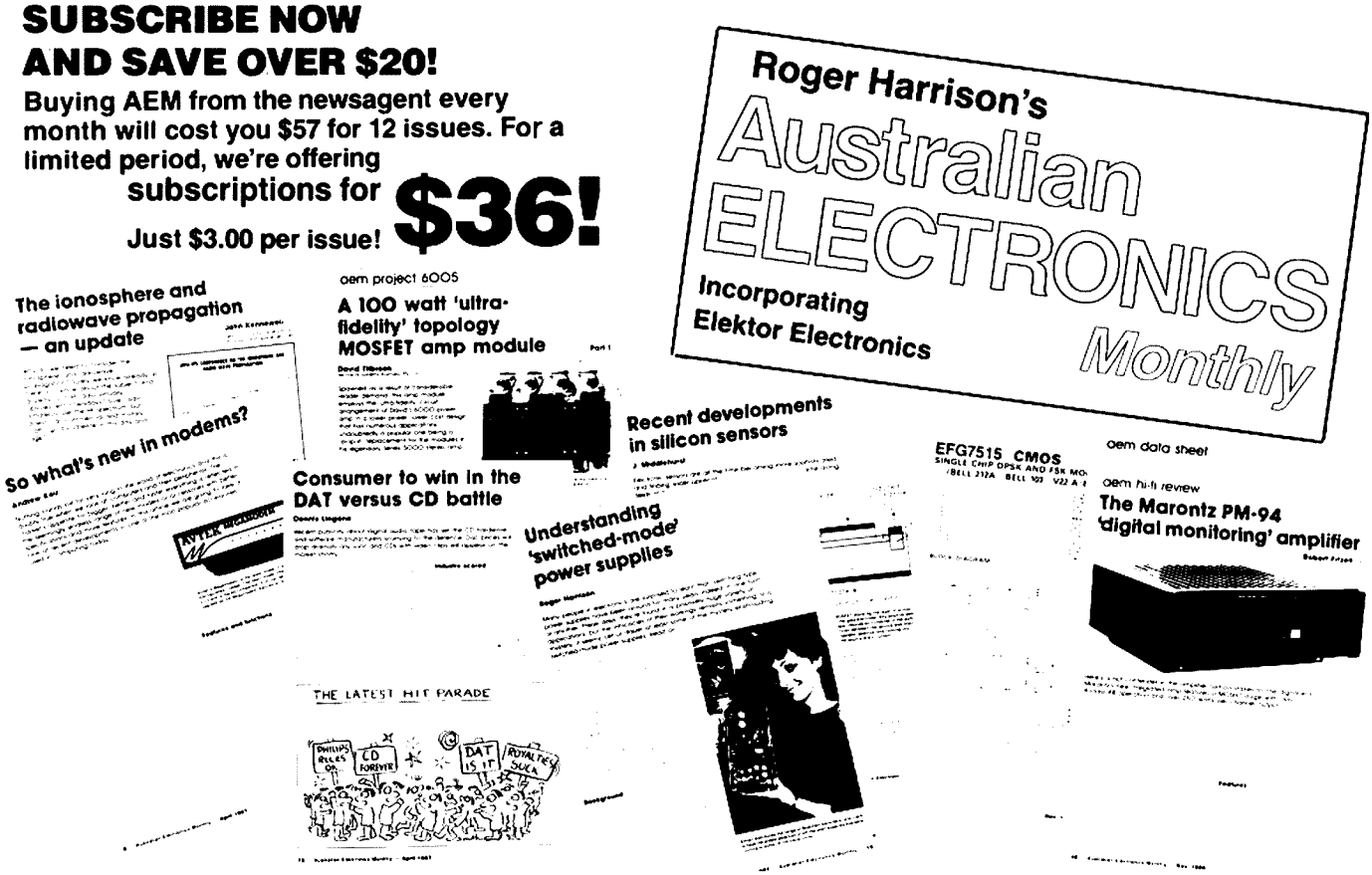

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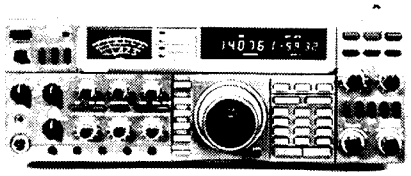

ICOM

Henderson Morrow Di Stefano IC487

Amateur Radio

JOURNAL OF THE WIRELESS INSTITUTE OF AUSTRALIA
VOL 55, No 11, NOVEMBER 1987

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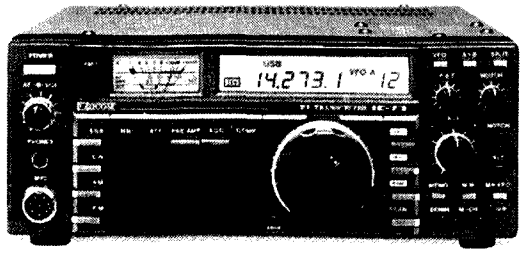

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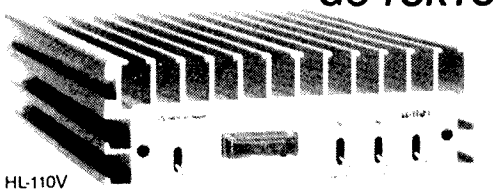

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Amateur Radio

FRONT COVER: Ferruccio Crespi I2SM, Engineer and Radio Amateur with his radio equipment in Brunello, Varese (see page 3).

Maidenhead Locator incorporated in Ross Hull Contest (see page 35).

Special Features

Technical Features

Radio OTH on Prince of Wales Island (see page 18).

Karratha Radio Club (see page 54).

Wrong caption.
QTH of Bill VK4WL
Prince of Wales Island.

Regular Features

DEADLINE

All copy for inclusion in the January 1988 issue of Amateur Radio, including regular columns and Hamads, must arrive at PO Box 300, Caulfield South, Vic. 3162, at the latest, by 9 am, November 9, 1987.

Amateur Radio

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HAMADS should be sent direct to the same address, by the same date.

Acknowledgment may not be made unless specifically requested. All important items should be sent by Certified Mail. The Editor reserves the right to edit all material, including Letters to the Editor and Hamads, and reserves the right to refuse acceptance of any material, without specifying a reason.

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Editor's Comment

HANDBOOK AND CALL BOOK

Something like a year ago (last December to be precise) we announced we were planning to produce a collection of specifically VK-oriented technical material, possibly in a loose-leaf format which could be updated from time to time. We went to the trouble of running a questionnaire on what you would like to see in such a handbook, and particularly whether you would be willing to pay extra for it.

The response was very gratifying. Thousands of replies, virtually all enthusiastic, and most of them willing to pay. Nothing has happened! We applaud your patience, because no one has yet asked "Where is the new Handbook?". Nevertheless, explanation is needed, although you may have found a hint in previous editorials. The problem is that at present we don't have the money to make a start! This is mainly because of rapidly rising costs and rapidly falling advertising. We have changed AR to less expensive paper and reverted to a minimal-colour cover; and with a few other economies we should just about finish the year on budget. But next year may well be worse!

Consequently, we are marking time on the Handbook. However, many of you may have wondered as to when there will be a 1987 Call Book. The answer is "There won't be!". And oddly enough, this is not entirely because of costs. The basic reason is that we have been publishing the Call Book ever since 1954 as a contractor to DOC (or DOTC now). The most recent contract was for a 10-year period, and came up for renewal this year.

For various reasons, all out of our control, the contract has yet to be renewed. It is now too late to produce a 1987 Call Book. Even if there had been no delay, costs would probably have bothered us anyway. Hopefully, we will be back in this business for 1988. Sorry, folks; we know the 1986 book is a bit out of date now, but it is better than nothing, isn't it?

Bill Rice VK3ABP
Editor

56th Anniversary of Talking to the World

FERRUCCIO CRESPI I2SM, from Milan, Italy, well-known in surrounding cultural circles, has a villa in Brunello close to Lake Varese and at the feet of the Italian Alps. The world is at his finger-tips. Well-known also to many Australian amateurs, he extends his greetings to all of them through this article.

Ferruccio is one of the few active Italian radio amateurs who can boast of being the most 'senior.' He has been sending his messages via radio around the world for 56 years. Transmitting defiantly during the time of Fascism in the 1930s and continuing into the post-war period, still today, every weekend, he leaves Milan to arrive in his oasis in Varesotto and throws himself into his immense world of voices.

Ferruccio 's life reads like a novel, with many chapters spent "riding the shortwaves." He remembers, for example, the day in 1962 when he was able to 'rescue' 50 passengers on a plane, which had a malfunctioning radio, by connecting the radio amateur pilot with Lisbon. He also recalls that, in 1980, thanks to a radio amateur on the island of Comore, he was able to, at the request of the Duke of Aosta, communicate a message to the niece of Queen Elena, of Rumania, to go immediately to Geneva to visit her sick grandmother.

"It was really the radio amateurs of those times", he remembers, "that carried out the first experiments with television." "I tried and had excellent results, and by using the Nipkov system, I was able to receive transmissions from London and Berlin in 1932."

During the 1930s, radio amateurs came under government control, the pioneer period was over and there was hope for a better understanding amongst the people of the world. Only in Italy, after a brief period of freedom, from 1920 to 1926, their licences were not renewed and the work was carried out clandestinely.

Ferruccio's work was interrupted many times due to sequestration, injunctions, fines and even interrogation by police. Then, at the war's end, radio amateurs brought their work back out of the cupboards to begin again.

As a founding member of the Association of Italian Radio Amateurs (ARI), of Varese. He now meets regularly with younger colleagues, placing his experiences at their disposition, believing firmly in the liberty and solidarity of this activity projected into the future.

—Contributed by Milvio Mondolo VK2AML
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FEDERAL NEWS

During September, 1987, the Federal Office saw two meetings — an Executive Meeting, and a Publications Committee Meeting, had the subscription notices printed with the Bandcard/Mastercard/Visa facilities incorporated in the wording, has been the scene of our computer experts adjusting the subscription pay-in format to accommodate these card facilities, and we received congratulations on our 75th Anniversary!

The Executive Meeting took place on Tuesday, September 22.

The Agenda Items for this meeting were:

Acquisition of Amateur Radio Limited
Discussion of Novices and two metres
Special calls signs for the Bicentenary
Production of *Amateur Radio*
Reports — Standards, FTAC, Finance, etc.

The meeting was attended by David Wardlaw VK3ADW, Federal President in the Chair, Bill Roper VK3ARZ, Peter Gamble VK3YRP, Michael Owen VK3KI, and Allan Foxcroft VK3AE.

Apologies were received from Bill Rice VK3ABP, Ross Burstal VK3CRB, Ron Henderson VK1RH, and Stephen Phillips VK3JY. Mrs Ann McCurdy was in attendance.

Minutes of the Meeting held on August 25, were read and confirmed.

AMATEUR RADIO LIMITED

Federal Executive is acquiring this Company from the VK3 Division, after all necessary actions have been complied with.

SPECIAL CALL SIGNS FOR THE BICENTENARY

The Special Call VI88 has been requested from the International Telecommunications Union through the Department of Transport and Communications, in Canberra. Also requested was VI88WIA, and the Divisions can use VI88ACT, VI88NSW, VI88QLD, etc, for the whole year.

NOVICES ON TWO METRES

The results of the Divisional surveys, and individual letters on the subject, have been forwarded to the *Future of Amateur Radio Working Party* for collation and comment. This Committee has been asked for a brief report prior to the next Executive Meeting.

FINANCE

Accounts were presented and passed for payment, and the debtors to the end of August were noted.

STANDARDS

Allan Foxcroft discussed the two-day meeting of the TE3 Committee, and the delays still occurring in the secretarial area of the Association. He noted that we are still awaiting response to our letter to DOTC re Wireless Video Transmitters.

Allan also noted a disappointing response to our request for assistance on Line Oscillator Radiation.

FEDERAL TECHNICAL ADVISORY COMMITTEE

Peter Gamble reported on discussions with the International Beacon Manager re 21 and 28 MHz Time-Share Beacons.

PRODUCTION OF AMATEUR RADIO

There was a general discussion on the rise in certain costs in the production of the magazine. The best possible magazine must be produced with the money available.

VISITS BY MEMBERS OF EXECUTIVE

David Wardlaw reported on his visit to the Townsville Amateur Radio Club to officially open their biennial Convention held at the James Cook University on September 4, 1987. Over 100 amateurs came from all over northern Queensland to attend the Convention.

The point was made that it was pleasing to have the President of the Institute present to talk to members and answer any questions they may have — naturally many topics were covered.

Ron Henderson forwarded a report of his visit to the Darwin Amateur Radio Club, where he met officials and members and discussed topics of concern with them. Unfortunately, neither David Wardlaw or Ron Henderson will be able to accept an invitation to attend the 21st birthday celebrations of this Club on November 6, 7 and 8, 1987.

A list of correspondence received in the office was presented and details of replies submitted.

CORRESPONDENCE

Every day in the Federal Office, a large and varied amount of mail is received. We can receive up to 100 items per day during the busy times, but it is never less than 20. This involves a considerable amount of time by the Secretary, to open, sort and distribute this quantity of mail each morning. The range of correspondence covers *all* areas — we have many letters *from* overseas amateurs who are arranging a visit to Australia requesting information on reciprocal licensing, letters from members commenting on a current popular topic, or an article in *Amateur Radio*, amateurs requesting copies of articles printed in magazines eight or 10 years ago (not *Amateur Radio*), as well as regular mail from Divisions, Federal Co-ordinators, members of Executive, etc, not to mention the usual flow of subscriptions, and notification of changes of address and new call signs. Add to this list a copy of our sister Societies magazines from around the world, overseas and local newsletters, and press releases from advertisers. This office makes every effort to answer all mail received, either personally from the Secretary, or by requesting a particular member of Executive or a Federal co-ordinator to answer on behalf of the office. So please bear with us! Don't stop writing — we need to know how you, the member, feels about current topics, but just be a little patient if a reply is not immediately forthcoming!

The 75th Congratulations mentioned in the correspondence above came from one of our sister Societies, who incorrectly had our foundation date as 1912 — we politely thanked them for their congratulations and asked them to amend their records.

NOVICE STUDY GUIDE

During September, we had a visit from the Federal Education Co-ordinator, Brenda Edmunds VK3KT, to discuss the final details and publishing of the *Novice Study Guide*. This important guide fills a gap in our list of publications for the amateur studying for a Novice Licence. Brenda has produced a comprehensive guide, in an easy to read style, which should prove a great help to instructors and students alike.

It will be available this month from your Divisional Bookshops, or the Federal Office. Price is $2.50 plus postage.

REGION III CONFERENCE, SEOUL, OCTOBER 1988

During the Olympic Games in Seoul in 1988, South Korean amateurs will use the special prefix HL88. Visiting athletes who have amateur radio licences will be able to operate the special station 6Y88SOC. This station will also handle third party traffic on behalf of all athletes.

AMATEUR RADIO MAGAZINE LABELS

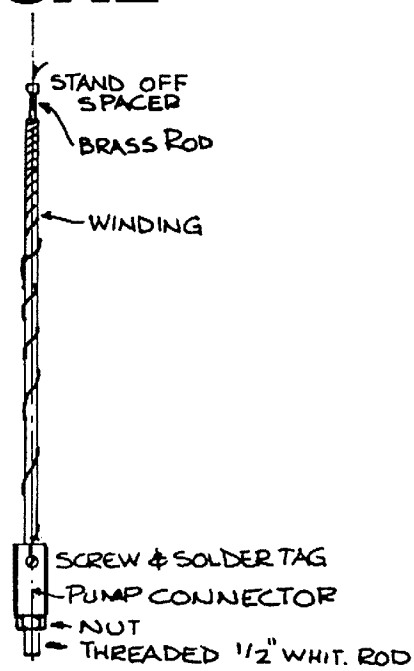
Thank you to all members who contacted this office by phone or letter to advise that there was more than one flysheet and label in their plastic cover of the magazine. This enabled us to ensure another magazine was posted promptly to those members.

FTAC

Do hope you all heard the excellent segment on the Federal Broadcast Tape during September featuring the FTAC Chairman, Peter Gamble VK3YRP. Peter clearly defined the role of FTAC within the Institute, and if you did not hear it, please advise the Federal Office, and arrangements can be made to print it in this section of *Amateur Radio*.

A RECIPE FOR A HELICAL WHIP FOR MOBILE OPERATION

Bob Elms VK6BE
72 Drew Street, Albany, WA. 6330



INGREDIENTS

1 brass spacer 8 mm long and 5 mm in diameter

1 piece 8# brass welding rod 120 mm long
1 electric fence strainer (as sold, 1500 mm length of 10 mm fibreglass rod)

1 reel 16# enamelled copper wire

1 windmill pump coupling (as sold, cylindrical brass 20 mm OD ready drilled and threaded to take ½" Whitworth rod)

1 55 mm length of ½" Whitworth brass or steel rod
1 steel or brass ½" Whitworth nut
1 8# or larger self-tapping screw

1 solder tag to fit screw

1 roll of PVC tape
5 minute Epoxy

METHOD

Drill into end of fibreglass rod 20 mm, dip welding rod tip in Epoxy and tap into end of rod.
Tin tip of welding rod and sweat on brass spacer.

Screw 55 mm length of threaded rod into pump coupling to depth of 30 mm and fit locknut. Tighten locknut.
Epoxy other end of fibreglass rod into pump coupling to a depth of 30 mm. Set aside till set.

Drill into brass coupling at right angles to fibreglass rod 20 mm from fibreglass. Screw in self-tapping screw with washer and solder tag. Tighten.
This completes the whip, which now has to be wound and tuned.

WINDING

Tin end of enamelled copper wire and solder to brass welding rod close to fibreglass section of whip.
Close-wind to length required, then space- wind increasing spacing to bottom of rod.
Bare end of copper wire and solder to solder- tag.
Check for frequency, and adjust by adding or subtracting turns if there is a large discrepancy, or by heating and sliding the brass spacer on the end of the rod up or down to make adjustments of 20 kHz or so. Allow for lowering of frequency of about 20 kHz when the whip is taped.
Tape the rod from the top of the winding down over the brass base so that the solder tag and screw are covered.
Recheck and readjust by moving the brass spacer if necessary.

NOTES

1. Rough checking for frequency can be done by mounting on car and coupling to a general coverage receiver, tuning across the range required. The whip is fairly sharp and an increase in noise can be heard as the receiver is tuned across the resonant frequency of the whip. If it appears that frequency is within the amateur band, use an SWR bridge to fine tune.

2. If difficulty is encountered in finding the resonant frequency of the whip, make up a loop on a PL259 plug and use this to couple a GDO into the base of the antenna when mounted in position on car.

3. The winding lengths given were for a standard base 70 mm high with mounting spring 120 mm high. If no spring is used the ½" Whitworth rod and nut should be omitted and the length of winding increased to make up the inductance of the spring. The windmill coupling will screw straight down onto the standard heavy duty base.

4. The brass spacer on the end of the whip is an important item. Do not leave it off. It not only allows for easy fine-tuning of the frequency of the whip, but it also prevents corona effects and arcing at the end of the whip. These can not only burn up the tip of the whip, but will cause TVI and BCI.

LENGTH OF WINDING

20 metres: Close wind for 290 mm, then space wind starting at about 20 mm, increasing to 100 mm at base of whip.

80 metres: (use 15 mm fibreglass rod glued into a hexagonal windmill pump coupling — these are reducing 5/16" to ½"). Close wind for 1035 mm, and then space wind as before. If 10 mm fibreglass rod is used as for the other bands, more turns will be required. Try an extra 250 mm for a start.

40 metres: Close wind for 750 mm, and them space wind as for 20 metres.

The whips were made in a very short time, and cost less than $10 to make. The fencing strainers and windmill couplings were purchased for about $3 each from a farm hardware store.

TOPICAL TECHNICALITIES — 1

(Apologies to G3VA)

Lindsay Lawless VK3ANJ
Box 112, Lakes Entrance, Vic. 3909

Are you confused about the theory practice and purpose of "Impedance Matching"?

If so, read on, the following might be useful. Match it with the 'conventional wisdom; of some amateur texts and technical articles about the topic.

Maximum energy transfer from a source to a load occurs only when the load impedance is the conjugate of the source impedance.

ie, Source and load resistances are equal and source and load reactances are equal but opposite kinds.

$$R_s \pm jX_s = R_1 \pm X_1$$

For that matched condition efficiency is 50 percent.

The most common practical reason for 'matching' is to obtain maximum 'Conversion Efficiency' and not maximum energy transfer.

An idealised design of a linear amplifier using solid state devices in Class B push-pull illustrates the conversion efficiency idea. The task is to convert DC energy to RF and couple that to an aerial. The chosen devices and the associated heat sinking are capable of dissipating 25 watts and will be used to that limit. The supply is 12 volts.

Assume sine wave drive and that the peak RF volts can equal the supply volts (E_b = 12 V) then

$$\text{RF power out} = P_o = 12\,I_p/2 \text{ watts} \quad \ldots(1)$$

I_p = peak RF current.

In Class B RF amplifier with sine wave drive:

$$I_p = (\P/2)I_b \text{ therefore,}$$

$$P_o = 3\P I_b = 12I_b - 25 \quad \ldots(2)$$

Solving (2) for I_b,

$$I_b = 25/(12\text{-}3\P) = 9.7 \text{ amps.}$$

The conversion efficiency = RF power ÷ DC power

$$= (12x9.7\text{·}25)/(12x9.7) = 0.78 = 78\%$$

The peak envelope power (PEP) is 182.8 watts and the average power 91.4 watts.

The next task (the so-called matching problem) is to transfer 182.8 watts PEP to the aerial preferably without further loss (we are already losing 25 watts). Look at the resistances involved so far:

$$\text{DC Resistance} = 12/9.7 = 1.57 \text{ ohms.}$$

$$\text{RF Resistance} = E_p^2/P_o = 144/91.4 = 1.57 \text{ ohms.}$$

1.57 ohms is not a good choice for aerial system resistance and we prefer to transform this to the popular choice, 50 ohms, therefore a step up transformation of $(50/1.57)^{1/2}$ is necessary; a broadband ferrite core RF transformer will do the job.

Solid state RF linears with transformer coupling to the aerial system differ from the valve types which could absorb reflected reactance in the tuned circuit anode loads. The aerial system for this example must present a resistive load otherwise the predicted efficiency will not be realised and there is the possibility that high reactive current components will destroy the solid state devices.

Standing waves on RF transmission lines have the effect of presenting complex impedances at the line input, therefore if standing waves cannot be avoided it will be necessary to use a coupler between linear output and line input to tranform the resistive component to 50 ohms and/or cancel the reactive component. Best, but not often the practical solution, is to adjust the aerial impedance to 50 ohms resistive and use a 50 ohm line direct to the linear.

Because of the absence of selective circuits in the linear output, it will be necessary to include a low pass filter in the aerial system to provide attenuation of out of band emissions.

None of the above mentions matching load impedance to source impedance. Where is the source impedance?

Contrary opinions welcome, addressed to QTHR.

ar

BUILDING BLOCKS REVISITED — Part 6

Harold Hepburn VK3AFQ
4 Elizabeth Street, Brighton, Vic. 3186

The modules so far described produce a transmit signal at a level of around one to two milliwatts into 50 ohms.

IT REMAINS TO boost this signal to somewhere around 30 watts in order to have a usable on-air signal or one large enough to drive a higher power linear.

At least three stages are needed to get to the 30 watt level and this article describes a two-stage "pre-driver" that delivers around two watts of continuous power (four watts PEP).

The "pre-driver" adheres to the overall philosophy of a broadband device whose output is constrained to the required operating segment by means of separate filters. It must be emphasised that the unit must never be put on-air without a filter installed.

The literature on medium to low level drivers is a little scant and some difficulty was experienced in choosing transistors that would do the work required of them and which were consistently available in Australia.

Table 1 — Test Results (without filters).

Supply volts	12.00
Collector volts — 2N5590	11.95
Base volts — 2N5590	2.24
Emitter volts — 2N5590	1.46
Collector current — MRF 517 — mA	60.50
Collector current — 2N5590 — mA	840.00
Total unit current — mA	940.00
Input — all frequencies	+1.5 dBm
Output — at 10 MHz	2.00 watts
Mid-band gain	≈ 31.5 dB

FREQUENCY — MHz	OUTPUT dB RELATIVE to 2 Watts
0.34	-10.00
0.72	-7.00
0.79	-5.30
0.95	-3.00
1.00	-1.55
2.00	-0.20
3.00	+0.10
4.00	+0.20
10.00	0.00
20.00	-0.70
30.00	-0.83
40.00	-0.97
50.00	-1.40
60.00	-2.60
62.10	-3.00
70.00	-5.20
73.00	-6.00
76.00	-7.00
84.00	-10.00

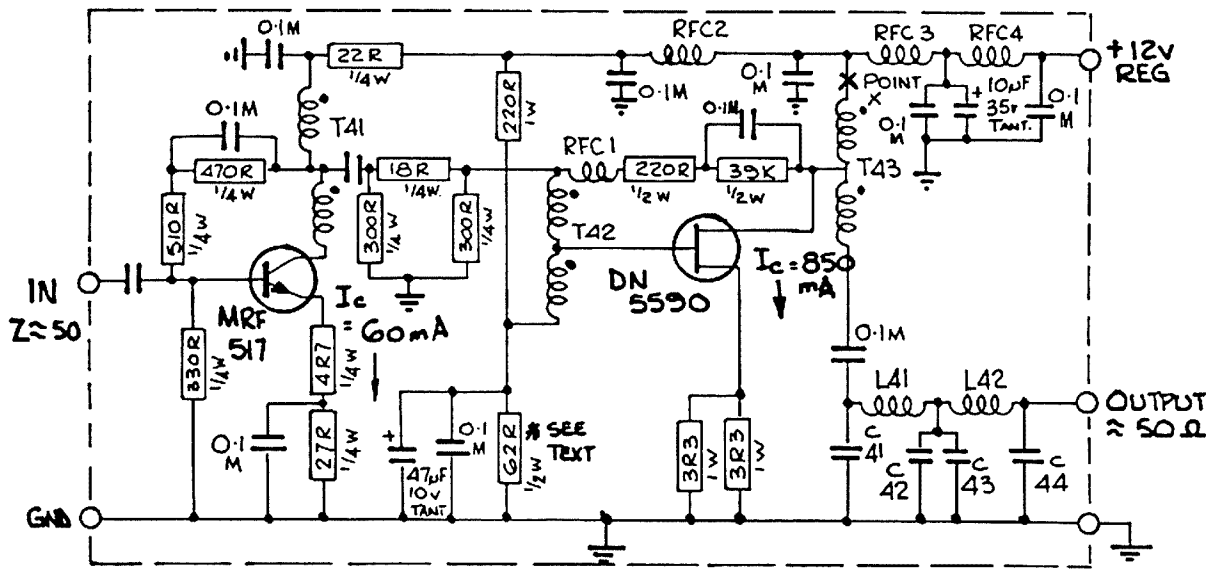


Figure 26:
Two-Watt Broadband Amplifier and Filters.

NOTES:
T41, T42 — Six Bifilar Turns No 26 AWG (0.40 mm) Enamel on Amidon T37/77 Ferrite Toroid.
T43 — Seven Bifiliar Turns No 26 AWG (0,40 mm) Enamel on Amidon BN 73-202 Ferrite Balun Core.
RFC1 — 20 Turns No 30 AWG Enamel Close-wound on Body of 100k half-watt resistor.
RFC2, 3, 4 — 2.5 Turns on six-hole Ferrite Bead — Philips No 4312-020-36700 or Amidon FB-43-5111.
C41-44. L41, 42 — See Table for various Amateur Bands.

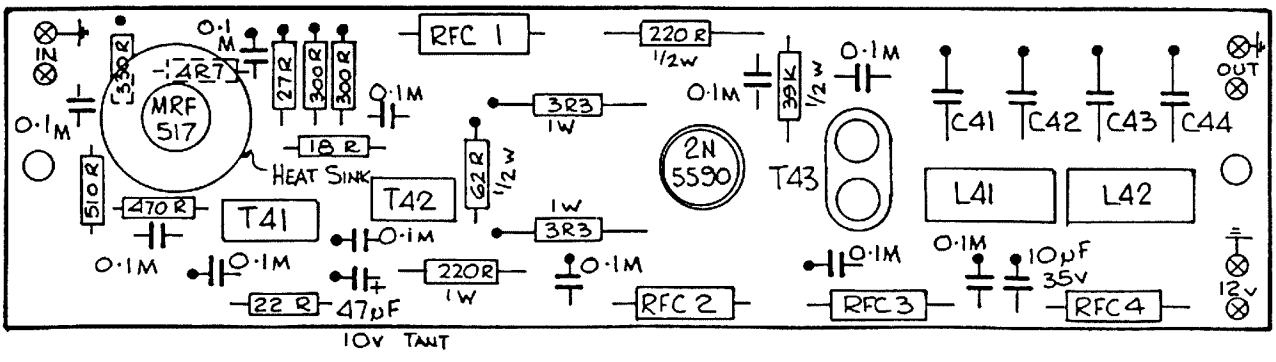


Figure 27: Layout of Components.

NOTE: ● designates soldering to top of board only.

Table 1 gives the performance of the unit before installing any filters. The Table shows it has a 3 dB (half power) bandwidth of over 60 MHz with less that 1 dB variation over the 2-30 MHz range of interest to amateurs. Mid-band output is 2.0 watts of CW power.

Figure 26 is the circuit diagram, whilst Figure 27 shows the layout of components on the 150 by 38 millimetres double-sided circuit board used.

Figure 28 shows mounting details of the board to the obligatory heat sink, while Figure 29 shows winding details for the output transformer.

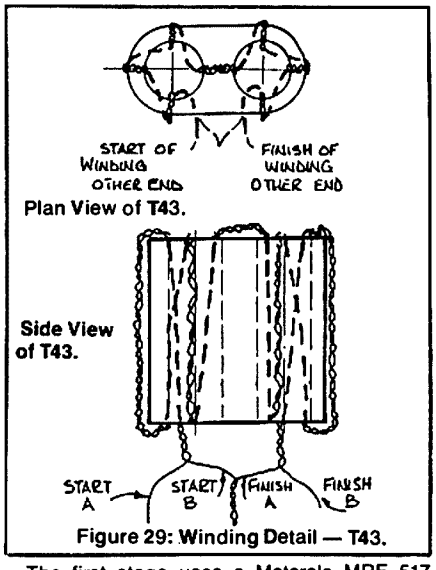


Figure 29: Winding Detail — T43.

The first stage uses a Motorola MRF 517 CATV transistor, while an old favourite, a 2N5590, is used in the second stage. A BFQ43 or 2N5109 could probably be used in place of the MRF517, but this has not been tried.

The MRF517 is biased to draw 60 mA of collector current and a "top hat" type of heat sink is obligatory if device longevity is to be assured. Emitter degeneration and shunt feedback between collector and base are used to achieve a very wide 3 dB bandwidth. The bandwidth of this stage alone is 250 kHz to 82 MHz! Input and output impedances approximate to 50 ohms.

A 3 dB resistive pad is used between the stages to assist the two stages "see" the 50 ohm load and source they seek. The pad does reduce the power available to drive the 2N5590, but this drawback was considered of secondary importance to the need to establish a 50 ohm interface. Its' omission, whilst reducing the drive needed for two watts output, did degrade the "flatness" of the overall response.

The 2N5590 output stage is again operated in Class A with a standing collector current of 850 mA. Again use is made of both emitter degeneration and shunt feedback to achieve wide bandwidth. Simple resistive biasing has been used and its "stiffness" has been assured by pulling some 45 mA through the 220/62 ohm bias network.

The high standing current of the 2N5590 demands very good heatsinking and a 150 millimetres length of "Minifin" is specified. This freely obtainable commercial heatsink has a central "valley" 41 millimetres wide into which the 38 millimetres wide PCB fits nicely.

The type of ferrite toroids and balun cores specified for T41, T42 and T43 are critical. T41/T42 are wound on Amidon 77 mix 9.5 millimetres OD toroids while T43 is wound on an Amidon 73 mix 13 millimetres square balun core. Substitution of other types of core will certainly have a profound effect on the bandwidth of the unit. However, at least three suppliers advertise Amidon products in AR and supply should present no difficulties. For convenience, these suppliers are listed at the end of this article.

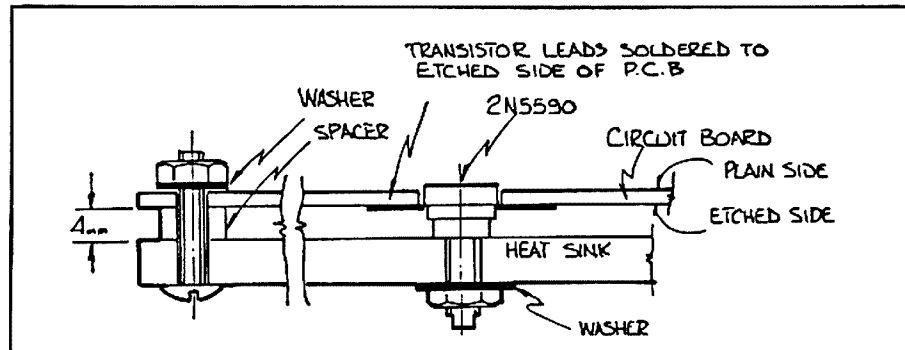


Figure 28: Board and Transistor Mounting Detail.

Output from the 2N5590 is filtered with a two section, 50 ohm, "pi" low pass filter arrangement. The capacitor sizes and coil winding data for each amateur band are detailed in Table 2. These filters use standard value dipped silver mica capacitors and Amidon powdered iron toroidal coil formers. Use of ceramic capacitors in place of silver micas is not recommended although 100 volts or 630 volt polystyrene capacitors are an acceptable substitute.

Table 2 — Filter Data.

BAND	L41/42 µH	No TURNS	AWG WIRE GAUGE	TORO FORMER	C41-44 pF
160	3.76	27	26	T50/2	1500
80	2.05	20	26	T50/2	820
40	1.08	15	24	T50/2	430
30	0.75	13	24	T50/6	300
20	0.55	12	24	T50/6	220
17	0.40	10	22	T50/6	160
15	0.37	10	22	T50/6	150
12	0.30	9	22	T50/6	120
10	0.25	8	22	T50/6	100

Footnote to Table 2:
0.40 millimetres can be used in place of 26 AWG
0.50 millimetres can be used in place of 24 AWG
0.80 millimetres can be used in place of 22 AWG
All wires are enamelled.

CONSTRUCTION

The unit is built on a 150 by 38 millimetre double-sided circuit board and the parts placement in given in Figure 27. It should be noted that *all* ground returns are made to the top or ground plane side of the board. These grounds are identified on Figure 27 by a solid black dot.

The method of winding the toroidal transformers T41/T42 was detailed in Figure 25 of Part 5 of this series (AR September 1987).

T43 is also bifilar wound, but on a two-hole balun core. Figure 29 shows how to do this. There are three turns through one hole, one turn between the holes and three turns through the other hole. The start and finish of the winding come out at the same end of the former — one out of one hole, one out of the other. Trial winding with a piece of string will be of great assistance in becoming familiar with what is required.

The method of soldering the 2N5590 to the underside of the board, and the method of mounting the board onto the heatsink is detailed in Figure 28. It will be found of great assistance to transfer the centres of the two 3 millimetre bolt positions and the 4.5 millimetre stud hole for the 2N5590 from the PCB to the heatsink *before* putting any components on the board.

COMMISSIONING

A temporary short is placed across the input pins and the output connected to a 50 ohm, 2-5 watt power meter. 12 volts are applied through a ammeter capable of indicating at least two amps.

Power is applied and the ammeter reading noted. If the total current drawn is between 0.9 and 1.0 amps then all is well!

If the total current is over 1.0 amps then the 62 ohm bottom bias resistor needs reducing in value. This is best done by paralleling it with, say, a 330 ohm or thereabouts until the total current drawn is within range. The composite resistor can then be measured and replaced with one having the next lowest standard value.

If the total current is too low then the 62 ohms specified must be increased in value. Do this by adding, say, 2.2 or 4.7 ohm resistors in series until the requisite total current is drawn. Measure the value of the composite resistor and replace it with one having the next highest standard value.

It is not anticipated that this rather annoying procedure will be necessary in most cases. However, some 2N5590s might fall far enough outside the average to need some bias adjustment.

Assuming that an operating frequency has been chosen, and that the appropriate filters have been installed, a signal may then be injected into the input and the output measured. This input signal will not need to exceed 2 mW to obtain two watts of CW output.

The next part of this series will describe a 30/40 watt PEP final.

FOOTNOTE:

Amidon product suppliers:

Stewart Electronic Components, PO Box 281, Oakleigh, Vic. 3166. Telephone: (03) 543 3733.

Ian J Truscotts Electronic World, 30 Lacey Street, Croydon, Vic. 3136. Telephone: (03) 723 3860/723 3094.

R J and U S Imports, Box 157, Mortdale, NSW. 2223. No telephone.

VHF/UHF BUILDING BLOCKS — Part 4

MODULE B — Building Block Six Metre Transverter

John Day VK3ZJF
5 & 7 Old Warrandyte Road, Donvale, Vic. 3111

In this fourth installment we will consider the design of a six metre transverter. Originally proposed as a 100 mW unit the final design is, in fact, a 500 mW unit.

As with all the proposed units in this series, a thorough search of the existing literature was undertaken. Until about 12 months ago, the only example of a solid state six metre transverter found was the W7ZOI design in the *ARRL Handbook*. Recently, however, a number of new designs have appeared in the British magazines with the release of six metres for use there. None of the designs seen were considered easy to construct due to availability of parts. The design presented here is simple conservative and, most importantly, the parts are easily obtained.

RECEIVE CONVERTER

The six metre receive converter was probably the easiest part of this whole series to design. At this sort of frequency many things become much less of a problem than at either lower or higher frequencies. Common dual gate MOSFET transistors, such as the BF981 and MFE131, exhibit excellent gain and good noise performance at these frequencies.

Purely for ease of supply, the preamplifier uses the BF981 as found in several other modules of this series. There is no need for a new PCB for the six metre receive converter. The converter is constructed on the same board as the two metre converter. A careful examination of the layout drawing will reveal that a 100 ohm resistor (B1R15) is used in place of the resonant circuit in the drain. Due to the gain of the BF981 at six metres, the use of a tuned input, a tuned output stage would require neutralisation, something the author always avoids. Thus the 100 ohm resistor limits the gain and provides a purposely mismatched load to help keep things "tame".

A small coupling capacitor is used to couple the output of the preamplifier stage into the second tuned circuit, at the input to the mixer. As readers may recall, this tuned circuit in the two metre converter is matched with tapped capacitors rather than the tapped inductors used elsewhere. This was done so the same PCB could be used here. This tuned circuit provides most of the selectivity for the converter.

The mixer, diplexer and post mixer amplifier are all identical to the same sections used in the two metre converter. For convenience and uniformity, the complete schematics and parts list are also shown in this article. Diplexer details are given in part 2 of this series.

LOCAL OSCILLATOR

No separate board has been produced for the local oscillator injection in this transverter. Module 7 of the VK3AFQ *Building Blocks Revisited* series is used instead. This module consists of a fundamental mode crystal oscillator, an MC1496 mixer stage and a Class A amplifier. In this application, the oscillator is operated with a fundamental mode crystal of the appropriate frequency (24 MHz for 52 MHz input with 28 MHz IF). The mixer is not used here but the amplifier is used to boost the output from the oscillator to a sufficient level to drive the two double balanced mixers.

If it is desired to use the six metre transverter with a two metre IF then a 94 MHz injection oscillator is needed, in fact the board from the two metre (six metre IF) transverter can be used here. Amended arrangements for mixer termination and IF amplifier will be discussed in a later installment.

TRANSMIT CONVERTER

Again the transmit converter is similar to the two metre transverters. Provision is made for an input attenuator to allow use of up to five watt exciters. For design details of this attenuator refer to part 3 (October 1987 AR), of this series.

The double balanced mixer is used in the same way and is followed by a pair of tuned circuits as before. There the similarity ends. At these lower frequencies it is possible to use somewhat simpler amplifier arrangements, including Class A feedback amplifiers.

However, simplicity of amplifier arrangements does not mean they are any less critical in design. As frequency decreases, the gain of the transistors increases, thus the lower the frequency the more chance of having unexpected instability and oscillation. If transistors are operated at 50 MHz or below, then significant measures usually need to be taken to prevent instability.

This six metre low power amplifier is a three-stage design with all stages operating in Class A. Using this technique with shunt and series feedback in all three stages, the gain of each is well defined and the chances of instability are dramatically reduced. Although expensive on supply power, this technique gives excellent performance, total power consumption for the three stages is in the order of 220 mA at 12 volts.

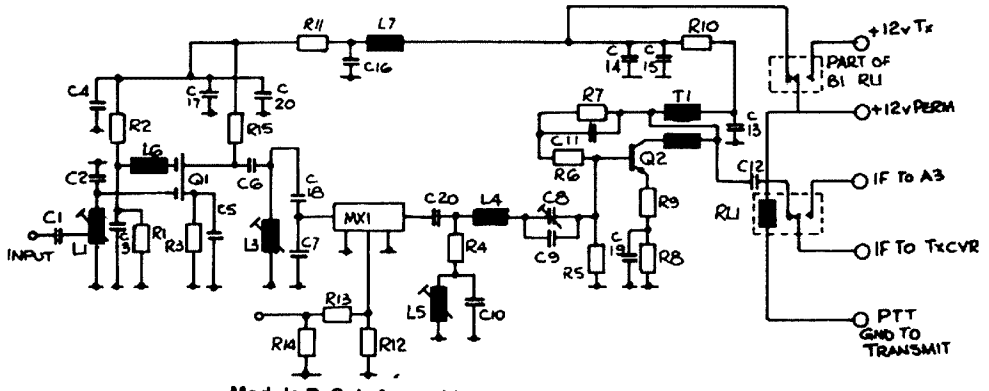
Located at the module input is the now familiar critically coupled pair of tuned circuits. With this arrangement the prototypes gave a frequency response at the 3 dB points of 51.590 MHz to 54.020 MHz, at the 10 dB points the response was from 50.950 to 54.800 MHz. As can be seen, it is only possible to cover one 2 MHz segment of the band, but it could be aligned for response from 50-52 MHz if desired. If the transverter is followed with a power amplifier having an ALC facility, this will flatten out and extend the power bandwidth slightly.

The first two stages are classic Class A amplifiers with shunt and series feedback, each stage having a gain of some 15 dB. Stage 1 uses a BFR96S, X packaged transistor and small commercial broadband transformer or a homemade bifilar toroidal transformer in the collector. Stage 2 uses an NTE77, TO5 transistor fitted with a small heatsink due to the high standing dissipation, both these stages have excellent performance in all respects. The output stage uses a Philips BFQ43 four watt TO39 RF power transistor. This device was chosen because of its ability to perform well in a Class A stage with approximately 160 mA of quiescent collector current. At the output of the module is a fairly conventional pi-section low pass filter.

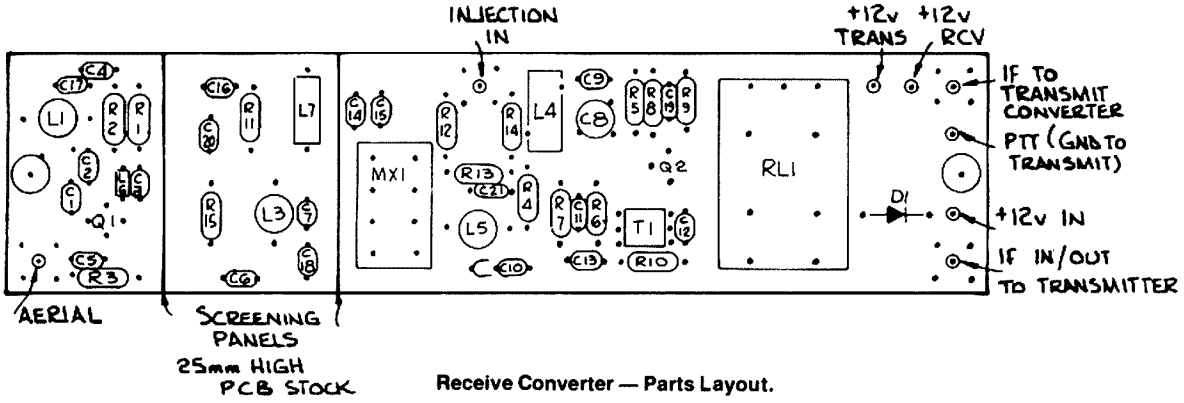
Given that the amplifier chain is functioning well below the 1 dB gain compression point and with the good inter-modulation performance of the mixer, it was found that the second harmonic was approximately -60 dBc and third order inter-modulation products were at a level of approximately -48 dBc.

ALIGNMENT

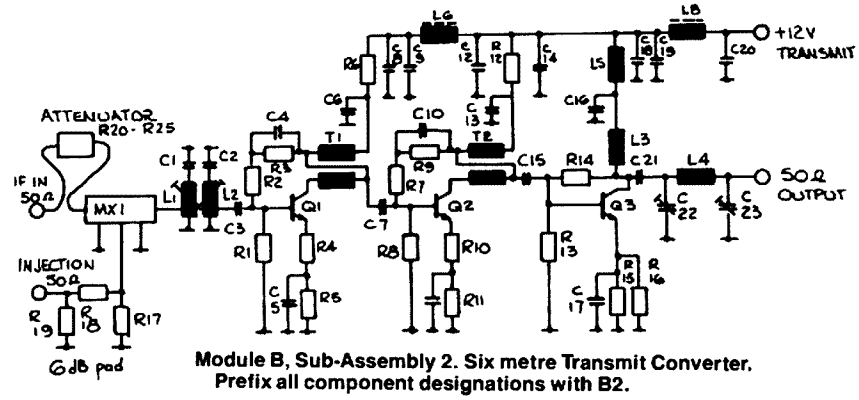
In general, the alignment of this module is similar to all of the others. All cores should be set at the top of their formers and the trimmers at approximately half-range. The crystal oscillator trimmer should be adjusted to 22 or 24 MHz as is appropriate if a frequency counter is available. If a counter is not available, leave it is the centre.



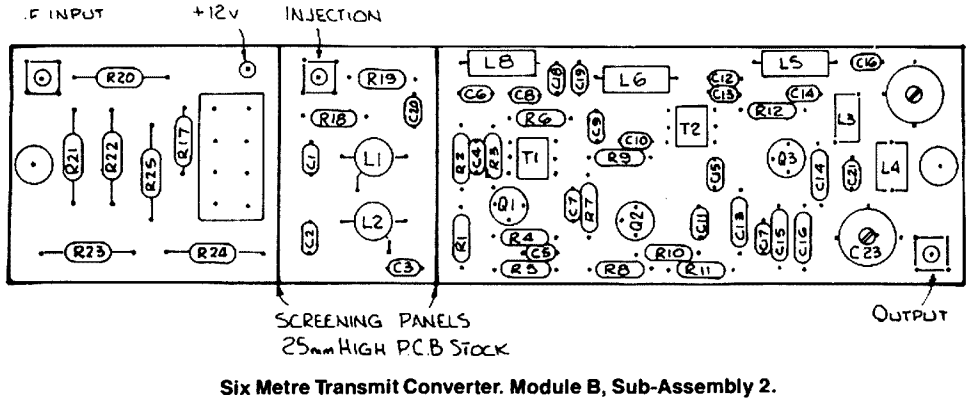
Module B, Sub-Assembly 1. Six metre Receive Converter.



Receive Converter — Parts Layout.



Module B, Sub-Assembly 2. Six metre Transmit Converter.
Prefix all component designations with B2.



Six Metre Transmit Converter. Module B, Sub-Assembly 2.

The transmit converter has only a minimum of adjustments, the filter following the mixer and the output harmonic rejection low pass filter. Set the cores in B2L1 and B2L2 level with the top of their formers and the two trimmer capacitors B2C22 and B2C23 to centre position. With drive applied and the output feeding a 50 ohm load, adjust the filter cores for maximum output and then the trimmers likewise for maximum output.

ADDITIONAL NOTES

Several local amateurs have requested a two metre to six metre transverter to allow them to utilise their two metre multi-mode transceivers on the lower band. This is possible by using the transmit converter as it is but with 92 or 94 MHz injection. This can be done with the local oscillator section of the two metre transverter previously described. The receive converter module requires modification for the much higher IF frequency, a modification should be available soon and will be published as soon as practical, but in the meantime it is possible to run the converter with just a 6 dB 50 ohm pad for termination in place of the diplexer, followed by a low gain (6-10 dB) amplifier if necessary.

Many two metre receivers have significantly better sensitivity than their HF counterparts so the additional gain may not be needed. If it is, then the following changes are suggested to allow the IF amplifier to work at 144 MHz. Remove B1T1 from the PCB and connect a 4.7 uH RF choke from the collector of B1Q2 to the top of B1C13. Now place a small bridge of wire between the collector of B1Q2 and B1C12 to couple the IF output and to reconnect the feedback network B1R7, B1C11 and B1R6.

ADDENDA

Some of you may have noticed some slight discrepancies between the photographs in parts 2 and 3 of this series when compared with the layout drawings presented. This is due in large measure to delays in the availability of final printed circuit boards. Copies of the correct layout drawings will be sent with all boards and kits.

AVAILABILITY

Due to the reasonably complex nature of this series of projects and the necessity of using double-sided printed circuit boards on all modules, with some of the later ones having plated through holes, I have decided not to release the artwork for the printed circuit boards. This is not an attempt to promulgate a commercial project series, but to protect myself and many others from the efforts of some over enthusiastic amateurs.

For your convenience, printed circuit boards and kits of components are available from the Frankston and Mornington Peninsula Amateur Radio Club (see Hamad under *Building Block Modules* this month). Assembled and tested boards, individually or in combination will be available from Kamtron Industries of Rowville, Vic. (See advertisement, page 7 October AR).

AUTHOR'S NOTE

The author will gladly answer technical queries on receipt of your written inquiry accompanied by a SASE. Due to other commitments and limited time, it is impossible to answer telephone inquiries.

PARTS LIST — Module B Sub-Assembly 1, Receive Converter

B1C1	1nF	Ceramic Plate
B1C2	10 pF	NPO Ceramic Plate
B1C3	1 nF	Ceramic Plate
B1C4	1 nF	Ceramic Plate
B1C5	1 nF	Ceramic Plate
B1C6	4.7 pF	NPO Ceramic Plate
B1C7	100 pF	NPO Ceramic Plate
B1C8		See option table (previous article)
B1C9		See option table
B1C10		See option table
B1C11	10 nF	Ceramic
B1C12	10 nF	Ceramic
B1C13	10 nF	Ceramic
B1C14	100 nF	Monolithic Ceramic
B1C15	10 uF	16V Tantalum
B1C16	100 nF	Monolithic Ceramic
B1C17	10 nF	Ceramic
B1C18	22 pF	NPO Ceramic Plate
B1C19	10 nF	Ceramic
B1C20	1 uF	TAG Tantalum
B1C21	10 nF	Ceramic
B1D	1N4002	or similar Silicon 1A Diode
B1L1	CG108	270-310 nH Adjustable Coil
B1L2		Not used
B1L3	CG108	270-310 nH Adjustable Coil
B1L4		See Option Table
B1L5		See Option Table
B1L6	FC540	Amidon choke bead on lead of B1R2
B1L7	10 uH	Moulded RFC
B1MX1	SBL-1	Mini Circuits Labs Mixer Doubler
B1Q1	BF981	Dual Gate MOSFET
B1Q2	2N3866	TO-39 Transistor
B1R1	10 k	Five percent 0.125 watt Carbon Resistor
B1R2	22 k	Five percent 0.125 watt Carbon Resistor
B1R3	33 R	Five percent 0.125 watt Carbon Resistor
B1R4	51 R	Five percent 0.125 watt Carbon Resistor
B1R5	1 k	Five percent 0.125 watt Carbon Resistor
B1R6	560 R	Five percent 0.125 watt Carbon Resistor
B1R7	3k3	Five percent 0.125 watt Carbon Resistor
B1R8	100 R	Five percent 0.125 watt Carbon Resistor
B1R9	4R7	Five percent 0.125 watt Carbon Resistor
B1R10	100 R	Five percent 0.125 watt Carbon Resistor
B1R11	100 R	Five percent 0.125 watt Carbon Resistor
B1R12	150 R	Five percent 0.125 watt Carbon Resistor
B1R13	39 R	Five percent 0.125 watt Carbon Resistor
B1R14	150 R	Five percent 0.125 watt Carbon Resistor
B1R15	100 R	Five percent 0.125 watt Carbon Resistor
B1RL1	NF2-12V	National two-pole 12 volt relay

PARTS LIST — Module B Sub-Assembly 2, Transmit Converter

B2C1	22 pF	NPO Ceramic Plate
B2C2	22 pF	NPO Ceramic Plate
B2C3	10 nF	Ceramic Plate
B2C4	10 nF	Ceramic Plate
B2C5	10 nF	Ceramic Plate
B2C6	10 nF	Ceramic Plate
B2C7	10 nF	Ceramic Plate
B2C8	10 nF	Ceramic Plate
B2C9	4.7 uF	Tantalum
B2C10	10 nF	Ceramic Plate
B2C11	10 nF	Ceramic Plate
B2C12		Not used
B2C13		Not used
B2C14	100 nF	Monolithic Ceramic
B2C15	10 nF	Ceramic Plate
B2C16	10 nF	Ceramic Plate
B2C17	10 nF	Ceramic Plate
B2C18	10 nF	Ceramic Plate
B2C19	4.7 uF	Tantalum
B2C20	100 nF	Monolithic Ceramic
B2C21	10 nF	Ceramic Plate
B2C22	130 pF	Film Trimmer
B2C23	130 pF	Film Trimmer
B2L1	CG108	270-310 nH Adjustable Coil
B2L2	CG108	270-310 nH Adjustable Coil
B2L3	10 uH	Miniature Moulded RFC
B2L4	6T #22	T50-6 Core
B2L5	1 mH	Miniature Moulded RFC
B2L6	10 uH	Miniature Moulded RFC
B2L7		Not used
B2L8	100 uH	Miniature Moulded RFC
B2MX1	MCL SBL-1	Mixer
B2Q1	BF96	
B2Q2	NTE77	with small Heat Sink
B2Q3	BFQ43	with small Heat Sink
B2R1	1 k	Five percent 0.25 watt Carbon Resistor
B2R2	560 R	Five percent 0.25 watt Carbon Resistor
B2R3	3k3	Five percent 0.25 watt Carbon Resistor
B2R4	4R7	Five percent 0.25 watt Carbon Resistor
B2R5	82 R	Five percent 0.25 watt Carbon Resistor
B2R6	33 R	Five percent 0.25 watt Carbon Resistor
B2R7	560 R	Five percent 0.25 watt Carbon Resistor
B2R8	1 k	Five percent 0.25 watt Carbon Resistor
B2R9	3k3	Five percent 0.25 watt Carbon Resistor
B2R10	4R7	Five percent 0.25 watt Carbon Resistor
B2R11	18 R	Five percent 0.25 watt Carbon Resistor
B2R12		Not used
B2R13	240 R	Five percent 0.25 watt Carbon Resistor
B2R14	1k2	Five percent 0.25 watt Carbon Resistor
B2R15	10 R	Five percent 0.25 watt Carbon Resistor
B2R16	18 R	Five percent 0.25 watt Carbon Resistor
B2R17	150 R	Five percent 0.25 watt Carbon Resistor
B2R18	36 R	Five percent 0.25 watt Carbon Resistor
B2R19	150 R	Five percent 0.25 watt Carbon Resistor
B2R20		See Text — Attenuator Design Detail
B2R21		See Text — Attenuator Design Detail
B2R22		See Text — Attenuator Design Detail
B2R23		See Text — Attenuator Design Detail
B2R24		See Text — Attenuator Design Detail
B2R25		See Text — Attenuator Design Detail
B2T1	T101	MCL Transformer or 5T # FT37-61 core Bifilar
B2T2	T101	MCL Transformer or 5T # FT37-61 core Bifilar

ar

Frequency Bands and Emissions

by the Future of Amateur Radio Working Party

The Working Party membership includes:
Ron Henderson VK1RH
Gordon Bracewell VK3XX
John Aarsse VK4QA
Stephen Phillips VK3JY

INTRODUCTION

The Future of Amateur Radio Working Party (FARWP) is preparing a series of Working Papers addressing future issues facing the Amateur Radio Service in Australia over the near and more distant future.

An earlier paper identified a number of factors which become limitations or constraints on the Working Party's deliberations. Frequency bands and emissions did not feature strongly in those factors, apart from acknowledging the need to conform to national frequency allocation plans, the national observance of ITU Radio Regulations and the assertion that occupied bandwidth was a more important characteristic of an emission mode than the precise details of how the intelligence was generated and then modulated onto the carrier.

AIM

The aim of this second FARWP paper is to clarify the available frequency bands and emission modes and to examine effects of possible changes in the future.

FREQUENCY BANDS

CURRENT SITUATION

Australian amateur radio frequency bands were examined in considerable detail by the Federal Council of the Institute in the "Band Plans for the Amateur Radio Service" paper adopted at the 1986 Federal Convention. That paper reviewed the status, (ie Exclusive or shared, gentlemen's agreements on modulation modes and IARU Region 3 considerations), however little detail was provided for bands above 1.3GHz. A brief synopsis of the current situation is given in Table 1.

SHORT TERM WIA POLICY GUIDANCE

The Federal Council has, over the years, developed policies related to a number of the current amateur bands displayed in Table 1 in addition to some other desired amateur allocations. These are considered in ascending frequency order in the following paragraphs.

VLF AND MF BANDS

There are two current policies; to seek a narrow band or spot frequency at VLF at about 190 kHz '(84.09.11) and to extend the 1.8 MHz band to 1.800 - 2.000 MHz '(75.110/1).This latter was a WARC79 planning motion and consequently is now in need of review.

HF BANDS

3.5 MHz

An early request for a *DX window* at 3.79 - 3.8 MHz '(71.15.01) was updated to seek 3.5 - 4.0 MHz and eliminate sharing '(75.110/1). This was revised in 1981 to seek 3.7 to 3.9 MHz '(81.127). Expansion of the novice segment was subsequently tied to any increase in this band '(86.09.01/1).

7 MHz

The pre-WARC79 proposal was for 7 - 7.5 MHz and eliminate sharing '(75.110/1). This was revised to seek 7.15 - 7.3 MHz in 1982 '(82.1203).

10 MHz

There are no requests outstanding with regard to the 10 MHz band.

14 MHz

The pre-WARC79 request for 14 MHz was to extend the upper limit to 14.5 MHz '(75.110/1).

18 MHz

There are no requests outstanding for the 18 MHz band, presuming exclusive amateur usage will be achieved in 1989.

21 MHz

The pre-WARC79 request for 21 MHz was to extend the upper end to 21.5 MHz '(75.110/1).

24 MHz

There are no requests outstanding for the 24 MHz band, presuming exclusive amateur usage will be achieved in 1989.

VHF, UHF AND SHF BANDS

50 MHz

A request for return of the 50 - 52 MHz band segment has been in existence since 1977 '(77.125) with a conditional use response. The easing of these conditions remains an active objective of the WIA.

420 MHz

No policies are active on the extent of the 420 MHz band, however opinions have been expressed on the balance between a broad shared band and a smaller exclusive allocation. ATV repeater considerations dominate bandwidth requirements.

576 MHz

The 576 MHz band has been subject to considerable pressure with the WIA policy indicating the need for an ATV repeater frequency allocation which need not be the same nationwide. Many overlapping policies exist with the most recent seeking a permanent ATV allocation '(84.09.07).

1296 MHz

No policies are active to seek changes to the 1296 MHz band, amateur usage of which is secondary and dominated by Department of Transport and Communications ATC radar allocations. Once again the shared band versus small exclusive allocation issue arises.

It is timely that the pre-WARC79 request for an amateur band at 220 MHz be reviewed '(75.110/2).

MICROWAVE BANDS

Recent DOTC initiatives to establish a Multi-point Distribution Service (MDS) in the shared 2.3 GHz band appear to make that band virtually unusable by amateurs, particularly in major cities and for weak signal (EME) working.

There are no policies existing for the remaining microwave bands, all of which are shared bands. Their use by Australian amateurs is restricted to dedicated experimenters whose aims are principally equipment design and development and establishing DX records.

WIA GUIDANCE FOR WARC92 (WORLD ADMINISTRATIVE RADIO CONFERENCE 1992

The WIA has no specific guidelines for WARC92, the topic not having been addressed as yet by the Federal Council. Indeed this paper provides a resume of past actions and current policies and becomes essential reading prior to WIA preparations for WARC92.

It is pleasing to observe that many of the 1975 motions for WARC79 have been achieved. A very few are outdated and clearly unlikely to be achieved.

Other considerations such as exclusive UHF SHF and microwave bands , whilst having a WARC connection, are more for national administration negotiations, unless the IARU sees a need to take a world wide position on exclusive bands. The Institute can be relied upon to actually represent the interests of amateurs in such negotiations.

IARU GUIDANCE FOR WARC92

At the last IARU Region 3 conference in Auckland in 1985, preliminary overtures were made in a paper submitted by the Chairman of Directors to initiate thought as to amateur band implications for the next WARC.

No doubt the Region 2 conference in 1986 and the Region 1 conference this year also considered the matter and a resume of their actions will be made for Federal Councillors prior to the 1988 WIA Convention. Note that with the IARU Region 3 meeting due in Seoul in late 1988, a clear initial WIA position must be presented in that forum.

Points arising from the Region 3 Auckland 85 papers are presented below in ascending frequency band order.

The need for a VLF assignment was raised and it was proposed to raise the MF segment 1.850 - 2.000 MHz to primary equally shared status.

The HF segment 3.750 - 4.000 MHz was proposed to be raised to primarily equally shared status. It was proposed 7.000 - 7.150 MHz becomes amateur exclusive and 7.150 - 7.300 MHz amateur primary equally shared status.

Proposed 10 MHz band be extended to 10.300 MHz and be on an equally shared status.

Proposed 14 MHz band be extended to 14.400 MHz amateur exclusive.

Proposed 18 MHz band be extended to 18.300 MHz amateur exclusive.

Proposed 21 MHz band be extended to 21.500 MHz amateur exclusive.

Proposed 28 MHz band be extended to 30.000 MHz amateur exclusive.

Proposed the 50 MHz band be extended to 50 - 54 MHz amateur exclusive.

Proposed the 144 MHz band becomes 144 - 148 MHz amateur exclusive worldwide.

In the 420 MHz band seek amateur equally shared status except the satellite band 435 - 440 MHz amateur exclusive.

Seek an exclusive amateur segment about 902 - 928 MHz.

Seek amateur primary status for 2400 - 2450 and 3400 - 3420 MHz.

Seek primary equally shared status for 3420 - 3475 MHz.

MF-HF Frequency Allocations — Table 1 — Unrestricted and Novice

	FREQ BANDS IN kHz	STATUS OF ALLOCATION IN AUSTRALIA		OUTPUT POWER PERMITTED		PERMITTED TYPES OF TRANSMISSION *	
		THE AMATEUR SERVICE	THE AMATEUR SAT SERVICE	UNRESTRICTED	NOVICE	UNRESTRICTED	NOVICE
	1800-1825	Primary	No allocation		No allocation		
MF	1825-1875	Secondary (non-interference) 1866-1874 to be avoided					None
	3500-3700	Primary 3525-3625 only allocated to novice			Mean Power 10 watts		CW AM
	3794-3800	Secondary (non-interference) 3794-3795 to be avoided		*Mean Power* *120 watts*	Peak Power 30 watts	CW MCW	ISB SSB
	7000-7100	Primary	Primary			AM ISB SSB FAX SSTV NBVM-AM NBVM-SSB FSK AFSK NBFM NBFM-FAX NBFM-SSTV	
	7100-7300	Secondary (non-interference)	No allocation	*Peak Power*			
	10100-10150	Secondary (non-interference 10137.5-10145.5 to be avoided		*400 watts*			None
	14000-14250	Primary	Primary		No allocation		
	14250-14350		No allocation				
HF	18068-18168	Secondary (non-interference) 18071-18079) 18101-18109) To be 18121-18134) 18141-18151) avoided 18156-18164)	Secondary (non-interference) 18071-18079) 18101-18109) To be 18121-18134) avoided 18141-18151) 18156-18164)				
	21000-21450	Primary 21125-21200 only allocated to Novice	Primary 21125-21200 only allocated to Novice		Mean Power 10 watts Peak Power 30 watts		CW AM ISB SSB
	24890-24990	Secondary (non-interference) 24896-24904) To be 24910-24918) avoided	Secondary (non-interference) 24896-24904) To be 24910-24918) avoided		No allocation		None
	28000-29700	Primary 28100-28600 only allocated to Novice	Primary 28100-28600 only allocated to Novice		Mean Power *10 watts* Peak Power 30 watts		CW AM ISB SSB

* See Table 3

Seek primary status for 5650 - 5670 MHz and primary equalled shared status for 5830 - 5850 MHz.

Seek primary status for 10.45 - 10.5 GHz and primary exclusive status for 24.00 - 24.05 GHz.

Seek primary equally shared status for 76 - 81 GHz and primary exclusive for 119 - 121 GHz.

Seek primary amateur equally shared status for 144 - 149 and 241 - 248 GHz.

GENERAL OBSERVATIONS

With WARC92 looming in five years time, the amateur community must now commence planning both nationally and internationally. Present indications in some countries suggest a hardening of attitudes to further amateur frequency allocations. Furthermore the shared allocations arising from the last WARC in 1979 have not proven completely beneficial to radio amateurs.

EMISSIONS

OCCUPIED BANDWIDTH

The concept of *occupied bandwidth utilised by an emission* was introduced in *Band Plans for the Amateur Radio Service* paper to permit grouping of the various modulation modes. Three bandwidths were identified, namely CW with a maximum bandwidth of 200 Hz, *Narrow Band* with an occupied bandwidth of 1.12 kHz and *Wide Band* for occupied bandwidths greater than 1.12 kHz. (This was further qualified to less than eight kilohertz below 50 MHz, ie AM.) Note also the occupied bandwidth of digital communications is dependent upon the transmission baud rate.

During considerations of band planning, the implied aim was to maximise the number of users (or available channels) whilst minimising mutual interference. The need to allocate spectrum according to user practice and future wishes in a dynamic way, whilst still separating incompatible modes, was acknowledged.

This theme of occupied bandwidth must be continued, for it is considered the characteristics of the modulating signal and not the detail of how it is generated are of greater importance in amateur considerations. This approach acknowledges the *bought out* or *black box* nature of the terminal device and concentrates the amateur expertise in the signal processing stages between terminal and transceiver. In support of this approach, it must be realised that the most complicated digital information stream with in-built error correction appears as a multi-tone modulation at a selected standard baud rate impressed upon the carrier frequency.

MODULATION MODES

Modulation modes may be classified by occupied bandwidth as described above and then further broken down into analogue that is continually variable signals) and digital or discrete state signals. To this end, all commonly encountered and a number of specialist amateur modulation modes are so categorised in Table 2, where each section is that Table progresses from the simply generated modes to the less common modes.

A maximum occupied bandwidth, as authorised by DOTC on amateur licences, is included on the Table for those modes permitted for amateur use. Typical figures are included for the non-authorised modes.

MODULATION CHARACTERISTICS

The two system characteristics influenced most by the modulation characteristics are selectivity and sensitivity. To achieve best selectivity performance sharp bandpass filters should be em-

TABLE 1 — continued

	FREQ BANDS IN MHz	STATUS OF ALLOCATION IN AUSTRALIA		OUTPUT POWER PERMITTED	PERMITTED TYPES OF TRANSMISSION *
		THE AMATEUR SERVICE	THE AMATEUR SAT SERVICE	MAX POWER OUTPUT PERMITTED	PERMITTED TYPE OF TRANSMISSION
V H F	50-52	Secondary (non-interference) Non-interference to any Ch0 50.15-52 WA and Ext Territories Peak power limit 100 watts 50-50.15 NT Peak power limit 25 watts 50.15-52 NT Outside B/C hours of Ch0 stns 50-50.15 SA, Tas. Peak power limit 25 watts 50.15-52 Outside B/C hours of Ch0 Stns	No allocation		
	52-54	Primary			
	144-146		Primary		
	146-148		No allocation	Mean Power	
	420-435	Secondary (non-interference)		120 watts	
	435-438		Secondary (non-interference)		
	438-450		No allocation		
U	576-585	Temporary		Peak Power	
H	1240-1260	Secondary (non-interference)		400 watts	All classes
F	1260-1270		Secondary (non-interference)		
	1270-1300		No allocation		(Subject to comment by WIA)
	2300-2400				
	2400-2450	Secondary (non-interference). Interference may be expected from ISM equipment			
	3300-3500	Secondary (non-interference)			
	5650-5670		Secondary (non-interference)		
	5670-5725		No allocation		
	5725-5850	Secondary (non-interference). Interference may be expected from ISM equipment			
S	10000-10450	Secondary (non-interference)			
H	10450-10500		Secondary (non-interference)		
F	24000-24050	Primary Interference may be expected from ISM equipment	Primary Interference may be expected from ISM equipment		
	24056-24250	Secondary (non-interference) Interference may be expected from ISM equipment	No allocation		
	47000-47200	Primary	Primary		
	75500-76000				
E	76000-81000	Secondary (non-interference)	Secondary (non-interference)		
H	142000-144000	Primary	Primary		
F	144000-149000	Secondary (non-interference)	Secondary (non-interference)		
	241000-248000	Secondary (non-interference) Interference may be expected from ISM equipment	Secondary (non-interference) Interference may be expected from ISM equipment		
	248000-25000	Primary	Primary		

Table 2 — Modulation Modes.

ANALOGUE	Maximum occupied bandwidth
AM	8K00A3E
DSBSC	8K00A3E
SSBSC	4K00J3E
NBVM	2K00J3EKN
ACSSB	2K00J3EKN
NBFM	6K00F3E
FM	36K0F3E
PM	36K0G3E
FAX	3K00J3C
SSTV	3K00J3F
TV	6M25C3FNN — VSB
Pulse	P1A/P1B/ K2A/K2B/ L2A/ L2B/ M2A/M2B/ K3E/ L3E/ M3E
DIGITAL	
CW	NON
ICW	200HA1A
MCW	6K00A2A
RTTY (Baudot)	1K12F1B
AMTOR	1K12F1B
Packet (HF/VHF)	6K00F2D/36K0F2D
Frequency Hopping	50 to 1000 hops/sec across a bandwidth of tens of MHz
Spread Spectrum	USA/FCC authorised full available bandwidth on bands above 420 MHz

ployed, care taken with the selection of local oscillator and intermediate frequencies and wherever possible incompatible modulations widely separated through band planning.

Sensitivity performance is achieved through optimising the signal to signal plus noise ratios at each stage of the process from antenna to detector. Spread spectrum modes may adversely affect performance by raising the prevailing noise floor.

Technology advances include achieving flexibility in signal processing through digitising early after down-conversion, and making all manipulations thereafter in software or firmware. Bandwidth considerations dictate the required processing speeds but much can be achieved with purpose built VLSI chips. That is, purpose built for general receiving applications or specially designed for specialist applications and adapted to amateur situations in inimitable amateur style!

GENERAL OBSERVATIONS

Amateur radio emission modes may be classified by occupied bandwidth. Furthermore future technical interest will lie in signal processing and interfacing terminal devices to transceivers rather than in the generation of the modulation itself. It naturally follows that the complexity of the signal processing achieved is directly proportional to the technical knowledge level of the amateur qualification held. In other words, basic theory levels can permit simple modes and more advanced theoretical levels are supportive of more complex modes.

CONCLUSIONS

It is predicted by the FARWP that amateur frequency allocations will not change markedly over the next 15 years. New bands are unlikely except perhaps at VLF or to replace existing temporary UHF allocations. A somewhat pressing matter for consideration by the WIA would appear to be the trade-off between wide shared allocations, or narrow exclusive segments at UHF

The Amateur Radio Service must begin planning soon, both nationally and internationally for WARC 92 and face the IARU Region 3 conference next year with definite proposals.

The Australian radio amateur is permitted a wide range of emission modes, specified on his licence as permitted occupied bandwidths. This approach permits considerable flexibility for the user, both now and in the future and should consequently be retained. Furthermore, there is a direct relationship between the demonstrated theoretical knowledge level of an amateur licence and the complexity of authorised emission modes.

1. Federal Council Motions
   84.09.11
   75.110/1
   71.15.01
   81.127
   86.09.01/1
   82.1203
   77.125
   75.110/2
   84.09.07

RADIODES

BASIC ELECTRONICS[4]

The procession of electrons past any given spot,
Is called electric current and it makes resistors hot.
It also has magnetic fields within it and around,
And we always say that current goes from positive to ground.
But now we know there's plenty of electrons in the earth,
So positive potential merely means there's a dearth,
And electron flow is opposite — with this we have to live.

So when you press your button or rattle on your key,
And energise your massive quad or long wire to a tree —
The movement of electrons past any given stop,
Is what gives you your power — but you need not feel a clot
If you think the current's flowing down from positive to ground,
Or electrons go off sideways and then spin round and round —
So long as you can tune your rig for signals pure and true,
And someone gives an answer every time you call CQ.

—"Hambard" (Originally printed in the Nigerian ARS Newsletter 1970s)

VHF UHF — an expanding world

Eric Jamieson VK5LP
8 West Terrace, Meningie, SA. 5264

All times are Universal Co-ordinated Time and indicated as UTC

AMATEUR BANDS BEACONS

FREQUENCY	CALL SIGN	LOCATION
50.010	JA2IGY	*Mie (Near Nagoya)*
50.075	VS6SIX	*Hong Kong*
50.090	KH6EQI	*Honolulu*
52.013	P29BPL	*Loloata Island*
52.100	ZK2SIX	*Niue*
52.200	VK8VF	*Darwin*
52.250	ZL2VHM	*Manawatu*
52.310	ZL3MHF	*Hornby*
52.320	VK6RTT	*Wickham*
52.325	VK2RHV	*Newcastle*
52.330	VK3RGG	*Geelong*[1]
52.345	VK4ABP	*Longreach*
52.350	VK6RTU	*Kalgoorlie*
52.370	VK7RST	*Hobart*
52.418	VK0MA	*Mawson*
52.420	VK2RSY	*Sydney*
52.425	VK2RGB	*Gunnedah*
52.435	VK3RMV	*Hamilton*
52.440	VK4RTL	*Townsville*
52.450	VK5VF	*Mount Lofty*
52.460	VK6RPH	*Perth*
52.465	VKBRTW	*Albany*
52.470	VK7RNT	*Launceston*
52.485	VK8RAS	*Alice Springs*
144.022	VK6RBS	*Busselton*[2]
144.400	VK4RTT	*Mount Mowbullan*
144.410	VK1RCC	*Canberra*
144.420	VK2RSY	*Sydney*
144.430	VK3RTG	*Glen Waverley*
144.445	VK4RIK	*Cairns*[1]
144.445	VK4RTL	*Townsville*
144.465	VK6RTW	*Albany*
144.470	VK7RMC	*Launceston*
144.480	VK8VF	*Darwin*
144.485	VKBRAS	*Alice Springs*
144.550	VK5RSE	*Mount Gambier*
144.565	VK6RPB	*Port Hedland*
144.600	VK6RTT	*Wickham*
144.800	VK5VF	*Mount Lofty*
144.950	VK2RCW	*Sydney*
145.000	VK6RPH	*Perth*
432.066	VK6RBS	*Busselton*[2]
432.160	VK6RPR	*Nedlands*
432.410	VK6RTT	*Wickham*
432.420	VK2RSY	*Sydney*
432.435	VK3RMV	*Hamilton*
432.440	VK4RBB	*Brisbane*
432.445	VK4RIK	*Cairns*
432.445	VK4RTL	*Townsville*
432.450	VK3RAI	*MacLeod*
432.535	VK3RMB	*Mount Buninyong*
432.540	VK4RAR	*Rockhampton*
1296.198	VK6RBS	*Busselton*[2]
1296.420	VK2RSY	*Sydney*
1296.445	VK4RIK	*Cairns*
1296.480	VK6RPR	*Nedlands*
10300.000	VK6RVF	*Roleystone*
10445.000	VK4RIK	*Cairns*

1. These are beacons which are listed for the first time as the result of information received during the month.
2. The three Busselton beacons are shown with frequency changes due to a comment in the August issue of *The West Australian VHF Group Bulletin* which said "It was reported last month that the Busselton beacon had been repaired after a recent failure. Significant credit should go to Don Graham VK6HK, who rebuilt the oscillator. The beacon is now operating on 144.022 MHz, on two-metres, and on multiples of this on the 70 centimetre and 23 centimetre bands. Frequency stability is apparently now very good."

From the same bulletin is a comment that the radome has disappeared from the 23 centimetre antenna on the Nedlands beacon. The radome. fashioned from an ice cream contained, has been in the weather for several years, so its loss was not considered too serious!

THE BEACON ISSUE

It seems my blast in August is bearing some results! A number of communications have been received for which I say thank you. It even brought a response from the Federal Office, via Peter Gamble VK3YRP, but there are still many answers needed yet. It appears at this date, 14/9, that nothing has been heard regarding the following beacons:

VK2RHV, VK2RGB, VK2RCW, VK1RCC, VK3RTG, VK3RMB, VK4ABP, VK4RTT, VK4RBB, VK4RAR, VK6RTT, VK6RTU, VK6RPH, VK6RTW, VK6RPB, VK6RPR, VK6RVF, VK7RNT, VK7RMC, VK7RST, VK8VF and P29BPL.

If the present official custodians of these beacons do not feel any need to write, perhaps there are others in the same areas sufficiently interested to prod the custodians into doing the right thing or even writing the required information themselves, to me. If time can be found, all I really need, I suppose, is the frequency, call sign and location of the beacon and whether it is operational or not. But it would be of some value to know the power output, operating mode and antenna system, also height above sea level, if known. Can I plead again for some more co-operation please! ! !

As a matter of interest, a letter from Steve VK4KHQ, at Mount Isa, indicates the Mount Isa Group are looking to establish a two-metre beacon on 144.440 MHz before long, this frequency having been reserved through FTAC. Townsville and Cairns Groups please not this in any sorting out of frequencies you may be undertaking.

Steve says his VK4KHQ keyer, on 52.060, now runs a 15 second CQ call with a five second break (or it may be on 52.050 if he is actually sitting in front of the equipment and able to answer a call promptly, and/or change frequency as required). The keyer can be heard for intermittent periods between 0100 and 0500 and again between 1500 and 1700 UTC, Monday to Friday. Weekend operation is very spasmodic.

On 19/7, Steve VK4KHQ, has an SSB contact with Mike VK8ZMA, in Alice Springs, on 52.050 MHz at 0525 while he (Steve) was portable at Karumba, on the Gulf of Carpentaria, using 10 watts PEP to a quarter-wave whip on his 4WD vehicle. That was his only contact during a two week stay, but then he added "...80 percent fishing and 20 percent radio!" On the way back to Mount Isa he ran the Tono 7000E into the six-metre transverter via the FT707, using the same CW identification. He received no calls but would like to hear from anyone who may have heard any of his signal.

Steve also sends some information regarding the Ross Hull which I will ass to other information received from various sources and send it to the Federal Contest Manager at the appropriate time.

THE MICROWAVE BANDS

Wally VK6KZ, a long time proponent of better band sharing facilities for the amateur population, particularly in the microwave regions, and one who has done more than just talk about the problem, has received a letter from the Acting Assistant Secretary, Spectrum Policy and Planning Branch of DOC, Mr Greeney, in response to an earlier letter sent to the Branch. There seems no reason why it should not be printed as the contents are of concern to quite a proportion of the amateur population. Dated August 13, 1987, it reads:

"Dear Mr Howse: I refer to your letter of May 25, 1987, regarding our earlier correspondence about exclusive spectrum allocations for the Amateur Radio Service at frequencies above 144 MHz.

"You requested that consideration be given to the redesignation of a 10 MHz segment (2300-2310 MHz) from the proposed Multipoint Distribution Service (MDS) band plan as a primary Amateur Service allocation. As you have already noted from a report in the Press, the Department is having difficulty accommodating the number of MDS applications already received, within the limited spectrum being proposed for the MDS services. Because of this very high demand for the primary fixed point-to-multipoint services in the 2300 to 1450 band, reallocation of a 10 MHz segment for amateur services as suggested in your letter, is not considered feasible. However the frequency assignment strategy being proposed for MDS reduces the likelihood of MDS assignments being made in the 2300-2310 MHz segment in the short term. In the longer term it is likely that in many areas, particularly in capital cities, assignments for MDS channels in this 10 MHz segment will be necessary. When this happens, amateur operators will have to use alternative amateur allocations for 'moonbounce' propagation experiments.

"Your letter also sought advice concerning the procedure to be followed so that more primary allocations of spectrum can be made available to the Amateur Radio Service, within the existing shared microwave bands. Quite clearly, there is a tremendous increase in the demand for microwave services in Australia. While the current sharing situation permits both licenced services and the Amateur Radio Service to share parts of the microwave bands there is generally no scope for making additional exclusive allocations to the Amateur Radio Service, with the consequent reduction in the availability of microwave spectrum for the important microwave services which currently share spectrum with the Amateur Radio Service.

"There are already a number of primary allocations to the Amateur Radio Service, as indicated in Dr McDonnell's advice to you dated May 13, 1987, as well as secondary allocations spread throughout the microwave frequency bands.

"I regret to advise you that this Department is not able to negotiate the allocation of additional primary Amateur Service allocations in the microwave frequency bands."

I have not spoken to Wally recently, but I expect this reply is really what he expected to get. Clearly, the implications are, that over a period of time, whether it be five years or 50 years, one by one the microwave bands will cease to have any Amateur Radio Service allocations, shared or otherwise, as spectrum demands increase from the "paying business world".

I can appreciate the position the Department is placed in. There is unquestionably a continuing

high pressure demand from industry and government departments for more and more spectrum space. Most of those areas would be lucky to have one radio amateur on their staff, let alone any more. Thus there is never going to be any thought or consideration given to those who experiment and we would be seen by most at decision-making-level as a bunch of public nuisances.

As the letter says "I regret to advise you that this Department is not able to negotiate the allocation of additional primary Amateur Radio Service allocations in the microwave frequency bands" it means the door has been well and truly shut in our faces because there is no longer any avenue open, even for negotiation for primary allocations in the microwave regions, no matter how small the segment may be. If the same philosophy is applied to the shared allocations, then we are in for a very lean time in the future. At least you tried Wally.

THE OVERSEAS SCENE

I had been waiting for Bill Tynan's (W3XO) *QST* pages *The World Above 50 MHz* for September to see what sort of Es season they had during the Northern Hemisphere summer period, which has just concluded. As Australian amateurs of the VHF world know, we had another excellent summer Es period last December, and the almost equally as good one the year before was not really matched by a similar set of conditions during the northern summer. The notes have arrived so I can now tell you haw they fared in the US.

Bill's opening paragraph reads "The 1987 summer Es season has truly been one of most outstanding since amateurs first discovered the mode in the early 30s. Not only were six and two metres affected, but also our one and a quarter metre band produced its first documented two-way Sporadic-E contact."

Of particular interest to the US amateurs were the contacts available across the Atlantic to Europe, beginning during the evening about 2200 UTC (remember, we are talking about the Northern Hemisphere. . .5LP). Signals were not particularly strong but the band seemed alive with G stations until they finally faded out around 0045. During this excellent 50 MHz opening the band also opened with Es on two metres over a large area of the US. One other important opening was the reception of the OX3VHF beacon on Greenland, but all attempts to raise OX3LX, by phone, failed so contacts were missed.

The 50 MHz openings extended beyond England to Holland and Finland, where, in the latter country, OH1ZAA reported completing 10 to six metre crossband contacts with VE1YX, W2CAP/1, and WA1EKV, between 2157 and 2224 UTC. As if all these great openings were not enough, around 0315 K1TOL worked KH6IAA, in Hawaii.

Two days later, on 19/6, during the afternoon, probably the greatest Es opening between North America and Europe ever recorded, with W9IP/2 in northern New York State listing a total of 86 European stations in G, GI, GW GM, GJ, EI, PA0, F and CT, beginning at 1820 and lasting for about three hours. WA1OUB worked 94 and K1TOL 98. Included in the list from WA1OUB are PA0XMA and F6DBI, whilst K1TOL worked LA and PH1.

The good Es conditions certainly were widespread over the Northern Hemisphere; Bill reports JA1VOK, having worked KH6IJ and KH6JJI around 2230 on 15/6 with signals to S9 plus 30 dBI JA1VOK also passed on the news that BV0AE, operating from Taiwan, 5/6 to 11/6, had contacts with all JA districts plus HL9TM and KG6DX. In fact, on this matter, a report from the Japanese *Ham Radio* magazine (courtesy Graham VK6RO) lists a total of 1663 contacts with the two highest areas being JA1 with 452 and JA3 with 439 contacts. There were four HL contacts and VS6SIX beacon being heard at 0326 on 8/6. The first-ever BV contacts during these days were made to the following stations, being the first worked for that area:
JA1VOK, JE2KCP, JA3EGE, JA5EPQ, JA6RJK, JA7QVI, JA8RC, JA9SJI and JR0PFP, also JA4MBM.

During the period 22/5 to 24/6, JA stations had contacts HL1, HL2, HL4, HL5, HL8, HL9, HL0, BV, VS6 and KH6. It is interesting to note there appear to have been no direct contacts between JA and W although there were some reports of JAs having been heard. Perhaps everyone was concentrating on the Europeans!

Bill W3XO, reports there had been more Es double-hop that summer than he could ever remember and, as it coincided with the VFO QSO Party, more stations were on, with six metres being open for almost the whole time. Portugal was worked by many East Coast stations and as far inland as K0. G stations were hearing the Ws but could not break through the contest QRM!

The weekend of the QSO Party produced some great two metre Es DX. On 14.6, WA7JTM, operated portable from 11000 foot Mount Graham in Arizona, and had 32 Es contacts. Stations were being worked simultaneously at single and double hop distances. KI4CI worked 50 Es stations spread over six US States and many worked XE1FUX/XE2 for a new country. It appears the longest Es contact was 1976.7 miles. A further excellent opening started on 29.6 and lasted for over five hoursIpe Whilst all this Es activity was going on it is interesting to record that suitable tropo-ducting conditions prevailed allowing KH6HME to work 120 contact on two metres as well as a number of 70 centimetre contacts, and to K6QXY, in San Francisco, on 23 centimetres.

Finally, what was probably the greatest interest to the US amateurs was the first documented two-way contact via Es on their 220 MHz band between K5UGM and W5HUO. It was due to the very high intensity of Es on two metres which prompted K5UGM to look on 220 MHz where he finally found W5HUQ, after first failing to make a contact. The final signals were S9 plus 50 dB. K5UGM runs 600 watts to a Boomer antenna at 40 feet with a GaAsFET preamplifier with 0.3 dB NF helping the receiver. W5HUQ runs 20 watts to a Boomer with a 0.5 dB preamplifier. It was the only QSO exchanged despite others trying so it was probably in the same realm as the attempt here last year when Roger VK5NY, almost made it to Brisbane on 70 cm and believed to have been Es. We should hear more of these type of contacts as interest increases and more operators become aware that such things do happen occasionally, probably very occasionally!

THE EME SCENE

Doug VK3UM, continues to have successful contacts via the moon, mostly random contacts. On 17/7 at 2345 he worked DL9KR, with 449 sent and 0 received; on 18/7 at 1730 WA9FWD 0 and 0; 1800 W0SD 0 and 0; 0014 OE5JFL 349 and 449; 0040 PA3CSG 439 and 429 (this being a new country); on 14/8 at 2245 DL6WU 0 and 0; on 15/8 at 1515 W9IP 449 and 439; 1530 NC1I 549 and 549; 2300 FD1FHI 439 and 439; 16/8 at 1630 K8WW 439 and 539; 1707 K2YUH 549 and 559, and 1745 K2YUH 439 and 439.

Doug is still continuing to fine-tune the whole set-up and the results he is getting certainly justifies the efforts being made.

While dealing with moonbounce there is a short comment in the August 1987 *The West Australian VHF Group Bulletin* which said "the Dubus magazine recently contained details of somebody working moonbounce on 10 GHz with only 100 mW output power. Problems were experienced on SSB however and the operator had to increase to 700 mW. It is amazing what one can achieve with a radio telescope dish antenna!"

NEW CALEDONIA

A postcard has arrived from Phillip Hardstaff of the South Pacific Commission in Noumea, with a few details of activity from that country. His home call is VK3XGK and he will be at Noumea for one more year with the call sign FK1TS. He has just bought an FT690 MkII and will be building a linear and a log Yagi antenna very soon. At the moment he is active on six metres running barefoot.

Next year, for awhile, he will be in the Cook Islands, ZK1, and hopes to get six metres running there.

On 22/7 from 0800 he had very strong signals from Australian television on 51.750 MHz, and New Zealand television on 50.740 MHz. He called and called, but no one answered. FK8EB was also calling. I can understand his frustrations!

Thanks for the card, Phillip. Please let me have some more information in advance if you can for the Cook Islands adventure so that the VK operators can look for you. One would expect the contacts, if any, to be available during the VK morning hours.

A further letter from Phillip shows, from a copy of his log, that he worked ZL2TPY on 52.050 at 0535 on 27/7 with three watts from the FT690 and received a 3 x 3 report. Other FK stations listed are FK8AX, FK8FL and FK1SB. He is also going to investigate the beacon I have been listing as operating from Noumea (which I have now removed) as he has not heard it operating since being there.

Phillip is also interested in trying two metres and will be looking to invest in a multi-mode unit eventually. This can be coupled to an already available 160 watt amplifier. Phillip would be most interested in operators who would be prepared to try two metres to FK on a regular basis to see what can be achieved. If anyone would like to try, please contact Phillip Hardstaff FK1TS, South Pacific Commission, BP D5 Noumea Cedex, New Caledonia; I am sure he would be pleased to hear from you. This will also give him the added incentive to get two metres on the air!

Phillip's Cook Island run will probably take place around November 1988 and is hoping to work on six metres from both the North and South Islands which represent two DXCC countries. On the return visit he would like to include stopovers on 5W1 and ZK2. So, there exists some future exciting possibilities for VK and ZL stations. Last year his work took him through 3D2, FO, ZK1 and ZL, but unfortunately he did not have any six metre equipment at the time. Most days his work keeps him in his workshop where the equipment is, so he is only a step or two away from daytime six metre operations. Operators should bear this in mind! He offers a ready QSL for any contacts made and asks for a QSL direct, no IRCs etc, as any card to him will get one back by air mail the same day the other one is received. One could not ask for better than that.

GEELONG ACTIVITY

Peter James VK3AWY, has elaborated on some news of the activity taking place in the Geelong camp. Along with news of the status of the beacons there, he says the six metre beacon will be returned to Mount Anakie after repairs in November. It currently runs 20 watts out to a pair of crossed dipoles with 850 Hz shift FSK identification. The Geelong Amateur Radio Club also hold licences for beacons on 144 and 432 MHz. The two metre beacon for 144.530 MHz is under construction and could be ready by November and the 432.530 MHz beacon is on the drawing board and is not expected to be installed until late in 1988. Mount Anakie is also the home of the Geelong two metre repeaters, VK3RGL on 147.000 MHz.

The Geelong members are currently constructing a double brick building to house all their equipment on the mountain and will contain room for four 19 inch racks, workbench, sealed battery compartment, etc, and will have a reinforced concrete roof and a plate steel door, so it sounds like a fortress! Inside there will also eventually be a 432 MHz repeater, UHF CB repeater and a few other things too. Incidentally, Mount Anakie is about 35 km north of Geelong and 398 metres above sea level.

OTHER MATTERS

I note from *Practical Wireless* (courtesy Steve VK5AIM) that Geoff GJ4ICD, uses a professional

panoramic receiving monitor to check the VHF bands spectrum and this enables him to "see" very easily the development and movement of E-layer propagation. From this he produces daily charts in histogram form. (As a matter of interest, Bob VK5ZRO, used to do this very thing. . .5LP).

From the same publication I note advice being given for UK amateurs not to exceed their licenced ERP of 100 watts. Apparently France has been running a subscription television service for some years well above 50 MHz. Now, however, they are licencing many stations on Channel 2, vision on 40.250 MHz and AM sound on 55.750 MHz. The stations can be on 21 hours a day. Some transmissions are not encoded but many are. (According to GJ4ICD, the late-night programs are quite disgusting, but very popular!). The opinion seems to be in the UK that the French authorities are looking for any excuse to get the UK government to revoke all the amateur 50 MHz licences, especially in view of the fact that the 50 MHz part of the VHF spectrum is allocated primarily to broadcast-use in ITU Region 1.

A letter has come from Wal VK2YHW, near Lismore, with some thoughts on the Ross Hull Contest. These details will also be forwarded to the Federal Contest Manager. As with all other correspondence, I will give readers a idea what others are saying in space which I hope to be able to devote to the Ross Hull before long. Thanks Wal.

DXPEDITION

Neville VK4ZNC, is currently planning a November/December DXpedition to three countries. Two of these will be unique to the six-metre enthusiast.

This will be the last of Neville's trips because of the upgrading of the sun spot cycle, so do not miss this opportunity, if Neville can achieve it. Interested? Then keep your antennas pointed to the north-east Pacific area with the receiver on 52.050 MHz.

Also, don't forget to listen for Dave VK0HI, on 52.170 MHz with a 180 degree difference in beam headings. Doesn't life become difficult? Good luck with all, or one, or maybe two, even three and if it is four new countries! Do not buy a Lottery Ticket, as you have hit the 'jackpot' and all your luck has run out for 1987, but 1988 is not far away. Good luck, from near the water at Meningie. **THE**

MENINGIE MOVE

The move has been made and VK5LP is now firmly entrenched about a decent golf ball drive from Lake Albert, at Meningie. Please note the new address at the top of these lines and that of the house number.

The move was made during the week beginning 24/8. Everything went like clockwork and there were no hitches except for the rain! It simply poured during more than half the loading operations, as if the Hills were having a final say! The welcome at Meningie was also in the rain, but it soon cleared and almost everything went inside quite dry. The house part is set up reasonably for our comfort but all the amateur radio equipment is still in cartons. New benches and shelves are being installed as I write these notes, so in the next few days I should be able to unpack some equipment after the benches have been given a finish of Estapol®

I have been a little concerned at the height of a rise close to me in the south-easterly direction. As I could find no one to measure it for me I laboriously did it with a spirit level, a long straight piece of aluminium tube (50 mm) and a calibrated vertical lube. The ground distance from the position where the tower will stand to the top of the rise is 195 metres (640 feet) and it's height is 19.35 metres (63'6"). That is about six metres higher than I originally thought, which is a nuisance but well within the capabilities of my 75 foot winch-up tower. It means I cannot make as much use of a secondary tower which could go to 40 feet as I envisaged. Nevertheless, once the rise is topped there is nothing in the way for a very long distance and, in a westerly direction I will be looking straight at the ocean being well above the intervening land. I am aiming to be back on the air in November which will give me a chance to try the site for summer Es.

Closing with two thoughts for the month: *Fame is essential to a painter but harmful to a forger;* and *Being put on a pedestal has disadvantages which you are apt to discover the first time you fall to watch your step!*

Everyone will now have to forget me as *The Voice in the Hills* because that no longer applies. I have now become *The Voice by the Lake.*

73. Eric VK5LP

ar

BILL VK4WL

Bill VK4WL, lives on Prince of Wales Island, which is located in Torres Strait between Cape York and New Guinea. It is only a short distance from Thursday Island.

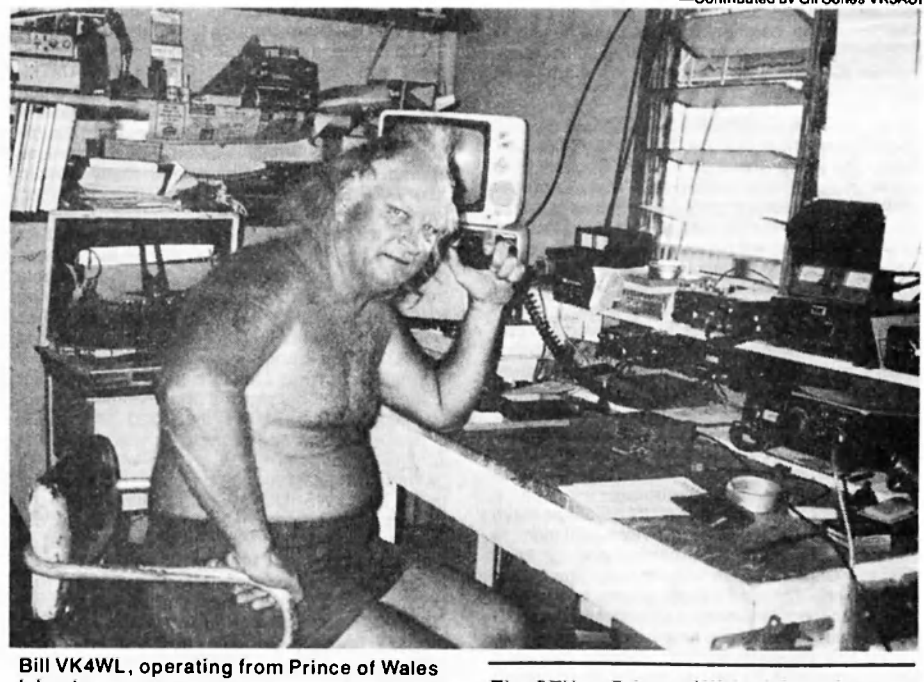
Bill enjoys a very pleasant QTH overlooking the beach. He is operational on six and two metres, as well as HF

During the Sporadic E season Bill welcomes contacts on two and six metres.

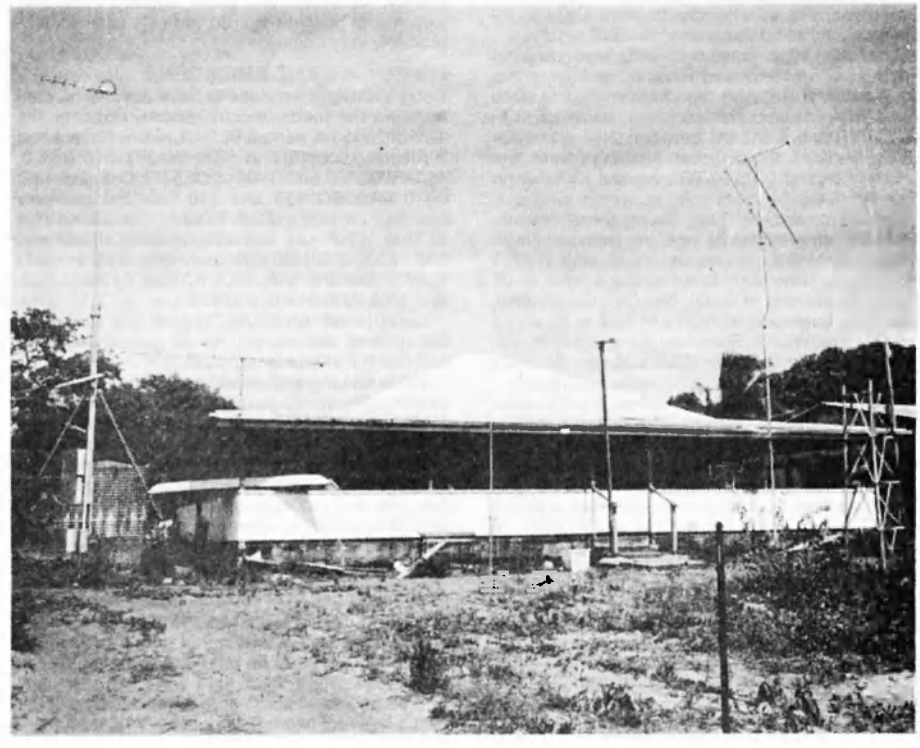
Bill's location is just about as far north as you can work and still be working within Australia!

Watch for him on six and two metres during the coming Sporadic E season.

—Contributed by Gil Sones VK3AUI



Bill VK4WL, operating from Prince of Wales Island.



The QTH on Prince of Wales Island, home to Bill VK4WL.

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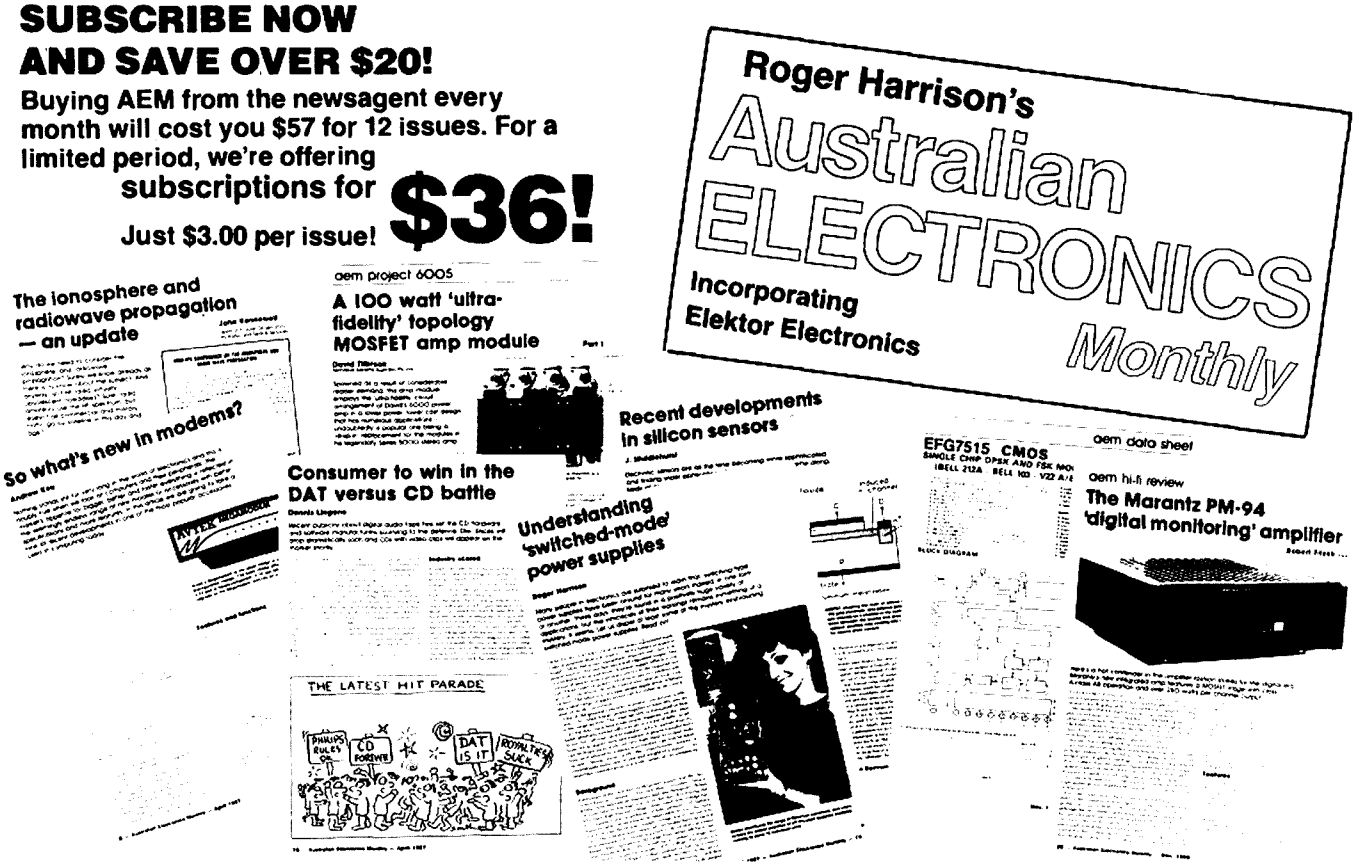

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Novice Notes

QUARTZ RESONATORS (Crystals)

Drew Diamond VK3XU
Lot 2, Gatters Road, Wonga Park, Vic. 3115

The overall efficiency of present day communications and broadcasting would not be possible but for the development of modern quartz oscillators, commonly known as 'crystals'. They are manufactured from crystalline quartz, SiO_2, which occurs in nature as a rhombohedral crystal.

Quartz is a piezoelectric material. Piezoelectricity is electric polarisation produced by mechanical strain. Conversely, a mechanical strain is produced in a crystal by a polarising electric field. As suitably prepared slices of the crystal make efficient vibrators, these slices can therefore be employed as the frequency determining elements in electronic circuits such as high stability oscillators and narrow band filters.

The quartz slices are designed to vibrate with a mode of motion that permits, among other considerations, rather small pieces of quartz to be used.

Crystalline quartz grown artificially in autoclaves (cultured quartz) is now widely used in place of natural quartz for the manufacture of resonators and optical instruments.

Figure 1 shows the orientation of the most commonly used crystal 'cuts'. The slices as shown are cut from the parent crystal by circular diamond impregnated saws, then lapped and polished to the required dimensions with special emphasis on the flatness and surface finish. To minimise frequency change with temperature, the angle between the major surface and the crystalline axis is critical. In some cases the tolerance is ± 15 sec of arc. This angle is measured in an Xray goniometer. The metal electrodes (usually gold or silver), coupling the quartz element to the

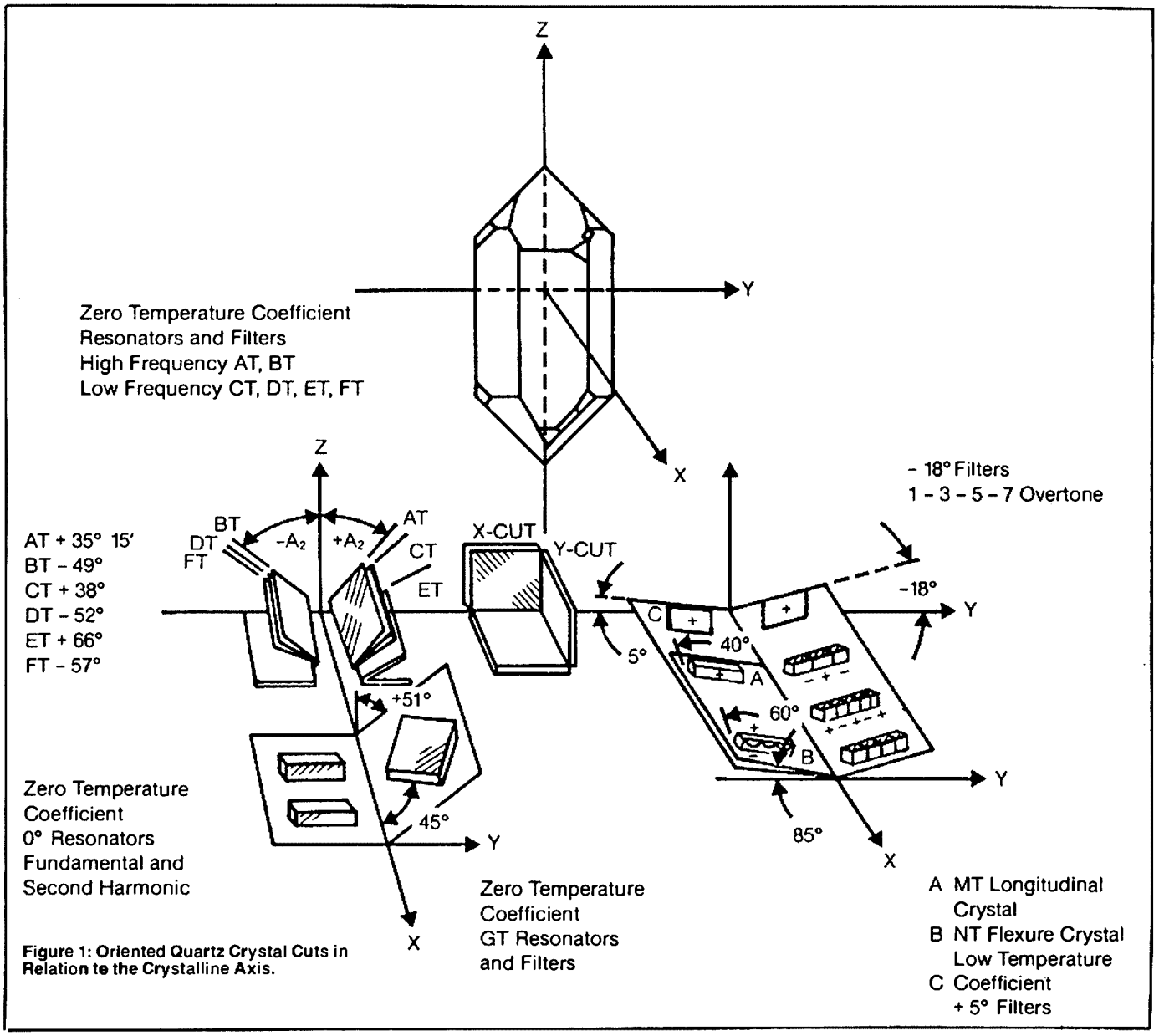

Figure 1: Oriented Quartz Crystal Cuts in Relation to the Crystalline Axis.

external circuit are deposited onto the surface by evaporation at low pressures. Most metal encased crystals are evacuated, and are back bled to atmospheric pressure with inert nitrogen (this is done so that no moisture remains, nor can enter the sealed enclosure). Resonators designed for high precision oscillators are mounted in evacuated all-glass enclosures.

In an oscillator, the resonator functions as a series tuned circuit of extremely high Q which, in some cases is greater than two-million! Oscillators are designed to employ the crystal so that full advantage is taken of this property. At certain frequencies, oscillators employing well made crystals of modern design may have a daily frequency drift as low as one part in 10^{11} and a short term stability (over an averaging time of one second) in the order of one part in 10^{11}. A number of 5 MHz oscillators of this performance made in the Telecom Research Laboratories have been in continuous service for more than 12 years.

RESONANT FREQUENCY

The resonant frequency of a quartz crystal is generally determined by the dimensions of the plate combined with the mode in which it vibrates.

Resonant frequencies of standard quartz plates range from about 1 kHz to 150 MHz.

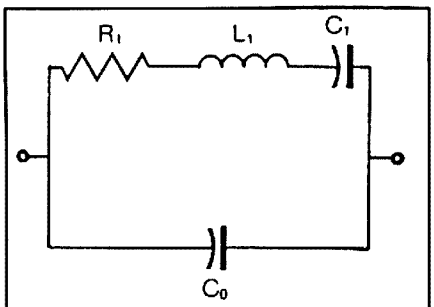

Figure 2: Equivalent Circuit of a Vibrating Crystal.

The equivalent circuit of a vibrating crystal is useful in explaining the basic concepts governing the crystal's performance. See Figure 2.

C_0 represents the static capacitance, which is the sum of the capacitance between the electrodes, and capacitance added by the wire leads and holder.

The R_1, L_1 C_1 branch is known as the motional arm. C_1 represents mass, and R_1 is the sum of the bulk crystal losses.

C_0 — Static Capacitance (electrode plus holder).
C_1 — Motional Capacitance (mechanical elasticity).
L_1 — Motional Inductance (mass).
R_1 — Equivalent Series Resistance (energy loss).

All crystals may be operated in either series mode (resonance — which is nearly equal to the mechanical resonance of the crystal) or parallel mode (anti-resonance). See Figure 3.

The latter is generally more sensitive to external parameter changes with respect to stray capacitance. Therefore, it is recommended to oscillate crystals near the series resonant frequency. In practice, the difference in these two frequencies is a small amount, and is dependent upon circuit capacitance, inductance and drive level, the latter having greater effect in overtone operation (more about overtone mode later).

TEMPERATURE COEFFICIENT

Temperature coefficient is the relationship between frequency stability or deviation with changes in temperature, and is expressed in parts per million (PPM) change over the operating temperature range for the crystal. The mode of vibration, the orientation of the plate in relation to the axis of the quartz, and the dimensions of the plate determine the temperature coefficient.

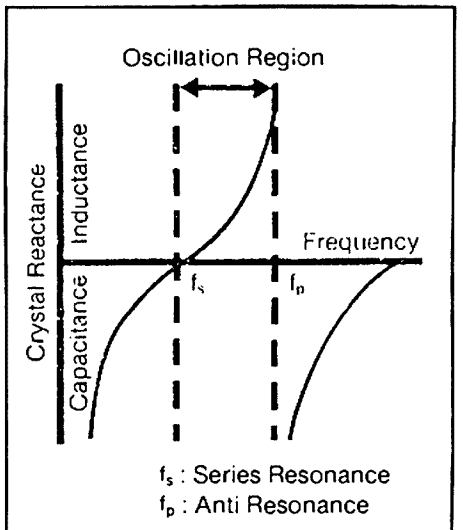

Figure 3: Relationship of Series Resonance to Parallel Resonance (Anti-Resonance).

RESISTANCE AND Q FACTOR

Resistance is the equivalent impedance of the quartz resonator and it determines the Q factor of a quartz crystal. High crystal Qs are obtained by reducing mechanical and acoustic energy losses, which are lumped together as R_1.

The crystal Q is related to the series resonant frequency fs, the motional inductance L, and the equivalent series resistance R_1 by the formula:

$$Q = \frac{2\pi f s L_1}{R_1}$$

A high Q factor, ie a low value for R, reduces the influence of external parameters, such as variations in supply voltage, load, temperature and oscillator components.

SPURIOUS MODES

Spurious (unwanted) modes are non-harmonic modes of vibration of the quartz plate. Since spurious modes are inherent in every crystal resonator, they are suppressed by special design techniques.

DRIVE LEVEL

Drive level, normally expressed in milliwatts, is the dissipated power between the two crystal leads. To assure optimum performance and stability; the level should be the minimum necessary to start and maintain the crystal in oscillation. Excessive drive can result in fracture of the crystal plate, unacceptable frequency drift and poor aging characteristics. Typical maximum drive levels for fundamental crystals would be in the range of 5 to 10 mW, and about 3 mW for overtone crystals.

FREQUENCY TOLERANCE

Frequency tolerance is the amount of frequency deviation (plus or minus) from the desired operating frequency at a specific temperature. It should be noted that commercially, the accuracy requirement for crystal tolerance is expressed as a percentage.

AGING

Aging of a quartz crystal is a general term applied to any change in parameters of a crystal unit taking place over a period of time. To prevent severe aging, circuits should be designed to keep the drive level at the absolute minimum.

LOAD CAPACITY

The load capacity is the sum of the capacity of the crystal socket and any other capacitance across the crystal in an oscillator.

ACKNOWLEDGMENT

The text and drawings above have been adapted from *Telecom Australia Research Laboratories Open Days Handout SE8/H 1985.* The permission of the Director Research, of Telecom Australia to publish the aforesaid material, and Mr J Freeman for his valuable comments is hereby acknowledged.

OVERTONE MODE

At frequencies above about 21 MHz, it is usual to go to overtone oscillators. Almost any modern crystal can be made to oscillate on its third, fifth, seventh, etc overtone, which is roughly 3, 5, 7 times the frequency for which the crystal was ground or etched. In overtone operation, the crystal in effect breaks up into an ODD number of layers, as shown in the sectional view of an AT cut crystal. See Figure 4.

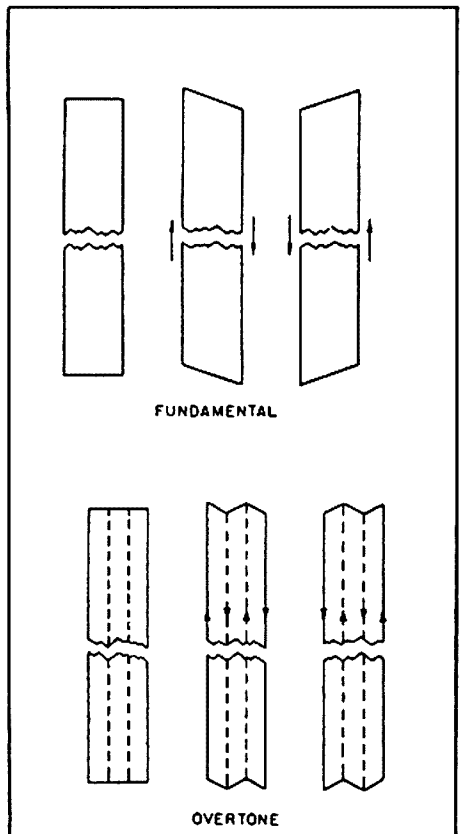

Figure 4: Greatly magnified edge views of quartz crystals, showing the mechanical distortion effect when voltage is applied across the crystal. At the left is a fundamental crystal, and at the right is one oscillating on its third overtone. Frequency of oscillation generally depends on crystal thickness — the thinner the crystal the higher the frequency.

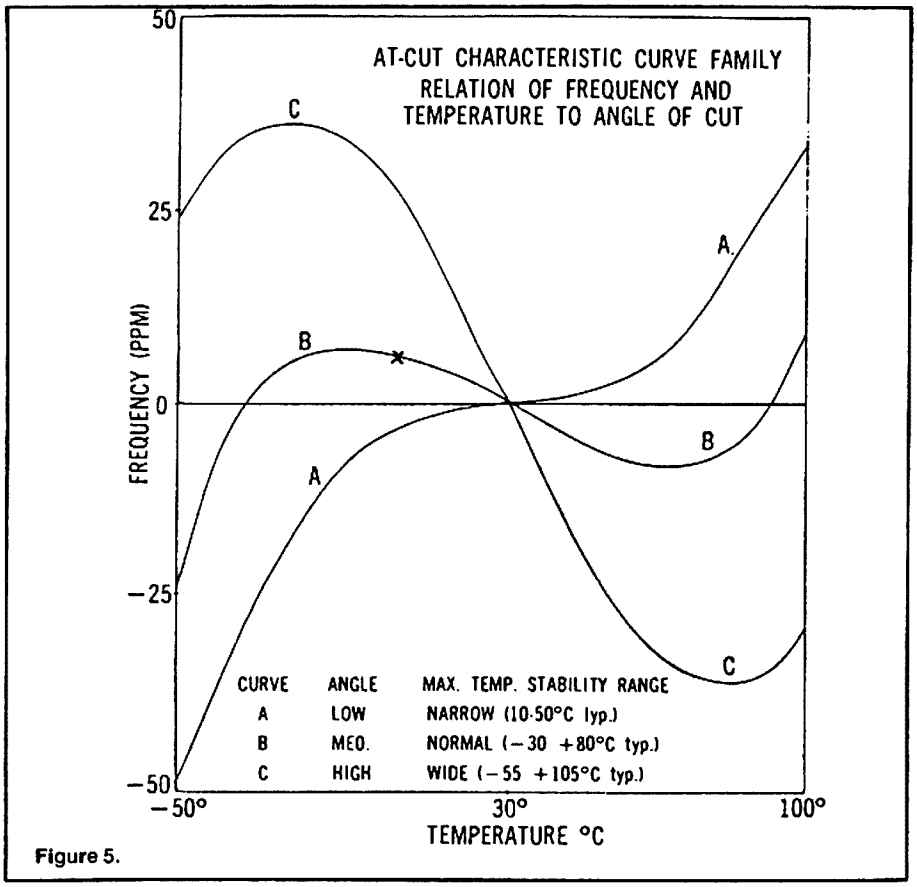

Figure 5.

The complete oscillation cycle is illustrated. Because of mechanical considerations, the overtone frequency will not be an exact multiple of the fundamental frequency, though close to it. Only the odd multiples are available as overtones; there is no such thing as an even numbered overtone. The third, fifth, seventh and ninth overtones can be readily obtained with suitably processed crystals and circuit design.

TEMPERATURE versus FREQUENCY CHARACTERISTICS

Figure 5 shows a typical set of curves for frequency versus temperature for an AT cut crystal. It will be seen that the angle of 'cut' is a compromise, depending on the required temperature range. Curve A for a low angle cut provides close frequency control near 30 degrees Celsius, whereas curve C would provide less stringent control but a wider temperature range is accommodated for a reasonably well maintained oscillation frequency. For oven control of the crystal temperature; the crystal is cut to operate at the 'turn over' point (bottom of the trough) of the designated temperature, so giving a tighter frequency control.

The term "parts per million" (PPM) means that for every MHz of crystal frequency; the actual oscillating frequency moves in direct proportion by the amount indicated. For example; a 7 MHz crystal cut for curve B and set accurately on its nominal frequency at 30 degrees Celsius, but operating at 10 degrees Celsius would be shifted upwards in frequency by 6 (PPM) x 7 (MHz) = 42 Hz. Used in a simple transmitter this shift would not be significant, but if this crystal frequency was multiplied up to some higher final frequency; then this change would be directly multiplied by the harmonic number, and could be a problem.

CASE STYLES

Figure 6 illustrates the three most popular crystal holders used by experimenters. Type HC-6 (English style D) would be appropriate where size is not a problem, and also where the user wishes to change crystals at will, as the size is not so small as to be easily lost.

Type HC-25 (English type K) lend themselves to relatively small scale work. A typical application would be for use in transceivers and computers where the crystal is plugged in and used on a long term basis. The HC-18 is similar, but has 'flying leads' intended for direct soldering into a circuit on a permanent basis. Most electronics parts suppliers now have a number of the most popular clock frequency crystals ex-stock at low prices, generally HC-18 and HC-25 styles.

SPECIFYING A CRYSTAL

As far as possible, the following information should be provided when a crystal is ordered from the makers:

* The exact frequency.

* Mode of operation (eg fundamental, third, fifth overtone etc).

* Operating mode, ie series or parallel (state load C for parallel operation — typically 30 pF. If in doubt, supply circuit).

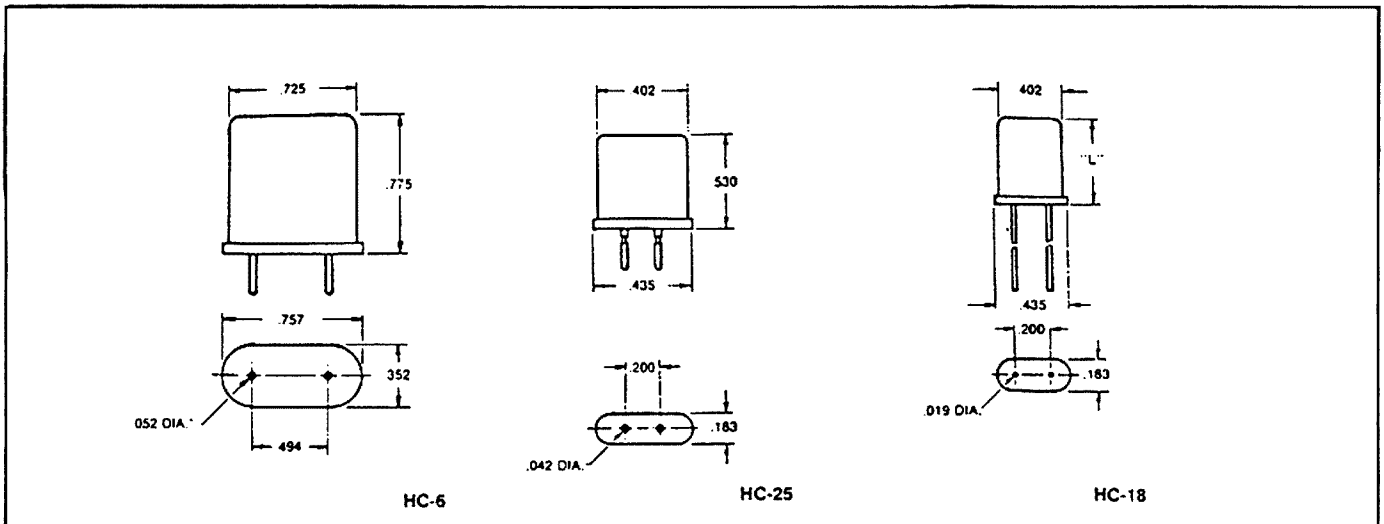

Figure 6: (Please note, measurements are in inches).

* Holder type.

* Expected operating temperature range.

* Temperature stability or frequency tolerance over the expected temperature range (see Figure 5).

* Any additional information if considered appropriate, eg make and model of transceiver and circuit function.

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ar

455 kHz BFO

Peter Parker VK6NNN

C/- Witchcliffe Post Office, WA. 6286

A BFO for use on an AM receiver to correctly resolve CW and SSB.

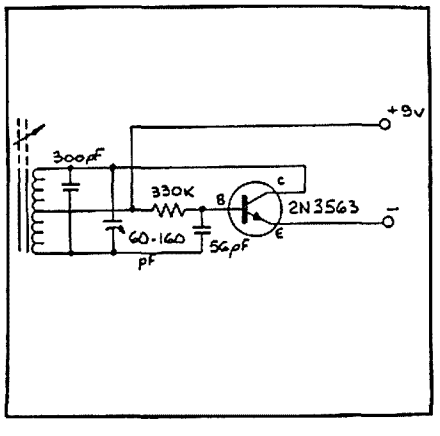
This unit does not need to be connected to the receiver, just placing it on top will usually suffice.

When the BFO is constructed, it is necessary to align it so that it oscillates at around 455 kHz. For the IF transformer, I found a matchstick useful as an alignment tool as it fitted in the alignment hole. The 60-160 pF variable capacitor is varied until 455 kHz is achieved. If turning both the coil and the variable capacitor does not work, the 300 pF capacitor will need to be altered.

ar

COMPONENT LIST

455 kHz IF Transformer
2N3563 Transistor
330 kohm resistor
56 pF Capacitor
300 pF Capacitor
60-160 pF Variable Capacitor
9 volt Battery



RODENT REVELS

John Lingards Sykes G3SRK

7 Hill Top, Lingards Road, Slaithwaite, Huddersfield, HD7 5UA

Never a dull moment as a ship's Radio Officer.

"For two pins I'd ram the Eddystone Light and find out whether rats really leave a sinking ship. If it is *true* I would be happy to go down on the bridge of my rat-free vessel." The Captain was just about the end of his tether and none of us around the saloon table had any word of comfort.

All ships provide food, accommodation and free transport for *some* rats but the S/S *Edendale* when I was her radio officer in the mid-20s was a rodents' paradise, the most popular rats' boarding house afloat and with a very distinguished clientele. The vessel, a steamship with auxiliary sails or, If you prefer, a sailing ship with auxiliary engine, had been built in the 1880s to serve the Australian immigrant trade but had long since been converted to a bulk-freight carrier without any loss of her classical lines. With her three tall masts, clipper bow and a handsome figurehead representing Eve holding a golden apple in each hand, she aroused interest and admiration wherever she appeared. I am confident that Eastman Kodak made more money from her than did her nominal shareholders. All her officers and crew adored the old lady but not more than her rats, none of whom had ever been seen to leave her. The Chief Officer, hoping against hope that some of his four-footed charges might be tempted to jump ship in Marsailles, a port greatly favoured by rats of all nationalities, had purposefully omitted to affix rat guards to the mooring lines, but all he had to show for it was a whacking big fine and the Captain's formal, if half-hearted reprimand.

After more than a hundred generations of inbreeding it was not surprising that our pedigree pets had developed complete immunity from every known brand of rat poison and disdain from every known breed of cat. Our four non- descript moggies patrolled in pairs during daylight hours, but spent their nights in the crows nest. It was no wonder that the Captain was at his wit's end and the rest of us apathetic, but when the Captain announced that he would pay £50 to any member of the ship's company who could evict his unwanted tenants there was a new surge of interest.

The engine-room staff produced an ingenious spring-loaded catapult intended to flick overboard any rat unwary enough to step on it. It had worked perfectly when tested with one of the Chief-Engineer's shore-going shoes, but no rat approached within a yard of it. A long, slim, well greased plank projecting over the bow and baited with salt pork turned out to be a novel and amusing arrangement for feeding dolphins and its inventor, "Chippy" had visions of patenting the device and selling it to cruise liners, but it didn't drown a single rat. My own attempt, bare electric wires stapled to the wooden deck, failed dismally but how was I to know that a diet that included rubber boots would in the end produce insulated feet? Anyway, I did bag a couple of barefooted seamen and might have got more if a sudden tropical downpour had not short-circuited the ship's generator.

Such then was the state of play as the S/S *Edendale* put into the German port of Bremen, at the mouth of the River Weser. Most of us in the officers mess had either forgotten about the Captain's proffered reward or had given up trying to win it; but not so our young Third Officer. A born romantic and something of a poet, he seems to be the only man aboard to appreciate that 'Hamelin town is in Brunswick' and that 'the River Weser, deep and wide, washes its walls on the southern side.' He had a hunch that the town of the Pied Piper could hold the solution to our difficulty and he determined to go there on his day off. He was well aware that the Pied Piper himself had disappeared into a hollow mountain along with the town's children but he reasoned that over the years the shocked townsfolk could have discovered a better way of dealing with a plague of rats. In the event, the Third Officer's inquiries led him to the Municipality's senior Pest Exterminator, who listened with respect and sympathy to the English youth's story before asking: "What colour are your rats?" On being told that they were common or garden brown he smiled and looked relieved; there was no problem at all! Half a dozen white Siamese fighting rats, if released below decks, would gobble up a ship load of common browns, though naturally it would take a little time. On being asked where white Siamese fighting rats could be purchased it 'transpired' that the Pied Piper's successor had only that morning received a small consignment direct from Bangkok and would be happy to release not more than six at a nominal price of 50 000 Marks (about £3.00) each, plus something for a travelling cage. Nineteen pounds and six caged rats quickly changed hands with much goodwill on both sides. Nemesis was about to strike.

Back on board the S/S *Edendale* the Captain, looking 10 years younger, congratulated his junior officer and handed over £20.00 with an assurance that the money would not be deducted from the reward which would become payable when the ship arrived rat-free at a British port.

The white Siamese fighting rats certainly looked their part, half as big again as our poor Brownies and, with teeth like marlinspikes, but in the officers' mess rejoicing was more muted than might have been expected. In a strange way I think we all felt a bit self-conscious and not a little ashamed over releasing the rodent equivalent of Bengal Tigers among our innocent and unsuspecting fellow travellers. Such stratagems might be acceptable in Siam and even in Hamelin, but the S/S *Edendale* flew the red ensign and whatever the name of the present game, it wasn't cricket. Nevertheless, when our cargo of maize had been discharged, a white Frankenstein was released in each of the four holds, another In the engine- room and the sixth in the paint and rope locker.

After bunkering *and* loading a cargo of coal at Cardiff it was back to Buenos Aires for grain. It was a melancholy passage for those of us who were sensitive to the massacre taking place below.

The Third Officer became insufferable recounting how he intended spending his reward. The Captain was even more self-satisfied and called for a daily count of rats seen on deck. The number decreased steadily from 50 on passing the Longship Light, to three on the day we picked up our pilot at the mouth of the River Plate. So overjoyed was our genial Captain that he promised a day's leave to every man in the forecastle and a slap-up dinner ashore to all his officers. The announcement was made in the officers' mess with unexpected results. The Chief Engineer, a cynic if ever there was one and still bemoaning the loss of his shoe put forward a counter proposal that the celebratory dinner should be held aboard and that we should dine on rabbit. The Captain's wrath was terrible to behold. "Rabbit, Mister? What the devil do you mean, rabbit? If this is some *kind* of joke I would *remind you* that I have no sense of humour, none whatever."

"I only mean that the Second Engineer, the Donkeyman and a couple of stokers have all reported seeing large brown and white rabbits in the stokehold. I know that the Donkeyman has been known to see pink elephants, but never at sea. The Second is a lifelong teetotaller and I have no reason to doubt the veracity of the stokers both of whom have sailed with me ever since I became Chief." There was only a moment of deathly silence before the truth dawned. The Third Officer's face went white, the Captain's Purple. The Second Officer collapsed in a fit of hysterical giggling and several others at the table appeared to be choking.

Yes, you have guessed it! The brown and white spectres were not rabbits, but hybrid rats, twice as large as their Siamese dads and three times the size of their British mums. Where there had been scores before there were hundreds now and this was only the beginning, but a good point to end my story.

ar

Marine Distress Call Procedure

Don Hopper VK4NN
Lloyds Road, Springbrook, Qld. 4213

The information Distress Calls *published in March issue of* Amateur Radio *is* **not** *Distress Call Procedure. It was produced essentially for the Inshore Boating Service and CB Service to assist in determining if an apparent distress call is genuine. Off-shore situations are usually quite different. VK4NN clarifies the issue and describes a number of real-life emergencies.*

I doubt whether there are any small craft, operating in Australian coastal waters which would have only amateur radio on board. Most speedboats, cabin cruisers and coastal yachts have a 27 MHz marine radio and a large number now also have VHF marine radio. The Australian Coastline near the centres of population is well covered by a radio network operated by the Volunteer Rescue Groups and there is little chance of a distress call on 27 MHz being missed by these stations.

It is my opinion that a small vessel equipped with 27 MHz marine radio and also having amateur radio on board would, should an emergency arise, call on 27 MHz emergency in preference to calling on an amateur radio frequency.

The appendix 3.1, Distress Call Interrogation form is not distress procedure. Part One note clearly states "If any answer indicates a *genuine* distress situation exists, immediately carry out standard procedures." The standard procedures mean International Distress Procedure.

I am not aware of the percentage of hoax calls received by the Inshore Volunteer Rescue Group but I do know the radio operators have quite a problem in assessing whether a distress call is genuine. The interrogation form assists them in establishing whether a call is genuine.

The same problem does not exist with distress calls sent by ocean going yachts on amateur radio bands. I know of only one amateur (a VK2) who makes a habit of transmitting hoax distress traffic. He is well known to Police and DOTC. When Sea Safety has me handle the amateur communications, I know his voice and his poor standard of Morse. Nevertheless, when he has claimed he has picked up a distress call it takes about four hours to be certain no distress situation exists.

The Distress Call Interrogation Form (March AR) is not an International Form and should not be confused with International Distress Procedure. For amateurs, the International Distress Procedure is clearly set out in 7.17 to 7.32 of the *Amateur Operators Handbook.*

However, I will set out the procedure and include aspects applicable to Australian requirements.

The Distress Message consists of:

"Mayday" or "SOS" in CW, repeated three times
The name of the vessel, or call sign repeated three times
Position of vessel
Nature of distress and kind of assistance required
Any other information which might facilitate the rescue

With most distress situations arising on amateur radio, panic is usually in evidence and the vessel in distress may not do any more than yell "Mayday". It is up to the amateur receiving the distress call to endeavour to obtain the information required to complete the distress message.

Common-sense is necessary by the receiving amateur. The vessel may be on fire and only a few seconds are available to send a distress call. The most important part of the distress message to obtain is the position of the vessel. On two occasions I have received panic calls, "Mayday, I am on fire abandoning ship". In such instances reply immediately to the call "What is your position, I cannot help unless you tell me". On the two occasions I mentioned, this did the trick and they gave a position before abandoning the vessel.

Immediately you have the distress message, or whatever part of it you were given, quickly check whether any other amateur also heard the traffic and, if so, ask them to monitor the frequency while you telephone *Sea Safety Canberra* — reverse charge to Canberra 47 5244 or STD (062) 47 5244.

Carry out the instructions Sea Safety give you. Sea Safety may ask you to listen for me, VK4NN, as their link on amateur radio for the Pacific Region, or for Art VK6ART, their link for the Indian Ocean.

It was never envisaged by authorities that yachts sailing across oceans would depend on amateur radio for safety of life at sea. No provision was made for our Search and Rescue organisation to have their safety network, via the OTC Coast Radio Service, available to handle distress traffic on amateur radio, Thus, as emergencies increased on amateur bands, VK4NN, a retired Marine Pilot and VK6ART, a recognised experienced operator, were employed by Sea Safety as their amateur links for communications in sea emergencies. Marine emergencies on amateur bands can develop into communication "nightmares". I hope this article may give more amateurs an awareness that once distress or emergency traffic is being handled by Sea Safety Canberra it is no longer amateur radio traffic and amateurs must not interfere with it.

Under International Regulations, the mobile station in distress, eg a cargo ship, is in control of distress traffic. On amateur bands, the vessel in distress is usually a yacht and, for practical reasons, I usually ask the vessel in distress to delegate control to me, VK4NN, under ITU Regulation 3136. However, Sea Safety Canberra is in overall control and I do no more than function as their communication medium. As Control Station, I may impose wireless silence and breaking this silence by amateurs is a breach under International Regulation 3146.

Distress is defined as being Threatened by Grave and Imminent Danger (Mayday). Urgency is defined as "Not being in serious and imminent danger but requires assistance, eg medical advice, disabled, etc, (Pan Pan). There is another unfortunate amateur radio signal, a double break, "Break-Break" which is accepted by maritime mobile nets as being some emergency. It leaves the station receiving the double break having to decide whether it is a distress or urgency situation, which is most unfair.

Following are some of the situations which have arisen recently on the amateur bands.

1. Yacht (a Chinese junk) on a voyage from Samarai to Cairns. Top of rudder post gave way, unable to repair. Disabled in rough seas. Did not know their position. Had sextant but no knowledge of how to do the calculations to establish their position.
   I had the crew take sun sights and I did the calculations in my chart room. Established yacht's position 75 miles off course and drifting on to Osprey Reef. Advised crew to set sails and idle engine so that they drifted clear of reef.
   Two and a half days to shepherd vessel safely into Lizard Island.

2. Yacht on voyage Port Moresby to Cairns. Bobstay snapped, bow-spirit cracked, bent vertical, mast unsupported.
   Rough seas, was endeavouring to make Cooktown with a beam sea. Advised them to put wind on starboard quarter and head for a reef opening off Lizard Island.
   Nearly went on reef when engine failed. Game fishing boat towed them to Lizard Island. Exercise took three days.

3. Voyage Brisbane to Honiara. Mast cracked in strong winds and rough seas. Established yacht's position by having crew take sun-sights which they passed to me for calculation. Heading for Mooloolaba In a beam sea, but insufficient fuel to reach port. Suggested they put wind on starboard quarter and head for Bundaberg. Reached port safely after three days.

4. Voyage Suva to Auckland. Skipper's first voyage. Had navigation computer, but did not operate it correctly. After 16 days had not reached Auckland. I had skipper take sights and pass them to me for calculation. I established he was to the west of New Zealand, 660 miles off course and only 540 miles from Sydney. Took eight days to get him back to Auckland!

5. Yacht at anchor on Sou'west side of New Britain. Skipper in severe pain, wife seven months pregnant. VK4 amateur, a doctor, diagnosed stones in kidney, suggested Immediate hospitalisation. Nearest air strip 70 miles away, no roads. Helicopter picked up skipper and landed him at Lae Hospital, 150 miles away, six hours after initial call.

6. Single-handed voyage Noumea to Brisbane by elderly man. Steering failure 70 miles out of Noumea, unable to return. Man In poor shape after three days. Diverted him to Bundaberg to ease his passage. Had to maintain constant contact for seven days due to man's stressed condition. Serious interference by amateur accusing me of "commercial traffic".

7. Yacht on voyage Noumea to Brisbane. Skipper with bad bout of malaria, rest of crew inexperienced and on their first voyage. My Marine Rescue Station, VJ4DZ, used to organise Volunteer Rescue Group to assist vessel into Moreton Bay. A persistent amateur kept interfering claiming what I was doing was illegal and would not let me keep sched with the sick skipper. A poor show.

8. Single-handed yacht in Tongan waters. Skipper swam into a marine stinger. Was in intense pain. Medical advice quickly available from a specialist in marine stingers at Princess Alexandria Hospital in Brisbane.

My involvement with Sea Safety includes locating yachts reported missing by worried families. Happily most are located quickly.

Two yachts departed Mexico together, bound for Fatu Hiva, Marquesas. One yacht arrived okay and after waiting for three weeks, reported the other yacht missing. Information came to Sea Safety from Honolulu Rescue Co-ordination Centre. Six hours later I was able to tell Canberra to advise Rescue Centre Honolulu to look next door to the Centre where the yacht was located. The skipper had diverted 2150 miles to Honolulu and not told anyone!

Most distress call have been from yachts on a reef. Quite a number manage to free themselves and proceed to port. One distress call came from a yacht on a voyage from Honiara to Thursday Island which went on a reef north of Princess Charlotte Bay. The interesting aspect was the vessel had no dinghy or life-raft!

NOTE: "Sea Safety" is the recognised short form of "Federal Sea Safety and Surveillance Centre" which is part of the Department of Transport and Communications. —Ed. ar

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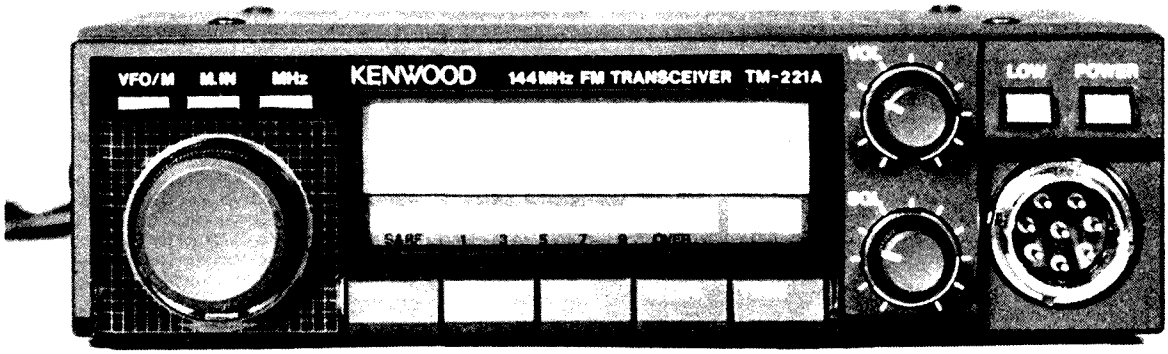

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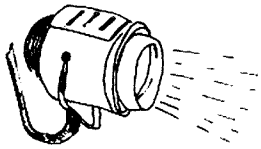

Spotlight on SWLing

Robin Harwood VK7RH
52 Connaught Crescent, West Launceston, Tas. 7250

I have just been reading a very interesting little book entitled *Assigned to Listen* by Vladimir Rubinstein and Olive Renier. It is an account of the early days of the famed BBC Monitoring Service from 1939 to 1943. This is through the eyes (and ears) of the monitors themselves.

It contains reminiscences of the early days when they were based at Wood Norton, near Evesham, Worchester. From early, hectic days, when demands were made upon them, with a lack of suitable translators and receivers that were primitive by todays standards.

The Service persevered and its expertise and information were quickly appreciated by various ministries and other subscribers. Up to the present day, the BBC Monitoring Service has maintained its standards and is still providing information gained from the monitoring and translation of various broadcasting outlets.

There were difficulties coping with static and poor modulation from transmitters, plus adjacent signals, although these problems were not nearly as bad as today's congestion on the shortwave spectrum. They achieved several coups and realised the importance of their work during the early days of World War II.

One translator was a little over-awed when Stalin, the wartime leader, suddenly came to the microphone. This was a few weeks after the German invasion of the Soviet Union in 1941. He had been silent until that point and troops were reeling under the "Blitzkrieg" onslaught. Stalin was nervous and could frequently be heard drinking from a glass. Stalin was, of course, Georgian, and his Russian was heavily accented, which presented difficulties to the translation added to the fact that the acoustics in the makeshift studios were not good which indicated they were probably from an underground bunker. Fortunately, the Soviet broadcasting organisation repeated the address from a studio announcer several times afterwards so that the text was able to be transcribed.

Naturally, the existence of the BBC Monitoring Service was top secret, yet the average person on the street knew that it was a secret wireless station, although they didn't know what transpired there. The effect on the small village of Evesham, with the many foreigners who worked there, is documented in the local paper, although there is no record of the activities of Wood Norton due to national security.

Eventually the decision was made that a new site had to be chosen and an Oratory School, near Reading, was selected. Reading, however, had the draw-back of not being very satisfactory for reception, so another site, three miles away at Crowley Park was chosen to be the receiving site. The Oratory School, at Caversham, was to be used for translation work, from signals fed down from Crowley Park. This came into being in 1943 and the BBC Monitoring Service is still utilising the same two sites today.

I do hazily recollect that satellite dishes were installed at Caversham to monitor the Soviet domestic satellites that feed television to Siberia and the Far East plus, presumably, the Atlantic Ocean satellites that relay television programs from North America and Europe. So, they have kept abreast and are continuing to monitor public broadcasts.

The BBC Monitoring Service certainly is up-to-date with identification of various broadcasting stations and future developments in broadcasting. Until recently many DX magazines had the "World Broadcasting Information" in their news columns, but the cost of this service has escalated beyond their slender means, although the "DX Partyline" on HCJB does broadcast this through the sponsorship of an American electronics firm. It should also be pointed out that the "World Broadcasting Information" is copyrighted.

Assigned to Listen is published by the BBC External Service and costs £3.95 (sterling). I received my copy from the BBC Shop, 35C Marylebone Street, London, W1, thanks to a VK7 who was visiting London for a conference. I am also aware that the BBC World Service also has their own shop C'- PO Box 76, London, England, WC2PB.

Well, Summer is just around the corner and the D87 broadcasting period commenced on Sunday, November 1. The previous period was hectic, to say the least, as one kept abreast of all the alterations stations made in September. These alterations are because of seasonal fluctuations and the need to avoid adjacent stations. Many experienced DXers regard the "S" period as "hopscotch-time", which is a fair analogy.

This month also sees the direct broadcast of two events. The first is on Saturday, November 7, at 0700 UTC. It is from Red Square, in Moscow, and is to celebrate the "Great October Revolution". This year is apparently the 60th anniversary of this event and every year there is a large military parade on that date. Many are probably wondering why celebrate a revolution in October during November! The answer is simple — Russia was on the Julian calendar at the time of the Revolution and the Julian calendar is 10 days behind the Gregorian calendar in the rest of the world. The new Soviet regime quickly brought the calendar forward to the Gregorian calendar. This makes me feel sad for all those who missed their birthdays as I do remember, in history class at school, that there were riots in England from people who missed their birthdays in the 18th Century when they "caught-up" with the Gregorian calendar.

The second event to be broadcast has more relevance to us in Australia and is from Whitehall, in London. It is the Remembrance Service from the Cenotaph, in the presence of Her Majesty the Queen. It is on from 1030 to 1120 UTC, in the usual BBC W/S outlets on either November 8 or 16. This has been broadcast on shortwave for over 50 years.

Well, until December, the very best of DX and 73 from VK7RH.

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TORNADO HITS EDMONTON

Refrigerator found 30 km away!

Sam Voron VK2BVS
2 Griffith Avenue, Roseville, NSW. 2069

It was Saturday, August 1, 1987, at 0730 UTC — that is one of the three times a day when radio contact is made between the third party traffic networks of Australia and North America. Sam VK2BVS, in Sydney, called into the *Australian Traffic Network* to North America, on 7.228 MHz, as he normally does each afternoon. K7QQP, controller of the USA net and Military Affiliated Radio System (MARS), asked Sam if he had any messages for the Canadian disaster area, because VE6UX, from the Canadian emergency network was on frequency.

Sam inquired if there was something wrong and was told that parts of Edmonton had been devastated by a tornado which had hit without warning during the peak hour rush at 5 pm on Friday, a Canadian long weekend.

Amateur radio was providing health and welfare communications for the general public. Telephone lines into Edmonton were congested and virtually non-existent but the internal telephone system was usable. "A state of emergency has been declared" announced VE6UX.

There were 26 dead, 250 injured and a damage bill estimated at over 250 million dollars.

A telephone call to OTC Australia confirmed telephone communications with Edmonton had been unavailable since 0100 UTC, so the Australian Traffic Network swung into action using experience gained from similar past emergencies. This experience allowed Australian amateurs to quickly respond by linking friends and relatives who were unable to communicate by normal means during such a time of distress.

The Canadian Consulate, in Sydney, referred callers to radio amateurs who had volunteered to accept messages from the public. The ABC National News Broadcast announced the telephone numbers of amateurs who could assist them. These included VK7RH, VK3CKK, VK5IQ, VK4NBK, VK6RQ.

Sydney CB operators, involved in the annual simulated emergency radio communications test, organised by the ATN over past years, were able to participate in a real emergency service for the first time, by accepting and delivering all Sydney messages.

This was extremely successful considering the tornado happened on a Saturday, normally the most hectic time on CB radio. Channel 14 AM, 27.125 MHz, was kept clear for the 27-hour duration of the emergency by CB operators acting as net controllers. One such operator was Ian NGD627, who had gained experience from such simulated emergency radio communication tests and was, therefore, familiar with how to assist and how to conduct such a network.

Sam VK2BVS, using his CB radio and call sign, NDG427, collected messages originated in Sydney and destined for Canada. He then passed these on to Mathew NEU232 for delivery. Messages for other parts of Australia were passed on the Australian Traffic Network frequencies — 3.570 MHz at night and 7.060 by day.

Much interest in gaining amateur radio licences have been generated in Sydney as a result of such amateur radio related activities on the CB band. Sydney is a city of four-million people and daily activity currently being focused on Channel 14 AM is increasing the interest amongst CB operators in learning and participating in public service amateur radio related activities. This increases the pool of operators able to assist in future events which may effect a large city like Sydney.

Meanwhile, in Canada, all television and radio stations were telling the country how Canadian amateurs were handling thousands of national and international health and welfare messages for the city of 700 000 people.

Congratulation to all radio amateurs for the quick response they provided to their community. It is pleasing to include Canada with the help we, in Australia, have been able to similarly provide in linking concerned relatives to the disaster areas of Mexico 1985, El Salvador 1986, and Vanuatu 1987.

ar

Electro-Magnetic Compatibility Repor

Hans Ruckert VK2AOU
EMC REPORTER
25 Berrille Road, Beverly Hills, NSW. 2209

Experience shows that there is often more involved than adding a filter to solve a TVA or RFI problem. Disappointment will only be avoided if all requirements are met and understood. If one wishes to build their own filter, they can use the mathematics published in radio amateur handbooks (see also AR, July 1982, page 17). Testing the attenuation versus frequency one will often discover that, at frequencies above 30 MHz, the attenuation leaves very much to be desired. Simple theory does not consider that the capacitors used do not only have losses but they have leads, which represent inductance and cause self-resonances. Similarly, the coils have losses and capacitance. If the various filter sections are not shielded with soldered in partitions, or the lid has gaps (insufficient solder or too few screws), more breaks in the attenuation versus frequency curve are likely.

The filter effect is also reduced, if the filter is not directly connected to the equipment shield, but via a length of coaxial cable with insufficiently RF-tight shield braid.

Figure 1 shows the coupling resistance of different coaxial cables in milli-ohm per metre as a measure of the shielding efficiency. Curve one is for single braid, two for double braid and the third for metal tube shield. That is why professional test equipment uses metal tubing instead of coaxial cable. The safety capacitors of 470 pF at the television antenna terminals, which separate the braid of the television coaxial antenna cable from the television chassis, are also helping the harmonics of the 15.625 kHz line frequency oscillator to reach the antenna thus causing RFI to broadcast receivers from long waves to short waves within the house and neighbourhood. A separation transformer may help in many cases (AR, March 1987, Figure 4 and 5). These safety capacitors were removed during TVA tests on a "Blaupunkt" television and the immunity improved by 15 dB at VHF and by 20 dB at UHF, the manufacturer reported. Their 23 ohm reactance at 14 MHz reduced the effective earthing of coaxial braid at the television chassis. The earthing of a highpass filter case would be similarly affected.

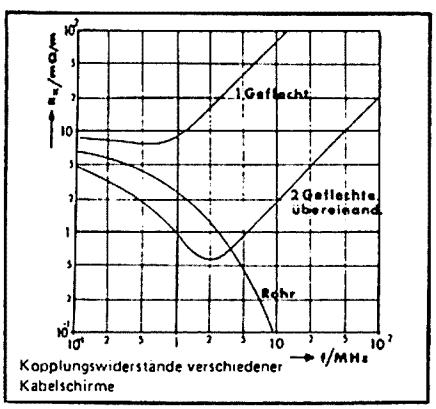


Figure 1: RF Coupling Resistance in mohm/m of Coaxial Cables with one layer and two layers of Braid and Metal Tubing Shield.

It is understandable that the industry attempts to use as little filter effort as possible, if such a filter does the job. Figure 2 shows a highpass filter made by Philips. All components are placed on a small PCB of about the size of a postage stamp. 20 dB attenuation at 14 MHz may be enough in some cases, if the filter is soldered to the tuner shield.

Examples. The following drawings are from the book *Elektromagnetische Vertraglichkeit* published by "Expert Verlag" author Dipl Ing D Jaeger. (The book was a present from DL1BU, who visited VK recently). The lessons we can learn from these drawings apply not only to the shielding and connecting of filters to transceivers and transmitters, but also to the interconnecting and earthing of the different parts of an amateur station. Such parts might be: transmitter, receiver, amplifier, processor, match-box, preamplifier, power supply, and monitor with computer, and filters.

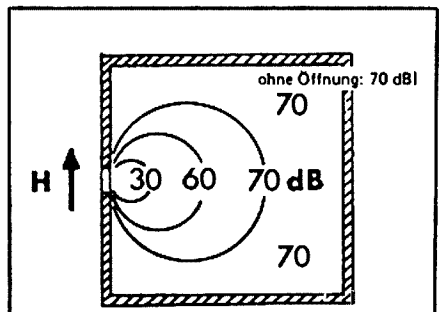


Bild 6.20: Verringerung der Schirmdämpfung durch eine Öffnung

Figure 3: Reduction of the Shielding Attenuation by an opening in the side wall.

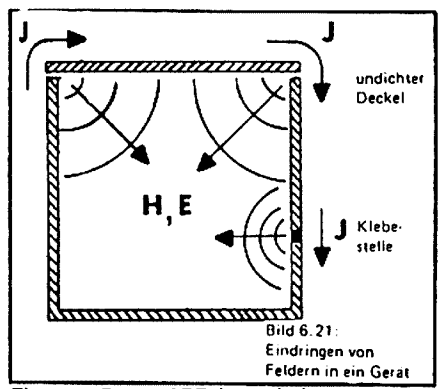


Bild 6.21: Eindringen von Feldern in ein Gerat

Figure 4: Entry of RF through the inadequately closed lid, and via a hole at one side with an insulated but not shielded wire.

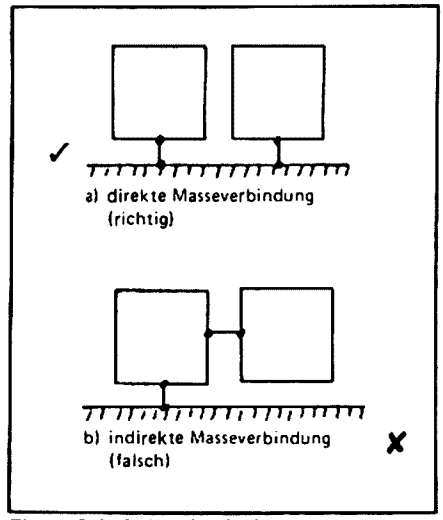


Figure 5: Left drawing is the correct way, and the drawing at right shows the wrong way of earthing several pieces of equipment which are interconnected.

6.3.5 EMV-gerechter Aufbau eines Gerätegehäuses

Eine Übersicht vermittelt Bild 6.23.

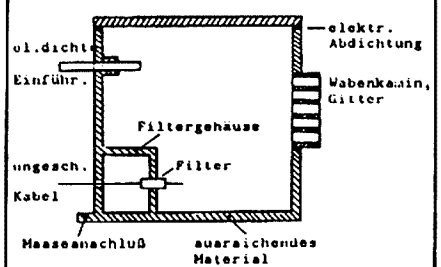


Bild 6.23: EMV-gerechter Aufbau eines Gerätegehäuses

Figure 6: EMC-correct construction of an equipment housing. The lid is closed RF-tight (with weather stripping). The filter is installed at the wall of a separate shielding box. The ventilation holes at the right side have depth, not just holes in sheet metal.

Figure 2: Highpass Filter on Printed Circuit Board.

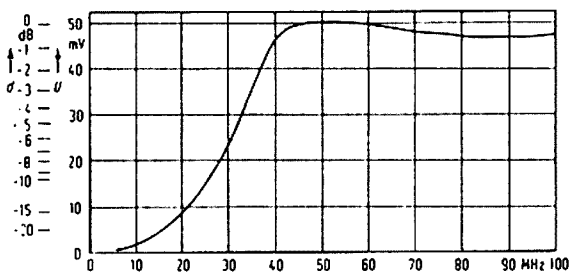


Bild 3. Durchlaßkurve des Philips-Hochpasses

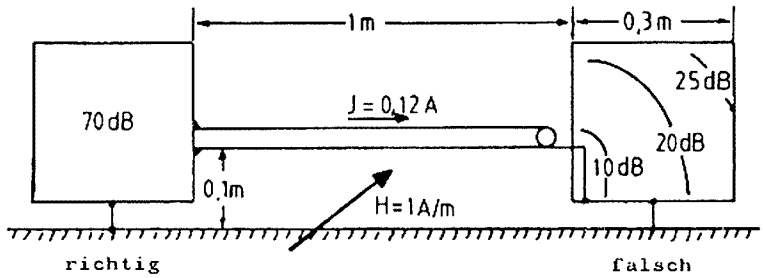


Figure 7: The interconnecting cable is not contacting the outside wall of the equipment at the right, in order to earth the cable braid before entering the other equipment on the right side.

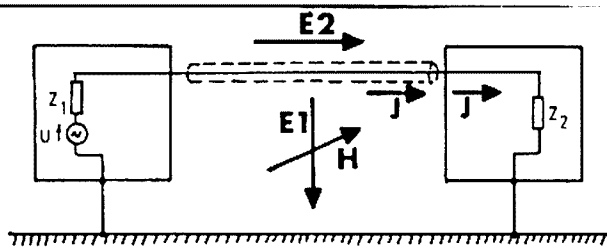


Figure 8(a): The braid of the interconnecting coaxial cable between the two units is not in contact with the equipment chassis outer wall.

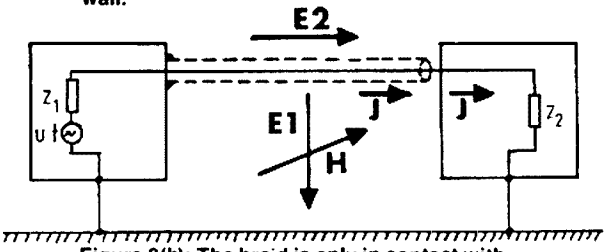


Figure 8(b): The braid is only in contact with the equipment at the left. (A VCR RFI case was recently solved, when it was found that an internal piece of coaxial cable braid had only been soldered to the chassis at one end).

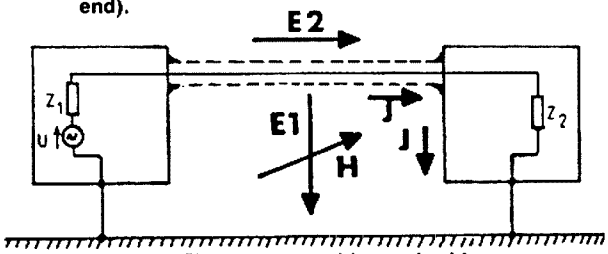


Figure 8(c): The correct earthing and cable connecting method.

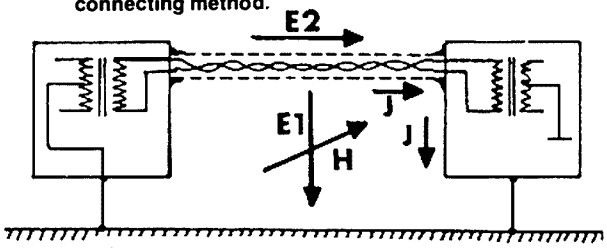


Figure 8(d): Double shielding and earthing plus decoupling with transformers is the best method for interconnecting separate apparatus and avoiding unwanted radiation.

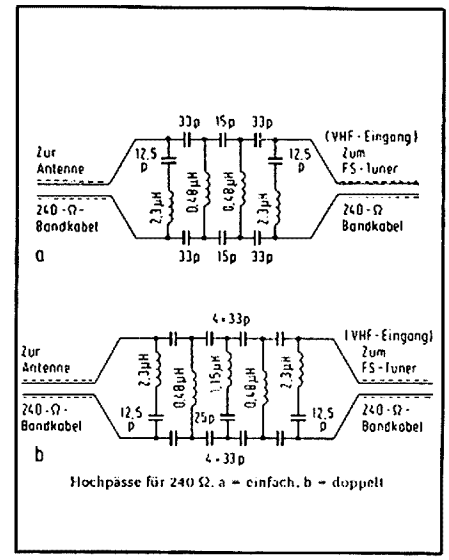
Table 1 shows just a few products provided by appliance manufacturers to improve the EMC (reduce susceptibility) of television receivers, because the German law requires performance standards.

Table 2 lists highpass and lowpass filters offered by special filter manufacturers.

All filters listed in Table 2 have male and female coaxial plugs directly installed to the filter shield to avoid cables between the filter and amplifier (television set, etc). There are also special filters to suppress radio telephone transmitter signals and/or the signals from CB and 145 MHz transmitters. There are many other television manufacturers who have filters available, like Grundig, Nord-Mende, Saba, etc. The appliances are so designed that space and connections for filters are provided where they are most effective.

Figure 9 shows two typical highpass filters with twin-lead 240 ohm termination. Two highpass filter circuits were described in AR, July 1982, suitable for 50-70 ohm termination and cable.

The accompanying photographs and attenuation versus frequency graphs clearly illustrate the design and characteristics of several commercially available and homemade filters.



Hochpässe für 240 Ω. a = einfach, b = doppelt

Figure 10.

Figure 10 shows, at the top a split-filter from Haro-Elektronik (DJ2NN), which includes a lowpass filter and a highpass filter with 50 ohm load, diode and harmonic energy power measuring facility. A milliwatt meter is supplied separately (see Figure 11). The split filter feature does not reduce the harmonic radiation from the amplifier (contrary to popular belief), but demonstrates how much harmonic power is generated under various preamplifier operating conditions. One problem is that, often the highpass filter does not have sufficient attenuation of the fundamental transmitter power. The indicated unwanted power output thus often contains some fundamental power as well. This is especially so, if the amplifier operates at 28-29.7 MHz. This can be checked by placing an additional good lowpass filter between the amplifier and the split filter. What is now indicated is only fundamental power leakage, which the lowpass part of the split filter should suppress.

Figure 10 shows, in the middle, a very good lowpass filter from the "Auth" company, type TP-30. The case is of welded construction, as it should be. The lowpass filter at the bottom of Figure 10 is the extremely effective LF-30-A from Kenwood. All of these three filters start to attenuate above 30-35 MHz.

The filters in Figure 12 show (from top to bottom), Schertler (DJ0AV loudspeaker filter on a toroid ferrite ring for the range 0.5 to 500 MHz,

Tabelle 2. Sperrfilter, Hoch- und Tiefpässe für Antennenverstärker und Empfänger — Table 2

Typ	Durchlaß-bereich	Durchgangs-dämpfung	Sperrbereich	Sperrdämpfung	Ein- u. Ausgangsimpedanz, Klemmanschluß
Auth. TP 1600*	0.1...1.6 MHz	< 1,5 dB	3...700 MHz	> 60 dB	60–75 Ω
Auth. BSF 27*	0.1...22 MHz 37...750 MHz	< 1 dB < 2 dB	27...30 MHz	40 dB	60–75 Ω
Auth. HF 40*	40...870 MHz	< 1,5 dB	0,1...30 MHz	>50 dB <30 MHz >80 dB <20 MHz	60–75 Ω
Hirschmann Sperr-62St1	0,15...68 MHz 90...790 MHz	< 1 dB 2 dB bei 90 MHz	87...87.5 MHz	40 dB bei 87.33 MHz	60–75 Ω
Hirschmann Sperr-62St11	0.15...26 MHz 87.5...104 MHz	< 1 dB 1.5 dB bei 89 MHz	87...87,5 MHz	36 dB bei 87.33 MHz	60–75 Ω
Schertler	85...800 MHz	1 dB bei 90 MHz 0,5 dB bei 200 MHz 5 dB bei 800 MHz	0,1...30 MHz	> 60 dB	240/60 Ω umschaltbar Lotanschlüsse
Auth. SF 145*	0.1...127 MHz 165...870 MHz	< 1 dB < 2 dB	144...146 MHz	50 dB	60–75 Ω
Auth. HP 174*	174...870 MHz	1 dB	0,1...150 MHz	>50 dB <130 MHz >80 dB <30 MHz	60–75 Ω
Auth. SF 435*	0.1...355 MHz 495...870 MHz	< 1 dB < 2 dB	430...440 MHz	50 dB	60–75 Ω

* Metallgehäuse 22 mm x 64 mm x 103 mm ** Leiterplatte 35 mm x 40 mm.

Table 2.
NOTE:
Passband in MHZ — Durchlassbereich
insertion loss — Durchlassdampfung
Attenuation range in MHz — Sperrbereich
Attenuation in dB — Sperrdampfung
Input-output impedance — Ein-Ausgangsimpedanz

Hf-T-enntransformatoren — Table 1

Ein- und Ausgang	Fabrikat	Bestell-Nr.	Anschlüsse
75 Ω	Cnetz		·- Koaxbuchse und -Stecker
75 Ω	Nordmende	525-523	- Koaxbuchse und -Stecker
240 Ω	Nordmende	525-522	240-Ω-Bandkabel
75 Ω	Philips	Hf Tr 7104	+ Koaxbuchse und -Stecker
75 Ω	Schaub-Lorenz		± Koaxbuchse und -Stecker
75 Ω	Telefunken		+ Koaxbuchse und -Stecker
240 Ω	Telefunken		240-Ω-Bandkabel
			+ nach DIN 45325 IEC-Norm

Hf-Hochpässe

Ein- und Ausgang	Grenzfrequenz	Fabrikat	Bestell-Nr.	Anschlüsse
75 Ω	40 MHz	Blaupunkt	8 627 000	Koaxbuchse und Stecker
○ 75 Ω	40 MHz	Blaupunkt		+ Koaxbuchse und Stecker
240 Ω	40 MHz	Blaupunkt	HP 3	Buchse und Stecker mit 12 mm Stiftabstand
240 Ω	450 MHz	Blaupunkt	HP 4	dto.
75 Ω	40 MHz	Philips	HP 7104	⊦ Koaxbuchse und -Stecker
240 Ω	27 MHz	Philips	4812154-97002	zum Einbau
75 Ω	47 MHz	Telefunken	309259921 O	zum Einbau
240 Ω	47 MHz	Telefunken	309259922 P	zum Einbau
75 Ω	170 MHz	Telefunken		zum Einbau
240 Ω	170 MHz	Telefunken		zum Einbau

- Durchgangsdämpfung 0,5...1 dB, Sperrdämpfung 40...60 dB
O mit eingebautem abstimmbaren Sperrkreis für das 2-m-Amateurband

Bandsperren

Ein- und Ausgang	Sperrbereich	Fabrikat	Bestell-Nr.	Anschlüsse
75 Ω	144...146 MHz	Cnetz und Schaub-Lorenz		+ Koaxbuchse und -Stecker
75 Ω	70...170 MHz	Telefunken	309259923 O	zum Einbau
240 Ω	70...170 MHz	Telefunken	309259924 P	zum Einbau

Hf-Drosseln

Verwendungszweck	Fabrikat	Bestell-Nr.	Anschlüsse	Bemerkungen
Netzverdrosselung	Nordmende	411.035	Einbau	für FS-Ger.
Netzverdrosselung	Vogt	DR 2739-05	Einbau	2polig
Nf-Verstärkereingänge	Valvo	431202036640	Einbau	8 µH
Nf-Verstärkereingänge und im Nf-Verstärker	Jahre	7405-1500	Einbau	Miniatur-ausf. 150 µH
Nf-Verstärkereingänge	Nordmende	423.504	Einbau	60 µH
Nf-Verstärker	Sony	1-407-050-11	Einbau	
Lautsprecher-Hf-Drossel	Nordmende	424 495	Einbau	≤ 5 W
Lautsprecher-Hf-Drossel	Vogt	DR 2739-05	Einbau	> 50 W
Entstöradapter für Plattenspieler	Elac			2polig
Entstöradapter für Tonhandgerät	Elac			
Lautsprecher-Entstör-Telelunkenadapter				
Lautsprecher-Entstöradapter Zehnder, Tennenbronn				

Table 1.
NOTE:
Input and output impedance — Ein und Ausgang
Make — Fabrikat
Attachment Method — Anschlusse
Plugs — Stecker
RF Separation Transformers — HF-Trenntransformatren
Highpass Filter — HF-Hochpasse
Bandpass Filter — Bandsperren
RF Chokes, main chokes, AF amplifiers, loudspeaker, record player, tape recorder — HF-Drosseln

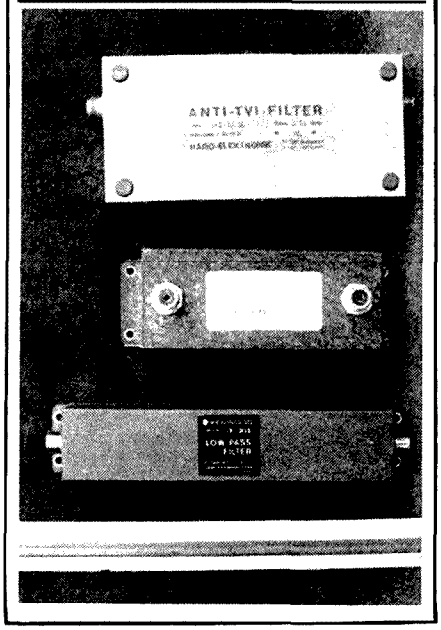


Figure 10.
offering over 40 dB attenuation, 250 watts AF at 8 ohms. Next is a VHF filter by Schertler with a stop-range of 0 to 150 MHz having over 30 dB attenuation, whilst the pass-range is 170 to 850 MHz with less than 0.5 dB insertion loss. The next filter shown is also from Schertler, the HPY-45 highpass filter. Stop-range 0-30 MHz with over 30 dB of attenuation and a pass-range of 45-850 MHz, with less than 1 dB insertion loss. THe last

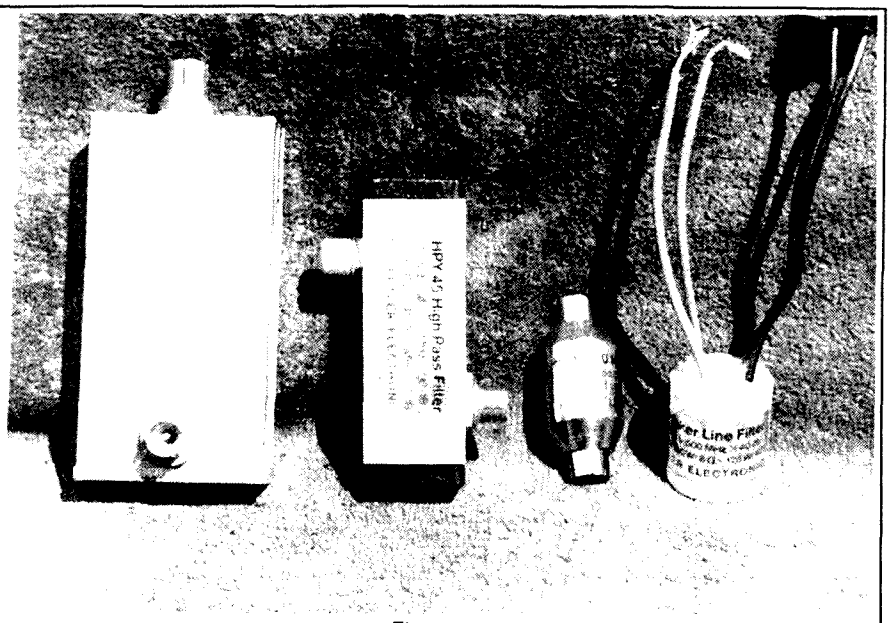


Figure 11.

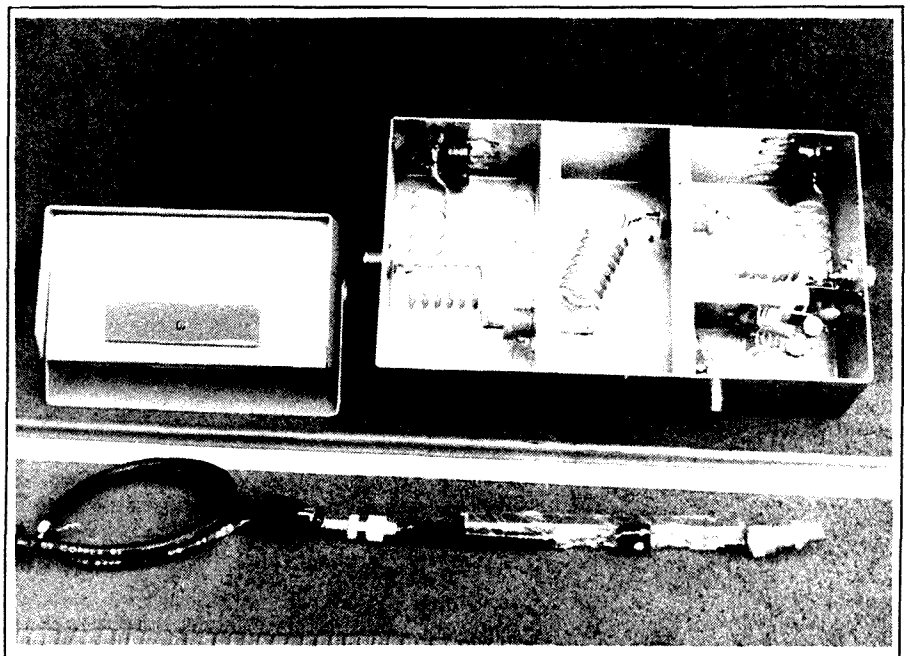


Figure 12.

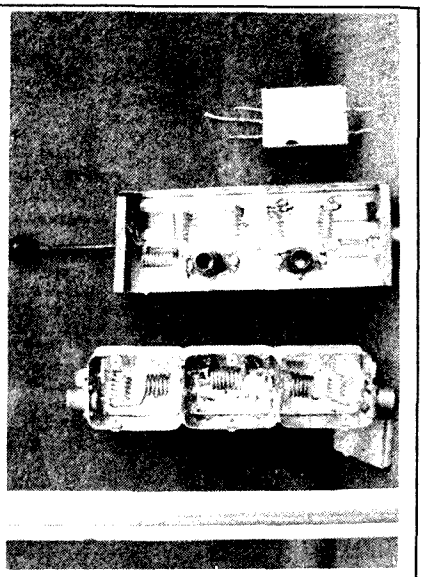


Figure 13.

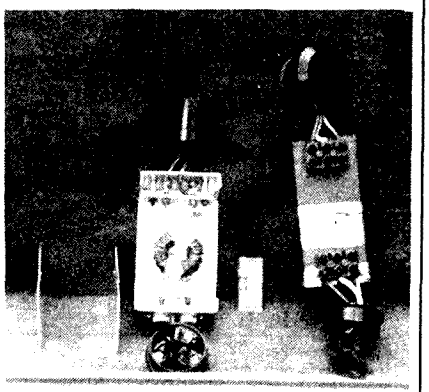


Figure 14.

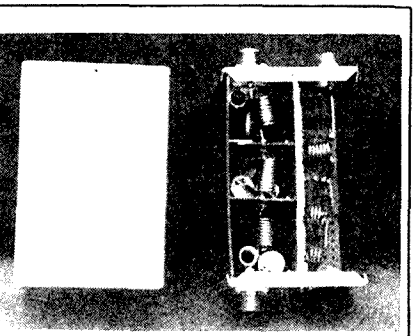


Figure 15.

filter shown in Figure 12 is a Telefunken highpass filter with six coils and nine disc capacitors. The attenuation exceeds 35 dB below 47 MHz and the insertion loss is less than 1.5 dB. The ruler at the bottom of the photograph reads centimetre dimensions. Tests showed that the attenuation of these filters was better than claimed by the manufacturer, a rare case!

Figure 11 shows the circuit and component values of the lowpass section of this large split-filter, type SP-30/5000-DC, are the same as those used for the lowpass filters the writer built (AR, July 1982, page 17), but the larger coils (six millimetres copper, silver-plated) and the ceramic capacitors make the filter suitable for powers of up to five kilowatts RF To reduce or avoid the unwanted inductive reactances of the capacitors, two coaxial capacitors are used in the centre of the filter, and in the other cases, several capacitors are in parallel and soldered as closely as possible to the wall of the case. The welded steel case is copper and zinc plated. The highpass filter with the 50 ohm load resistor and rectifier diode can be seen in a corner of the case. The instrument to the left of the filter is calibrated in milliwatts (up to 500 mW). Running 400 watts two-tone PEP output, the meter should not show more than two milliwatts true harmonic power, operating at 29 MHz. The second harmonic may have to be suppressed with an open quarter-wave coaxial stub. Figure 11 shows, below the centimetre ruler, two separation transformers, which should be placed between the television coaxial feeder and the television antenna terminal, to keep unwanted RF from the television tuner, which may be picked up by the braid of the television feeder. At the same time, this transformer reduces the radiation of the television line-frequency-oscillator via the television antenna and feeder (see also EMC-Report, AR, March 1987, page 49). One transformer is made of two coaxial cable loops, whilst the other one uses a twin-hole ferrite core and two-three turns each of thin insulated wire. The split-filter (Figure 11), is also from HARO (DJ2NN). It has gold- plated terminals with teflon insulation. The harmonic power watt meter becomes more useful if the meter is a 50 uA type having a range of -10 to +17 dBm or about 50 mW.

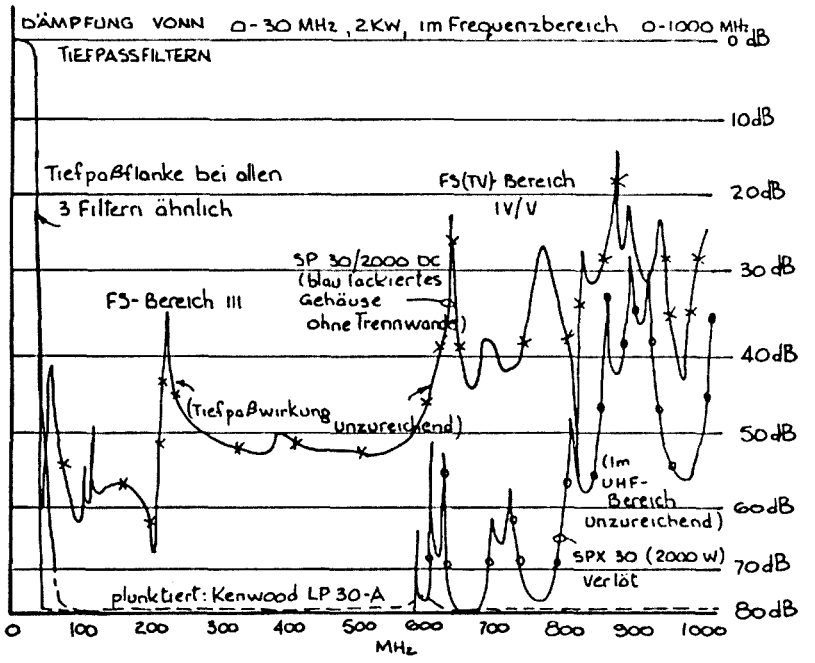


Figure 18 (a).

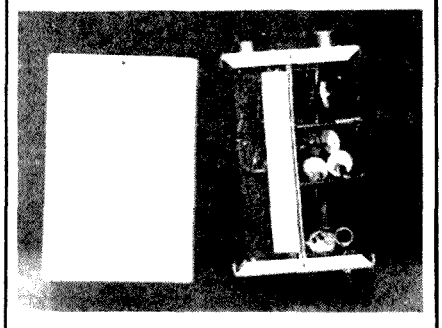


Figure 16.

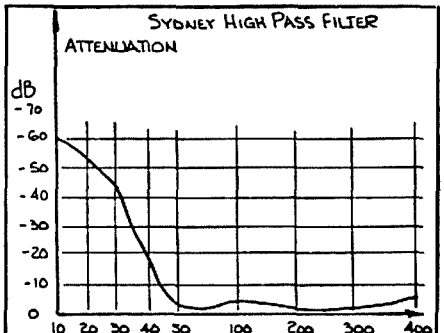


Figure 17.

Figure 13 shows three homemade filters. At the top is a highpass filter for twin lead termination of 280 ohms. It consists of four 20 pF capacitors and three coils one-eighth inch in diameter. All coils are earthed at the centre. The coil in the centre has 40 turns, the other coils, which are connected to the wires (terminals), and have 22 turns (*ARRL Handbook* literature). The larger filter in the middle of Figure 13 ia a highpass filter which was described in AR, July 19082, page 16. To increase decoupling between the coils of the various filter sections, the coils were placed at right angles, The filter at the bottom of Figure 13 is the well-known lowpass filter already mentioned earlier (*ARRL Handbook* literature, also used by HARO DJ2NN). The special ceramic disc capacitors have flat terminals (no wire leads). By using three separate cases, the shielding was good.

The two large filters in Figure 14 are mains-line filters. The filter on the left uses a ferrite ring core and two coils wound in opposing sense to avoid core saturation. The coil leads go to tubular feed-through capacitors of 2000 pF, which have been soldered to pieces of PCB. The other mains line filter has two long coils (no ferrite core) and feed-through disc capacitors of 5000 pF are soldered to the ends of the case. The effectiveness of these mains line filters depend very much on effective earthing to the appliance chassis (if there is one?). A wide copper broad strap was used to obtain the earthing connection. The open filter (between the line filters) carries three spiral coils on PCB and two 39 pF disc capacitors. This filter is identical to the shielded type HPY-45 shown in Figure 12. It may be directly soldered to the television tuner, if its attenuation of signals below 30 MHz is adequate.

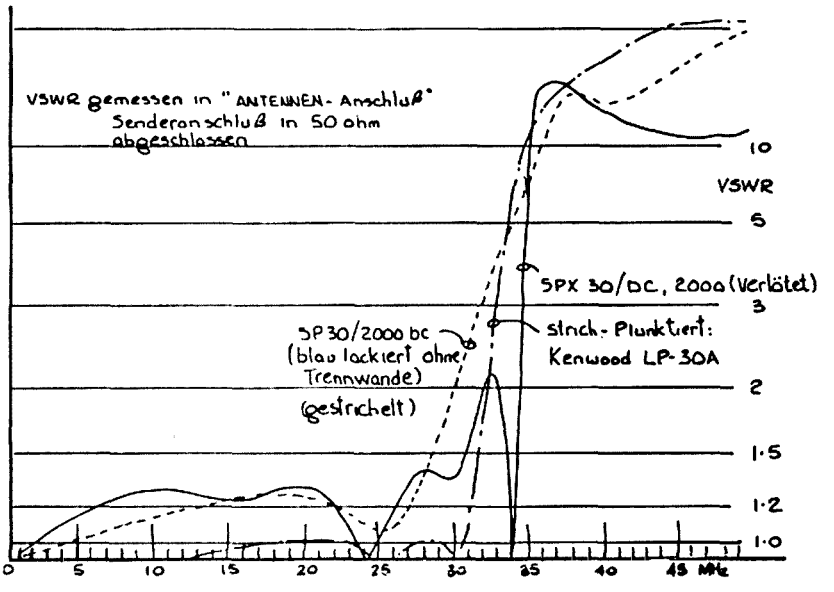


Figure 18 (b).

Figures 15 and 16 show an experimental filter. Test indicated that more and more partitions had to be soldered in to maintain sufficient attenuation at over 50 MHz. The outer extruded case did not help, having insufficient contact with the internal PCB shield.

MEASURING FILTER ATTENUATION VERSUS FREQUENCY

With the exception of Figure 8 (a and b), the filters were tested in the following way:

HP Signal Generator, model HP-608d 10-420 MHz, Output Indicator with 50 ohm load, Schottky Diode with 20 uA bias, Amplifier IC-741, 1 kHz Tuned Circuit to reduce noise and to pass the 1 kHz 80 percent signal generator modulation signal, Millivolt Meter, Philips GM-6012.

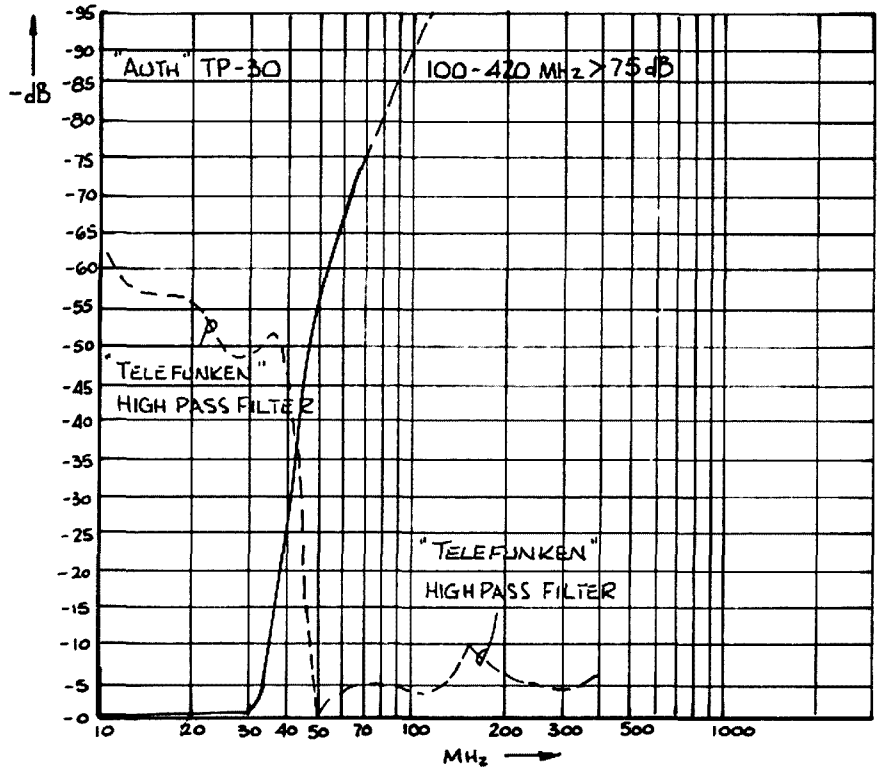


Figure 19.

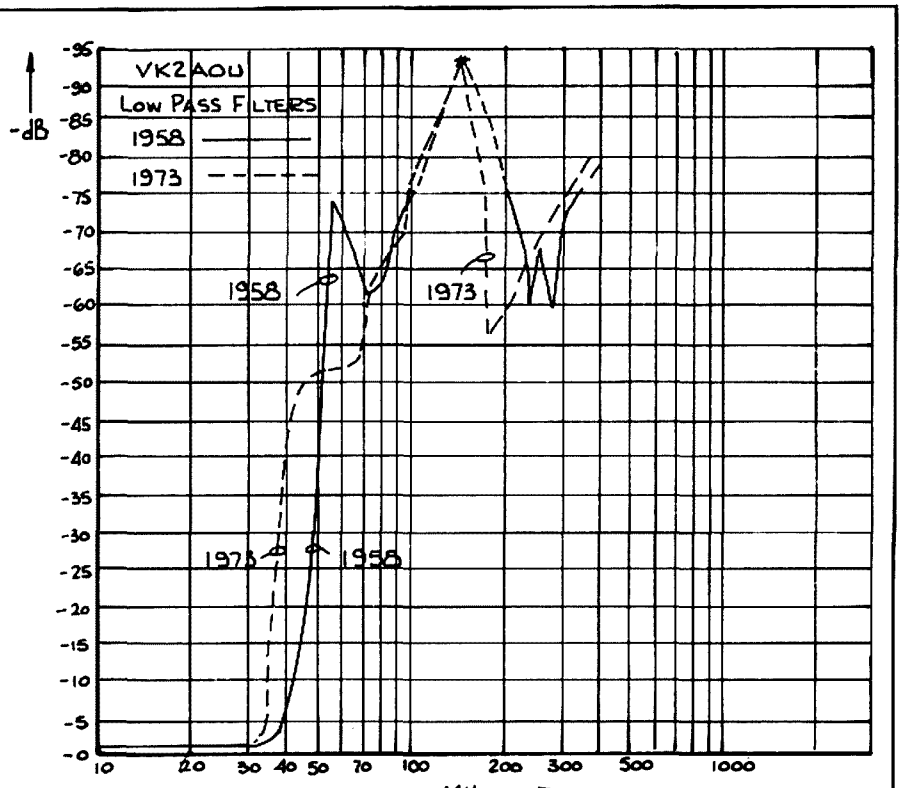


Figure 20.

All this equipment was standing on a large sheet of aluminium and directly earthed to this base. Equipment with feet of insulation material was earthed via a wide short foil strap. The signal generator attenuator was always do adjusted that the same two millivolts VTVM reading was obtained, operating the Schottky diode at the same potential. A correction curve was measured to take care of any frequency dependency of the millivolts indicating equipment.

This set-up gives an attenuation test range of 70 dB, which covers most needs. A spot test was made at 146 MHz by using a VHF receiver at the output of the filters.

In Figure 17, the locally made highpass filter has the L and C components mounted to a strip of sheet metal, and metal end-caps are used, but only a cardboard dust-cover is provided. This filter may help, if the problem is not too great, and if the filter can be effectively earthed at the television antenna terminal. The insertion loss at higher frequencies (UHF) seems to be high, and this could affect the television picture quality of Channel 28 reception.

Figure 18 (a) shows measurements which were made by DL1BU with professional equipment (x-y-recorder, etc). Three recordings are shown. The dotted line shows the excellent performance of the Kenwood LP30-A lowpass filter, which has only a very minor bump at 600 MHz. The attenuation is otherwise better than 80 dB from 100 to over 1000 MHz. The curve with crosses was measured on an earlier HARO filter, which did not have separating partitions, and the painted case was not welded or soldered at the joints.

This type of filter is quite useless (type SP30/2000). An improved version, type SPX30(2000W), with correctly soldered joints was very good up to 580 MHz (curve with small circles), but at higher frequencies (where more and more services are, or will, be operating, eg mobile phones at about 800 MHz), the attenuation was very poor.

The three curves in Figure 18 (a) are from the same filters, but show how the SWR is affected by insertion of these lowpass filters. The Kenwood filter gives the cleanest curve again. The soldered HARO filter exhibits an SWR increase, not matching the 50 ohm termination resistance.

Figure 19 shows the "AUTH" lowpass filter has the same clean and very good response as stated by the manufacturer. The attenuation is over 75 dB from 100 to 420 MHz (most likely higher). The Telefunken highpass filter has far more than the claimed 35 dB attenuation below 35 MHz, and about twice as much attenuation at this frequency as the locally made filter. The Telefunken filter has no partitions but an effective shielding case, and the adjacent coils are so placed that they are more or less decoupled. There is some attenuation at higher frequencies.

The curves in Figure 20 are the response curves of two homemade lowpass filters similar to the one shown at the bottom of Figure 13. The 146 MHz spot-test was done with a VHF receiver as detector for the filter output. The reduction of the attenuation in the 180-280 MHz range may be due to capacitor self-responses. One filter was made in 1958 and the other one in 1973 using slightly different L and C values. Both filters are satisfactory, but not as good at VHF and UHF frequencies as the AUTH and Kenwood filters, which later became available.

In Figure 21, the solid line represents the response curve of the HARO split-filter SP-30/5000-DC (for five kilowatts of RF power). It has, at VHF, similar "dips" at about 65 and 220 MHz as the filters just described in Figure 20, which uses the same circuit. The attenuation is again about 25 dB at 145 MHz. The dotted line shows the response curve of the small and simple Schertler highpass filter, similar to the locally made filter which has twice as many components (see Figure 17).

In Figure 22, the solid line of the HARO "Super-Split-Filter" SPX-30-DC has an ideal characteristic

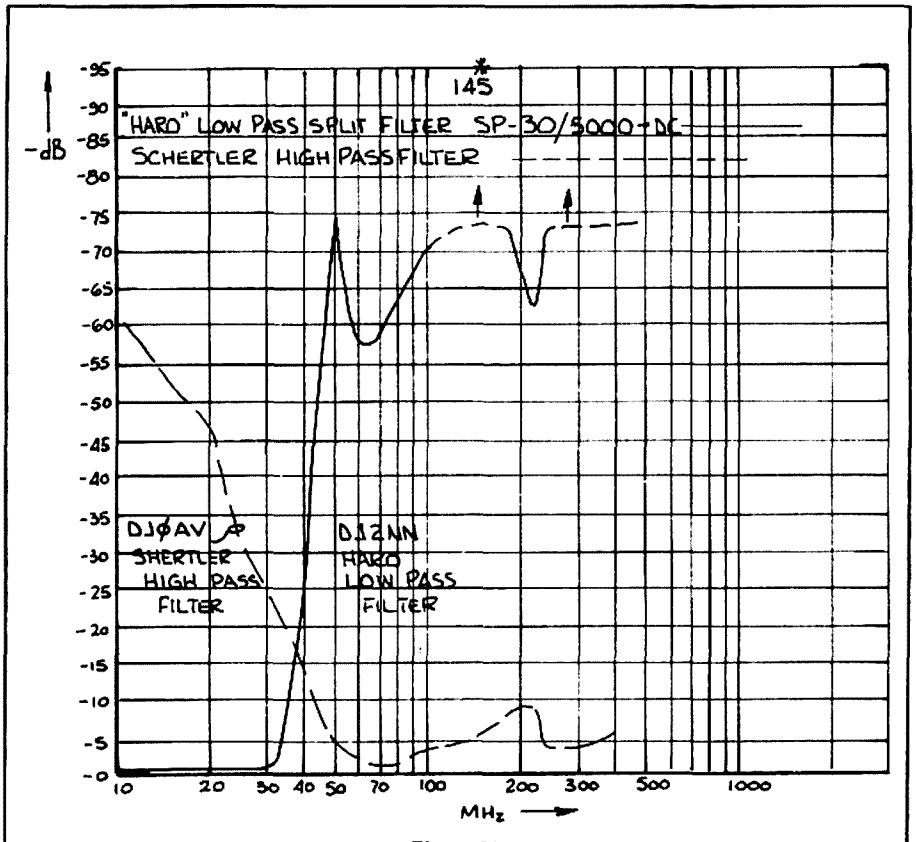


Figure 21.

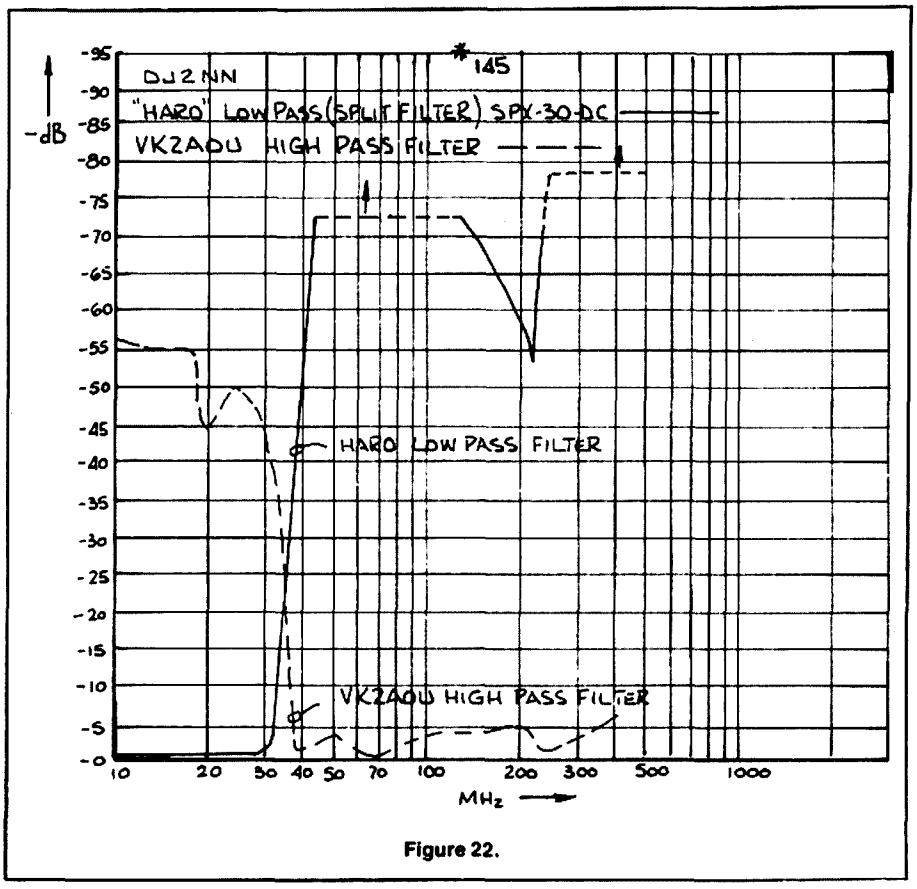


Figure 22.

up to 145-150 MHz. There is a deep undesirable break at about 215 MHz, showing here reduced attenuation.

The dotted line, representing the curve of a homemade highpass filter is very similar to the curve of the Telefunken filter in Figure 19. The VK2AOU highpass filter, Figure 22, is also shown in the centre of Figure 13.

Finally, it must be emphasised that the next filter may be partly or even completely useless if the television chassis is picking up unwanted RF like an aerial, if the filter case cannot be directly earthed and connected to a television chassis earth without unwanted C or L reactances between filter and appliance, or, if the feeder braid is carrying the unwanted RF signal to the tuner input terminal. In other words, electronic appliances must be so designed that filters can improve the appliance selectivity, immunity or electromagnetic compatibility with legal transmitter radiation. Service technicians should check whether the highpass filter their firm provides is effective when attached to the appliance (television, etc). It has happened that, such a filter did not help, and the serviceman used this to claim to the customer that the radio amateur was using far too much power causing interference. He did not understand or did not wish to admit, that the television set was so badly designed, that not even a good filter could improve the selectivity of the television set.

ar

US NOVICE BOOM

Applications for the novice licence in the United States have quadrupled since that grade of licence was enhanced with additional privileges.

Federal Communications Commission General Radio Branch Chief, Larry Welkert said there would probably be more than 6000 novice licence applications in June, compared to a normal of 1500.

The increased entrants into amateur radio had been attributed to the new voice, digital modes and band privileges given to the US novice.

Contests

Frank Beech VK7BC
FEDERAL CONTEST MANAGER
37 Nobelius Drive, Legana, Tas. 7251

CONTEST CALENDAR

NOVEMBER

14 — Australian Ladies' Amateur Radio Association Contest (Rules October AR)
14 — 15 — European DX Contest, RTTY Section (Rules September AR)
28 — 29 — CQ WW DX Contest, CW Section

DECEMBER

4 — 6 — ARRL 160 metre Contest
5 — 6 — TOPS 3.5 MHz CW Contest
12 — 13 — ARRL 10 metre Contest
19 — Ross Hull Memorial VHF/UHF Contest (Rules this issue

JANUARY 1988

— 10 — Ross Hull Memorial VHF/UHF Contest (Rules this issue

RESULTS

CQ World-Wide DX Contest 1986, Australian Results

The top scores in the World Section "Single Operator all-band'

8R1X	8 940 450 points
P4OA	8 172 930 points
PJ2FR	6 925 920 points
FY5YE	6 484 830 points
VK9NS	4 766 779 points
VE6OU/3	4 497 972 points
V3ICV	4 165 972 points
TA2BK	3 973 710 points
WR6R/KH6	3 937 192 points
ZF2FL	3 736 635 points

Congratulations to Jim Smith VK9NS, for winning the Oceania trophy.

Australian results of the 1986 WW contest.

VK2KL	A	816 920	2147	104	190
VK4BJD	A	231 957	398	78	135
VK3PU	A	120 582	235	68	106
VK2AYK	A	88 572	265	48	73
VK5ZN	A	59 605	250	34	57
VK8OB	A	10 738	70	18	34
VK6HD	28	269 973	933	21	78
VK4KWO	21	60 747	368	24	43
VK2APK	14	242 176	677	33	95
VK3SM	14	52 528	187	29	69
VK5QX	14	651	31	4	3
VK2EKY	7	103 230	381	29	64
VK3BEE	1.8	1 575	16	5	7

Rules for the 1987 CQ WW DX CW Contest remain the same as in previous years.

STARTS: 0000 UTC Saturday, November 28, and ends 2400 UTC Sunday, November 29.

EXCHANGE: RST plus zone.

MULTIPLIER: Two types of multiplier will be used.

1. A multiplier of one for each different zone contacted on each band.
2. A multiplier of one for each different country contacted on each band. Stations are permitted to contact their own country and zone for multiplier credit. The CQ Zone Map, DXCC Country List, WAE Country List and WAC Boundaries are standards.

POINTS:

1. Contacts between stations on different continents are worth three points.
2. Contacts between stations on the same continent but different countries, one point.
3. Contacts between stations in the same country are permitted for zone or country multiplier credit but have zero point value.

SCORING: All stations, the final score is the result of the total QSO points multiplied by the sum of your zone and country multiplier.

EXAMPLE: 1000 QSO points x 100 multipliers (30 zones + 70 countries) = 100 000 (final score).

AWARDS: First place certificates will be awarded in each category in every participating country and in each call area of the USA, Canada, Asiatic USSR, and Japan. All scores will be published.

To be eligible for an award a single operator station must show a minimum of 12 hours of operation. Multi-operator stations must operate a minimum of 24 hours. A single band log is eligible for a single band award only. If a log contains more than one band it will be judged as an all band entry, unless specified otherwise.

In countries or sections where the returns justify, second and third place awards will be made. All certificates and plaques will be issued to the licensee of the station used.

LOG INSTRUCTIONS:

1. All times must be in UTC.
2. All sent and received exchanges are to be logged.
3. Indicate zone and country multiplier only the *first time* it is worked on each band.
4. Logs must be checked for duplicate contacts, correct QSO points and multipliers. Submitted logs must have duplicate contacts clearly shown. The original log may be requested by the contest committee if further cross-checking is necessary.
5. Use a separate sheet for each band.
6. Each entry must be accompanied by a summary sheet showing all scoring information, category of competition, contestants name and address in *block letters* and a signed declaration that all the contest rules and regulations for amateur radio in the country of operation have been observed.
7. Sample log and summary sheets and zones maps are available from CQ. A large self-addressed envelope with sufficient postage or IRCs must accompany your request. If official forms are not available, make up your own 80 contacts to the page on 8.5 x 11 inch paper.
8. All entrants are required to submit cross-check sheets for each band on which 200 or more QSOs were made. All other entrants are encouraged to submit cross-check sheets.
9. Duplicate contacts penalty — up to one percent — three additional contacts removed, one to three percent — 10 additional contacts removed, over three percent is grounds for possible disqualification.
10. QRP stations must indicate same on their summary sheets and state the actual maximum power output used, with a signed declaration.

DEADLINE: All entries to be postmarked no later than December 1, 1987 for the phone section and January 15, 1988 for the CW section.

MAIL TO: CQ Magazine, 76 North Broadway, Hicksville, NY 11801, USA.

JACK FILES SUNSHINE STATE MEMORIAL CONTEST

The contest was held over the weekend July 18-19, 1987. This year showed an increase in participation. There were 223 stations taking part, call areas from VK1 to VK8, ZL1 to ZL4, H4, P29 and FK8.

Logs received were of a very high standard and were a pleasure to check.

This year the CW mode was introduced and, from the interest shown, a CW section will be included in next year's contest. Many thanks to those stations who operated from the rarer shires. VK4ARR/P operated from the front seat of his four-wheel drive in the Gulf country giving us Cook Shire.

David VK4NLV, is, due to business, not able to come on air during weekends. He came out of hospital on the morning of the 17th and, feeling okay, decided to have a mobile DXpedition and, together with his father-in-law, who acted as log keeper and assisted in lashing the dipole to Shire sign-posts, travelled almost 1100 kilometres and operated from the following Shires:
Monto, Eidsvold, Wondai, Kingaroy, Mundubbera, Gayndah, Murgon and Nanago.

This activity caused a problem due to the one-hour rule, however, this will be allowed for in future contests.

Jack Ford VK4SF, operated QRP running three watts to an inverted Vee and would like to see more QRP operators take part.

The SWL section winner is a 12-year-old from West Australia. The contest, as usual, was conducted in a very friendly manner and I would like to thank all those who took part and to congratulate the section winners and look forward to next years contest.

A number of suggestions have been made and these will be forwarded to our Divisional Council for discussion.

VK4AIX, Qld Contest Manager

SECTION 1(a) TRANSMITTING ALL BANDS

CALL	PTS	CALL	PTS
VK4VR	1206	VK4IY	320

SECTION 1(b) TRANSMITTING HF ONLY

VK4AIV	1196	VK4YB	1187
VK4BMW	1088	VK4MWZ	928
VK4ARR/P	847	VK4NLV/P	784
VK4NEF	778	VK4JTF	711
VK4AOE	669	VK4AQD	661
VK4FNQ	524	VK4JM	510
VK4QY	393		

SECTION 1(c) TRANSMITTING UHF/VHF ONLY

VK4ZML	363	VK4YPB	101

SECTION 1(d) TRANSMITTING QRP ONLY

VK4SF	114

SECTION 1(e) CLUB STATION

VK4WIM	1041	VK4WIJ	917

SECTION 2 STATIONS OUTSIDE VK4

VK2JBM	402	ZL3KR	382
VK3YH	363	VK2BQS	219
VK8AV	214	VK7NRR	175

SECTION 3 SWL SECTION

J McBride 114 points

CHECK LOGS

VK4AIX VK4NFE

RULES FOR THE 1987 ROSS HULL MEMORIAL VHF/UHF CONTEST

Objects: Australian amateurs will endeavour to contact as many other amateurs as possible using the contest bands.

Period: From 0001 UTC, December 19, 1987 until 2359 UTC, January 10, 1988 (third Saturday of December until second Sunday January).

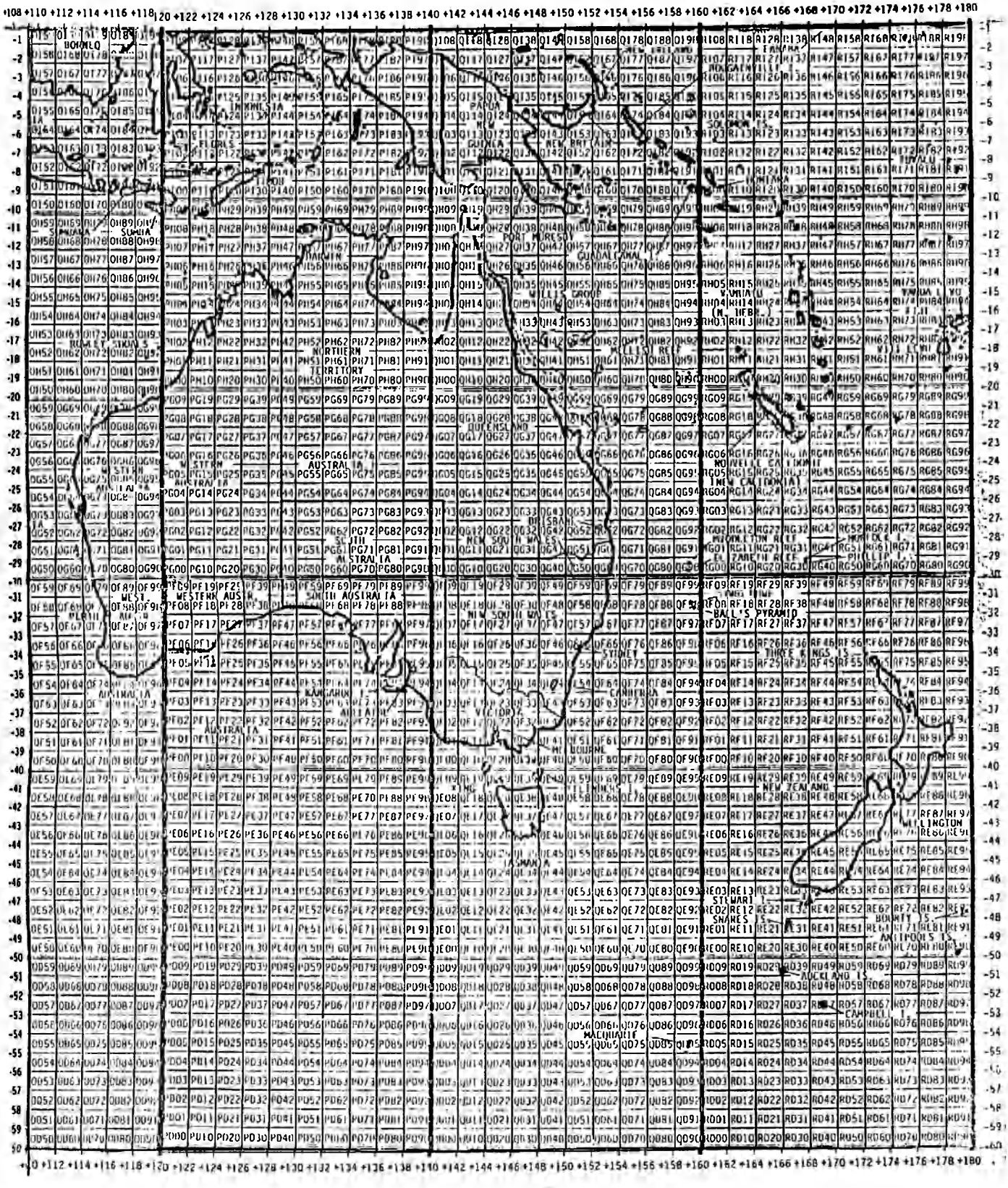
Bands: 52, 144 and 432 MHz.

Modes: Any mode that your licence allows. No terrestrial repeaters are to be used for scoring. No cross-band contacts *unless* via an orbiting satellite. Satellite contacts permitted if the *uplink* is in the contest band. Contacts within ones own *Maidenhead Locator Square* will not count.

CONTEST EXCHANGE: Report, serial number and Maidenhead Locator Square. (The serial number will commence with 01 and increase by one for each QSO until 99 is reached, when the number returns to 01 again) each UTC day.

Score: One point per contact, per band, per UTC day.

Total Score: The total score will equal the number of valid contacts, plus 50 times the number of different locator squares worked, Irrespective of bands.



Maidenhead Locator Map.

Operator: Single operator only. One transmission only at one time.

Log Sheets: The following details must be shown: Date and Time in UTC, Band used, Mode, Station Worked, Report Sent, Serial Number, Locator Square, Report Received, Serial Number Received, Locator Square Received.

Cover Sheet — Operator's name and call sign, address and a signed statement that the station has been operated within the contest and licence rules and spirit of the contest.

Overseas Stations: Rules similar to those for Australian stations.

Receiving Section: Logs for the receiving section must show the same information as for a transmitting station log, except for the second number exchange. If both stations participating in the contact are heard, both may be claimed, but must be listed as separate entries on the log. Scoring will be as for the transmitting log. Any scoring contact may be logged with no limit to the number of times that one station can be logged.

Awards — A perpetual trophy is awarded annually for competition between members of the Wireless Institute of Australia. The winners name is inscribed on the trophy and the winner also receives a suitable certificate. The entrant with the highest overall score for the contest will be the winner and their Division will hold the trophy for one year.

Certificates will be awarded to the highest scorer in each Maidenhead Locator Field. The locator fields will also be used to declare the winners outside Australia.

Participation Certificates: Indicate on the entry sheet and enclose a large (approximately 127 x 178 mm) SASE if a participation certificate is required.

Sample Log Entry: Note: Only Four Character Level of locator system used.

20.12.87	1750	144 SSB	VK9ZZZ	58	37	QE38	58	58	RG30
20.12.87	1759	144 SSB	VK0GC	55	38	QE38	54	23	QD95
25.12.87	0432	432 FM	VK8XYZ	59	01	QE38	53	19	PH57

Entries: Cover sheet and your total score set out to show the number of points claimed throughout the contest, plus 50 times the number of different locator squares worked. NOTE: For the purpose of this contest a separate log for each band used is not necessary.

Entries to: The Federal Contest Manager, C F Beech VK7BC, 37 Nobelius Drive, Legana, Tas. 7277. Entries must be postmarked no later than February 1, 1988.

At the time of writing these notes, the majority of Remembrance Day logs have been received and have been scrutinised. A noticeable feature is the small number of CW entries and the dearth of novice logs.

The NZART and I have synchronised the dates for the John Moyle National Field Day Contest for 1988 and this contest will not now conflict with any of the other major contest held during March. A minor change has been made to a rule in order to facilitate better VK/ZL participation So you can arrange for the wife to let you off the hook for the field day (you could try the Bicentenary excuse this time).

The Ross Hull Memorial Contest will need some explaining this time around. After much reading and historical searches, plus hours of discussion, I came to the came conclusions that my predecessor had come to — that the number of entries received by the FCM did not warrant the continuation of this contest in anything like its present form.

Much has been written over the years about the vagaries of VHF/UHF propagation and contest scoring in such a large country as Australia, which has large amateur populations in small areas with large distances between these populated centres. I have decided that a different approach should be tried with a conscious effort made to reward those stations that rotate the antenna and work weaker DX stations, rather than run up great scores by working many nearby stations.

To achieve this, and to make this contest a more challenging temptation, it has been decided to begin the use of the *Maidenhead Locator* system in the Ross Hull Contest. A perusal of the rules, as published in this column of AR, will make it obvious that a station located in a city suburb will have to chase the distant station just as much as the station located many hundreds of kilometres away. For example, a station with a large amateur population within 100 kilometres can easily make up 100 points whereas a station in the outback would struggle to make 50 points. To reduce this imbalance, I have introduced the use of the Maidenhead Locator system in order to reward the effort of looking for the DX station and, at the same time, to encourage the use of portable operations. The new rules for this contest will make it much more of a challenge with the simplified rules as a bonus. Please give it a good run and I am certain that it will produce some very interesting results.

Please make yourself familiar with the Maidenhead Locator system of Squares and Fields. This system is now used world-wide and many major contest incorporate it.

Those who have read the rules for the Ross Hull Contest will have noticed that a Participation Certificate will be available upon request by entrants. This is a clever device used by Jock White ZL2GX, and it had the effect of dramatically increasing the number of logs received for the various contests that he manages for NZART. I am expecting a similar increase in entries next year. Meanwhile, please read up and make a note of your Maidenhead Locator Square and, as I mentioned in AR, September, some information can be found in AR, January 1985, August 1985, and the ZL Call Book, if you can borrow one. A copy of the World Atlas, containing all 32400 Maidenhead Locator Squares is available from your national radio society. If not, it may be ordered directly from the address below if you enclose a self-addressed envelope, without stamps, together with six IRCs (1984 prices), so it could be a little more now.

An excellent suggestion from Col Wright VK7LZ, would be the commencement of ladders at both the HF and VHF scenes for the achievement of a worked all locator squares throughout Australia. This would be a real challenge on any band and make the DXCC look like WAC on the CQ WW weekend.

To assist those amateurs who may not have access to the articles that have already been published on the Maidenhead Locator System, I have included a made-up map of the Australasian area, together with some details of how to determine a particular location to the fourth locator level.

FINDING ONE'S MAIDENHEAD LOCATOR

Start by finding your longitude and latitude in degrees and minutes from a local map. The read the first four characters (Field plus Square) directly from a map. Then read the fifth and sixth characters (Sub-Square) from the tables below. Now you must be careful. Because a Square is two degrees wide (west-east), you must observe if you are in the left part (western part) or in the right part (eastern part) of the longitude table. Please also observe that the upper parts of the tables are for eastern longitudes and northern latitudes and the lower parts of the tables are for western longitudes and southern latitudes. This is because the locator has a constant direction, while longitude and latitude are changing directions at the Greenwich longitude and the the Equator. Do not forget to print your locator on your QSL card!

VK NOVICE CONTEST RESULTS TROPHY CHANGES HANDS WINNER FOR 1987 IS VK2NNK

As I promised, before handing the duties of FCM over to Frank VK7BC, I have completed details of the VK Novice Contest for 1987. I also hope to soon have all certificates for this year completed and forwarded to the Federal Office for distribution. Once I have achieved this, I will have tidied up, pretty well, all the loose ends resulting from the change-over.

Individual scores for the 1987 VK Novice Contest are as follows:

PHONE/NOVICE

CALL SIGN	QSOs	PTS	CALL SIGN	QSOs	PTS
VK5NOD	234	860	VK3PSG	66	249
VK3NLS	265	791	VK3KNK	55	228
VK2NNK	196	777	VK7NBC	53	197
VK5NOT	176	654	VK7NBF	45	178
VK7NDO	169	628	VK6NSH	42	174
VK7NRR	132	487	VK3PMY	24	116
VK3NXA	117	456	VK4NVS	36	102
VK3PMZ	106	423	VK6NXS	23	86
VK2LEE	100	401	VK4NEF	19	72
VK2MBI	88	392	VK3VAS	19	70
VK6NWR	84	299	VK3KCT	18	60
VK6NTJ	66	262	VK5NOC	15	56
			VK4NCM	9	47

CW/NOVICE

VK2NNK	43	156	VK5NOD	6	36
VK3VAS	48	151	VK7NBF	12	36
VK4NCM	42	87	VK3NLS	8	35
VK3PSG	16	42	VK3KCT	13	32
VK7NXA	11	37	VK6NTJ	4	11
			VK6NNN	1	2

PHONE/FULL CALL

VK3YH	211	780	VK2OE/1	78	247
VK3AJU	225	774	VK4OD	74	212
VK5QX	177	665	VK3KS	43	163
VK3YZ	157	598	VK2KL	40	148
ZL3KR	126	499	VK1RH	30	129
VK2BQS	112	461	VK5GV	26	103
VK7KZ	112	412	VK8AV	23	102
VK3CLS	56	253	VK3XF	20	86
VK3XB	60	251	VK3ZI	11	42

CW/FULL CALL

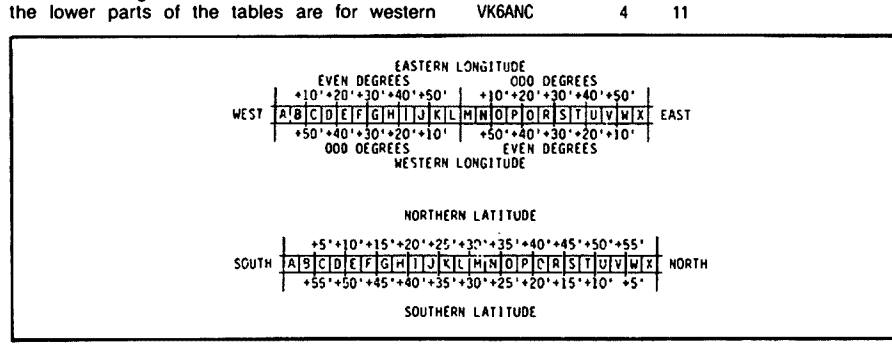
VK3CQ	66	195	VK4OO	24	66
VK3XB	53	177	VK3BDU	19	59
VK2OID	35	137	VK6AFW	12	44
VK3KS	27	96	VK5QX	8	19
VK2AZR	23	81	VK3XF	6	15
VK4BRZ	24	72			

PHONE/CLUB

VK6ANC	140	568	VK2END	35	157
VK2ATZ	145	521			

CW/CLUB

VK6ANC	4	11			



SWL			
L20282	899	VK6NNN	42

CHECK LOGS
VK1RN, VK5ADD.

The following table shows the results of combined scores (ie Phone and CW) and thus indicates the number of points gained towards the Novice Contest Trophy.

CALL SIGN	PHONE	CW	TOTAL
VK2NNK	777	156	933*
VK5NOD	860	36	896
VK3NLS	791	35	826
VK3PSG	249	42	291
VK6NTJ	262	11	273
VK3VAS	70	151	221
VK7NBF	178	36	214
VK4NCM	47	87	134

* TROPHY WINNER

Thus VK2NNK wins the Novice Contest Trophy having wrested it from the hands of Don VK5NOD, who has won the trophy for the previous three consecutive years. Our heartiest congratulations go to the winner, Steen Jensen VK2NNK. His effort was an excellent one, obviously helped by the reasonable number of CW contacts made. This was probably not too easy as many of the contestants complained about the severe lack of stations operating on that mode. I would also like to make mention of the CW entry from VK3VAS, who obviously concentrated more on CW than on phone. Len VK3NLS, again put in an excellent effort as well as submitting what I have come to expect as an immaculate log.

It is interesting to note the excellent competition for the trophy this year although the total entry of only 69 transmitting logs as against the 1986 total entry of 85 is somewhat disappointing.

Of special mention also must be the entry by VK6NNN. Peter scored only two points in the CW transmitting section and then reverted to a listening mode with a 42 point entry for that section. The station set-up used by him is certainly of great interest. He used, for his transmitter, a one-valve, home-made unit crystal controlled on 3.540, 3.560 and 3.580 MHz. His receiver was a one valve regenerative set. The Antenna Tuning Unit was as described in *Amateur Radio* magazine for June 1986. Power supply — a home-built unit providing 6.3 volts AC and 240 volts DC. Transmitter Power Output was five watts approximately. (Peter is a 15-year-old student and he demonstrates the point that it is possible to get on the amateur bands with limited funds).

It is really great to hear of such a truly basic approach to a Novice Contest and I feel that Peter VK6NNN, is certainly worthy of commendation for his effort and approach.

Now for some comments received with the logs.

"This was my first contest as I am only new to AR" — VK7NXA.
"I enjoyed it this year and it sounded as though the great majority heeded our appeal for the 'fair go'" — VK7NBF.
"I enjoyed it very much and I think I can improve my system next year. Thanks for a good contest, this is my first" — VK5NOT.
"The contest was great, but where were all the club stations? There activity was very low" VK3YH.
"...pity there were not a few more novices on the air — and I only worked six on CW!" — VK4OO.
"One question — could you explain to me how one person can give a contact with a novice call sign and then offer you one with his full call sign too?" — VK3PSG. (It is a bit unusual, Liz. I could see that a full call operator is qualified to operate a station under novice conditions, BUT!!! —VK5QX).
"Where were they? ? ?" — VK3CQ.
"One thing which I think warrants a mention is the lack of CW operators. I am pretty abysmal at CW, however, on three separate occasions I requested club stations to work me on CW and each time was told that they did not have (a) key, (b) operator, or 'we might be able to find (a) or (b) later...' I figure is I am prepared to work CW for points, surely the club stations can do the same" — VK3NLS.
"Unfortunately, I was working most of the weekend ... spent a lot of time calling CQ on CW on 80 to no avail ... perhaps this contest should be amended to the VK Novice CW Contest exclusively ... shooting one's mouth off into a microphone is really no indication of a contest" — VK8AV. (Anyone else with ideas? — VK5QX).
"Again a large number of operators using non-standard phonetics or using no phonetics at all" — L20282.
"Had transmitter problems which were not fixed until two hours into the contest. No answers to my CQs on Saturday night (our time) but had one answer on Sunday (our time) so I entered the receiving section in between my fruitless CQs. ..now know the importance of a good antenna. ..the 20 metre long feeder tuned aerial was not up to my successful G5RV at home ... staying with my grandparents who live in Safety Bay 220 kilometres north of my home QTH. .. Peter (age 15)" — VK6NNN.
I feel that some consideration could be given to, say, a six-hour period of operation as a separate Section. Those able to run the full 24-hours could still do so" — VK3YZ.
"I enjoyed my first Novice Contest and t will be back again next year. One problem is knowing who is a novice station. Also, are there Novice stations in New Zealand" — VK2LEE. (With the proliferation of call sign suffixes these days it can be a little hard to differentiate grades of licences Lee. I began back in the days when there was only one class of licence. My understanding is that ZL does not have any "Novice" stations in the form that we understand. — VK5QX).

Finally, I come to a letter which I received from Ken VK3AJU. I understand that Ken is a journalist by profession. He certainly provides a good story. Maybe he should be writing his own column in *Amateur Radio* magazine. I will leave you to judge as I provide most of the text of his letter.

"I certainly shot myself in the foot in the recent Novice Contest.

"Hoping to avoid the usual tedious typing of the log, I resorted to carbon paper (it still exists, although one has to search to find it), I would take extra care with my handwriting and keep the log in duplicate, the carbon to be sent to you as my contest entry.

"Alas, the carbon copies were not fit to be used as kitty litter and the top copies not much better as far as readability for anybody but myself. So I threw the carbons away.

"Unfortunately, I also threw away one sheet of the top copies. Disaster! In a small country town one could have put on gum boots and repaired to the local rubbish tip with a rake. Not so in metropolitan Saint Kilda with its hi-tech compactors and destructors.

"There was, of course, the invisible impression of my writing on the page previous to the one destroyed. Could this be lifted to visibility by shading with a lead pencil like we used to make pencil rubbings of pennies at school? No success.

"An electron microscope, perhaps? Possibly it would reveal the pattern of rupture of fibres in the paper sheet immediately under the one destroyed? Perhaps the tribophysics department at CSIRO could take it on as a project?

"Even better, perhaps, the police forensic department. Surely they must have handled similar problems in fighting white-collar crime?

"Unfortunately, the contest entry date drew near and made it impossible for me to recruit any of these agencies in what I am sure they would have found a challenging research project.

"All that is left of the missing 26 QSOs are the doodles on the reverse of the following page. I enclose it for your interest, or rather a photocopy of it.

"How many points do the missing QSOs represent?"

At this stage Ken went to quite some lengths to explain the way in which the log was made up, average contacts and points per page, average number of duplicates, best ad worst case scenarios, etc. He then stated that he would leave the matter to the "inherent fair-mindedness of the Contest Manager" to decide what his accepted score would be. Ken will be able to tell just how fair-minded I am by his perusal of the results. I might ask after such a story just what leeway did I have left in which to manoeuvre?

Ken concludes, "If ever I do manage to keep an original log clear enough to submit as a contest entry, it will be by photocopying, not carbon paper! See you in the Remembrance Say. Cheers, Ken VK3AJU.

"PS. I'm sure your title should be Contests (plural) Manager, not Contest Manager."

So there it is for yet another year. I would hope that next year many more operators, particularly novices, will decide to enter in the VK Novice Contest. It is a good fun contest and always friendly. I would also hope that more clubs will keep this one in mind and not only enter the club station, but also help publicise this activity designed to encourage the newcomers to our hobby.

For now, again I wish you all the very best in all your activities and ask you to continue to support the efforts of our new FCM, Frank VK7BC. Good luck.

73 de Ian VK5QX.

1987 NATIONAL CW SPRINTS RESULTS

There were 25 logs received, so the level of participation could have been higher, but comments suggest this "quick" CW contest was highly enjoyable. Regrettably, no logs were received from Novice or Novice/Limited operators, but their presence was noted in their having provide contacts for others.

The overall winner, who will receive a trophy, was John McMillan VK2BAT. Congratulations from the Adelaide Hills Amateur Radio Society and the VK5 Division, John.

Certificates were not awarded in some divisions simply because no log was submitted — this should encourage more participation next year!

It was pleasing to not that there were no discrepancies found in any of the logs submitted.

Congratulations to the winners, and on behalf of the Society, thanks to all those who took part.

Logs submitted and points claimed:

VK2BAT*	29	VK2AIC	18
VK2CDG	13	VK2SU	11
VK3JA*	26	VK3OA	25
VK3BGH	24	VK3XB	15
VK3KS	10		
VK4OD*	25	VK4SF	21
VK4YB	21	VK4BIL	15
VK5ADX*	27	VK5GZ	25
VK5FN	24	VK5ZN	23
VK5ARC	21	VK5AYD	15
VK5AF	11		
VK6ABP*	26	VK6HQ	24
VK6AFW	16		
VK8AV*	23	VK8HA	12

Operator's Comments:
"... very enjoyable..." — VK2BAT.
"Great fun TKS" — VK2SU.
"Thanks for two most enjoyable contests..." — VK3BGH.
"I really enjoy these short contests so keep up the good work." — VK4SF.
"... a lot of fun ..." — VK4BIL.
"... disappointed with the number of operators ... one hour duration is ideal." — VK5GZ.
"I enjoyed participating and am looking forward to the next one." — VK5FN.
"Thanks for an enjoyable hour. I look forward to the next one." — VK5ZN.
"CU NXT YR" — VK5ARC.
"Thanks ... There is no excuse for not being in it..." — VK8HA.

Hans Smit VK5YX
National CW Sprint Manager

1987 NATIONAL PHONE SPRINT RESULTS

The level of activity, on-air reports, and comments included with logs (see below), all indicate the success and popularity of the second annual National Phone Sprint held on July 18, 1987.

On behalf of the Adelaide Hills Amateur Radio Society and the VK5 Division of the WIA, congratulation are extended to the overall winner of the Phone Sprint and the certificate winners.

The overall winner, who will receive a trophy for his efforts, was Ian Buchanan VK2KL. Congratulations Ian, and thank you for your effort and kind remarks.

About 115 stations participated in the Sprint with VK4 stations much in evidence. This was the result of the Sprint overlapping the last 30 minutes of the Jack Files Contest. Many considered this an advantage, while a few suggested that the two events should not clash.

This year I operated the Society's club station, VK5BAR, and found this to be a rewarding experience — both in promoting the Sprint and the opportunity to thank participants for their support. When VK4 stations were contacted, they

appreciated our additional points for the Jack Files and expressed best wishes for the success of the Sprint.

There were 37 logs received from VK1-8, ZL1 and ZL3. VK0DS did not submit a log but delighted many with his operating in the Sprint. Thanks Doug, for being there!

One operator did *not sign* the *mandatory* declaration which was required with all logs. As it happens, his score was not the highest in his area so it doesn't matter, but it would be a shame to miss out on a certificate because of a failure to abide by what must be the simplest rules of any contest — be careful next time!

VK7 and VK8 certificate winners had no competition — a case of be in it and win it! Are you other VK7s and 8s going to let it be that easy next year?

Congratulations to the certificate winners (indicated by asterisks in the following list) and thanks to all participating stations.

Logs submitted and points claimed:

VK1PJ*	53	VK1ZL	46
VK2KL*	54	VK2RJ	48
VK2LEE	42	VK2CXX	38
VK2ENX	33	VK2ENU	22
VK2AIC	18	VK2CJH	16
VK3BGH*	42	VK3CRA	36
VK3JA	35		
VK4YB*	44	VK4OO	40
VK4BIL	34	VK4AOE	14
VK5AC*	45	VK5FN	42
VK5KGS	37	VK5RV	31
VK5GZ	30	VK5AYO	29
VK5ADX	23	VK5PEB	22
VK5ASH	21	VK5ANW	19
VK5YX	12		
VK6ABP*	51	VK6APK	34
VK6AFW	28	VK6LD	23
VK7NRR*	33		
VK8AV*	48		
ZL3KR*	28	ZL1AQO	9

Check Log:
VK5BAR 68

Operators Comments:

"Congratulations to all concerned . . . a well organised contest." — VK2KL.
"These Sprints are a good idea. Please to wrok VK0DS." — VK5GZ.
"How about two Sprints a year, each mode?" — VK2LEE.
"A great little contest . . . look forward to next year." — VK6APK.
"It was great fun! Thoroughly enjoyed it." — VK5ANW.
"A lot of good fun . . . will sure CU next year . . . Jack Files overlapped and probably caused lack of VK4 participants this year." — VK4OO. (Not so, Tom. See summary — VK5SJ).
"And it was good fun again!" — VK4BIL.
"Very impressed with idea of the one hour contest. Thoroughly enjoyed it. Only comment . . . why overlap with the Jack Files contest?" — ZL3KR. (We are working on it, Alan. — VK5SJ).
"The one hour time period was just right. I think you have found the right formula for this event." VK3CRA.
"What an exciting finish in the last few minutes! Why the overcrowding around 3.600-3.620 MHz when we had the whole phone band? Wish stations would check their logs before wasting time on repeat contacts." — VK6AFW.
"Enjoyed participating, looking forward to the next one." — VK5FN.
"Only recently back on air after many years absence. What a great comeback. Look forward to the next Sprint." — VK5ASH.
"Thanks . . . for a really enjoyable contest." — VK6ABP.

John Hampel VK5SJ
National Phone Sprint Manager

ar

Intruder Watch

Bill Martin VK2COP
FEDERAL INTRUDER WATCH CO-ORDINATOR
33 Somerville Road, Hornsby Heights, NSW, 2077

We must always be aware, when hearing intruders, of the possibility that we may be hearing intermodulation products. This was brought home to me just before I began work on this column, as I was listening to the ABC on 576 kHz. From time to time, I could hear CW popping up on the receiver, an AM model, with a turntable and cassette deck. The signal was about strength four. I listened for the next transmission, and the call sign was "VIS", which is Sydney Radio, but, of course, does not have any output on 576 kHz. So, I went to another receiver, and the CW disappeared. So you see we must treat with suspicion any more or less local transmissions that we hear in the event that it may well be that the receiver is the offender, rather than the originating station.

There were 91 AM mode intrusions reported for July 1987; 142 using CW; 42 using RTTY; 25 intrusions using other modes, and 36 intruder stations used their call signs on air. Reports were submitted by VK2DEJ, VK3s AMD, PUW, XB; VK4s AKX, BG, BHJ, BTW, DA, KHA; VK5GZ; VK6RO; VK7RH and VK8s JF and HA. Many thanks to those people for helping-out.

The infamous USSR Naval intruder "UMS" has made his seasonal change from 20 metres back to 21.032 MHz for our summer. Listen for him there if you are short of stations to report. The intruder "KGB" (sounds ominous!) has appeared from time to time and, along with "VRQ" (Vietnam), has caused interference to the CW transmissions from W1AW.

The DOC has undergone a name-change and is now the Department of Transport and Communications (DOTC). I have written once again to "ORARI", the Indonesian Amateur Radio Society, asking for their help in having an intruder removed from 14.051 MHz, who uses CW there. Purely commercial traffic, definitely non-amateur and should not be there.

In the October column I mentioned my computer had 'crashed', and now I have it fixed. Following Murphy's Law, it also blew a fuse in the power supply, which caused some confusion. However, I seized the opportunity to secure another computer (the same brand), but this time with a dual disc drive, which is marvellous. However, it almost brought me back to "square-one", with all the different commands, etc. The existence of this column in AR is, however, proof that at least I can get the word-processor a little under control! The difference between cassette and disc drive is amazing.

Have a listen on 3.593 MHz on Fridays at 0700 UTC, for the Intruder Watch Net, and all are welcome to join. I recently has an inquiry from an amateur who mentioned that it is difficult for newcomers to the hobby to know what is going on with regard to whether they can be sure they are actually hearing an *Intruder*, and also the somewhat confusing different mode designations that are used. I will mention some of the modes in the column from time to time, and try and help to clear some of the confusion. There is a pamphlet in existence, which explains a lot, and can be obtained by writing to me (column address) or all the State Intruder Watch Co-ordinators should have copies. VK2 Sydney residents can pick up one at the WIA Divisional Office.

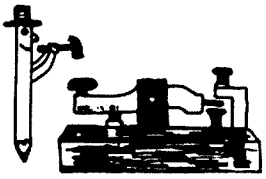
The mode for the month: A1A — This, of course, is CW, and we all know what that sounds like. The only thing we need to know is where does it become an intrusion if it is *non-amateur.*

1. It is **not** an intruder on 80 metres.
2. It **is** an intruder on *any* section of the 40 metre band from 7.000 to 7.300 MHz.
3. It **is** an intruder between 14.000 and 14.250, but **not** from 14.250 to 14.350 MHz.
4. It is **always** an intruder on all of the 21 MHz amateur band.
5. It is **always** an intruder on any section of the 10 metre amateur band.

Do not forget, I said ***"Non-Amateur CW"***.

Better go before the Editor kicks me out! See you in December.

ar



Pounding Brass

Gilbert Griffith VK3CQ
7 Church Street, Bright, Vic. 3741

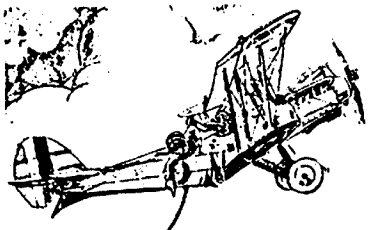
It seems odd to be writing about the latest bit of fun in the RD Contest knowing that, by the time you read this, the VK/ZL/O Contest will be over as well. I am glad to see the numbers increasing in the Morse section, it certainly makes things more interesting when the bands are crowded.

We really do need a few more Morse operators on the 160 metre band though. How about some new antennas this summer, fellas?

Work is piling up here as I have a number of projects in the pipeline. My "Drew Diamond" home-brew is back from it's sea trip (I loaned it to a real "Sparky"), and it needs a re-build, with the modifications featured in September AR, I hope.

I still have not built that 8044 ABM keyer using the new chip, so I hope to incorporate that in the QRP rig, too. It is a lot of fun talking to others who have built the same rig, plenty to discuss, never mind the weather.

A letter came from Vic VK5AGX, this month. We are competitors in the contest scene and usually work all bands in any one contest. He encloses the following extract about early wireless operating procedures, and mentions that he first flew in 1932 in Vickers Virginia bombers which had the same attributes as the ones in the article.



71 YEARS AGO — Wireless Operating

How the RFC did it in the First World War

These instructions for Observers appeared in "Notes for the Preliminary Training Officers of the RFC as Pilots", published by the Stationery Office in 1916.

Wireless during a Flight — The aerial wire is generally about 150 to 250 feet in length, so you should never attempt to let it down until you are well above that height, also making allowances for trees, buildings and other objects.

When up a sufficient height, say 500 or 600 feet, let down the aerial. Do not allow it to run out too fast, this is the most frequent cause of the wire breaking in the air or of tangling. If the wire becomes entangled it will cause difficulties and accidents when landing, as it will be impossible to wind it in completely, and the hanging wire becomes a source of danger. It may become entangled in trees and so might bring down the plane. In such a case it would be advisable to cut away the aerial. The best method of letting out the aerial is to slowly release the tension on the brake and letting the aerial run out smoothly and gradually, at the same time steadying the drum with the other hand. Let out the whole of the aerial, the rope and the shock absorber. If the set has been properly adjusted and put in order, no further adjustments need be made, depress you key and see if the ammeter is fairly high. If the ammeter reading in the air is low, or the spark is bad, the battery may be run down or the trembler not properly adjusted, usually caused by not tightening the lock nut up sufficiently during the ground test, or the spark gap electrodes may be dirty or wrongly adjusted. The fault may be also outside and out of your reach. The only thing you may do to improve matters is to adjust the spark gap. Under no circumstances make any alterations or adjustments while flying except that of the spark gap and the tuning clips, and never adjust the latter with the key depressed.

Before sending any message, send the letter V for three or four minutes and also your call letters at times. This is to give the operator on the ground an opportunity to tune his receiver so as to get best results, and the sending of the call letters is advisable so that the ground operator may keep in touch with you and not take signals from another plane working within range, whose messages are intended for a different battery. Before coming down reel the aerial drum right up and after landing see that the accumulator is removed for testing and if necessary for recharging.

General Notes — Never attempt stunts on an aeroplane fitted with wireless. Do not sacrifice clearness of signals for the sake of extra speed. Always test the spark before leaving the ground. (Unless a ground test is carried out). Remember that the strain on an operator listening intently for your signals is great. The signals are never very strong and they vary, also he has to distinguish between your signals and other wireless sets working within range. A complete understanding between the pilot or observer and the ground wireless operator is necessary to secure the best results. Always ask the wireless officer for assistance or advice when in difficulties. A ground test should be made sometimes at night, with the aerial out, to observe for any sparking. All parts of the set, and especially the bare copper helix, must be kept clean. The fair lead must be kept free from oil and mud or dirt, and good contact with the aerial ensured under all conditions in the air. If the aerial makes bad contact, or touches any part of the machine, intermittent and weak signals will result. The cord between the drum and the aerial may become loose or worn, or it may stretch or become damp; this should be seen to. Great care should be taken that all screws and lock nuts are tightly secured before every flight, as the vibration is likely to shake them loose.

I have a pile of literature, all of some interest to Morse operators, and thought the following information from Tony Smith G4FAI, would either create a stir or ease worried minds, I am not sure which. It was a help to me in a recent talk I gave at the local Apex club. It is amazing how little people outside the field know about amateur radio and communications in general. Anyway, they did take a few WIA brochures, so maybe you could try a talk to some of the service clubs in your area. They are usually happy to have guest speakers, and always supply you with a free dinner too!

RADIO AMATEUR INFORMATION SHEET No 3: MORSE

Issued by the Department of Trade and Industry Radio Regulatory Division — UK

The Department is often asked questions about the use of Morse code. This information sheet gives general guidance on Morse and answers those questions.

Why bother with Morse?

It is a requirement of the International Radio Regulations that those who work the HF and MF bands, with their potential for long-distance communication, must have a knowledge of Morse code. Also, Morse is very effective; it is often able to provide radio contact when other modes have failed.

What are the advantages of Morse?

As well as its effectiveness, the narrow bandwidth of Morse uses the radio spectrum most efficiently, allowing parallel contacts to take place within a small spectrum space. This is a great advantage in crowded band conditions. Morse is a truly international language which enables two-way communication between amateurs who would otherwise be unable to understand each other.

Also, Morse need only very simple transmitters and receivers, in contrast to the increasing complexity of equipment using other modes. So, through Morse, youngsters and others with limited resources can enjoy and learn about radio communication.

Is it true that the use of Morse generally is declining?

Yes, its usage in the maritime service and other professional services may be declining but there is no reason to suppose that this will be reflected in the amateur service where it is still very popular. Almost all the world's national amateur radio societies wish to see Morse continued because it is invaluable for long-distance communication and for breaking down language barriers.

I am not Interested in Morse so why can't I just use speech contact on the HF and NF bands and not bother with the Morse test?

It may be true that some who pass the Morse test prefer to use only speech contact but the International Radio Regulations must still be followed and all those who work the HF and MF bands must recognise and understand Morse transmissions. This requirement matters because some of the bands are shared with other services and it may be necessary to give way in your communications to a Morse transmission. It is important that amateurs do not miss a request to move frequency through a lack of Morse training.

Many who begin by thinking that learning Morse is hard work and that they will never use it, become converted to its good points. A Morse test is within the spirit of self-training associated with amateur radio. To pass the Morse test is a large step in the enjoyment of the hobby, leading to that most rewarding experience of long-distance communication.

Will the test be too difficult for me?

Keep at it and remember there are about the same number of Class A licensees as Class B licensees so this is positive proof that you too can get there. Learning Morse take discipline — you need to be committed to pass the test. Most think the rewards are worth the effort.

The Department has helped by permitting Class B licensees to use Morse at their own stations, so they gain practical experience to

prepare for the test. The Radio Society of Great Britain (RSGB) also co-ordinates a Slow Morse Transmission service to help Class B licensees practice their sending and receiving of Morse before taking the test.

What does the test contain?

There is a sending and then a receiving portion of the test in plain language each lasting three minutes. This is followed by a sending and then a receiving portion of numbers each lasting one and a half minutes. The speed tested is 12 words per minute.

British Telecom International (BTI) was running the test but now the Radio Society of Great Britain is to undertake it, why?

There were criticisms about the rise in the price of the test and the small number of BTI testing centres, usually the Coast Stations, meant high travel costs for some candidates. So the Department decided to invite fresh proposals for running the test. The RSGB's bid was the most attractive.

Amateurs testing amateurs and a Society with no examination experience. Does this make sense?

The Department wants to give the best possible service to radio amateurs. The RSGB proposals offered a reasonable test fee and at least 70 testing centres, one in each county, region or designated Island. Tests will be held every two months at each centre.

The Department will maintain its close interest in the amateur Morse test and it will set up a steering group to monitor and control, with the RSGB, the running of the scheme. It is not unusual for a national radio society to run the Morse test. After all, a national society will certainly have the best interests of the amateur radio hobby at heart. In the longer term, as we said earlier, it may be that Morse is almost exclusive to amateur radio, so the national society may eventually become the remaining specialists on the subject.

Will the test change?

Possibly, the Department is always receptive to any ideas for improvements to amateur radio. The RSGB, representing a large body of amateurs, liaises continually with the Department about the hobby. Change often occurs via this relationship.

If you have any problems or queries about amateur radio you are welcome to contact the Department of Trade and Industry.

We will be happy to help you.

That's it for this month Knights, sorry about the short shrift last month, but the Editor and I decided to cut a letter which would have filled the column.

PHONE PATCH UPDATE

A component value in the phone patch Line Isolation Unit (LIU) article in the September edition of AR magazine was incorrect.

The capacitor across the line — the one shown in the component overlay nearest to the switch wires — was marked 0.1 instead of 0.01 and the incorrect value would reduce the frequency response resulting in muffled signals.

LIU Designer, Geoff Donnelly VK2EGD, who found the error also advises that printed circuit boards for the unit are available from RCS Radio Pty Ltd, of 651 Forest Road, Bexley, NSW. 2207, phone (02) 587 3491, at a cost of $8 approximately.

Geoff, who is handling the certification process for the LIU requires those submitting completed units to supply their name, address, call sign, and the telephone number of the service for which the LIU is principally intended.

The transformers approved for use in the LIU are:

Arlec 45035 Telecom Eng App Ra81/144 and Ferguson MT627 Telecom Eng App RA83/177.

The isolation capacitor Telecom Eng App RA85/141 is available from Jaycar in Sydney and Melbourne.

—Contributed by Jim Linton VK3PC

How's DX?

ZP450A — PARAGUAY

For the first time ever, the Paraguayans have had a special call sign operational. The event began at 0000 UTC on August 8 and concluded on August 16 at 2400 UTC. The main station was located in the centre of Asuncion as part of celebrations to mark the 450th anniversary of the foundation of Asuncion. To lend support to the special call, 24 other stations operated with a portable letter from the home stations.

A total of 12 000 QSOs were made on all bands including CW, RTTY, SSTV and SSB, and all documents were sent to the ARRL for approval as a valid prefix for Paraguay. Approximately 200 countries were worked.

A special commemorative OSL card will be sent to those requesting it via airmail upon receipt of their QSL and some IRCs to cover return postage. All other OSLs will be sent via the bureau. SWLs will also be acknowledged.

The Radio Club Paraguayo would like to thank all stations who contacted the special call signs and would welcome comments and suggestions for future operations.

QSLs to Radio Club Paraguayo, PO Box 512, Asuncion, Paraguay, or via the bureau.

Support stations were:

Fredy ZP5AL/A, Perdro ZP5CCG/G, Reina ZP5RFN/N, Simon ZP5JU/U, Miguel ZP5BEE/B, Hugo ZP5HEB/H, Alberto ZP5PX/P, Wolfi ZP5VG/V, Fred ZP5CF/C, Alberto ZP5JAL/J, Luis ZPJCY/Q, Pedro ZP5WU/W

Mike ZP5CDV/D, Walter ZP5CPN/K, Malcom ZP5RG/R, Rosario ZP5MJY/X, Edgar ZP5EU/E,

WORKED ON THE EAST COAST

JUNE:

ZB2/GB0SWR/MA on 14 MHz CW.

YS1GMV on 14 MHz SSB, QSLs to W3HNK (prompt reply received).

9Y4NW on 14 MHz CW.

JULY:

YE9X (Indonesia) 7 MHz SSB, QSLs to YC9VX.

3C2A (Equatorial Guinea) 14 MHz SSB, QSLs to AK1E.

AUGUST:

OF3UJ (Finland — Special prefix for 70 years of Independence Celebrations) 14 MHz SSB.

YV1BVJ on 10 MHz CW.

HS0B (Thai Amateur Radio Society Club Station, Alan operator) 14 MHz SSB.

Alan says he is operating on the weekend around 0030 UTC on 14.175 MHz SSB. Originally from ZL, he has lived in HS for the past 20 years. His direct QSL address is PO Box 2008, Bangkok, or via the bureau. Alan believes more activity is expected in the new year from Thailand as new regulations were passed and accepted by the government of Thailand. This will result in more amateur activity.

KP4YD on 7 MHz SSB.

KC6GM (Republic of Belau/Palau, formerly the Western Carolines, Toshi operator)14 MHz SSB and CW. QSLs to JR1BMU.

T20EE (Tuvalu) on 14 MHz SSB. QSLs to N6NDH.

Contributed by Steve Pall VK2PS

ar

QSP

NATIONAL MDS NETWORK PLANNED

One of the leading players in MDS is Corporate Data Services (CDS-TV), a Melbourne company which has run a non-domestic service called the Real Estate Channel in Melbourne since April 1986.

CDS-TV plans a national network of MDS services once the DOC has overcome frequency planning issues associated with the proposed channel allocations.

Carl Johnson, executive director at CDS-TV and secretary of the MDS Applicants Committee, said test transmissions of a Band A service in Sydney on 2109.750 MHz had already commenced from a transmitter located on Centrepoint Tower.

(Future services will have to locate their transmitters within a 500 metre radius of the first licensed service, according to DOC regulations).

Programming for the service will be split between business, real estate and medical. The business section will occupy most of the daytime programming.

As this services is on a Band A channel, there will be no government encryption requirements. However, Mr Johnson said CDS-TV would be using one of the PAL over-the-air encryption systems to provide user addressability and security. He said there are over 100 of these types of systems available, with Paytel being probably the foremost.

To receive the service, subscribers will need to lease a decoder and a microwave-to-VHF downconverter as well as paying a subscription fee. The service will also be subsidised by advertising.

(Network Technologies, a Sydney company, is also currently developing special interest business television on a subscription basis. Its proposed Investment Research Network is similarly designed for the financial sector).

CDS-TV is also one of the many to apply for a VAEIS licence on Band B. Services on this band must be B-MAC encoded to prevent fortuitous reception. With a sport and entertainment base, the services will come into direct competition with the recently established club and hotel satellite services for the non-domestic market.

Other applicants for the Band B licences include Sportsplay and ICOM. Mr Johnson believed that as many of the established broadcasters had already put their money into satellite areas they would not be making a play for MDS.

Australian Downconverter

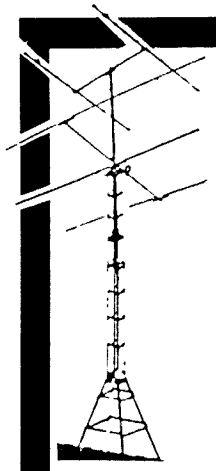
Australian industry is well placed to take part in the MDS expansion as the Band A downconverters are, in fact, made in South Australia by Codan.

In 1984, AAP commissioned MITEC, the microwave technology development centre at the University of Queensland, to develop a high quality downconverter as those available overseas did not meet its requirements.

AAP, which has run a data service on Channel 3 in each major capital city since October 1984, put requirements and specifications to MITEX for a downconverter that would minimise reflection and corruption.

The completed design was transferred to Codan in Adelaide where hundreds of units have since been made. AAP plans to develop the downconverter for the overseas market and is looking at Codan among other companies to manufacture it.

—From *Broadcast Engineering News*, February 1987



EMTRON'S MODULAR ANTENNA TOWERS

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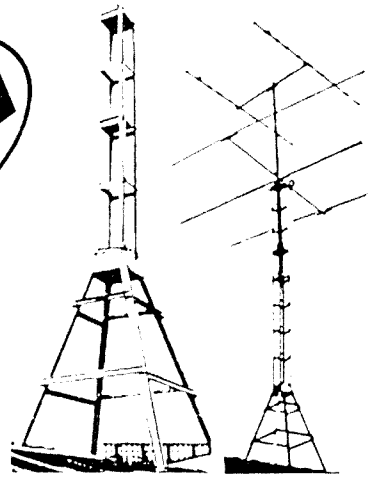

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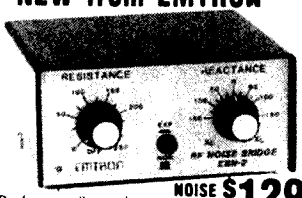
Modular, portable, extremely rugged.
• One man assembly and installation • Lightweight
• High quality aluminium alloy • High stability

Finally here are strong, sturdy antenna towers that are simple to assemble, lightweight, strong and can be used on your roof top or packed up and used in the field. Available in three modules 3.8m (12½'), 5.5m (18') and 7.5 (25'). The 12½ foot model has base and one tower module, the 18 foot has two tower modules, and the 25 foot model contains three tower modules.

MODEL ET-1 Base plus 1 tower section, and hardware $497
MODEL ET-2 Tower section only $190

NEW from EMTRON



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NEW EMTRON EDM-1 DIP METER

1.5 TO 250 MHz WITH 6 PLUG-IN COILS

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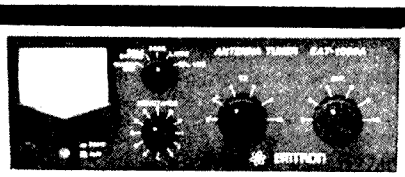

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416 Logan Road, Stones Corner
Qld. 4120. TLX:144696

Ph: (07) 394 2555
FAX: (07) 39 4316

COMMONWEALTH CONTEST

COMMONWEALTH CONTEST 1987 — Results

In past years, the fact that conditions were good or poor seemed to have the greatest effect on the size of the VK entry in this contest. Has another factor been introduced — Australia Post, maybe, with it's annual increases in postal charges. We hope not! From a peak of 66 VKs who submitted logs in 1984, our figures have gone down, 58, 52, to 44 this year when conditions were really fairly reasonable. Though the Commonwealth Contest has, for the last 20 years, occupied the second full weekend in March, and will continue to do so, a clash this year with the VK/ZL Field Day contest must surely have reduced our numbers.

We congratulate a new winner for the VK section of the contest, Kevin Smith VK6LW, who was level with the eastern State's leaders until the last few hours when an opening on 14/21 MHz experienced only in the West, enabled him to shoot to the front, and with 372 contacts, into fourth place overall. Russ Colestron VK4XA, who had won each year (excluding 1979) from 1978 to 1986, had to be content with third place behind VK2APK, but he will surely come again!

Outright winner was VE7CC, with 398 contacts and a marvellous 171 bonuses which must surely be a record. Out at the end of the world, our best were VK6LW 135, VK2APK 132, VK4XA 125 and VK3MR 105 — no others over the century. Appearing in the results, but not heard here were calls from 5N, 8P9, ZZ, ZD8, and other exotic places, as well as 68 from the UK — even a VP8 appeared in the statistics.

A shortage of bonus points in the Receiving Section contributed to Eric Trebilcock's second placing behind BRS 1066. The RSGB special station, GB5CC, was voted a good addition to the contest and to the list of bonus areas, and will again operate in 1988. See *The GB5CC Story*.

TOP TEN

1	VE7CC	5391	6 GW3YDX	4488
2	VE6OU/3	5123	7 G4BUO	4213
3	6Y5HN	4794	8 VE3CRG	4199
4	VK6LW	4548	9 G4EDG	4066
5	G3FX8	4536	10 G4CNY	4058

RECEIVING SECTION

2 Eric Trebilcock BRS 195 1955

AUSTRALIAN SCORES

4	VK6LW	4548	79	VK6AJ	1408
11	VK2APK	4055	80	VK7RY	1403
14	VK4XA	3703	81	VK8HA	1395
23	VK3MR	3050	91	VK3AUQ	1150
27	VK2BOQ	2788	95	VK4BKM	1090
28	VK7RO	2783	103	VK4TT	845
31	VK5AGX	2738	104	VK3FC	835
32	VK3ZC	2660	108	VK3DOV	805
36	VK4XW	2375	110	VK2SU	800
37	VK6RU	2367	111	VK4BRF	795
40	VK3OQ	2140	114	VK3KS	755
41	VK3XB	2138	120	VK6ED	665
47	VK5GZ	2045	128	VK6RZ	625
48	VK5BN	2030	129	VK3XF	625
49	VK3MJ	2020	131	VK2AIC	600
50	VK5UM	1960	133	VK7CH	588
51	VK2OID	1945	135	VK3JI	540
55	VK2EL	1823	137	VK2AZR	520
57	VK3BDH	1775	144	VK7ZO	335
58	VK5RG	1698	145	VK2GT	305
62	VK3CGG	1630	146	VK5BS	300
66	VK2AOF	1550	148	VK3VQ	255

Single band entries among the above were:

3.5 MHz VK7ZO (Overseas Winner)
7.0 MHz VK4BRF (Overseas Winner), VK5BS
14.0 MHz VK4TT, VK3JI, VK2GT

PACIFIC AREA SCORES

17	ZL1AIZ	3468	38	ZL1HV	2272
22	ZL2BR	3083	98	ZL3AGI	1025
33	9V1TL	2455	108	ZL2ALJ	805

VK TEAM EVENT

For the fourth year, New South Wales has won the four man team title. In recent years, some fine operators have surfaced in some of the smaller States. With the larger number of VK2/3 participants there to be worked, surely a team of four could be organised to knock off NSW or Victoria for a change!

TEAMS	1987	1986	1985	1985
VK2	10611	11890	10632	16272
VK3	9988	10391	8784	14549
VK6	8988	9618	6482	10303
VK5	8773	8910	8761	8965
VK4	8013	10143	8359	12475
VK7	5109	6274	7982	7571

The only other areas with more than four entrants were:

G	17303	14408	13193	17064
VE3	14830		8626	

AWARDS

The Gold Medallion for the leading VK entrant was won by Kevin Smith VK6LW.

The Silver Medallions for the leading State Team were won by D F Kiesewetter VK2APK, K Nad VK2BQQ, S W Wardle VK2DID, and S Bourke VK2EL.

HOW THE LEADERS MADE THEIR SCORES

QSOs/Bonus per band 80-10 metres (claimed).

VE7CC	57/37	86/46	225/64	33/24	-
VE6OU/3	68/30	175/52	257/44	5/5	-
6Y5HN	71/20	138/41	11/10	-	
		254/53			
VK6LW	25/20	98/37	151/49	97/28	1/1
G3FXB	37/20	88/50	131/72	17/17	2/2
GW3YDX	39/21	87/49	134/69	17/17	2/2

As promised last year, Alan Gray G4DJX, has produced a table showing the areas contacted and the number of suffixes (different stations) worked from VK — of course, by the stations who submitted logs.

From it you will see that 39 call areas were worked, but the table for the UK which is apparently in a better global position for working DX (as if we didn't know) shows that 53 were worked from there. Total QSOs reported were 16989 compared with 13405 last year, while 28 MHz was responsible for 56 QSOs compared with 67 last year — is the cycle on the way down again?

ANALYSIS OF VK OPERATION

AREA	3.5	7	14	21	28	TOTAL
C2	1	1	1			3
G	2	84	157	84		327
GB		1	1	1		3
P2		1	1			2
VE1		2				2
VE2		2				2
VE3	4	19	6			29
VE5		2				2
VE6			1			1
VE7	4	5	5	2		16
VK1	1					1
VK2	10	18	13	6		47
VK3	16	16	23	11	4	70
VK4	11	6	20	4	1	42
VK5	12	11	13	5		41
VK6	6	10	10	4		30
VK7	6	7	6	4	2	25
VK8	1	2	2	2		7
VK9L	1	1	1	1		4
VK9N	1	1	1			3
VO1		3	1			4
VS6		5	6	4		15
VU		7	9	2		18
ZB2			1			1
ZC4		1	1	1		3
ZL0			1	1		2
ZL1	15	22	10	4	1	52
ZL2	6	15	8	1		30
ZL3	1	4	2			7
ZL4		1				1
ZL7	1					1
3O6		1				1
4S			3			3
5B4				1		1
6Y		1	1			
8P		1				1
9J	1		2			5
9M2	1		2			3
9V		1	2	1	1	5
AREA	21	31	31	19	5	
SFX	103	257	312	139	9	

There were 39 call areas worked.

The Golden Anniversary of the Commonwealth Contest proved to attract more entrants than ever before, some 150, and although band conditions were only fair, some very respectable scores were made. It is remarkable and a tribute to the contest that contacts being made between station over 50 years ago are still being made today, and the strength of friendship which has resulted and continues to form between participants is surely an essential part of our hobby. The contest also tests an amateur's station and operating skill to the maximum, demanding a good knowledge of band conditions at this time of year and the ingenuity to construct even better antennas to weedle out those faint, but crucial signals from the noise. The Commonwealth is a dignified contest where manners and experimentation are set against a competitive spirit.

THE RESULT

The winner of the Golden Jubilee contest is Lee Sawkins VE7CC, making this his fifth outright victory in the past 10 years. Congratulations. Lee used a combination of TS820 and L4B driving an 80 metre inverted Vee, a 40 metre two-element Yagi at 105 feet, on 20 a five-element KLM at 100 feet, 15, four-element Yagi at 85 feet. He was closely challenged by John Sluymer VE6OU/3. who made over 100 extra QSOs but just lost on bonus points. John used the following (if you can imagine this, you are doing well!). A TS940S and MLA2500 feeding; phased inverted Vees at 130 feet for 80 metres, three-element Yagi at 150 feet for 40 metres, six-element Yagi at 150 feet on 20 metres, four-element Yagi at 1650 feet for 15, CL36 and 402BA at 75 feet.

Nigel Hoyow 6Y5HN, drops to third place this year, but I have a feeling we have not heard the last of Nigel if his new QTH is as promising as it sounds. Doug Renwick VE5RA, made a gallant effort from Barbados as 8P9HG, and must have felt he was in with a chance up until the last few hours when things went quiet from there. Perhaps the biggest improvement has come from Kevin Smith VK6LW, who finished in fourth place. This was a clever piece of operation and Kevin made good use of all bands to pick up over 130 bonus points. Could we have a future VK6 winner here?

I am beginning to lose count of the number of time Al Slater has won the Col Thomas Rose Bowl. He wins it yet again, but not after a severe testing from first time entrant, Ron Stone GW3YDX. As Ron said on his entry, "had the contest ended at 0900 I probably would have beaten Ron. However, I am sure he has done it again on bonuses". Only just Ron, 161 to your 158 — not much of a difference after 24 hours!

AWARD WINNERS

Senior Rose Bowl — Lee Sawkins VE7CC
Junior Rose Bowl — John Sluymer VE6OU/3
Col Thomas Rose Bowl — Al Slater G3FXB
Receiving Rose Bowl — C Bradbury BRS 1066.

SINGLE BAND WINNERS — UK
3.5 MHz — G3KSK
7 MHz — G4ODV
14 MHz — G3RZP

SINGLE BAND WINNERS — Overseas
3.5 MHz — VK7ZO
7 MHz — VK4BRF
14 MHz — ZL3AGI
21 MHz — VU2UR

SPECIAL AWARDS
The Special Awards given to celebrate the Golden Anniversary have been allocated as follows:
Special Award — Dud Charman G6CJ
Overseas Winner — Lee Sawkins VE7CC
UK Winner — Al Slater G3FXB
UK Receiving Winner — C Bradbury BRS 1066

The Committee discussed at length who should receive the award giving the most to the contest throughout its history. There were many candidates — some of whom are mentioned later, but it was decided unanimously to present the award to Dud Charman G6CJ, for the length of time he has participated in the contest, and for the skill in operating he has shown over the years. Dud entered his first BERU contest in 1936, and has present ever since. Many of the Old Timers will remember the time when Dud led the list of entrants in 1952, but could not accept the Senior Rose Bowl because he was chairman of the HFCC at that time. This reflects his ability in operating since this feat has only been accomplished by two other UK amateurs in the history of the event. Many thanks Dud, for all you have done for the Commonwealth Contest and I am sure I speak for all amateurs when I wish you good luck for the future.

The Committee also recognised the outstanding contribution made by Mai Geddes G2SO/Z23JO, Snow Campbell VK3MR, Frank Cooper G2QT, John Tutton VK3ZC, and Victor Williams VE3KE/VE7UZ. In order to thank them for their participation, they will be receiving a special certificate for their efforts over the years. Thank you gentlemen.

ACTIVITY AND CONDITIONS
Compared to last year the biggest improvement was in the number of different call areas active. Although conditions were not markedly different this increase in call areas makes the contest much more enjoyable and interesting. This year a total of 60 areas were worked at one time or other and again it is the UK amateurs who seem to be in the best location for working the majority of areas, with G3FXB, contacting 41 out of the 60. With increased publicity and improved conditions (!) there could be over 70 call areas active during next year's contest.

80 metres held out to the east coast of VE and ZL, but propagation to VK and Africa was disappointing. Many stations were pleased to work VU2ALM who provided the only signals from Asia, whilst G3MXJ, G4FAM, G3PEK, G4BUD, GD3AHV and GB5CC were the only ones to contact 9J2BO on this band. North America is the place to be for 80 metres, with 27 call areas being worked and the only absence being Asian signals from that part of the world. No doubt strong east European signals wipe out Commonwealth signals for the Asian stations on 80 and 40 metres, but it made a pleasant change to have a good level of activity from them on the HF bands.

40 metres would certainly supply more if it opened to VE4, 5, 6, and 7 from the UK. Signals to Oceania are always good at this time of the year and quite often more reliable than 20 metres.

20 metres was again the 'bread and butter' band supplying 54 percent of the total number of QSOs. The biggest change in propagation is shown on 15 metres where there was a substantial opening to VK/ZL and also VE which did not happen last year. Perhaps this sheds some light on the change in propagation due to our shift through the sun spot cycle. It was a shame for the Asian stations that 15 metres failed to open to VE, otherwise they would have had a share of all the activity present on that band.

10 metres has still to show any appreciable sign of improvement. If it had not been for the presence of GB5CC and Z23JO, there would have been no contacts made from the UK. Elsewhere there was minimal use of the band with most traffic taking place between VK2/3 and ZL1/2. Surely things can only improve.

COMMENTS
"I hope you have more VU entries this year" — VU2UR.
"Where were all the VKs this year?" — G3PEK.
"I was dog-tired when the contest started. I'd been up since about 0500 and had to put the antenna back up on the garage roof (Not so easy at nearly 66 years of age with only a YF to assist!)" — VK2AQF.
"Good to hear old 'G' friends again" — VK5AGX.
"Receiving the 10 metre certificate in 1984 was one of my biggest thrills. As I recall, I made only five QSOs but I listened for quite a long time and suddenly the band opened marginally to the UK, and then Africa. Nothing heard on 10 metre this year. Perhaps next year? ? ?" — VE2AEJ/3.
"If you could arrange to have GB5CC within ground wave range for me next time along with an operator I know who will suggest we QSY to 26 MHz I will be greatly obliged!" — G3JYP.
"I was running two watts to a dipole so a lot of my 599 reports must be suspect, but I enjoyed being sought after." — ZL0AKB (He didn't manage to work any Ga! ! !).
"Propagation was very poor considering I had to fight to get the VK call signs which normally are booming through most mornings." — ZC4AP.
"Piece of wire in roof-space of bungalow. About 11'6" above ground. What Pat Hawker calls an AOG (Act of God) aerial." — GW3HCL.
"I came back to England for the weekend in order to take part so I think it cost me about £2 per QSO in fares!" — G3TMA.
"Score only slightly higher than 25 years ago . . . Inverted Vee, sloper end buried in eight foot of snow. Power winch and crank-over winch also under snow. Rotator jammed and beam pointed north, finals in amplifier gone soft." — VO1AW.
"There were hundreds of ZL/VK field day stations. but not on the BERU contest. Is there anything wrong between England and New Zealand?" — VK2BQQ.
"Although I cannot claim to have taken part in all 50 contests, I have been in quite a number, my log showing the first being in 1932, which must have been one of the earliest BERU contests." — VK7CH. (It was the second, and Mr Harrison came sixth in Region 12 of the BERU).
"Another BERU contest over and I am another year older having taken part in many of the contests in my 59 yaars on the air." — VK3FC.
"Greetings and thanks for another interesting contest. Next year 21 MHz should be wide open, and maybe 28 MHz?" — VK8HA.
"It was pleasant to say hello again to so many of the participants who make this an annual event." — VE3IY.
"Very pleased to have 40 metres open to VK/ZL shortly before the test ended." — VE3KZ.
"Now aged 71 and licensed nearly 53 years. Have been in quite a few BERU tests. Ex VE2WA, VO6U, WE4SO." — VE3ST.
"I am concerned at the number of stations who confused my call with that of Russ VK4XA. This is usually a clear indication that the received strength is not in accordance with the report given." — VK4XW.
"Will I be last this year?" — VK7ZO.
"My first BERU contest — and on the 36th anniversary of receiving my licence too. Now I know what I have been missing!" — G3HJF.
"Conditions interesting, a pleasure to participate." — G3IGW.
"Had no QSOs between 0400 and 0600 UTC. Kept myself awake by reading the RS catalogue." — G3JKS.
"Level of activity terrific. Worked a few new ones, ZD8CW on 80 metres, VS6DO on 40 metres, also located 5A0A on 15 metres whilst tuning." — G4OBK.
"Lots of fairly unusual places seemed to think they had joined the Commonwealth. Prize goes to K1 heard calling CO BERU. Perhaps he hasn't heard about the events of 1776!" — G3WRR.
"Hope to have a quad up at 120 feet for next year, also definitely going to invest in a paddle after pounding away for so long on a straight key." — 5B4UK.
"I find this the best contest in the whole year of contests. Most of the others are a waste of time." — Z23JO.
"Miss Rusty G5WP, especially for the 3.5 MHz contacts." — VE7UZ.

The RSGB would like to thank everyone who has helped to publicise this event. Hopefully, there will not be a clash between the Commonwealth and VK/ZL Field Day for next year. We hope to run GB5CC again as this seems to have had only positive comments from entrants, see you on March 12-13, 1988. Finally, thanks to those who sent in check logs:
VK3VQ, GW3HCL, G3VDL, VK3KF, G4HMD, G4CP, VS6UO, ZL0AKB, GM3ITN, G2QY, G3WP, VE3AOT, GI5TK, and again John Tutton VK3ZC, for help with publicity in Australia.

THE GB5CC STORY
Don Beattie G3OZF, and Alan Gray G4DJX, made the journey to Wokingham for the weekend to operate GB5CC from the QTH of Ian Sheppard G4LJF. If you think you have a decent station take a look at this one — a four element triband beam for 20, 15 and 10 metres, a three element 40 metre beam, and five 80 metre slopers all over 100 feet high.

We arrived at 10 am, began preparing the shack, and by 11/30 am put out a few tentative CQs. As this was to be the first ever use of a GB5 prefix, we were expecting a certain amount of interest, but fortunately this was minimal and we were able to concentrate on working Commonwealth station once the contest began. With the favourable site and call sign we were hoping to prove that the contest can be won again from the UK, and, indeed if you include the 300-odd UK QSOs also made, this was the case.

However, although we obviously lost out on some of the other Commonwealth call areas due to UK traffic, there is still a mighty difference between the top UK entrant, Al Slater, and the overall winner Lee Sawkins. Maybe next year. . .?

We tried to make the best use of all bands, making scheds and QSYing where appropriate. The big disappointment to us was 10 metres. It was only in the dying minutes of the contest that we got through to Mai Geddes Z23JO. Attempts with ZB2EO, ZC4ZP, and 9J2BO gave no results. Things may be different next year when openings to VE from the UK may occur. The operation by Commonwealth stations was exemplary and it is a pity other operators failed to take notice of this. One station, who would only give his call as UA1AA, continually jammed the station repeating that we were on a DX frequency. If he had taken the trouble to listen to the operation he would have heard the DX and us working it. It is a shame that a perfect example of communication between amateurs throughout the world should be spoiled by a few. This apart, we finished the weekend with the satisfaction of knowing that we had enjoyed ourselves tremendously, and had given a reasonable opportunity for other stations to work GB5CC.

Alan Gray G4DJX

GB5CC RESULTS

BAND	QSO	BONUS	AREA	POINTS
3.5	102	24	13	990
7	174	50	26	1870
14	186	57	27	2070
21	72	24	16	840
28	18	4	2	170
Total	552	159	38	5940

Contributed and compiled by John Tutton VK3ZC

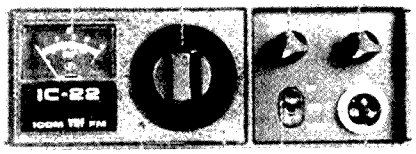
Know your Second-hand Equipment

ICOM HF & VHF TRANSCEIVERS

Ron Fisher VK3OM
3 Fairview Avenue, Glen Waverley, Vic. 3150

Some of the early Icom and Inoue equipment was covered in the March 1966 issue of AR. It is therefore high time to look at some others from this popular series. The sales of Icom equipment in Australia really progressed when Vicom opened in Melbourne during late-1974. They distributed Icom products and also sold Yaesu and Kenwood for a time. Vicom also introduced the Uniden 2020 to Australian amateurs.

However, it is probably fair to say, the one single rig that put both Icom and Vicom "on the map" was the IC-22, a two-metre FM series. Perhaps one reason for this was that Vicom, at that time, were prepared to carry large stocks of crystals for all of the popular two-metre frequencies. Most of the other distributors were reluctant to do this and, in consequence, lost sales.



ICOM IC-22

The IC-22 was a two-metre transceiver with 10-watt output and 22 channel capability. As mentioned above it was crystal locked and required two crystals for each channel, one for transmit and one for receive. Whilst the external appearance was identical to the IC-20 (see March 1986, AR), the internal construction was completely changed. The module construction of the IC-20 was simplified to two large circuit boards — one for the transmitter and receiver components and one to take the crystals and their associated trimmers. They were normally sold fitted with three channels to the users requirements.

Price new in 1975 was $198 and secondhand value today would be about $100, assuming it is fitted with five or six useful channels.

ICOM IC-22A

Released early in 1975, the 22A was a cosmetically improved version of the IC-22. Electronically it was identical to the 22 but featured a redesigned front panel with an easier to read channel-selector. Transmitter power output was again one or 10 watts. Overall performance of these sets was excellent and they also had a very good reliability record. Price when new in April 1975 was $210. Secondhand value today would be about $120.

ICOM IC-22S

Appearance was the same as the IC-22A and most of the essential specifications remained the same but there was one important change, no crystals were required. The 22S featured a PLL synthesiser and operating frequencies were programmed by inserting diodes into a matrix board. As with the earlier 22 and 22A, there were 22 channels available and, as sold, they were programmed for repeaters one to eight and simplex 40, 50 and 51. The remaining channels could then be programmed to the owners selection. Soon modifications became available to add an external switch box to enable any frequency to be immediately selected. It wasn't long before the 22S became the standard two-metre FM rig. It seemed that "everyone had one".

All went well for several years but then troubles began to appear. These were first attributed to dry solder joints, mainly in pins connecting the double-sided circuit boards. Later other troubles appeared — so much so that the 22S now has a dubious reputation on the secondhand market.

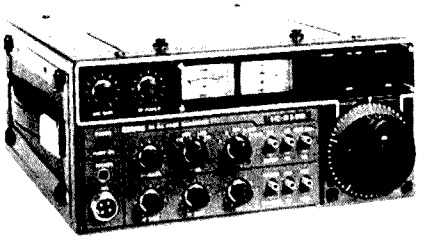
Price when new in 1977 was $269. Secondhand value today would be about $140, but ensure it is working. Check all programmed channels for transmit and receive operation in duplex A, B and simplex modes. If this is okay — good luck. . .

ICOM IC-245

Perhaps the best way to describe the 245 is to say that it was an IC-22S with a digital VFO and LED digital frequency readout. It sold at an up-market price of $479 and, as such, is a rather rare item today.

The thing that really put the 245 into a class by itself was the optional SSB adaptor. The photograph shows the 245 with the SSB adaptor attached underneath.

Tuning rate on FM was in five kilohertz steps and with SSB selected, 100 kHz steps. Power output on transmit was 10 watts with no provision for low power selection. In later life, these transceivers also proved to be rather troublesome. Price in 1977 as mentioned above was $479, but the SSB adaptor was an option at an extra $129. Secondhand value today for both units combined would be about $250.



ICOM IC-211

The IC-211 was Icom's first fully self-contained multi-mode two-metre transceiver. It's features included — built in AC power supply or operation direct from 12 volts DC, operation in FM, SSB and CW modes, two VFOs that would track to provide a repeater offset for FM operation, separate S-meter and centre tune discriminator meter, effective noise blanker and selectable AGC for SSB. Tuning rates of five kilohertz for FM and 100 Hz for SSB, plus a seven digit LED frequency readout. These transceivers were capable of excellent performance and were very smooth to operate. Transmitter output was 10 watts FM and CW and 10 to 15 watts PEP for SSB. As long as the AC or DC power was connected, the last operating frequency of the VFO was remembered, however there were no additional memories. Later a digital remote control unit became available which did have a limited memory capability. This unit, known as the RM-2 or RM-3, contained its own digital frequency readout and a keyboard for frequency selection. The RM-2/3 was also usable with the HF SSB transceiver, model 701, which will be featured next.

The IC-211 was released in early 1977 and the price was $785. Price of the optional RM-2 or 3 remote controller is not known. It should be noted that the IC-211 also suffered from its fair share of troubles, also. These often showed themselves as jumps in frequency and the two VFOs reverting to the same frequency during split-operation.

Secondhand value today for an unmarked working IC-211 would be about $350. The remote controller would be about $100.

ICOM IC-701 HF TRANSCEIVER

Released during early 1978, the 701 was the first Icom HF transceiver produced since the original IC-700 of 1969. As was expected, the 701 was technically very advanced and, in fact, set the scene for our present-day transceivers. It was, like the VHF IC-211, fully synthesised with two VFOs and was fully solid-state including the final stage, but now with 100 watts output and requiring a separate 12 volt DC supply.

Initially, it came complete with the 701PS power supply and a desk microphone. Later both the power supply and desk microphone became options. Some other interesting features on the 701 included — motor driven band switch, hang AGC system, an RIT that switched off as soon as the main tuning dial was moved, two speed tuning of 100 Hz and 1 kHz steps.

However, one of the problems was that the VFO frequency reverted to the band edge when the power was switched off and then on again. Unlike the IC-211, there was no memory of the last in-use frequency. Despite this, the 701 was a very pleasant unit to use and it produced very acceptable audio quality on both transmit and receive. Early examples were very prone to trouble but most were repaired under warranty. Towards the end of their production run they became mush better as Icom obviously tightened their quality control. A secondhand unit bought today should be reasonably reliable. The most common problem today is the failure of the final transistors. They are also prone to intermittent connection in the motor driven band changing relay system. This can often be temporarily cured by rotating the band selector when set to the 'external' position.

Price of the IC-701 new in 1978 was $1575 complete with AC power supply. Secondhand value for the combination would be about $575. Note too that the original IC-PS701 power supply was not a regulated supply and delivered about 18 volts on no or low load. While the 701 transceiver was designed to cope with this, the supply is not suitable for use with other equipment.

Next month we will look at some more equipment from Icom.

ar

AR Showcase

SHARP EXPANDS POPULAR TWINCAM RANGE

Sharp, market leaders in portable audio products, have released three new Twincam stereo radio cassette recorders which doubles their selection.

The new cassette recorders are popular due to their easy operation, high performance and compact design.

The key to this latest success is the innovative Twincam mechanism, which stacks one tape behind the other with a single motor drive operation, making speed deviations and revolution irregularities with recording a thing of the past.

The Twincam back-to-back design is also more space efficient, allowing Sharp to incorporate more powerful amplifiers and bigger speakers, while still keeping the portable units surprisingly compact.

Features on Sharp's Budget Twincam (WQ-T232), which will appeal to those wanting big (50 watt PMPO) power at a competitive price, include two-way four speaker system, three-band graphic equaliser for sound tailoring, CD/Line in, bass reflex ducts, for good base response, continuous playback and improved editing functions for ease of operation. The WO-T232, is available in red, khaki green, black and designer gray.

Customers requiring extra power (60 watt PMPO), and a mid-range price should like the new Spectrum Twincam model, this unit includes a five band spectrum analyser, and convenient auto program-search system (APSS), which is very handy for searching out the start of the next music selection.

The third new portable, the Auto Reverse Twincam (WQ-T483), features the exclusive Twin Mechanism with a feather-touch full logic twin auto-reverse, 70 watts power (PMPO), four band graphic equaliser, auto-reverse dubbing, and a four-band radio, as well as the standard features included in other Twincam models. APSS is also available on both tapes for added convenience.

The new Twincam models, for use both indoors and outdoors, are designed to look as great as they sound and provide first-class entertainment at a reasonable price.

—Contributed for Sharp Corporation of Australia by Jordan Hardingham Pty Ltd

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NATIONAL LAND MOBILE EXPO 88

The National Land Mobile Expo 88 has been selected by the US Department of Commerce for its prestigious foreign buyers program. The Expo is one of only 18 US trade shows selected by the Department of Commerce for the program, joining such major conventions as Comdex and Wescon. The Expo will be held in Las Vegas from April 20-22, 1988.

The foreign buyers program is designed to attract overseas attendees to US trade shows and to assist exhibiting companies in transacting business with foreign firms. As part of the program, the US Foreign and Commercial Service Marketing Development Division will provide a number of services to exhibitors at the Expo. The Division will print an export interest directory that contains information about exhibiting US companies including name and address, products and services, and international marketing objectives. The Division will also promote the show with listings and announcements in domestic and international publications.

At the Expo, the US Foreign and Commercial Service will manage an international business centre to assist with registration for foreign attendees and arrange meetings between overseas buyers and exhibitors. Export counselling will also be provided and the Division will encourage local financial institutions to participate and offer export financial advice.

The Expo is sponsored by Communications, Global Communications and Cellular Marketing.

The National Land Mobile Expo is in its 12th year and is considered the leading trade show for the mobile communications industry, and includes mobile and portable radios, microwave, paging and cellular equipment.

For further information contact Bert Engelhardt, Commercial Consul, Hyde Park Tower, 38th Floor, Park and Elizabeth Streets, Sydney, NSW. 2000. Phone (02) 261 9200.

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THE PUZZLER'S GUIDE

Readers who like *Morsewords* will be interested to know that *The Puzzler's Guide*, a new book by Audrey Ryan, is now available in bookshops and newsagents for $7.95.

This is a great book for people who love to solve word puzzles but is also for those who would like to, but don't know where to begin.

The Puzzler's Guide takes readers through the basic steps and the more complex rules for solving popular puzzles like cross reference, word search, straight and cryptic crosswords, diagramless puzzles and more — even the new logic problems.

There are step-by-step worked puzzles, other samples to try and a section on 'educated guessing' to remind you of the rules of English usage. *The Puzzler's Guide* makes a great present for a friend or for yourself, to make the most of those leisure hours.

The Puzzler's Guide is published by Australian Puzzler Press

❑ ❑ ❑

REMEMBER

When inquiring about products published in AR always mention where you read of the product.

Listening Around

Joe Baker VK2BJX
Box 2121, Mildura, Vic. 3500

Well, here I am again after quite a long absence caused by a combination of the bitterly cold winter we have been experiencing (who said Sunraysia had a warm climate), and some medical problems which were accentuated by the cold weather. (The Osteo-arthritis in my right knee has felt as though someone has hit the knee with a heavy mallet!).

Hopefully, the coming summer will treat me more kindly!

I was very pleased to see that my earlier articles has brought a response from another amateur who was probably on Morotai Island around the same time as myself. It is a pity we did not meet, but I was pleased to see his photographs published in AR. I regret that, due to the scarcity of film plus the restrictions on photography during wartime, I was unable to take more than about half-a-dozen photographs during my stay in the Northern Territory and Morotai. Unfortunately, I no longer have the few that I took either.

Looking at the photographs published my memories of the types of equipment that was then in use came flooding back and I wonder if any other amateurs who were either in the Northern Territory or Morotai at that time have any photographs.

Writing about the wartime years, about 20 years ago I was given a book which may be of interest to people who served in the RAAF particularly those who served at Mudbury (near Hull) in England. RAAF pilots took-off from here on raids across the English Channel into enemy territory. The book is called *Manual of Air Navigation, Volume 1*, and is the 1941 edition reprinted in May 1943. It is marked "For Official Use" and contains an enormous amount of detail with maps showing targets used by the airmen whose job it was to smash the enemy lines. It also contains logs, signed by pilots and navigators who took part and details of the weather encountered whilst en route to the targets. The word "Helder" features on many of these documents as apparently it was a type of reporting point.

Following is an extract from a document dated April 1, 1941, and signed by Ivor Brain P/O navigator and second pilot Sgt Steers. Crew listed were Sgt Shooter, Sgt Sparkes, P/O Turret. This is the weather forecast which they mention:

"Depression centred over Denmark. Should move E. A secondary off NW coast. Moving SE. Occlusion probably E of Hanover 0000 GMT. Some medium cloud over whole route. Heavy rain probable on return to Mudbury. Vis 5m except showers. Ice at 6000'. Pressure 1002 mb. Aerodrome level."

The very large map accompanying this document shows tracks right from Mudbury, one going to Emden, and another through Helder to areas near Onsbruck and Minden. There are also many navigation symbols which are Greek to me. There are also arrows showing the direction of stars like Polaris and Vega. This map, one of many, is marked "Drawn and Hellographed at OS 1940" whatever that may mean!

Despite its age, this book is still in reasonably good-shape and, whilst I do not want to part with it because of its obvious historical value, I would be willing to sent photocopies of any of the maps or parts of documents to anyone interested.

As there was a paper shortage during wartime, there are many alterations made to some of the material in red ink, and sections needing revision were pasted over the original material. Although intended for use by RAAF personnel in England, the book bears the marking "Reprinted by Authority of the Air Board: A H Pettifer, Acting Govt Printer".

The book also has illustrations of equipment such as the P6 Compass, P6 Grid Ring, P6 Bowl, P6 Container and Lid Ring, the Astro Compass Mark II, the Master Unit of the DR Compass, the Pilot's Repeater, the Navigator's Repeater, the Control Panel, and many other gadgets. Following is an extract about Aircraft Radio:

"Means for reducing precipitation static —

"1. Radio static on aircraft in the form of a continual roar or squeal of changing pitch is called by various names:

"Precipitation Static, Rain and Snow Static or Corona Static.

"It is caused by electrical discharges in clouds and is distinct in cause and behaviour from the thunderstorm static which causes a clicking or brief crashing sound in the radio when lightning flashes, somewhere nearby, followed by periods of clear reception of the radio signal. Past experience has shown some ways to reduce corona static and are given in paragraph 2.

"2. (a) Instrument flight should be avoided when possible where the temperature is between minus 4 deg C and plus 1 deg C. Corona static usually occurs in clouds or rain or snow where the temperature is near freezing. It is particularly advisable to avoid flying parallel with a cold front in this temperature range.

"2. (b) As corona forms more readily at low pressures than at high, slow motor speeds are advisable since less pressure reduction will be encountered at the propeller tips. The faster the motor speed the greater is the reduction in pressure encountered at the propeller tips. In the vicinity of charged clouds, it is usually on the propeller tips that the corona first begins. It is visible as a faint bluish-white "Saint Elmo's Fire" at night, but cannot be seen in the daylight. Corona forms more easily at low pressures than at high, and slow motor speeds result in more pressure near the propeller tips than high motor speed.

"2. (c) The compass receiver using the loop antenna is the best to use in corona static conditions. Corona anywhere on the airplane produces a radio wave nearby which is most intense in its electric component, whereas the loop antenna is responsive only to a magnet component.

"2 (d) The trailing antenna can be grounded and then unreeled to 50 or 100 feet. It is important to ground the antenna prior to unreeling to prevent electric shocks to persons near the antenna and inside the cabin. The trailing antenna terminal on the antenna selector switch should be grounded with a piece of wire or some metal object. The trailing antenna will help in some cases.

"2 (e) If the airplane is provided with an anti-static discharge wire, it should be released. These have been found to reduce corona static in some cases."

And, so the *Manual of Air Navigation Volume 1* goes on.

Re Saint Elmo's Fire, isn't that the expression that the crews of the sailing ships of old used to say was an eerie light on a very dark night high up on the rigging as they sailed around the world all those hundreds of years ago? I wonder if the sailors on the re-enactment fleet will see the same Saint Elmo's Fire as crews of the First Fleet probably saw!

* Saint Elmo's Fire, electrical appearances sometimes seen about masts of ships, steeples, etc.
—Derivation from *Collins National Dictionary*

NEW ANTENNAS FOR FRANK

A few days prior to writing this article (September 8), I was chatting with Peter VK2MUG, whose government position takes him to various parts of outback New South Wales. Peter's home QTH is Coleambally, but I have spoken to him on 60 metres when he has been on various outback station homesteads, usually in the early hours of the morning when we have been some of the few amateurs on-air at the time.

My last contact was the one referred to above, when he was in Broken Hill, and at the home of Frank VK2ZI. Peter was operating Frank's equipment as Frank had retired for the evening. Peter said, "Frank wants to know about that interview you did with him last February. He has been checking AR each month and is disappointed at not seeing it."

The photograph shows Joe VK2BJX, in the studio of Radio Mildura 3MA, during the recording of one of his fortnightly broadcasts.

—Photograph courtesy John Morris VK3NRJ

The interview referred to was a tape recording, taken with Frank's permission, from an 80 metre QSO about 10 pm on February 28, 1987. Frank told me about some special antennas that had been erected for him by Graeme VK2ZZV, of Cardiff. The antennas were erected at Broken Hill to assist Frank hear the OSCAR 10 satellite. The recording was eventually transcribed from the tape into a note book awaiting the time when I would write it into an article.

Then I was stricken by some of my medical problems, then the cold weather and a miserable winter. I still had the notes, but on rereading them some of my writing was a little illegible so it was necessary to transcribe the tape again. Finally here is a report of my interview with Frank.

Frank was telling me that VK2ZZV had decided to make an Australian version of a Japanese satellite antenna, and was now a distributor for the antennas. The first shipment was released on January 21, but before they were released Frank arranged a test with Graeme VK5AGR. Graeme took measurements against the strength of the beacon at mean anomaly 55 on OSCAR 10 and on this reading Frank's signals were a half to one S-point below the beacon.

When VK2ZZV arrived the following week to install Frank's antennas, another reading was taken by Graeme VK5AGR, under the same conditions and Frank's signals had gone up to two and a half S-points above the beacon giving him a gain of three S-points using the new antennas.

At that time — back in February — Frank's antennas were the only ones in existence (being the prototype), but the full production run was expected early March. Several antennas had already been ordered from Graeme VK2ZZV's Cardiff Antenna Farm. Frank went on to say they were fantastic antennas.

Frank said: "In past years, I have worked a tremendous number of course, Joe, and over a period of the last three years I was averaging Q5 with an average strength of about 3, 4, and 5 — extending right across the world. I have quite a stack of QSL cards from OSCAR 10 alone which cover practically all the European countries and most American areas — everywhere in fact. But the difference now is that, with these new antennas, the reports that I am getting back are 5, 6, 7 and 8, with two or three extra new countries as well.

"The antennas consist of the 70 centimetre uplink — 40 element crossed Yagi on the one boom, and the downlink is a 24 element crossed Yagi. Of course, this is considerably larger than my original antenna.

"So, that's the story" said Frank, "the beauty of them is that the construction is so much simpler, there is no harness required because the relays for switching them from clockwise to anti-clockwise are built into the antennas. So you can understand just how efficient they are.

"This information is going to be published in the AMSAT Newsletter which will be out early this coming week, so there is bound to be some comments on the antennas in the newsletter!"

Frank also has photographs of his new antennas.

He is very grateful to the two Graemes, VK2ZZV who ventured all the way from Newcastle to Broken Hill to install the antennas for him, and to VK5AGR for helping with the tests.

My apologies to Frank who has been waiting for this article to appear — but better late than never!

Regards to all from Joe VK2BJX

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Thought for the Month

A committee is a body that keeps minutes and wastes hours.

Australian Ladies Amateur Radio Association

Joy Collis VK2EBX
PUBLICITY OFFICER, ALARA
Box 22, Yeoval, NSW. 2868

ALARA CONTEST

It hasn't taken long for November to get here, and how the year has flown!

November is an important month for ALARA, because our contest is always held in this month.

This year *Saturday, November 14,* 0001 to 2359 UTC, is our big day, and we look forward to plenty of activity, and hopefully good propagation, which will allow the participation of some of our DX members.

We have been very pleased, in past years, to have the support of so many OMs, and very much hope they will join us again this year.

This is an excellent opportunity for anyone working towards the ALARA Award, or upgrading their present award, to gain some valuable points. Contacts made during the contest count towards our award, but not those made during official nets.

This year will see the awarding of the Five Year Trophy, which will be presented to the licensed YL operator (not necessarily Australian) with the highest aggregate score over the last five years. I hope to be able to give you the last four years aggregate shortly.

So, leave the dishes in the sink, the vacuum cleaner in the cupboard, prevail upon the OM to fix himself a sandwich, and come and join us on November 14. Hope to hear you then!

FLORENCE McKENZIE MEMORIAL TROPHY

Due to difficulties in finding a suitable place to display the *Florence McKenzie Memorial Trophy* in the VK3 Division, an offer has been accepted from the VK5 Division to house the trophy permanently. Out thanks to the VK5 Division, and also to the VK3 Division for their assistance.

This lovely trophy, awarded annually to the novice YL (not necessarily an ALARA member) with the highest CW score in the ALARA Contest, was won last year by Bobbie VK2PXS.

We hope for plenty of CW activity this year also, so get those keys dusted down and ready for use! We will be looking for novice YLs, in particular.

ALARA—MEET

Our second get-together (ALARA-Meet) was held in Adelaide on September 26-27. I hope to be able to give you a report on this next month.

AWARD PRESENTED TO VK3BIR

A presentation of an engraved award was recently made to Mavis VK3BIR, in appreciation of her efforts in support of ALARA in her various roles as State Representative, President, Vice-President, Treasurer and Editor of the Newsletter.

All members echo the sentiments in the letter that accompanied the award.

Congratulations Mavis, a worthy recipient.

(Bron VK3DYF)

ALARA COMMITTEE

The ALARA Committee is now complete, with Bobbie O'Hare VK2PXS, and Helene Dowd VK7HD, continuing as VK2 and VK7 State Representatives respectively.

JLRS 30th ANNIVERSARY

I hear that, in celebration of the 30th Anniversary of Japan Ladies' Radio Society, the new President, Chizue Yamada JA1EYL, on behalf of the Society, sent souvenir pendants to DX members. The pendant has, on the front, "JLRS 30th" and on the reverse the call sign of the recipient. A really lovely thought, and much appreciated by the YLs who received one.

(Bron VK3YDF)

Bron says the pendants are gold, and about the size of the ingots worn these days. Certainly a novel and charming idea. Several Australian YLs were delighted to receive these pendants.

NEW/OLD CALL SIGN

Congratulations are due to Audrey Gover, now VK4NAD. This call sign was held by her late husband Alf (May AR, page 62), and Audrey will now be able to carry on his call sign.

Audrey is mainly a CW operator and we hope we will hear from her during the contest.

How about trying for the Florence McKenzie Memorial Trophy, Audrey!

80 METRE ALARA NET

Our 80 metre net on Monday nights still proves popular.

It was a pleasure, on Monday recently, to be joined by VK3KMK with the 1st Mooroolbark Girl Guide Company, and to speak to some of the girls. Future YL operators, maybe?

BITS AND PIECES

Phyl, formerly VK4BPL, is now VK4CPL. The mixup occurred when it was discovered that VK4BPL belonged to someone else.

All hustle and bustle at the QTH of Bev VK6DE and Brian VK6AI recently when their daughter was married. We hope everything went smoothly, Bev.

Alexander, son of Liz VK3PSG, is now VK3MAR. I am sure he will make good use of the call sign he recently gained.

The Queensland YL Net operates on Tuesday evenings on 3.570 MHz at 0930 UTC, 7.30 pm local time. It is run by Josie VK4VG.

ALARA AWARD

Certificates have been issued to:

129	10.07.87	Marge Weller ZS2O8
130	22.07.87	Samuel Torpe FK8DD
131	18.08.87	Leonard Mendel K5OVC

It is good to see DX stations taking an interest in acquiring our award. I am sure they are not disappointed with it.

NEW MEMBERS

A welcome is extended to new members:
Patricia VK3PRV
Karen KA5WXE
Catherine KA1OKF

Great to have you in ALARA.

For this month

—73/33, Joy VK2EBX

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RADIODES

BASIC ELECTRONICS[3]

Resonance is not so simple,
When we try to understand.
But we cannot just ignore it —
Or dismiss it from the land.
For, without a resonant circuit —
Messages would go by hand.
Think of it — there'd be no wireless.
Wirelessless then we'd be.
We wouldn't know 2π fL,
Or one above 2π fB.
You couldn't buy traps for your dipole —
Or a TA33!

So let's resolve we'll one remember,
Of the numerous formulae.
We think it's of prime import,
To get the resonant frequency.
Hertz, please note, is *one* above —
2π root LC!

—"Hambard" (Originally printed in the Nigerian ARS Newsletter 1970s)

Awards

Ken Hall VK5AKH
FEDERAL AWARDS MANAGER
St George's Rectory, Alberton, SA. 5014

AWARDS ISSUED IN AUGUST

DXCC

PHONE
357 Peter Forbes VK3QI

CW
130 Peter Forbes VK3QI

CPEN
237 Peter Forbes VK3QI

DXCC UPDATES IN AUGUST

VK2BQS	171 open	163 phone
	102 RTTY	
VK2DTH	300/301 phone	
VK3AWY	306/310 phone	
VK3OT	300/304 phone	303/307 open
VK3YJ	301/302 phone	
VK4AK	313 phone	315 open
VK4BG	283/294 phone	290/304 open
VK4RF	296/320 CW	
VK5LC	267/278 phone	
VK6NE	307/317 phone	

ROYAL SOCIETY OF GREAT BRITAIN CERTIFICATES AND AWARDS

HF CERTIFICATES AND AWARDS: General Rules

The following general rules and conditions apply to HF certificates and awards issued by the Radio Society of Great Britain and should be read in conjunction with the conditions which govern the award of the individual certificates.

APPLICANT ELIGIBILITY

Overseas claimants need not be members of the RSGB but, where they are, they should enclose proof of membership such as a recent address label from *Radio Communication*.

Claimants may be either licensed radio amateurs or shortwave listeners. All certificates, but not special plaques or cups, are available on a "heard" basis to listeners.

CLAIM ELIGIBILITY

Each claim from overseas must be accompanied by all cards in the case of those categories of award attracting a plaque of cup. In other cases a statement from the applicant's national society or a statement by two officials of a local society affiliated to the national society that the necessary cards have been checked will be accepted, except that the HF Awards Manager reserves the right to ask to see some or all of the cards. For IOTA claims special rules apply (see IOTA Directory).

Each claim from a non-member of the RSGB must be accompanied by a fee of £3.00 or 12 IRCs or US$4.00 per certificate or class of certificate. The fee for members is £1.50 or six IRCs or US$2.00. These fees will be revised from time to time. All applicants submitting cards for checking must include sufficient payment to cover their return. Cards will only be returned by air, or registered mail if adequate postage is sent with the claim. (For registered mail add four IRCs).

CONTACT ELIGIBILITY

All contacts must be made by the holder of the call sign, on bands below 30 MHz.

Contacts may be made from any location in the same DXCC country.

Except where otherwise indicated, credit will be given for confirmed contacts made on or after November 15, 1945.

Contacts with land mobile stations will be accepted, provided the exact location of each station at the time of contact is clearly stated on the evidence submitted.

By decision of the RSGB's HF Committee credit will not be given for contacts made on the 10, 18, and 24 MHz bands. This decision will be reviewed when the bands become freely available to licensed radio amateurs world-wide and restricted power limits are removed.

Credit will be given for contacts made entirely on a single mode of transmission or on a combination of modes. Certificate endorsements for single mode transmission and/or single band may be made on the submission of cards clearly confirming the mode or frequency of transmission, but the request must be made at the time of the submission. Credit will not be given for cross-mode or cross-band contacts.

DISQUALIFICATION

Any altered or forged confirmations submitted for credit may result in disqualification of the applicant from the RSGB's award program.

In the case of any dispute concerning a claim, the decision of the appropriate Awards Manager, in consultation if necessary with the HF Committee, shall be final.

DX LISTENERS' CENTURY AWARD (DXLCA)

This award may be claimed by any shortwave listener eligible under the General Rules who can produce evidence of having received signals from amateur radio stations located in at least 100 DXCC countries. Stickers are available for every 25 additional countries confirmed.

A five-band endorsement is available for hearing 100 countries on five-bands. The same countries do not have to be heard on each band.

COMMONWEALTH CENTURY CLUB (CCC)

This award may be claimed by any licensed radio amateur eligible under the General Rules who can produce evidence of having effected two-way communications, since January 1, 1984, with amateur radio stations in at least 100 Commonwealth call areas in the current list.

A handsome plaque with a plate detailing name, call sign, date and number of the award will be available to all recipients on payment of a contributory charge.

Additionally, in recognition of the magnitude of the achievement, any licensed amateur providing evidence of having effected two-way communication since January 1, 1984, with all the Commonwealth call areas on the list current at the time if application will be able to claim a suitably engraved cup (charge to be determined).

Lists of Century Club members will be published regularly in *Radio Communication* while recipients of the cup will be invited to submit shack photographs and a suitable write-up for inclusion in the journal.

FIVE-BAND COMMONWEALTH CENTURY CLUB (5BCCC)

This award, available in five classes, may be claimed by any licensed radio amateur under the General Rules who can produce evidence of having effected two-way communication, since November 15, 1945, with the requisite number of amateur radio stations located in the call areas listed, using all five-bands, 3.5, 7, 14, 21 and 28 MHz. Each station should be located in a different call area per band. The five classes are for contacts as follows:

5BCCC Supreme	— 500 stations
5BCCC Class 1	— 450 stations
5BCCC Class 2	— 400 stations, with a minimum of 50 on each band
5BCCC Class 3	— 300 stations, with a minimum of 40 on each band
5BCCC Class 4	— 200 stations, with a minimum of 30 on each band

Certificates will be issued to winners of all classes. Additionally, as in cases of the CCC, winners of the Class 1 award will be eligible to claim a handsome plaque suitably inscribed on payment of a contributory charge, while winners of the Supreme Award will be able to claim an engraved cup. The cost of this is £17.00 including postage and packaging and VAT.

Lists of the Supreme, Class 1 and 2 winners will be published regularly in *Radio Communication* with a suitable write-up on each Supreme award winner.

28 MHz COUNTIES AWARD

This award may be claimed by any licensed radio amateur eligible under the General Rules who can produce evidence of having effected two-way communication, since April 1, 1983, with amateur radio stations located in 40 counties/regions in the UK, Channel Islands and Isle of Man on the 28 MHz band. Stickers are available for 60 and all 77 counties/regions confirmed.

WORKED ITU ZONES (WITUZ)

This award may be claimed by any licensed radio amateur eligible under the General Rules who can produce evidence of having effected two-way communication, since January 1, 1984, with land based amateur radios stations located in at least 70 of the 75 broadcasting zones as defined by the International Telecommunications Union (ITU).

A handsome plaque detailing name, call sign, date and number of the award will be available to all recipients on payment of a contributory charge.

Additionally, in recognition of the magnitude of the achievement, any licensed amateur providing evidence of having effected two-way communication, since January 1, 1984, with all 75 ITU zones will be able to claim a suitably engraved cup (charge to be determined).

Lists of award winners will be published regularly in *Radio Communication*, while recipients of the cup will be invited to submit shack photographs and a suitable write-up for inclusion in the journal.

FIVE-BAND WORKED ITU ZONES (5BWITUZ)

This card, available in five classes, may be claimed by any licensed radio amateur under the General Rules who can produce evidence of having effected two-way communication, since November 15, 1945, with the requisite number of land based amateur radio stations located in the 75 ITU broadcasting zones, using all five bands, 3.5, 7, 14, 21 and 28 MHz. Each station should be located in a different ITU zone per band. The five classes are for contacts as follows:

5BWITUZ Supreme	— 350 stations
5BWITUZ Class 1	— 325 stations
5BWITUZ Class 2	— 300 stations, with a minimum of 50 on each band
5BWITUZ Class 3	— 250 stations, with a minimum of 40 on each band
5BWITUZ Class 4	— 200 stations, with a minimum of 30 on each band

Certificates will be issued to winners of all classes. Additionally, as in the case of the WITUZ, winners of the Class 1 award will be eligible to claim a handsome plaque suitably inscribed on payment of a contributory charge, while winners of the Supreme Award will be able to claim an engraved cup (charge to be determined).

Lists of the Supreme, Class 1 and 2 winners will be published regularly in *Radio Communication* with a suitable write-up on each Supreme award winner.

NOTES

In the case of the WITUZ and 5BWITUZ, confirmations need not bear the appropriate ITU zone number, but in order to count for credit they should give the location of the station in sufficient detail to place it clearly within one particular zone. Doubtful cases indicating possible overlap across two zones will not be given credit.

The HF Awards Manager will use, as his reference, the *Radio Amateurs Prefix Map of the World*, published by Radio Amateur Callbook Inc, Lake Bluff, Illinois, 60044, USA. In the case of countries which encompass two or more ITU zones, eg USA, USSR and Brazil, zonal boundaries will generally follow the longitude/latitude grid lines as shown in the map. In the few instances of discrepancy between map and the accompanying prefix/country list, the decision of the HF Awards Manager will be final.

The island of Minami Torishima (JD1) lies outside the 75 broadcasting zones. As a special feature of this award program, a confirmed contact with this island will be accepted for credit for one missing zone, and in the case of 5BWITUZ, for one missing zone per band.

IARU REGION 1 AWARD

This award, available in three classes, may be claimed by any licensed radio amateur eligible under the General RUles who can produce evidence of having effected two-way communication with amateur radio stations located in the requisite number of countries whose national societies are members of the Region 1 Division of the International Amateur Radio Union (IARU). The three classes are for contacts as follows:

Class 1	All member countries on the current list
Class 2	45 member countries
Class 3	30 member countries.

Members of IARU Region 1 are:

Algeria	Kenya
Andorra	Kuwait
Austria	Lebanon
Bahrain	Lesotho
Belgium	Liberia
Botswana	Luxembourg
Bulgaria	Malta
Cyprus	Mauritius
Czechoslovakia	Monaco
Denmark	Morocco
Djibouti	Netherlands
Faroes	Nigeria
Finland	Norway
France	Oman
Gabon	Poland
Gambia	Portugal
German Dem Rep	Rumania
German Fed Rep	San Marino
Ghana	Senegal
Gibraltar	Sierra Leone
Greece	South Africa
Hungary	Spain
Iceland	Sweden
Ireland	Switzerland
Israel	United Kingdom
Italy	USSR
Ivory Coast	Yugoslavia
Jordan	Zambia
	Zimbabwe

A special version of this award is available, in the same three classes, for confirmed contacts on the 28 MHz band since July 1, 1983.

ISLANDS ON THE AIR (IOTA)

The IOTA award program was created by Geoff Watts, a leading British shortwave listener, in the mid-1960s. In March 1985, it was at his request, taken over by the RSGB. By this date it had already become well established and highly regarded among amateurs world-wide.

In all, the IOTA award program consists of 15 separate awards. They may be claimed by any licensed radio amateur eligible under the General Rules who can produce evidence of having effected two-way communication, since December 1, 1964, with the requisite number of amateur radio station located on islands both world-wide and regional. Many of the islands are DXCC countries in their own right; others are not but, by meeting particular eligibility criteria, also count for credit. One of the great merits of IOTA is that it is an evolving program with new islands being added to the list when they are activated for the first time.

The following awards are available:

IOTA Africa	IOTA-AF
IOTA Arctic Islands	IOTA-AI
IOTA Antarctica	IOTA-AN
IOTA Asia	IOTA-AS
IOTA British Isles	IOTA-BI
IOTA Europe	IOTA-EU
IOTA North America	IOTA-NA
IOTA Oceania	IOTA-OC
IOTA South America	IOTA-SA
IOTA West Indies	IOTA-WI
IOTA World Diploma	IOTA-WW
IOTA Century Club Award	IOTA-CC-100
IOTA Century Club Award	IOTA-CC-200
IOTA Century Club Award	IOTA-CC-300
IOTA Century Club Award	IOTA-CC-400

A feature of the IOTA program is the quarterly Honour Roll appearing in the *RSGB DX News Sheet*, which encourages continual updating of claims.

The 14-page *Directory of Islands* lists all islands which count for IOTA award claims, which, in all cases, must be accompanied by QSL cards, should be addressed to the IOTA Awards Manager, Roger Balister G3KMA, La Ouinta, Mimbridge, Chobham, Surrey, GU24 8AR, England. (Please note — applications for IOTA awards do not go to the HF Awards Manager.

APPLICATIONS FOR AWARDS

Cards should be enclosed in accordance with the requirements of the awards being claimed. Non-members of the RSGB should enclose £3.00, 12 IRCs or US$4.00 for each certificate or class of certificate applied for. Members should enclose £1.50, six IRCs or US$2.00 for each certificate or class of certificate applied for. Please ensure that each claim is accompanied by the name, call sign (if applicable) and full address of the applicant. Claims (except for IOTA) should be sent to the RSGB HF Awards Manager, Steve Emlyn-Jones GW4BKG, PO Box 20, Bridgend, Mid Glamorgan, CF35, United Kingdom.

Contributed by David Evans G3OUF, Chief Executive/ Secretary, RSGB

ARRL INTERNATIONAL HUMANITARIAN AWARD

Terms of Reference

Whereas amateur radio operators engage in assistance to *people in need* throughout the world, and daily communication between common people from all parts of the world, and

Whereas amateur radio is the only medium where average people throughout the world can meet to talk to each other and spread goodwill across otherwise impenetrable political boundaries, and

Whereas the world is in need of positive efforts toward international understanding and peaceful communications,

Be it resolved that the American Radio Relay League hereby establishes a committee for the purposes of developing an annual international prize to be awarded to truly outstanding amateur radio operators in areas of international humanitarianism and the furtherance of peace.

1Inasmuch as amateur radio operators provide public service and promote international goodwill and understanding, this award is dedicated to those amateurs who, through amateur radio, are devoted to promoting welfare of mankind. In order to help all people, both amateur radio operators and others, to understand the purpose and importance of this award, it shall be called the, *ARRL International Humanitarian Award.*

2The selection of the recipient of the award shall be made by a committee appointed by the President of the ARRL, and shall serve at his or her pleasure for the term of office.

3Any licensed radio amateur world-wide, or group of amateurs who, by use of their skills of amateur radio, have provided extraordinary service for the benefit of others in times of crisis or disaster, is qualified to receive the award

4Nominations for the award will be accepted by the committee from a licensed radio amateur, governmental or any other organisation which has received the benefits of the radio amateur's extraordinary service. In the event that no nominations are received, the committee may determine possible recipients or may decide to make no award in a given year.

Nominations must contain the following

a) A summary of the actions of the nominee, which qualify the recipient for the award.

b) Statements from at least two references including names and addresses for verification

All nominations and supporting materials for a given year's award must be submitted in writing in English to *ARRL International Humanitarian Award, 225 Main Street, Newington, CT 06111*, in sufficient time that they are received by December 31.

5The award is to include the following elements:

a) An appropriate plaque or medallion to be presented at the ARRL National Convention or at the recipient's home convention.

b) An article describing the recipient and his/her extraordinary achievements is to be written for use in *QST* and consumer magazines.

6ARRL will seek voluntary contributions to create an endowment to fund the award, with suitable recognition to be given to donors. Should the expenses of administering the award exceed the income available from the endowment, these expenses will be reimbursed as authorised by the ARRL Board.

7Because of the importance of this award to promoting international friendship among, not only amateur radio operators, but all persons of the world, extreme care must be taken to insure that each recipient is deserving of the award. Therefore, the Committee will be responsible for verification of all nominations, with the most rigorous scrutiny given to finalists in the selection process.

8Initial promotion of the award is to include the following:

a) A major article on the subject to appear in *QST*.

b) A design contest among radio amateurs world-wide, for the development of a distinctive plaque or medallion to be used as the award.

The ARRL are at present seeking nominations for the 1987 and 1988 ARRL Humanitarian Awards. The deadline for the 1987 ARRL Humanitarian Award is December 31, 1987 and the deadline for 1988 is December 31, 1988.

Contributed by Mary E Schetgen N7IAL, Assistant Secretary, The ARRL Foundation

AUSTRALIAN LADIES' AMATEUR RADIO ASSOCIATION (ALARA) AWARD

This award is available to all YL, OM and SWL operators.

Applicants are required to provide the following:

VK/ZL	There are to be 10 members contacted/heard, and to include five Australian call areas.
DX	Five members to be contacted, and to include four Australian call areas

All contacts to have been made with members on or after June 30, 1975. No repeater contacts will be allowed.

Applicants must submit a complete extract of log entries, which is to be certified correct by two other amateurs whose signatures must be appended. In the event of an applicant in an isolated location being unable to obtain certification, QSL cards should be forwarded in lieu.

Application must include full name, address, signature and call sign of the applicant.

All contacts must be from the same call area. Official ALARA Net contacts do not qualify.

Special endorsements available; eg mixed, all CW, all phone, all 28 MHz, etc. Endorsement stickers available for each 10 additional members contacted. For DX applicants, five additional members contacted.

Applications should be accompanied by the equivalent of $A3 or seven IRCs.

The fee for additional stickers is $A1. (No fee for stickers awarded with the original issue of the certificate, only for additional stickers applied for at a later date!).

Applications should be forwarded to the ALARA Awards Custodian, Mavis Stafford VK3KS, 16 Byron Street, Box Hill South, Vic, 3128.

Log extract should include Date/Time UTC, Band, Mode, Call Sign of ALARA Member Contacted, Report Sent, Report Received, Name of ALARA Member.

PERSEKUTUAN PENGAKAP NEGARA BRUNEI DARUSSALAM AMATEUR RADIO CLUB AWARD

The above award is available to licensed amateurs or shortwave listeners who can submit proof of confirmed contacts with/or having heard, from V85 stations of Negara Brunei Darussalam under the following requirements:

DX stations in CQ Zone 28 are required to contact eight V85 Scout member stations and any two club stations making a total of 10 QSL cards.

DX stations other than CQ Zone 28 will need to contact three V85 Scout members and any of two club stations making a total of five QSL cards.

SWLs require 18 V85 stations and two club stations making a total of 20 QSL cards.

Applicants should send a log extract (GCR) in alphabetical order by suffix, photocopies of QSL cards along with a fee of US$5 to the Award Manager, PO Box 2227, Bandar Seri Begawan 1922, Brunei Darussalam.

The V85 amateur radio club stations are: BS, BP, JAM, IS and BSJ.

Scout members who have personal call signs are: BA, HG, IR, HD, RA, SB, SK, RM, DU, MI, NO and MH.

The PPNBD Amateur Radio Club is also issuing an award to commemorate 10 years of participation in Jamboree on the Air (JOTA). The Association will issue a Special Award Certificate to licenced amateurs who have established two-way radio contact.

DX stations in CQ Zone 28 need to confirm contact with 10 V85 stations and any of the two club stations making a total of 12 QSL cards.

DX stations other than CQ Zone 28 require contact with four V85 stations and any of the two club stations, making a total of six QSL cards.

SWLs require 18 V85 stations and any of the two club stations, a total of 20 QSLs.

Contacts will be valid from October 17, 1987, to April 17, 1988.

Any band, any mode.

Club stations will be V85: BS, BP, JAM, TS and BSJ.

Applicants should send a log extract (GCR) in alphabetical order by suffix, photocopies of QSL cards along with a fee of US$5 to the Award Manager, PO Box 2227, Bandar Seri Begawan 1922, Brunei Darussalam.

Applications must be received before December 31, 1988.

AWARDS PROGRAM OF THE HUNGARIAN RADIO AMATEUR SOCIETY

General Rules as at January 1, 1986

1. Hungarian Awards can be obtained by licenced radio amateurs and SWLs world-wide. The specific rules of awards are given below.
2. All amateur bands and modes may be used, except contacts via repeaters.
3. Contacts/reception may be made from any location within the same DXCC country. Each station may be contacted only once on any band and any mode.
4. The log should show the call sign/s, name and QTH of the applicant, as well as the following information:

Station Worked/Heard; Date; Time in UTC; Band; Mode; Received Report (SWLs should indicate the station being worked by the heard station).

5. Each list must be accompanied by a statement from the applicants national society or from any two amateurs, other than the applicant, that the QSL cards of the contacts/receptions listed are in the possession of the applicant and that the items of the cards are correctly listed. (The exceptions are the Szeged Festival and DUNAFERR Awards when only a log extract is required, plus the confirming piece from QSL cards).

Foreign participants in the HA-DX Contest may apply for the following Hungarian Awards upon the contest QSOs using a separate application form: Budapest, Balaton, Dunakanyar, Pannonia, Savaria and WHD.

6. The fee for Hungarian Awards is as follows:

Pannonia, Savaria, Balaton and Budapest — all 10 IRCs each; Hungarian Rummy Diploma/HRD, Hungarian Canasta Diploma/HCD, Szeged Festival and Worked Hungarian Districts/WHD — all five IRCs each; Videotron Bronze — two IRCs, Videotron Silver — three IRCs and Videotron Gold — five IRCs; Hungarian Castle Series/HCS — Bronze, five IRCs, Silver, eight IRCs and Gold 10 IRCs; Dunakanyar/DD — six IRCs; Dunaferr no fee but postage should be sent.

7. The decision of the MRASZ Award Committee is final.
8. All correspondence may be sent to the Manager, or to the Hungarian Radio Amateur Society Award Committee, PO Box 22, Tiszakecske, Hungary. H-6061.

Pannonia Award

The Radio Amateur Society of Gyor-Sopron County issues this Award. Applicants must submit proof of contacts made on or after January 1, 1966.

Applicants must obtain eight QSL cards from HA/HG 1, 2, 3, 4 call areas/two cards from each call area/more than one band. Manager: Radio Club HA1KSA, PO Box 79, Gyor, Hungary. H-9001.

Savaria Award

The Radio Amateur Society of Vas County issues this Award. The applicant must submit proof of contacts made on or after January 1, 1976.

Applicants must obtain 10 different HA1 or HG1 QSL cards. Manager: Savaria Radio Club, Puskas Tu7, Szombathely, Hungary. H-9700.

Balaton Diploma/BD

The Radio Club Siofok issues the BD. The applicant must submit proof of contacts made on or after January 1, 1967.

Amateurs must make two-way communication with amateurs indicated under a), b), or c). Stations require 15 points and at least one contact should be with a member of the Radio Club Siofok.

a) Radio Club Siofok and its members count as five points. HA, HG3KGJ, KHL, GI, GJ, GQ, HE, HL, HQ, HZ, IG, IK, IQ, IS, NG, 4XW, 6NP, 8UA.

b) Stations with a permanent station around Lake Balaton count for three points. HA, HG1KXX, XA, XH, XX, ZY, 2KRQ, RQ, RC, SH, Y, YRC, 3KHB, KHO, GG, GO, HK, HO, HU.

c) Any other stations in Zala, Veszprem and Somogy County count one point. HA, HG1KRA-KRZ, KXA-KXZ, KZA-KZZ, RA-RZ, XA-XZ, ZA-ZZ, DRA-DZZ, 2KPA-KTZ, PA-TZ, ENA-EZZ, 3KGA-KIZ, GA-IZ, FLA-FSZ.

Manager: Jozsef Turjanyi HA3GJ, PO Box 78, Siofok, Hungary. H-8601.

Budapest Award/BPA

This Award is issued by the Radio Amateur Society of Budapest. Applicants must submit proof of contacts made on or after January 1, 1959.

Stations must have obtained 25 different QSL cards from HA, and HG5 stations. Manager: Verebes Janosne HA5YR, PO Box 64, Budapest, Hungary. H-1475.

Hungarian Rummy Diploma/HRD

The Amateur Radio Society of Somogy County issues the HRD Awards. The applicant must submit proof of contacts made on or after September 1, 1972.

The HRD Award is issued in three categories.

BRONZE: "hand rummy" collecting 14 cards in accordance with the rules of the game.

SILVER: full collection of one of the four series plus one Joker of the same colour. For example — diamond 2 . . . A plus red Joker. /14 cards.

GOLD: full pack, containing 54 cards.

HRD-106: two packs of QSL cards are necessary for the Award from 108 different stations.

Hungarian Canasta Diploma/HCD: Three canastas /21 cards, have to be confirmed in accordance with the rules of the game.

The canasta contains seven cards of the same figures, two of them can be equivalent; eg seven cards of figure 5, seven cards of figure 8, and seven cards of Kings. Not more than three cards substituted by the four Jokers and the "little-Jokers"/figure2/ in one canasta.

Note: Contacts on or after April 4, 1980 are valid for the HRD-108 and HCD Awards.

Amateur stations belonging to the radio club of "Tivadar Puskas" can send any kind of HRD card for QSOs. These stations are: HA, HG3 GA, GB, GD, GH, GL, GM, GR, GU, HD, HF, HH, HM, HS, HV, HX, HY, KGC, KGL, KGR, KGU, KHC, KHJ.

Allocation of the HRD cards:

HA HG Call Areas	Spade	Heart	Diamond	Club
1	A		J	
2	2		J	
3	3		J	
4	4		J	
5	5		Q	
6	6		Q	
7	7		K	
8	8		K	
9	9		K	
0	10		K	

? ? ? red and black Joker = Y =

Manager: Jance Mihalyfy HA3GA, PO Box 173, Kaposvar, Hungary. H-7401.

Szeged Festival Award

The Amateur Radio Society of Csongrad County issues this Award yearly for QSOs made between July 1 and August 31, from 0000-2400 UTC. The deadline for applications is December 31, to the manager.

Stations must gain five points from two-way contacts as indicated in a) and b).

a) Stations with permanent residence in Szeged count as two points. /HA, HG8CA, CB, CD, CH, CP, CT, CV, CZ, CX, DC, DE, DF, DP, DQ, DR, DT, DZ, EK, EL, KCC, KCK, KDA.

b) Any other stations in Csongrad County counts as one point. HA, HG8CA-FZ, KCA-KFZ, LSA-LZZ.

Manager: Imre Kelemen HA8CH, PO Box 673, Szeged, Hungary. H-6701.

Worked Hungarian Districts/WHD

The Hungarian Radio Amateur Society issues this Award and applicants must submit proof of contacts made on or after January 1, 1958.

Stations need 10 QSL cards from any five Hungarian call areas/ HA, HG1, 2, 3 . . . 0. Two cards are required from each call area on two bands. Manager: Janos Retkes HA8UB, PO Box 22, Tiszakecske, Hungary, H-6061.

Videoton Award

The Videoton Radio Club issues this Award for applicants who submit proof of contacts made on or after January 1, 1969.

Only HA4 and HG4 QSLs are valid. There are three groups of special cards, 3-4-3 different cards illustrating a BC receiver, a TV receiver and computer set respectively.

This Award is issued in three categories:

— BRONZE: one complete set of any group.
— SILVER: a complete set of any two groups.
— GOLD: all ten cards.

Manager: Halmi Belane HA4XP, Berkes Fltp.40, Szekesfehervar, Hungary. H-8000.

Dunakanyar Diploma/DD

The Radio Amateur Society of Pest County issues the DD Award. Applicants must provide proof in the form of five different QSL cards from the HA, HG7 call areas. Contacts to be made on or after January 1, 1970.

Manager: PRASZ Award Manager, HA7PL, PO Box 36, Budapest, Hungary. H-1387.

Hungarian Castle Series/HCS

The Hungarian Radio Amateur Society issues the HCS Award. Applicants must submit proof of contacts made on or after January 1, 1968.

Many Hungarian stations in each call area have special cards for the HCS Award — from number 1 to number 36. It is issued in three categories.

— BRONZE: Numbers 1-12 or 13-24 or 25-36.
— SILVER: Numbers 1-24 or 13-36.
— GOLD: Numbers 1-36.

The application must be accompanied by the confirming piece from the OSL cards.

Repartition of the QSL numbers by call areas is as follows:

HA, HG1 — 7, 22, 25, 31
HA, HG2 — 6, 8, 12, 15, 21, 23, 30, 32, 35
HA, HG3 — 3, 14, 23, 30, 32, 33, 35
HA, HG4 — 17, 23, 30, 32, 35
HA, HG5 — 1, 13, 36
HA, HG6 — 4, 10, 11, 34
HA, HG7 — 2, 5, 19
HA, HG8 — 16, 20, 24
HA, HG9 — 18, 27, 28, 29
HA, HG0 — 9, 26, 29

Manager: Janos Retkes HA8UB, PO Box 22, Tiszakecske, Hungary. H-6061.

Dunafarr Award

Issued by the Dunaujvaros Radio Club yearly for QSOs with HA and HG4 stations made between April 22 and May 8 from 0000-2400 UTC. The deadline for applications is May 31, to the manager.

Two-way contacts are required as indicated in a), b), c) below. Applicants require 40 points.

a) Club Stations in Dunaujvaros count as three points. HA, HG4KXG, KYJ, KYH, KYP, KYV, YYJ.

b) Individual stations in Dunaujvaros and other club stations from Fejer County count as two points. HA, HG4BG, XG, XU, XX, YA, YI, YJ, YK, YL, YO, YP, YQ, YU, YV, ZE, ZM, ZV and each call sign between HA, HG4KXA-KZZ, YXA-YXZ.

c) Individual stations from Fejer County count as one point. All HA and HG4 stations with a two letter suffix.

Note: This Award/Sticker may be claimed every year anew. Manager: Radio Club Dunaujvaros, Award Manager HG4YI, PO Box 132, Dunaujvaros, Hungary. H-2401.

TASMANIA DAY AWARD

The *Tasmania Day Award* is created to commemorate the foundation of Tasmania by Abel Tasman in 1642. The award is sponsored by the Tasmanian Division of the Wireless Institute of Australia, and with the blessing and assistance of the Tasmanian Government.

RULES

CONTEST PERIOD: From 0800 UTC, November 21, to 0800 UTC, November 29, 1987.

OBJECTS OF THE AWARD: to encourage any licensed amateur to make contact with Tasmanian licensed amateurs over the above period. Shortwave listeners may also participate.

AWARD BANDS AND MODES: Any band/mode available to the applicant may be used.

CONTACTS: Any Tasmanian station may be contacted **once** only.

To qualify for the award, any licensed amateur or shortwave listener must log the following Tasmanian contacts:

Australian Amateur Stations — five only
New Zealand Amateur Stations — three only
All other overseas Amateur Stations — one only
Shortwave Listeners — five only with both call signs included.

SUBMISSION OF LOGS: An extract of log, signed by the applicant, together with the sun of $A2, should be sent to:

The Award Manager, Mr R Jackson VK7NBF, Falmouth House, Falmouth, Tas. 7215.

QSL cards and counter-signatures are not required. Logs should reach the Award Manager before January 31, 1988.

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Education Notes

Brenda Edmonds VK3KT
FEDERAL EDUCATION OFFICER
PO Box 883, Frankston, Vic. 3199

It is some time now since I made my last public appeal for information and assistance.

This does not mean that the information and assistance is no longer required.

Letters I receive ask for details of where courses are being run, or correspondence courses, or for comments on books or equipment. Some of these queries I can answer or hand over to some knowledgeable person, but often all I can do is quote information from the Call Book or magazines.

May I ask again that, if your club or group is running classes, either regularly or on an occasional basis, you let me know about them and let me have the name of the contact-person.

If you have come up with some good new idea or method of teaching, or have found some useful aids, please share them with all those who are devoting time and effort to encouraging the new recruits. Either send me a note, or better still, write it up for publication in this magazine.

A member of my local club recently offered to compile a list of all the CW practice sessions that are run on air. I do have some frequencies and times, but it would be useful to be able to distribute a list on request, so I accepted the offer with enthusiasm.

Similarly, I would be pleased to have listings of all the on-air nets which are helping novices to upgrade so that I could direct new novices there.

I am interested also in hearing about new books or articles which are relevant to either level course. The original aim for the Study Guides was to have recommended texts or chapters listed for each section. We all have our own preferred resource materials, and I have prepared a short list of recommended texts for students, but I am sure that there are many useful publications of which I am not aware. It may still be possible to add a reading list to both Guides.

When I receive a query from a potential amateur, I try to direct him or her to the nearest club for classes or general support. I usually have no way of knowing how the club responds. I do not have time to notify each club every time I distribute its mailing address, but I trust that the new members are made welcome.

Some of the letters I receive are very appreciative of help given by friends, clubs, ROs or other amateurs. Others say "I have not been able to get much help from the local club". I find this disappointing especially if I have recommended the club in the first place.

I do have a problem, though, when I receive requests for help from students who are out of reach of clubs, groups or classes. I have asked previously for members who would be willing to offer some support to a student, either in their own area or on a corresponding basis, but so far I have had very little response.

Those who are studying on their own or by correspondence need all the support we can offer. So far I have not taken the liberty of passing on names selected from the Call Book, but I have been tempted to. Perhaps clubs could register their interest in "adopting" one or two of the isolated students. Or I could set up a "Pen Friends Bureau".

Helping the newcomers has been a longstanding tradition in amateur radio. Let us encourage its continuation. I look forward to receiving names of willing helpers.

I am pleased to announce that, by the time you read this, the Novice Study Guide should be available from the Divisions, the Executive or from me. It is advertised elsewhere in this issue.

It is intended to be used by both class instructors and students, in conjunction with the DOC syllabus.

We will, of course, be looking for feedback from those using it. I will collate all comments received.

Once again I would like to thank all those, both Institute members and DOC officers, who have contributed to it.

Best wishes to all who are sitting the November examinations. Remember, read the question and all the answers. May you all receive a nice new licence for Christmas.

73, Brenda VK3KT

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Light Alarm

A circuit which will oscillate in the presence of suitable light.

Peter Parker VK6NNN
C/- Witchcliffe Post Office, WA. 6286

The 100 kohm variable resistor in this circuit governs the sensitivity. The LDR can be replaced with two probes to become an audible continuity indicator.

A rain alarm can be made by inserting the probes in a plastic bucket. A bath filling indicator can be made in the same way.

This unit can also be used as a soil moisture indicator to determine when plants require watering.

With an LDR, which costs approximately 80 cents, the unit can function as a wake-up alarm. The transistor is not critical.

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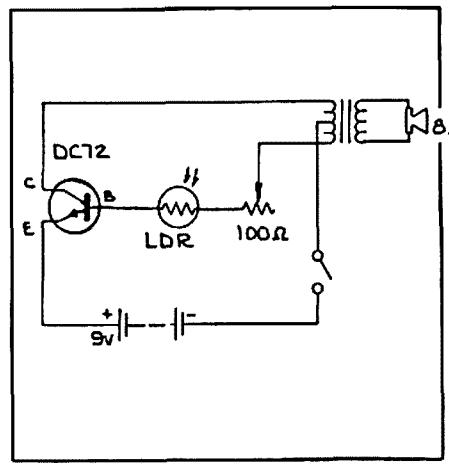


PARTS LIST

1 kohm - 8 ohm Optional Transformer
8 ohm Speaker
100 kohm Variable Resistor
Light Dependent Resistor
OC72 or equivalent Transistor
9 volt Battery
Switch

AMSAT Australia

Colin Hurst VK5HI
8 Arndell Road, Salisbury Park, SA. 5109

NATIONAL CO-ORDINATOR
Graham Ratcliff VK5AGR
INFORMATION NETS
AMSAT AUSTRALIA
Control: VK5AGR
Amateur Check-In: 0945 UTC Sunday
Bulletin Commences: 1000 UTC
Primary Frequency: 3.685 MHz
Secondary Frequency: 7.064 MHz
AMSAT SOUTH WEST PACIFIC
2200 UTC Saturday
14.282 MHz

Participating stations and listeners are able to obtain basic orbital data, including Keplerian Elements from the AMSAT Australia Net. *This information is also included in some WIA Divisional Broadcasts.*

ACKNOWLEDGMENTS
Contributions this month are from Bob VK3ZBB, VK5AGR BBS and UoSAT Bulletin Board.

AO-10 UNAVAILABLE FOR USE

AMSAT-OSCAR-10 must not be used for communications for several months due to complete discharge of the on-board battery. The spacecraft initially went off the air on Tuesday, August 4, with the transponder off and the Engineering Beacon ejecting meaningless telemetry. The situation was corrected by Wednesday, after the intervention of a command station to reset the IHU. The upset of transponder operations is likely to have been caused by a random glitch in the IHU output which commanded the transponder off. The IHU has been unusable since its memory has sustained massive radiation damage.

The sun angle is too low to allow adequate amounts of solar radiation to be absorbed by AO-10s solar panels — available power will be reduced to near-zero levels by late September. The entire satellite will then power down, the second episode in its life when complete power down has occurred. During these episodes, power levels are so low that no on-board electrical systems can be sustained.

Power down is inevitable since controllers no longer are able to maneuver the satellite's attitude in orbit. This ability was afforded by the IHU energising the magnetorquers in precise sequence and timing. Since the IHU is inoperative, the satellite's attitude stays fixed with regard to inertial space. However, since the satellite and the earth move around the sun as a system, the attitude of AO-10's solar panels with respect to the sun changes seasonally. We are now approaching the worst season for AO-10 sun angles.

Total abstinence is required for a long while, until the sun angle will be again good enough for charging the battery. The next period of communication via AMSAT OSCAR-10 will start around November 20, when illumination is better than 75 percent.

Until further notice from AMSAT — Do Not Use OSCAR-10! ! !

FUJI-OSCAR-12

Fuji-OSCAR-12 has completed its first full year in orbit and, although it continues to be plagued by a chronic power shortage, new software has been loaded into the on-board computer (OBC) to enhance the Mode JD mail box operation, to include:

1The maximum number of messages is increased to 100. If memory for messages is used up, older messages will be deleted and their memory space will be used to record the latest mail. There is 150 kbytes of memory space for storing messages.

2Mail can be deleted by its receiver as well as by the sender. You can save memory space by using K command after reading personal mail sent to you.

3Trailing blanks after "subject" are removed and are no longer sent.

New commands included in the new software package include:

a) F<d> command
Show file headers posted on the day specified by <d>. Currently <d> should be a decimal number standing for the day. Month or year cannot be specified; ie "F6" means "list files posted on sixth day (of any month, year)."

b) M command (M = Mine)
Show file headers addressed to current user. This command is useful when the user wants to see only his personal mail quickly.

c) B command (B = Bulletin)
Show file headers addressed to "all". You can look for bulletin or general information without listing lengthy personal mail headers.

d) U command (U = User)
Show call signs of users currently logging into the mail box. This command is useful when you set your "FRAC" and MAXFRAMES parameters optimum for number of current users. SSID is ignored when listing call signs.

MODE JA OPERATING PROCEDURES

During the early 1980s. AMSAT operation planners studied means of reducing QRM on the Mode B passband caused by Doppler shift. Varying Doppler shift magnitude and direction at different locations caused stations to drift into one another. To minimise such disruption and to facilitate net operations, a standard tuning practice was recommended. All Mode B stations were advised to adjust only their uplinks — maintaining a constant downlink frequency as heard at their QTH. This reduce Doppler — induced QRM significantly when employed on AO-10, Mode B.

Now, however, a study by WA2LQQ concludes that the application of this standard practice to FO-12 Mode JA has an unexpected and undesired effect. Not only does it not reduce Doppler — induced QRM on Mode JA, but it actually makes the situation three times as bad as it would be if the receiver were adjusted instead of the transmitter.

The difference has to do with the use of the 70-centimetre downlink as a pilot frequency. SInce Doppler shift on 70-centimetre is about three times greater than at two-metres, adjusting the receiver (which experiences higher Doppler shift than the transmitter) is the best tactic. Aggravating the situation is the fact that FO-12's relatively low orbit means fairly high Doppler shift and high rate of change of Doppler shift magnitude.

A preliminary recommendation is being made that Mode HA users adopt the practice of adjusting only their *receivers* to stay tuned into the QSO. This will not totally eliminate Doppler shift of the QSO and minor transmitter frequency tweaking will always be required.

From ANS

RS-1, launched October 26, 1978, continues to be heard. Latest reports of the famous "5015" telemetry block on 29.400 MHz come from Toshi JR3FRF. He happened upon RS-1 while monitoring for RS-10 and 11. The transponder and telemetry formatter of RS-1 as well as the battery failed many years ago, but the transmitter still works. When illuminated by the sun, the solar panels provide sufficient energy for RS-1 to be heard sending its spurious telemetry.

From ANS

SATELLITE ACTIVITY FOR THE MONTH OF JULY 1987

1 LAUNCHES
The following launching announcements have been received:

INTL NO 1987	SATELLITE	DATE	NATION	PERIOD min	APG km	PRG km	INC deg
055A	Cosmos 1882	Jul 01	USSR	97.7	679	645	82.5
056A	Cosmos 1863	Jul 04	USSR	90.8	383	208	72.9
057A	Cosmos 1864	Jul 06	USSR	104.8	1019	977	83.0
058A	Cosmos 1866	Jul 08	USSR	89.5	327	284	64.8
059A	Cosmos 1868	Jul 09	USSR	89.8	386	177	67.0
060A	Cosmos 1867	Jul 10	USSR	100.8	813	797	65.0
061A	Cosmos 1868	Jul 14	USSR	94.5	726	279	74.0
062A	Cosmos 1869	Jul 16	USSR	97.8	679	647	82.5
063A	Soyuz TM-3	Jul 22	USSR				
064A	Cosmos 1870	Jul 25	USSR	88.7	282	168	71.9

2 RETURNS
During the period 56 objects decayed including the following satellites:

1987-044A	Progress 30	Jul 19
1987-046A	Cosmos 1847	Jul 22
1987-056A	Cosmos 1863	Jul 18

3 NOTES
1987-063A Soyuz TM-3 carried cosmonauts Aleksandr Viktorenko and Aleksandr Aleksandrov of the Soviet Union and Mohammed Faris of the Syrian Arab Republic.
The spacecraft will dock with the manned complex MIR.

SATELLITE ACTIVITY FOR THE MONTH OF AUGUST 1987

1 LAUNCHES
The following launching announcements have been received:

INTL NO 1987	SATELLITE	DATE	NATION	PERIOD min	APG km	PRG km	INC deg
065A	Cosmos 1871	Aug 01	USSR	88.3	212	191	97.0
066A	Progress 31	Aug 03	USSR	88.8	369	193	51.6
067A	PRC 20	Aug 05	China	90.2	395	171	63.0
068A	Meteor 2-16	Aug 18	USSR	104.1	974	954	82.5
069A	Cosmos 1872	Aug 19	USSR	89.6	333	208	72.9

2 RETURNS
During the period 49 objects decayed including the following satellites:

1975-049A	Molniya 1-30	Aug 12
1983-110A	Cosmos 1507	Aug 19
1985-114B	USA 14	Aug 09
1987-013A	Soyuz TM-2	Jul 30
1987-058A	Cosmos 1865	Aug 14
1987-065A	Cosmos 1871	Aug 10
1987-067A	PRC 20	Aug 23

3 NOTES
1987-067A PRC 20 carried two micro-gravity experimental devices from a French company and was recovered at a predesignated area in China.
1986-066A Progress 31 carried expendable materials and varied loads for the orbit station MIR.

—Contributed by Bob Arnold VK3ZBB
ar

AMSAT—AUSTRALIA NEWSLETTER

This fine monthly publication published on behalf of AMSAT-Australia by Graham VK5AGR, now has 200-plus subscribers. Should you also wish to subscribe, send a cheque for $20 made payable to AMSAT-Australia and post to:
AMSAT-Australia, C/- PO Box 2141, GPO, Adelaide, SA. 5001.

The Newsletter provides the latest news items on all satellite activities and is a must for all those seriously interested in Amateur Satellite activities.

SUNDAY EVENING NEWS BROADCASTS

The value of the Sunday Evening News Broadcasts has been demonstrated once again in recent months with the launch of RS-10 and 11 and the commencement of the Fuji OSCAR-12 BBS Bulletin Board Service. The frequency is 3.685 MHz at 1000 UTC.

de Colin VK5HI

BEACONS

A reminder to anyone with input to either the tone access or pager interference inquiry should submit their material without delay. As well as the notes in this column, the text of the respective inquiries has been read in the Federal Tapes.

A temporary frequency allocation has been made to establish a 10 metre beacon at Cairns. The frequency is 28.265 MHz. All 10 metre beacons, world-wide, are subject to frequency and operating changes from 1990 to a shared frequency, shared time slot concept.

A reminder to all beacon and repeater groups to keep the Federal Data Base up-to-date on these systems. Any changes, additions, etc should be sent to FTAC, PO Box 300, Caulfield South, Vic. 3162.

73 de Tim VK2ZTM

Radio Amateur Club Old Timers

QSO PARTIES — WINTER 1987

Participation in the 40 and 80 metre parties in August was at a low level, considering that one took place on the evening of the monthly broadcast, and the other a week later. However, eight of the none who competed in poor conditions on 40, and eight of the 11 who were in the 80 metre one sent in logs — a high percentage which was much appreciated.

40 m	MODE	QSOs	MULT	TOTAL
VK3VF	CW/SSB	9	5	225
VK2AWA	CW/SSB	8	4	160
VK3XB	CW	8	4	160
VK3KS	CW	8	4	160
VK7BJ	SSB	6	5	150
VK7RY	CW/SSB	5	5	125
VK3ZC	CW	6	4	120
VK3XF	CW/SSB	7	3	105
ZL2AT	SSB			175
ZL3BJ	CW/SSB			150
ZL2BD	SSB			100

80 m	MODE	QSOs	MULT	TOTAL
VK3VF	CW/SSB	16	7	560
VK3KS	CW/SSB	16	7	560
VK3XB	CW/SSB	16	7	560
VK3XF	CW/SSB	12	6	360
VK7BJ	SSB	12	6	360
VK2AKE	CW/SSB	11	5	275
VK3ZC	CW	10	5	250
VK7RY	CW	9	4	180
ZL3BJ				595
ZL2AT				490
ZL2BD				330
ZL3AY				250

MORSEWORD 8

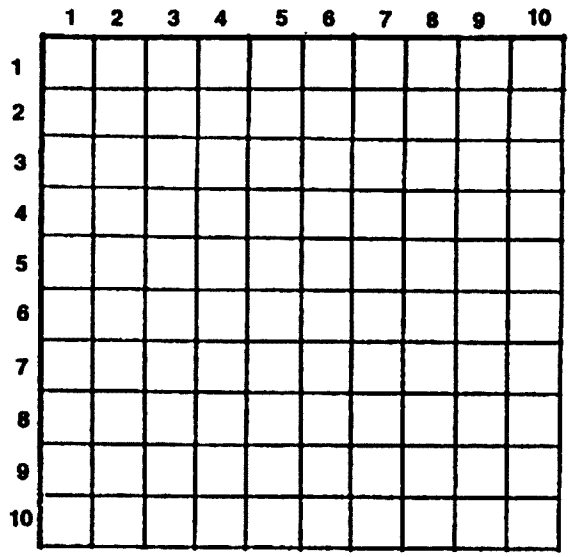
Compiled by **Audrey Ryan**
30 Starling Street, Montmorency, Vic. 3094

ACROSS

1. Road
2. To close completely
3. Resign
4. Fastener
5. Boy's name
6. A forbidden thing
7. A part of speech
8. Swerve
9. Wander
10. Sausage

DOWN

1. Bantu warriors
2. Keen
3. Pews
4. To murmur
5. A fish
6. Sudden burst of energy
7. Hand
8. 'Rob . . .' (novel)
9. Smut from the chimney
10. Monarch



Solution page 62.

Club Corner

KARRATHA RADIO GROUP

Karratha Radio Group produced and transmitted 'live' by torch light, an official VK6WIA Practice Morse Broadcast Session, portable from the ironstone hills of Burrup Peninsula, located near the Port of Dampier, in the north-west of Western Australia.

The group, of mixed interests, formed in June this year, meets every week studying for the novice examinations. They are all very keen listeners to the VK6WIA Practice Morse Broadcast, received at Karratha reasonably well.

We decided to gain "hands on" experience to produce our own program. Setting up the first field project involved building an antenna and finding a suitable transmitting site well away from Karratha and Dampier, the mining and petro-chemical centre of our north-west.

The site was located near Hearson Cove, eight kilometres north of Dampier. A one wave-length horizontal loop for 80 metres was chosen as adequate to make the direct communication with Perth, about 2 000 kilometres south.

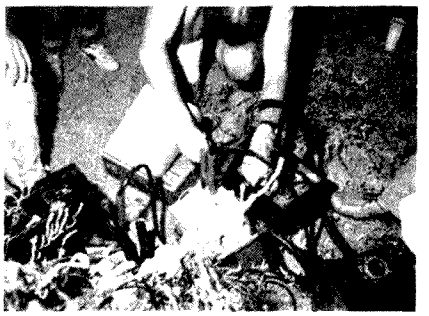
The transceiver was a small portable IC730 (100 watts SSB — 50 watts CW), and three 12 volt batteries (fully charged but without using a back-up generator).

After committing ourselves to the VK6WIA Practice Morse roster we began to wonder if this set-up would be adequate.

The antenna, although 85 metres long, did not pose any problem for space, but height was more difficult. Four steel star-pickets were installed between the cracks of the ironstone rocks and the mini Rhombic went up into its traditional shape, head first towards Perth.

The transceiver was switched on and 28 eyes and ears froze! "This is VK6WIA/P calling Perth for a signal report." To the group's surprise, "UR 5/9, go-ahead!". Everyone yelled; 'Just great, it works!"

Malcolm VK6LC, tuning up.



Keith, checking the power supply.

The date for the State Broadcast was arranged for Wednesday, July 22, and now we had to design the program to start at five words per minute, progressing up to 20 WPM.

The group worked very hard producing texts that were orientated to their area or town. Open air shacks are just the thing this time of the year! The weather at Karratha is beautiful, the days being around 30 degrees Celsius and the nights cooling down to 23 degrees Celsius.

On Wednesday, the 22nd, the night was excellent, with a clear sky, bright stars and a slight breeze. The group arrived, set up all the equipment and stood-by.

Tne broadcast started and each person, as author of their text, conducted its read back. This was really something for the group to produce their own CW session and realise the time and effort that goes into such programs. The portable station and equipment was very well set up with everyone participating in one way or another.

The broadcast went for two hours including a very large call back response. Everyone enjoyed the exercise with the WIA and sharing their interest with others.

It was a lot of fun — getting it all together and making it such a success. It is hoped this article will attract other groups into similar club interests.

Thanks are extended to the VK6 Division and the Department of Communications.

Wally (13 years), the CW Read-back.

STATION INFORMATION: VK6WIA/P

Equipment	IC-730 (100 watts SSB — 50 watts CW)
CW Equipment	VK6WIA Electronic Tape Keyer
Power Supply	3 x 12 volt Car Batteries
Antenna	1 λ Horizontal Loop for 80 metres
Lighting	Battery Torches
ATU	FC-102
Co-ordinator	Malcolm Johnson VK6LC
Group Leader	Steve Hill VK6NAK
Time Keeper	Michael Van De Zanden VK6AMZ
Photographer	Michael Tutt SWL

FOOTNOTE:

At the novice examination held on Wednesday, August 26, four of the group passed at least one subject, including Wally (aged 13) who passed the code, both sending and receiving.

—Contributed by Malcolm Johnson VK6LC, VK6WIA Councillor and Practice Morse Co-ordinator

Peter and Group in action.

VK2 Mini-Bulletin

Tim Mills VK2ZTM
VK2 MINI BULLETIN EDITOR
Box 1066, Parramatta, NSW. 2150

1988 MEMBERSHIP DUES

At the September Council Meeting the budget for the next year was considered. It was determined that the Divisional component of the membership fee would remain unaltered. For 1988 however, the Federal component of the fee will have to rise by $3.00. Full details of the 1988 fee structure as it applies to VK2 members will be given in the next *Mini-bulletin*. If you know anyone who is thinking of joining, you might advise them that applications received prior to the end of the year will be processed at the 1987 rate. Contact the Divisional Office for application forms between 11 am and 2 pm, Monday to Friday, on (02) 689 2417, or Wednesday night between 7 and 9 pm.

VK2BWI — Morse training sessions

A couple of additional operators have become available recently, but additional help is still required. Either call in to the session which is conducted nightly on 3.550 MHz or contact the Divisional Office.

GENERAL ACTIVITIES

Friday, November 20, has been set aside for an informal dinner. Details from the office or via the broadcasts . . . A Trash and Treasure sale will be held in the car park at Parramatta, Sunday afternoon, November 29 . . . An Old Timers group meets in the library at *Amateur Radio House* on the third Thursday of the month. Further details from Tom VK2JTD, or the office . . . Wagga ARC was unable to conduct their field day, which had been scheduled for late October . . . The last VK2WI broadcast for the year will be on December 20, and will recommence in 1988 on January 10.

NEW MEMBERS

A warm welcome is extended to the following new members who were in the September intake.

R Z Bojarski	VK2EEF	North Bondi
E J Brown	Assoc	Guildford
B Cobby	VK2MBT	Balmain
P F Eotvos	Assoc	Bowral
P A Hall	Assoc	Belrose
H J Hogrefe	VK2XHH	Holmesville
R L Johnson	VK2DRL	Castle Hill
S R Lee	Assoc	Campsie
R A Lord	VK2FDK	Tanilba Bay
R P Murnane	Assoc	Manly Vale
E G Popham	VK2EZQ	Mount Colah
P M Reid	Assoc	Murwillumbah
B M C Stoddart	Assoc	Lambton North
C E (Mrs) Stoddart	Assoc	Lambton North

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Five-Eighth Wave

Jennifer Warrington VK5ANW
59 Albert Street, Clarence Gardens, SA. 5039

AMATEUR RADIO PUT TO GOOD USE!

A couple of months age, Trevor O'Daniel VK5NTZ, (since upgraded to VK5ATZ), was travelling along a back-track between Swan Reach and Stockwell, when he noted a set of fresh-looking skid marks. On investigation, he discovered that a car had gone off the road, skidded along and finally wedged itself *under* the 36 inch concrete pipe-line. Those of you who know, what I call, the Mannum Pipeline, will know that there is not much clearance underneath! So, you can imagine the state of the car and Trevor's consternation at finding the driver still trapped inside (where he had been for an hour when Trevor arrived). Trevor went back to his own vehicle and was able to contact a VK3 on 80 metres. The VK3 contacted Blanchetown Police, who in turn contacted Adelaide, and some two hours later the driver was finally freed using the "Jaws of Life" to extricate him. When I heard the story from Geoff Taylor VK5TY, the gentleman was making a steady recovery in the Royal Adelaide Hospital (RAH), despite a broken pelvis, dislocated hip and assorted sundry bruises and contusions. I don't doubt that he will be singing the praises of amateur radio in future, and thanking his lucky stars that Trevor came along when he did.

And, as if that wasn't enough excitement for one week, Trevor also learned that he had passed his AOCP. Trevor, like many other OMs and YLs in VK5, owes much of the credit to Geoff and the "VK5TY course of instruction." Geoff's wife, Christine has gained her AOLCP this year and, like me, was able to get the OMs old "Z" call — in her case, VK5ZCQ.

It was good to hear Sue VK2DCR, back on the Adelaide air-waves after a long absence (when she moved to Sydney). If you don't recognise the call sign, you might know her better as VK5AYL — her former call sign — which she is hoping may still be available.

SILENT KEY

It is with deep regret that we note the untimely passing of Dave Adlam VK5QL. Dave, as VK5ZAQ, was Secretary of the VHF Group in 1975. At the beginning of April 1977, he was co-opted to Council as Assistant Treasurer, and by the end of that month, has been nominated and elected to Council as Treasurer, a position he held until April 1980.

Dave had not been active for many years, but ironically, I understand, that he had just started being active again. Dave suffered a heart attack back in August, I think, although it was sometime before I heard about it. He was 38-years-old.

Our sympathies are extended to his wife Hillary and family.

TEKPRO VISIT

On Thursday, September 3, about 24 people availed themselves of the opportunity to look over the Tekpro Division of Teknis. Tekpro manufacture high quality professional and military specification printed circuit boards. We saw computer controlled high-speed drilling and associated programming units and highly automated printing, screening, abrading, plating and solder reflowing equipment. It was a real eye-opener and it was not only the ammonia fumes that took the breath away!

I would like to thank Nev Cooper VK5ANC, who suggested the visit and 'squared' it with his boss Al (whose surname I forget, but his father has a "W" call sign!). Thanks to you both for a most interesting and enlightening evening.

SIR MARK OLIPHANT — HONORARY LIFE MEMBER

At the August meeting it was proposed by those present, on a recommendation from Council, that Sir Mark Oliphant be offered Honorary Life Membership for his services to radio science and allied branches of physics.

I am pleased to announce that Sir Mark has graciously accepted our offer and, as he has now moved to Canberra to live with his daughter, we will ask the VK1 Division if they would be willing to do the presentation for us.

Our other current Honorary Life Members are: George Luxon VK5RX, Geoff Taylor VK5TY, Brian Austin VK5CA, Rob Wilson VK5WA, Bob Murphy VK5MM, Colin Hurst VK5HI and Ian Hunt VK5QX.

DIARY DATES

November 7 —Adelaide Hills ARS Trash and Treasure Sale, Westbourne Park Memorial Hall, Goodwood Road, Westbourne Park (just south of Big W) from 10 am.

November 22 —WIA Picnic (probable date). Bridgewater Oval. Date unconfirmed at time of going to press, listen to Broadcasts for details.

November 24 —Monthly Meeting, Speaker Ray Dobson VK5DI, on the latest in radio modules that have been produced by Philips Industries. 7.45 pm.

November 26 —Old Timers' Luncheon, Woodville Oval. Details from George VK5RX.

December 8 —Christmas Social, Woodville Community Hall, 64c Woodville Road. Bring a mate (OM, YL etc) and a plate of supper.

Don't forget that there will be no meeting in January 1988 as it is Australia Day and there will be many Bicentennial Activities happening!

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VK3 WIA Notes

RESULTS OF VK3 DIVISION SURVEY

Following is the result of the VK3 Division Survey conducted in August, together with a letter of recommendation to the *Future of Amateur Radio Working Party*.

The response to the survey was excellent and the VK3 Council wishes to advise all members of what has been done with the final evaluation.

Attention — Chairman
"Future of Amateur Radio Working Party"

Manager — Regulations,
Radio Frequency Division,
Operations Branch — Department of Transport and Communications,
Belconnan, ACT. 2617.

1The Victorian Division of the Wireless Institute of Australia conducted a survey of Victorian amateurs during the month of August. Both members and non-members of the WIA were invited to participate. Survey papers were distributed to all members through the medium of AR magazine and made available on request to non-members through Club and Zone Secretaries, and from the Division Headquarters at Fitzroy.

2There were 547 completed and returned. Returned survey papers have been analysed and the overall result follows (Annex A). Returned papers are available for scrutiny if required.

3In accord with the wishes of the majority of amateurs who responded to the survey, the Victorian Division Council makes the following recommendations:

3:1Restructure of the *current* licence system to include an extension of privileges for novice class licence holders.

3:2Technical standards of the Amateur Service should be maintained, and the novice class licence should be considered as the basic minimum technical level for entry into the Service.

3:3It is highly desirable that all classes of amateurs have a common frequency allocation to allow communication and experimentation between licensees of different levels of technical expertise.

3:4Transmission of "data" should be permitted only by persons holding a LAOCP or AOCP qualification.

3:5Novice class licence holders should be granted VHF/UHF privileges and a "no code" class of novice licence introduced.

This licence to permit transmission only on allocated VHF/UHF frequencies. The frequency allocations should be such as to maximise use of existing allocated amateur bands, but not detract from the incentive to "upgrade."

3:6Novice class licence holders should not be granted operating privileges on the entire 144 and 148 MHz band, however it is desirable they be allocated a 150 kHz segment of the band and FM, SSB and CW should be permitted. The suggested frequency allocation is 145.000 to 145.050 MHz SSB and CW, and 145.050 to 145.150 MHz FM.

3:7Novice class licence holders should be permitted to operate on the six metre band SSB and CW. Suggested frequency allocation is 52.100 to 52.150 MHz.

3:8The amateur frequency allocation on the 70 centimetre band should be utilised more effectively, including the 70 centimetre repeater network. It is recommended that Novice class licence holders be permitted to use the FM mode only on frequencies 438 to 440 MHz and 433 to 435 MHz.

3:9The theory level of the novice examination should be investigated. If the standard is proved to have risen significantly in recent years, and is in fact higher than was originally intended as an appropriate base level for an introduction into amateur radio, it should be restored to that intended level.

4The Victorian Division makes no recommendation regarding the desirability of including questions on basic FM and VHF/UHF theory in future novice examinations, and relies on the recommendations of the "Future of Amateur Radio Working Party" in this regard.

5It is hoped the input from this Division will be given every consideration.

Yours faithfully,

(Signed) Barry Wilton VK3XV,
President.
September 14, 1987

ANNEX A
WIA Victorian Division Membership Survey Result

		YES	NO
SECTION A: COUNCIL INTERIM POLICY			
1A	Do you support the VK3 Council's "Interim Policy" as published?	252	295
SECTION B: LICENCE RESTRUCTURE			
1B	Is there a need for any restructuring of the Amateur Licence System?	431	114
2B	Would it be advantageous to have a licence of lower technical standard than the novice licence?	32	515
3B	Would you support the introduction of an additional licence class below LAOCP to allow novices data-mode privileges?	249	298
4B	Should a "no code" class of novice licence be introduced to allow holders to have VHF/UHF privileges only?	345	202
SECTION C: ADDITIONAL PRIVILEGES FOR NOVICES			
1C	Should novice licence holders be given VHF/UHF privileges?	432	114
2C	Do you agree with the 1987 WIA Federal Convention decision to recommend to DOTC that novices be allowed to operate on the entire 144-148 MHz band with full FM privileges?	80	467
3C	Should novices be given a frequency allocation that would allow all grades of amateurs to communicate?	426	118
4C	Should novice licence holders be allowed to operate on a portion of the 144-148 MHz band?	339	207
	FM	293	233
	SSB	233	286
	Data	198	325
5C	Should novice licence holders be allowed to operate on a segment of the six metre band?	387	160
	FM	368	177
	SSB	366	178
	Data mode	84	460
6C	Should novice licence holders be allowed to operate on a segment of the 70 centimetre band?	402	145
	FM	393	151
	SSB	112	432
	Data mode	109	435
SECTION D: JAPANESE RECIPROCAL LICENCES			
1D	Do you support the DOTC decision to allow Japanese Telephony Class licence holders a reciprocal licence which allows 10 W FM operation on all bands above 30 MHZ?	275	263
2D	Do you support the concept of allowing visiting Japanese Telephony Class licence holders a "Temporary Visitor's" licence for a specific period, eg 12 months?	394	145

NOTES

1.Amateurs who voted YES to question 1A were not required to answer all the questions.
The questions not requiring an answer were covered in the "Interim Policy."
A total of 252 YES answers to question 1A were received and have been added to the total votes recorded in other questions on the following basis.

1B YES	2B NO	4B YES
1C YES	2C NO	5C YES
5C FM YES	5C SSB YES	5C DATA NO
6C YES	6C FM YES	6C SSB NO
6C DATA NO		

2.It should be noted that in some instances not all questions were answered on a small number of returned papers. There were 33 replies regarded as invalid.

NEW MEMBERS

A warm welcome is extended to the following new members.

Donald Bainbridge VK3BDJ	Leopold
Manfred Bartz	Endeavour Hills
John Chambers VK3NYW	Seaford
Brian Fairess VK3NDP	East Brighton
Ian Godsil VK3DID	Parkdale
R M Johnson	Toorak
Alexander Kapko VK3XLI	East Brighton
Desmond Kealey VK3XHH	Montmorency
Bruce Leech VK3YIY	Sunbury
Hendrik Lodder VK3AXJ	Mount Waverley
Max Maujean 3B8BL	North Dandenong
Gino Nativo VK3XML	Brunswick
Julian O'Donnell	Doncaster
Bob Verstegen VK3KDZ	Endeavour Hills

VK4 WIA Notes

Bud Pounsett VK4QY
Box 638, GPO, Brisbane, Qld. 4001

PRESENTATION

At the WIA Queensland Divisional Meeting on July 17, 1987, well-known Queensland amateur, Guy Minter VK4ZXZ, was awarded a merit badge and certificate by the Queensland Division for his services to the WIA and the Amateur Radio Service. The awards were presented on behalf of the Division by it's President, David Jerome VK4YAN. The Certificate read as follows:

Guy is a well-known and respected amateur and has been involved in Institute and amateur radio activities at all levels. His involvement has often been to the exclusion of all else; such is his dedication to the amateur service.

A brief outline of his amateur involvement follows:

—Joined the Townsville Amateur Radio Club in 1972.
—Joined the Gold Coast Radio Society in 1974 following a work transfer.
—Elected treasurer of that club the same year.
—Attended the first Radio Club Conference in 1976.
—Licensed as VK4ZXZ in 1979.
—Joined Council in 1979 and appointed Divisional Treasurer.
—In 1981, elected Divisional President. During his time as President he visited every radio club in Queensland at his own expense in his own time.
—Became Alternate Federal Councillor in 1982 and again in 1986.
—Chairman of 1982 Radio Club Conference.
—Appointed Federal Councillor in 1983. Also served on Federal Finance Sub-Committee.
—Awarded 75th Anniversary Medallion by Federal Executive.
—Represented Australia as an observer at the IARU Region 3 Conference in Auckland, 1985.
—Presently serving as Secretary to the Queensland Technical Advisory Committee.

Guy's one and only aim in performing these various tasks has been to seek the best for amateur radio and the WIA. He has been very capably supported by his wife, Anne VK4ANN, and he deserves recognition by this Division for his services rendered at all levels of Institute activity.

Judging by the reaction of those attending the meeting, the decision to make the award to Guy was a very popular one. When the award was proposed at a Council meeting about 10 days earlier, the Chairman found himself with the task of selecting from about 10 seconders to the motion. Congratulations, Guy!

Contributed by Ross Mutzelburg VK4IY, Federal Councillor

ALARA IN QUEENSLAND

After five years of representing ALARA in the State, Margaret VK4OE, has relinquished the position to Josie Gleadhill VK4VG. Queensland ladies are advised that their net will now be heard on 3.570 MHz at 0930 UTC.

It came as a pleasant surprise for my wife and VK4WIA newsreader, Bonnie, to be sponsored for ALARA membership by Val Rickaby VK4VR. Val is one of our State Divisional Councillors. Here, in Queensland, our ladies are very much to the fore in amateur radio.

WELCOME VISITOR AT COUNCIL

Members of the Divisional Council were pleased to have, as a guest, David Wardlaw VK3ADW, at the September Council Meeting. Discussions with David were very fruitful and both parties benefited greatly by our Federal President's visit.

David was on his way north to attend the North Queensland Radio Convention, in Townsville.

CENTRAL QUEENSLAND JOINT VENTURE

Gladstone and Rockhampton amateurs have co-operated to bring into operation a six-metre repeater site at Amy's Peak some 60 kilometres south-west of Gladstone.

The Central Queensland Branch of the WIAQ (Rockhampton) provided most of the equipment while the Gladstone Amateur Radio Club made available the site and attended to the licencing and administration. Amateurs from both centres assisted with the installation.

This six-metre repeater transmits on channel 3725 (53.725 MHz) and receives on Channel 2725, using the new Australian split of 1 MHz for six-metre FM repeaters. The aerial system is vertically polarised.

HISTORIC GYMPIE

Gympie Amateur Radio Club, have followed up their 1986 "Goldfest" by setting up an operating station and display in co-operation with the Gympie and District Historical Society.

VK4WIH, will operate from one of the museum buildings in the Society's complex in Lake Alford Park, on the southern outskirts of Gympie.

This Historical and Mining Museum has even more significance now as it is close to the major new deep mining development at Monkland, in the West of Scotland Shaft.

THE GOLD COAST AMATEUR RADIO AND HOBBIES FESTIVAL

It was, in past years, known as the Gold Coast Hamfest and has always been a very popular event. The theme of the event has now been expanded hence the name change.

The venue is still the same, the Albert Waterways Complex, Hooker Boulevard, Broad Beach, Gold Coast. Everyone is welcome on Saturday, November 14.

Bud Pounsett VK4QY

QSP

LICENCE FEES UP

The Department of Transport and Communication (DOTC) has increased its revenue obtained through radiocommunication licence fees by an average of seven percent.

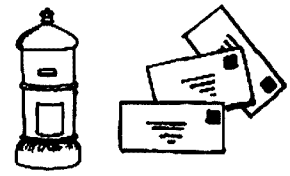
The amateur station fee, including repeaters and beacons has risen by $2 a years to $28.

Licence fees are reviewed each year as part of DOTC Federal Budget submissions.

A full list of the new radio communication licence fees, which are effective from December 1, 1987, is available from the Department's State branches and regional offices.

Any opinion expressed under this heading is the individual opinion of the writer and does not necessarily coincide with that of the publisher.

Over to You!



PROTEST

I wish to protest against novices using the two-metre band without the necessary qualifications.

It will not be long before we will be like the CB licence group, pay a fee to the Department, get some equipment and you are a full-blown amateur.

To the powers that be; take a running jump at yourselves and knock these silly ideas on the head.

Yours faithfully,

W S Lawson VK4ALC,
143 Greenslopes Street,
Cairns, Qld,4870.
ar

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CASUAL INTEREST

I have been taking a casual interest in the debate that has been going on about licence reform and have been motivated to write something, on the subject of attracting young people to amateur radio. I believe this is one of the aims of the restructuring issue that is being tossed around. By way of introduction, I am 16 and studying a fairly heavy Year 11 Mathematics/Science course. I have been a member of the WIA since late 1984 and studied for and obtained my full call last year.

On the subject of attracting young computer people to communications: there seems to be an incentive problem. Young computer people find satisfaction in programming and also see computers as a means of getting a good position in an expanding field at the forefront of technology. They see data communications as more beneficial to them in the end than radio communications, which plays no visible (to them) role in their envisaged future occupation (Yes, young people do take their future into account in the pursuit of hobbies).

If they knew that radio communications was also an expanding field at the forefront of technology (also more people going into computers so greater work prospects in radio fields!) their attitudes might be somewhat better. The problem is that the forefront of technology in radio is nowhere near as accessible as the forefront of technology in computers. Technology is trendy and amateur radio (one of the more accessible parts) is seen as a product of a past generation (ie shortwave and valve transmitters), and so is not as interesting. Things our parents would have been amazed by are passed off as "old hat". Our state-of-the-art transceivers are seen as glorified CB sets; nothing spectacular.

Amateur radio also has an image problem with the wider range of young people, those who may take up amateur radio for the communications experiences it offers (rather than technical experimentation). This is partially a result of the CB boom. The images of "truckies" and other exotic personalities are still hot in young people's minds, and imagination. Television promotion has given CB an attractive air of renegadery and excitement which amateur radio cannot match. When you say you are into radio, the first thing people want to know is do you talk to truckies, or can you let them have the mic so they can hassle the P-platers who hang out on the UHF channel 40 (even if you are using an IC-22S!)? When the purpose of amateur radio is explained, I am sure people get the impression that it is 'way above' them (except: my descriptions of WICEN activities I have been involved in receive more interest. Is it because people are interested in knowing how I came into contact with competitors?). Amateur radio (in my experience) does not attract that much attention amongst young people. For those interested in communication, CB is far easier.

Even if young people are aware of amateur radio, the prospects of many hours study and $ $ $ to get there are a little daunting (compared to the almost instant gratification of a computer). This is especially so for those with no prior electronics knowledge or introduction which might make them eager to experience amateur radio. I am sure though, that if people were given reason to be eager for amateur radio, then this would not be a hurdle at all. In relation to this subject, equipment is a problem, and by the time you can afford it personally, there is no time to use it (in between studies and performing the function as a social being). Home-brew is a possibility, but being mainly limited to CW, that aspect may remove much of the attractiveness in amateur radio.

Please do not confront me on that point. Although Morse is more satisfying, fast and efficient at the end, it is cumbersome and frightening at five words per minute, and phone for the beginner is almost painless and offers a wide range of experiences to be had at once (even if it is the 'lazy option'). The idea is to attract people.

I have gone on for long enough (there is more I can think of). Anyway, what I am getting at is that perhaps we are tackling this from the wrong angle. Licence changes are all very well but won't make all that much difference if no one is interested. If young people are to be aware of what amateur radio really is, and they need to have a good reason to enter it in terms of amateur radio's value to them.

You may be interested to know why I became on of the few Australian amateurs under 18 after all this. For a start I was interested in electronics and shortwave listening and so had good exposure to it (engineer uncle). I read lots of old magazines and became enthused, dreaming of DX and other enviable pursuits. I got the WIA novice course (excellent course) when 12, but did not do much until at a WIA meeting, the second I went to, where I was interrogated about why I wasn't studying for my licence. Les VK3BPW, told me I had half an hour after tea to do my Morse (big motivational problem). So from February 1986, I had half an hour after tea of Morse most days in the week, using the VK5 and VK2 Slow Morse Broadcasts (also excellent). In June I applied for the novice examination, being informed by Vic Pleugar, of DOC, (who gave lots of encouragement) that lessons were on in Swan Hill with Rex VK3OF, where the examination would be. I went to several of these, bought the ARRL Handbook, studied hard, applied for the AOCP and passed everything in October.

The point is, I had a reason to become an amateur. I wanted to become an electronics (communications) engineer, because I saw jobs and money there. I saw amateur radio as helping. Joining the WIA and going to meetings helped. I felt 'out of place' not having a licence, and not being able to talk to the people there on air (what were these repeater things? ? ?). Les took me on the Sea Lake Mallee Rallee with WICEN, and that helped — it is a very satisfying part of amateur radio. I did work experience with a commercial communications firm in Mildura. That helped.

I think few young people have, or have access to, half the motivation that I have had. Perhaps that is the problem we have attracting young people to amateur radio. I am sorry I cannot offer solutions, just explain some of the problems I have seen, in the hope that it will help put amateur radio on the correct road to recovery (I still want to be able to use my hard-earned licence in 40 years time, when I have time to).

Something I get a little angry about: Not so long ago in ARA and AR I read a letter putting over the attitude that "it is ridiculous that the AOCP can be passed by a 15 year old with ease."

To enlighten:

As far as I am aware, such a 15 year old at our local high school spends 25 hours a week learning, with at least an extra 10 hours per week after school doing the same thing. During a year, such a 15 year old will do dozens of one hour, short answer or multi-choice tests, essays and paragraph answers and six hours of maths above AOCP standard per week. At the end of each semester, most 15 year olds spend two to three weeks studying to be examined on the previous semester or years work, in up to 156 hours of examinations over four week-days.

Does it really surprise people with an attitude like this that such a 15 year old, with 11 years of solid learning behind him, should have less difficulty than they do passing the AOCP? Is not the AOCP failure rate, usually above 50 percent and set by mostly adult candidates, an indication of the difficulty of the AOCP? ? ?

Good Luck,

Yours sincerely,

Ben Jones VK3AKP (L30377),
PO Box 2,
Manangatang, Vic. 3546.
ar

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TECHNICAL CORRESPONDENCE

Permit me to differ with JH1FCZ about the two rings form of the 'Hentenna'. It was referred to in the 1978 edition of *Amateur Radio Techniques* by Pat Hawker G3VA, quoting Italian work published in 1965. Does Figure 4 format of the Hentenna have a figure of eight pattern? I have seen, somewhere, plots showing a sharp null on the line of the rod connecting radiating element (or should that read 'powered element') and ground, otherwise omni-directional radiation. As yet, Invalid Pensioner VK5KIC, has not found pennies enough to come up on two metres, six metres or 70 centimetres. G3VA, points out that the ground-plane should be metal, preferably copper or aluminium, Its surfaces protected against corrosion, at least 25 percent larger than the powered ring, to pull the radiation down close to horizontal.

The Italian work referred to by Pat Hawker, was done on 500 MHz.

In his opening remarks he refers to the quad 'hoop' basically one wavelength in perimeter, and to the original Boyer (W6UYH) DDRR hula hoop, resonated to a quarter-wave by a capacitor at its free end. The Italian group, in 1965, pointed out that 'compared with the Boyer quarter-wavelength, "less known is the half-wavelength closed loop aerial which has a quite different, and in some ways, better performance." ' The half-wavelength form has an impedance close to 50 ohms for coaxial-connection point to vertical-to-earth-point angles of 20 to 160 degrees. The band width over that power-connection point range of angles ranges from close to three percent (if I guess values on the graph adequately) to about 15 percent. I tried very successfully, a skeleton-ground antenna like the one formatted in Figure 4, until it penetrated that polarisation was horizontal, and it is a pre-requisite that, in the Australian CBRS on that UHF band, that polarisation be vertical.

Further, I gather, that under the present CB regulations it is no longer permissible to use an aerial other than a Department of Communication Approved Type available commercially, at least for transmitting.

I did not realise the half-wave 'leaky wave-guide' aerial (I use Pat Hawker, probably on one occasion only, terminology) had been independently invented a few years later.

"Amateur radio techniques" refers ... no it doesn't, that was in the Boyer quarter-wavelength

section . . to a model for 26.5 to 32 MHz 27" (685 mm) in diameter, standing 3½" (89 mm) above the roof of the car 'using the vehicle roof as a ground plane, which performed better than a quarter-wave'.

All book-learning; the financial and other limitations of an Invalid Pensioner have limited my possibilities of experimentation.

Yours sincerely,

Ian Crompton VK5KIC,
9 Craig Street,
Richmond, SA. 5033
ar

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COMMENTS FROM THE DARWIN AMATEUR RADIO CLUB RE NOVICE BANDS AND K-CALLS

After our August general meeting a discussion was held. The following is a resume of the outcome.

It is very apparent that there is a lot of claiming and counter claiming by people with vested interest going on amongst the membership of the WIA. We felt that it was about time that some members took a long hard look at their attitudes.

At the meeting we decided that a common band was mandatory to keep interest alive in amateur radio. It has become apparent that most of the experimenting is done by Z-calls on the VHF/UHF bands, and nowhere near as much is done in the lower HF bands. Isn't experimenting what our hobby is all about?

The novices have no way of contacting any Z-call holder because, let's face it, who likes to keep a noisy HF rig running all day and night so that N-calls can talk to them. It is a lot easier the other way. The novice can leave a rig running on the local repeater.

We felt that 70 centimetres would be better than two-metres because of the "crowding in the big smoke". But, really chaps, would it matter? The outcome was that on a VHF/UHF band there should be a common segment including repeater access 10 watts maximum output FM only. No RTTY, Packet, etc. This would give all classes a chance to chatter and organise things, maybe to the betterment of our hobby.

Now for a bigger bag of worms! What about the K-calls? I mean K-calls, not holders of both Z and N licences. (The combination came about to make regulation easier). Why, with their superior licence qualifications should they not be able to use RTTY, Packet, and other exotic modes within their licence frequency and power limitations/ allocations. Let's face it, they have the qualifications, but they have not demonstrated to DOTC the ability to modulate their eardrums to Morse at 10 WPM or more — that's all!

We believe that K-calls should be able to use all the modes they have shown their technical competence at (by examination) on all bands they are licensed for. There obviously needs to be more thinking done within this great organisation. Not committees to look at this and that because vested interests come to the fore and the only ones who come out of the woodwork are those who have an axe to grind. No one else is interested because they see this issue as a fait accompli.

The only way to find out what amateurs think is to hold a compulsory ballot of ALL amateurs. We realise that this is totally impractical. Nevertheless, some means of gauging all amateurs' responses (both members and non-members of the WIA) needs to be found and done.

Bill Murphy VK8ZWM,
President,
Darwin Amateur Radio Club.
ar

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THE JAPANESE NOVICES HAVE TWO-METRES, SO WE WANT IT TOO WE WANT A COMMON BAND, SO GIVE US TWO-METRES

Well, I have been told by various novices that they do not want to be given two-metres! They want to earn it, as a privilege of a Full Call.

Strikes me, this is just another example of big business out to make a dollar, selling novices two-metre equipment.

As for the Common Band — well, as must be abundantly clear to all, the problem can easily be resolved, by Limited Calls doing the 10 WPM Morse. It's that simple!

I have renewed my subscription to the WIA after a lapse of some years. Recent events prompted me to take this, as there are some aspects of current proposals I find disturbing, and indeed, foolish.

"Novices on two-metres". Harmless enough perhaps — in isolation. The complaining about "common band" — the suggestions of additional classes — beginners — computer — technician — and extra. Now, let's face it. All this started back in the 50s with the introduction of the "Z-Call". The thin edge of the wedge.

I have gone along with the concept — high tech fellow, who won't, or can't, associate with the rowdy conditions on HF — then there is CW. I just can't believe these clever people are incapable of mastering Morse. Of course they could do it.

Let's get amateur radio on its feet again. One Grade: Amateur. Full Call. You either are qualified or you are not. You share all bands — or none. Oh yes, as an introduction and stepping stone — the beginner's level — Novice. Nothing else. We will know where we stand. So will DOTC, and the radio clubs and the would-bes, and the rest of the World.

Let's face it — all this Bi-centenary nonsense — "200 years an established country" — and we still allow ourselves to be led by the nose from overseas — so childish.

So, let's phase out the limited — give them a couple of years to pass the 10 WPM and the K-calls — that must have been one of the best examples of muddled thinking for some years, followed by the present nonsense.

Well, that fixes that! Thanks to all the people who have spent many hours figuring out various grades and allocations, etc. It is nice to know the alternatives.

But, let's face it — the Novice Scheme was the greatest, let us keep it as is, and the AOCP Full Call.

Examinations — It seems so simple. DOTC sets the examination — the same one, all over the country, on a given day. The papers are sent to a trusted person — as in the past — eg the Postmaster. Under his direction, supervision is provided, and the completed papers returned to DOTC. Now, maybe DOTC do not wish to spend the time on marking papers — so couldn't they assemble random bundles of numbered answered sheets (no names or addresses) and have marking done by some reliable people outside the Department?

Beats me, why in this day and age, with multi-choice Q and As, and computers to scan the results, why all the fuss?

Oh, another thing. Some fool is suggesting a Second Body to — let's say "compete" with the WIA. If he'd get off his big arm chair and go chase up more support for the WIA and help us "get the bugs out", then perhaps he would earn some respect. Why do people want to destroy the system! Let's face it — the WIA is in a muddle — let's all pull our weight and squash the nonsense. Let's work for the following: AOCP and Novice. DOTC do Examinations. WIA and AMATEUR RADIO FOREVER!

73,

Jim Griffiths VK2BGG,
10 Anne Street,
Wauchope, NSW. 2446.
ar

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FREE LOADERS?

At the recent VTAC AGM the Victorian Division again attacked the so called free loaders of Institute owned/controlled repeaters, and like devices. They went on to say that non-members who use repeaters should at least contribute to the repeater fund.

This, to a certain extent, may sound fair enough. However, the Institute must understand that repeaters are, by law, open access! Before embarking on the provision of the various repeaters the Institute knew they would have to use only members' funds.

I have pointed out to the Institute on numerous occasions that they do little to encourage members . . . The Institute must "sell" its product! In the case of repeaters (and like devices), if it is necessary to attract funds, then the service must be "sold" to the users in as many ways as possible, this includes keeping everyone fully informed of the state of the devices, and the service.

From previous correspondence on the subject of keeping members fully informed, the Victorian Division seems to take the attitude that everything belongs to the committee, and what they decide has got nothing to do with the members! For example, how often has the Sunday morning broadcast contained a comprehensive status report? (should be weekly!). How often have members been left for weeks (months) guessing what is wrong with this or that repeater, or like device?

In contrast, those involved with ATV are provided with an excellent up-date service by Ron Harrison VK3AHJ. Ron makes a point of keeping everyone well informed on the ATV device/s status every Sunday morning. Consequently, the Melbourne ATV group has an excellent chance of attracting funds.

Yours sincerely,

Tony Tregale VK3QQ,
73 Nepean Street,
Watsonia, Vic. 3087.
ar

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GREAT CITIES LINKED

On Thursday, August 20, Melbourne packet radios stations linked their computers through a series of dedicated VHF repeaters to the National Capital, Canberra.

The combined technical expertise, dedication and efforts of the Melbourne and Albury/Wodonga packet radio groups finally made this major network link possible with the completion and installation of VK3RPN at Wodonga.

Data signals from Melbourne are lifted over the Great Dividing Range by VK3RPL, situated high in the Divide where it looks clear to the north over the Strathbogie Ranges and along the Goulburn Valley to VK3RPW, at Shepparton. This central Victorian packet repeater provides excellent coverage and is a vital mid-State link. The equipment is state-of-the-art, installed and maintained by one of the State;s finest radio clubs.

The Shepparton signals follow the general direction of the eastern section of the Midland Highway, passing north of Benalla and Wangaratta, arriving at VK3RPN, Wodonga, in good shape to travel interstate across the mighty Murray River to our friends in VK2.

The toughest part of the data highway is the job of VK3RPN, the long haul north-east over Albury to VK2WG-E, east of Wagga. The Wagga Amateur Radio Club maintains the efficient operation of this most important part of the data highway. VK2WG-1 is tasked with ensuring the packet signals avoid the massive Kosciusko Park, and have a clear run to Canberra.

The time taken for data signals to travel between the cities will depend on the level of traffic on the data highway. An average time for the return trip will be in the order of 10 seconds.

Victoria has opted for dedicated VHF packet repeaters to provide the coverage within the State. The main north-south trunk is complimented in the north-west by VK3RPM, at Bendigo. To the west, the Ballarat repeater is nearing completion.

The heavy Melbourne traffic is handled by VK3RPK and VK3RPA on 147.600 MHz, both stations dedicated to packet and in prime locations to cover the sprawling metropolis.

These days most home computers can be used for packet operation without any great difficulty. For many computers, a simple and inexpensive modem, program and radio is all that is required to allow full access to the fast growing packet radio facilities. A recent inexpensive modem design allows packet and line operation at the touch of a switch.

If you have a computer and a full or limited amateur radio licence, then packet will connect your two hobbies, and your computer to the outside world. However, don't despair if you have a novice licence or are a SWL, because just receiving packet can be great fun.

For more information on this fast growing aspect of amateur radio, contact VK3QQ, QTHR, or phone (03) 434 3810 or, write to the President, VK3AVE, Melbourne Packet Radio Group, Box 299, St Albans, Vic.

Tony Tregale VK3QQ,
73 Nepean Street,
Watsonia, Vic. 3087.
ar

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GOOD SHOW QUEENSLAND

Having listened to, and dealt with the VK4 News System on many occasions, I wholeheartedly agree with the comments by Bud VK4QY, in September AR.

The VK4 Broadcast system is a perfect example of the true amateur spirit of co-operation and product excellence . . . and all this with the lowest membership fee in the country!

Congratulations from the deep-south to everyone involved with one of Australia's finest news services. Keep up the good work, folks!

Yours sincerely,

Tony Tregale VK3QQ,
73 Nepean Street,
Watsonia, Vic. 3087.
ar

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UPON CHECKING. . .

Re my thoughts on Equal Temperament Tuning (Keyboard Instruments) which was published last month, upon checking my notes I find that I used Bottom A frequency instead of C (not that it makes a lot of difference).

The sentence therefore should read:

Since the frequency of bottom C is 32.703196 Hz, top C must be both 4186.0091 Hz and 4243.12 Hz which anomaly. . .

Heard some chatter on 40 today about the WIA. The sender said a bit an then remarked that he ought not to be criticising over the air, etc. I would have thought that it would be just the place to air any grievances. I, for one, would certainly like to be filled in on what the grievances are . . . it's not the first rime I've heard a bit of criticism. It might be an idea to have a committee 'discussion' with those who feel things are not going right after the Sunday broadcasts . . . or in a special column in AR so that these things can be aired instead of being allowed to fester.

Qne thing is for sure, we have to stick together.

Yours and 73,

Don Law VK2AIL,
RMB 626 Adelong Road,
Tumblong, Vic. 2729.
ar

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OTHER HOBBY

The accompanying photograph is of my other hobby . . . model ship building, a legacy no doubt inspired from my days as a ship's radio officer.

This model is the *Titanic* with two ships' clocks in the background.

Regards,

Bob Clifton VK5QJ,
4 West Terrace,
Beaumont, SA, 5066.
ar

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AERIALS — SOME PRACTICAL CONSIDERATIONS

I have a suggestion to add to the interesting and informative articles by Ted Roberts VK4QI. If you are buying PVC tubing to make strain insulators, get the amber coloured electrical conduit — it stands-up to Ultra-Violet better.

For those interested, the use of PVC conduit in direct sunlight is covered in Australian Standards Association — Wiring Rules. The specification is AS 2053 and the conduit is marked with the letter "T".

Yours faithfully,

Jack Peatfield VK5AF,
1 Filmer Avenue,
Glengowrie, SA. 5044.
ar

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OLD COMMUNICATIONS EQUIPMENT

Many amateurs would know of my efforts to collect, restore and write about old amateur and military communications equipment.

In the course of my research I am sometimes asked to assist with deceased estates, and find that very often the family do not have any idea of the value or importance of the deceased amateur's radio equipment.

To them it is a mystery or even a hindrance to settling their affairs, and consequently it is sold for little money or simply taken to the tip. I have known of modern equipment worth thousands being sold for just $50, and articles of significant historical value just dumped to clear the estate. In several cases, the widow has been in dire financial straits and obtaining a fair price for the equipment would have been of significant benefit to the family. It can be very sad and traumatic.

It seems incredible that we should not consider the inevitable, and spending time with the bereaved family of an amateur would make you realise what a simple but important task it is to list and value your equipment, and, of course, other important items, to help your family.

If you don't, I guarantee that your proud possessions and mementos will be discarded on the tip! Do you want that?

We all owe it to our families to, al least, indicate the disposition of our equipment if we pass away. And, don't put is off till you retire — you could be run over by a bus tomorrow.

Might I suggest that a trusted (and note the emphasis on trusted!) amateur friend or the WIA be enlisted to help sell modern equipment, and the WIA historians be given the opportunity to select items of historical interest, particularly documents, photographs, awards, etc. There are also collectors like myself who would appreciate and preserve vintage items that would otherwise have to be dumped, where they have little monetary value.

Please do it now!

Your sincerely,

Colin MacKinnon VK2DYM,
52 Mills Road,
Glenhaven, NSW. 2154.
ar

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OFF LIMITS? ! ?

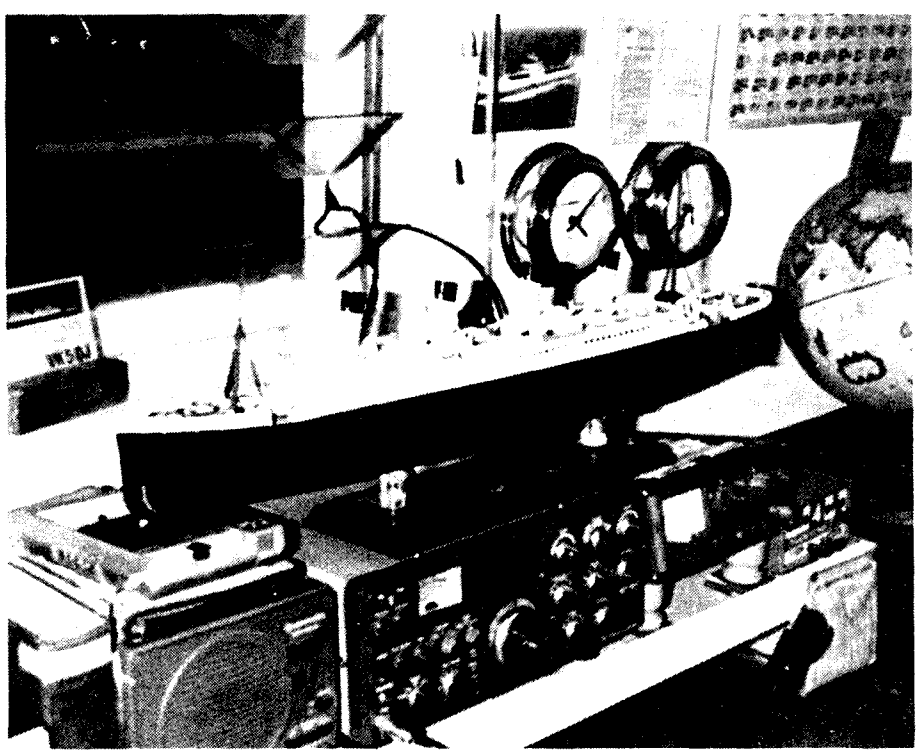
The article about the Catalina *Frigate Bird II* in AR for September 87, page 28-29, reminded me of the time I spent at Rathmines in January 1958, as an Air Training Corps member. The Frigate Bird II was hangared at Rathmines at the time, but was strictly off limits.

Just before I left, there was one heck of a ruckus because a group of RAAF Radio Apprentices from Wagga, also on camp, had vandalised the Cat and stolen the radio equipment. In the process they had severely damaged the aircraft.

I do note with some alarm that radio equipment donated to the Catalina project, and to other aircraft restoration efforts, will become inaccessible to the radio enthusiast and the public! The Catalina will hang under the ceiling of the Power House Museum, and the *T1154/R1155*, which at present makes a marvellous display next to the Lancaster at the Australian War Memorial is to be installed inside the aircraft, never to be seen again.

This is not right!

We are losing our chance to promote radio in our haste to help the aircraft enthusiasts. I will gladly donate some black painted biscuit tins to simulate the internal radio equipment (who is



going to know the difference?) so that the real radio equipment can be preserved and made available for display where we can see it!

Please think about it fellas, how can we promote the history of our hobby when we are effectively hiding it from view forever?

Yours sincerely,

Colin MacKinnon VK2DYM,
52 Mills Road,
Glenhaven, NSW. 2154.
ar

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PROVOCATIVE AND CAUSTIC

My letter objecting to the downgrading of *Amateur Radio* magazine (see September 1987, page 58) was deliberately provocative and caustic.

I was gratified to see so many other letters in the same issue, agreeing with my point, and in more gentlemanly terms.

I hope all members will read these letters and realise the importance of maintaining AR at the previous high standard. Already you can see the backward step taken by deleting the colour cover, and if a realistic view is not taken on costs, it will only deteriorate further.

I would like every member to write a two-line letter to the WIA stating simply:

1. I do not want AR downgraded.
2. I am prepared to pay a few dollars more to ensure that AR stays the best magazine I can get.

The letter from Bruce Kendall (same issue) pre-empted my next approach, and I agree with his concepts wholeheartedly.

You might think the WIA is in the business of providing services to members. Wrong! WIA and AR is all about marketing. We have a product and we need to convince the customer that he has to have it. (That is quite different to him ***needing*** it).

Let us examine what the product is and whether the customer perceives an overwhelming desire to have it. Is it a long list of all the services the WIA can provide? I hate to say it but the prospect will reply that the DOTC does what the politicians tell it to do anyway, who cares about Special Event Call Signs, and repeaters and beacons are there for all to use. Is it the bickering and dissension that pervades the hierarchy? Who needs that!

The one thing that he can get only by being a member is the AR magazine, so does the customer see value in that? Dare I say that AR is old-fashioned in appearance and layout. It doesn't really grab you does it? The front cover with its somber type style and lack-lustre colour reminds me of an obituary notice.

Sometimes I wonder if in trying to provide something for everyone, the end result is a bland porridge with little to turn the customer on at all. Often less is more, and perhaps we need to write less, print it in larger, more eye-catching type face and make sure it is a marketable product.

We need to critically examine each and every item printed in AR. Will each article and column attract customers, and will they look forward to each issue because they ***have*** to have it? Do we need to know the precise times and dates that Bill and Harry contacted each other 55 times three months ago, on the XX band? Do we need a Women's Weekly type column to learn that Ethyl and Harriet entertained 12 other old buddies to tea and scones? (WOW — that will get some affirmative action!)

Seriously, each columnist should keep in mind that he is marketing a product and not writing a new version of War and Peace.

A point that has not been covered and where I am sure we are missing a good bet is in marketing advertising to electronic companies. There is an excellent trade magazine called *What's New in Electronics* that is larger than AR, has heaps of colour, heaps of advertising, including effective marketing of advertising space. We need to be in there, marketing AR as an effective advertising tool to companies with an interest in our members.

If I appear to be critical of the make-up of AR, let me acknowledge that writing a monthly column and putting together such a complex magazine on a voluntary basis is a time consuming, frustrating and thankless task and those who do contribute to our magazine deserve our gratitude and admiration.

Yours sincerely,

Colin MacKinnon VK2DYM,
Marketing Director,
Brymac Pty Ltd,
52 Mills Road,
Glenhaven, NSW. 2154.
ar

Silent Keys

It is with deep regret we record the passing of —

MR G B THRUM	VK2CGT
MR ARTHUR SMITH	VK3UX
MR H N BOWMAN	VK5FM
MR R J FOXWELL	VK5ZEF

Obituary

ALBERT IRVIN KEITH CLARKE VK2IC

Albert Clarke was a man who has left his mark on society, his friends and the amateur fraternity.

With his great zest for life and irrepressible sense of humour, Albert enjoyed the respect and popularity that comes to very few.

His passing, in Mona Vale District Hospital on July 21, 1987, at the grand age of 90 years, occurred after a short illness.

Despite his age, and effects of being both wounded and gassed during war service in France with the 1st AIF, resulting in him being hospitalised in South Africa, Albert enjoyed surprisingly good health and activity until his final illness.

Wireless, as it was then known, attracted his interest and a desire to become one of those mysterious "hams" resulted in his Experimental Licence being granted in 1932 with the call sign VK2IC, which coincided with two of his initials.

After discharge from the 1st AIF, Albert settled in Fricourt Avenue, Earlwood, a location from where he became very well-known as a keen and successful DXer.

It was at that address I first met Albert who introduced me to the mysteries and delights of amateur radio. Who taught me how to grind crystals, how to build receivers and transmitters and encouraged me, as a young teenager, to get my own Experimental Licence in 1936.

Albert joined a group of local wireless enthusiasts who formed the Lakemba Radio Club. This club included such great DXers as Vince Cole, Harold Ackland, Charles Luckman, Bill Phelps, Vince Bennett, and Jack Pike, to name a few. For some years Albert taught Morse code to budding amateurs until the club closed down after the outbreak of World War II, in 1939.

Val, Albert's only child, being brought up in a home where wireless was a way of life, did not think it strange to have an amateur in her own home when she and Stan Bourke VK2EL, married. Suddenly there were two amateurs in the family!

Albert retired to a life of leisure in 1958 and, following his wife's death in 1976, decided to reside in the RSL Retirement Village, Narrabean. From such a location, high on the hill overlooking Narrabean Lakes and the Tasman Sea, Albert continued as an active amateur working DX right to the end.

Vale — Albert Irvin Keith Clarke, a fine man, good friend and a loss to the amateur ranks.

Geoff Bower VK2OI

ar

ARTHUR (ART) SMITH VK3UX

Well-known and respected DXer Art VK3UX, passed away peacefully in his sleep on September 6, aged 79.

Art, who gained his licence in the early 1930s, was a real experimenter. He built a multitude of equipment, learning more about the hobby with each successful project being completed. At the commencement of hostilities in 1939, he boxed his equipment, for despatch to a holding area, though for some reason it never left his premises. Nevertheless, it was officially sealed. When amateur transmissions were again permitted, Arthur was one of the first back on the bands.

Art was proud of his lifetime connection with the Victorian Railways, rising from his first position as a Porter, to that of Station Master at a number of stations prior to his retirement which enabled him to spend more time with his wife Agnes, fondly known to all as "Bobbie". Early in his retirement they enjoyed an overseas trip and each on their return resumed a common interest in the garden (being affectionately 'nick-named' Mr and Mrs Greenfingers, as they could and would propagate any plant) and an individual interest in painting and amateur radio.

Both made friends wherever they went and Art was a stalwart to the VK3UE, Australian Travellers, ANZA, Pacific DX and the South East Asia Nets, being net controller to each, on many occasions. His patience was rewarded by having worked nearly every country in the world, but none of his verifications were ever submitted for any certificates. Arthur's philosophy, was as he put it 'I know that they are in my log and are verified, I am satisfied.'

Another of his many interests was racing homing pigeons. Arthur, never shirked responsibility and he served the local club (becoming an Honorary Life Member) and the Victorian Association in various capacities in the office of President, Secretary and Treasurer, a sport with the same club that Australian Test cricketer Bill Lawry, indulged in, though at times as Arthur often remarked, '...race days clashed with his prowess with the bat and ball on the cricket field.'

Another of his pastimes was the Freemason Lodge, becoming a member of the Grand Lodge and reaching the position of Past Grand Sword Bearer.

Arthur suffered several heart attacks over a period of five years, the fourth one in 1979 being so severe when he suffered four Cardiac Arrests in six hours and he was later told that his life expectancy was about six months. Unfortunately shortly afterwards, Bobbie's premature death left a big void in his life, nevertheless, this gentleman's positive thinking extended his life for nearly eight years. Every minute was a bonus that he enjoyed spending with the hobby he loved, or talking about the achievements of his children, Ian (an engineer), David VK3ZSS (a research physicist at Cambridge University and presently a professor at the Phoenix University in Arizona) and Bette (a Hospital Scientist who did a tour of duty with World Vision on Hospital re-establishment in Kampuchea).

Art's articulate phone, CW transmissions and words of wisdom will be sadly missed from the HF bands by his many friends across all Continents. His scheds and propagation MUF trials with Bill ZL4AW and Andrew ZS2OM (a white cane operator) alone, would more than fill an average log book.

Sincere condolences to Ian, David and Bette, his daughter-in-laws Beth and Gwenneth, grandchildren Craig, Leigh and Kathy; Heather and Marion from the amateur fraternity, to whom he contributed so much.

Contributed by Ken McLachlan VK3AH and Gavin Douglas VK3YK on behalf of the members of the VK3UE Net

ar

MORE BROADCASTERS

The Federal Government will invite applications for 40 new public licences over the next seven years.

Transport and Communications Minister, Senator Gareth Evans, said 34 licences would go to community-wide radio stations.

The balance would cover special-interest areas such as ethnic, fine music, Aboriginal and sporting interests.

Australia already had 68 public radio stations on air, making it the growth area in broadcasting.

There were 138 commercial stations and 140 ABC and SBS stations.

DANGEROUS PHONE

A fluorescent telephone is a potential killer according to Telecom, which has banned it.

The *Fluorophone* is a clear plastic telephone which has a glowing coloured base powered by 240 volt mains power.

Consumer Affairs in Western Australia has already banned the phone and Telecom has refused to issue it with a permit, deeming it illegal to plug into a phone socket.

Telecom says the *Fluorophone* could send mains power down Telecom lines exposing technicians to a life-threatening hazard while working on telephone lines.

The phone's fragile fluorescent tubes could also be easily broken exposing householders to the lethal voltage.

SOLUTION TO MORSEWORD 8

Across: 1 street 2 seal 3 quit 4 zip 5 Alan 6 no no 7 noun 8 skew 9 roam 10 snag

Down: 1 impi 2 eager 3 seats 4 coo 5 hake 6 zap 7 fist 8 Roy 9 soot 10 king

	1	2	3	4	5	6	7	8	9	10
1	•	•	•	—	•	—	•	•	•	—
2	•	•	•	•	•	—	•	—	•	•
3	—	—	•	—	•	•	—	•	•	—
4	—	—	•	•	•	•	•	—	—	•
5	•	—	•	—	•	•	•	—	—	•
6	—	•	—	—	—	—	•	—	—	—
7	—	•	—	—	—	•	•	—	—	•
8	•	•	•	—	•	—	•	•	—	—
9	•	—	•	—	—	—	•	—	—	—
10	•	•	•	—	•	•	—	—	—	•

PREDICTION CHARTS

Due to circumstances over which I have no control, and a physical condition which is causing me increasing concern, I am finding it increasingly difficult to continue to produce these charts.
With IPS offering (for a very reasonable charge) to prepare their *Grafex* computer produced predictions for individual users, perhaps it would be to your advantage to subscribe and have the latest information available for your personal use. Together with daily solar/geomagnetic reports, one should soon acquire a fairly intimate knowledge of what is going on around us with respect to propagation.

Propagation being such a variable phenomena, being "in the know" will be to your advantage in snaring the really elusive DX. A working knowledge of what is going on will provide you with an edge over those who don't.

Your comments on the value of these charts would be appreciated. Drop me a line with your views or suggestions before I make a final decision.

Perhaps there is someone who might take over if there is a demand.

73, Len Poynter VK3BYE

Solar Geophysical Summary

— JULY

SOLAR ACTIVITY

Solar activity was at low levels except for two days (24, 27) when M Class flares were observed. The sun was without spotted regions from the first to the fourth, sixth, and 11th to 14th. After the 16th, several regions started to grow rapidly and one of these produced the M Class flares observed on the 24th and 27th. By the end of the month there were still five spotted regions visible.

The growth of these regions during the month was associated with a steep rise in the value of the 10 cm solar flux. This peaked at 112 on 23rd. This is the highest flux value observed since June 15, 1964.

The monthly averaged sunspot *number for* the month was 33.0, the third value over 30 in the past four months. The yearly averaged sunspot number for January 1987 was 17.5, and a steep rise from the solar minimum value of 12.4 observed for September 1986. This steep rise suggests that the new solar cycle (number 22) could be a strong solar cycle.

GEOMAGNETIC ACTIVITY

The level of geomagnetic disturbances increased during the month with two significant disturbances. The most severs disturbance was that observed on the 28th, A-24 and 29th, A=36, when the field was at major storm levels at times. This disturbance is thought to have been associated with earlier solar flare activity.

Daily Solar Terrestrial Reports — WWV each hour plus 18 minutes.
Propagation Summaries — Radio Australia, 0425, 0825, 1225, 1625, 2025 UTC.
IPS Telephone Recorded Message — on (02) 269 8614.

—From data supplied by the Department of Administrative Services, IPS Radio and Space Services, Sydney
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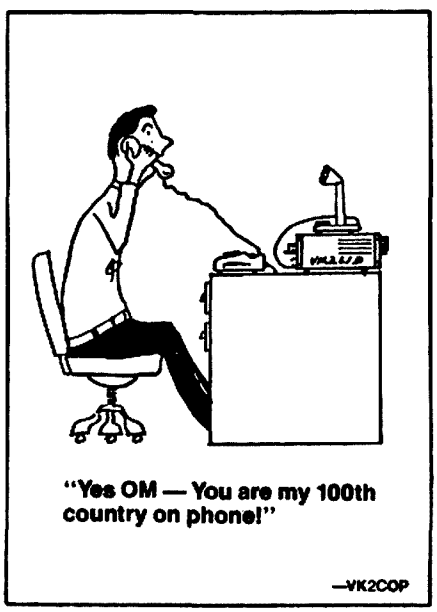
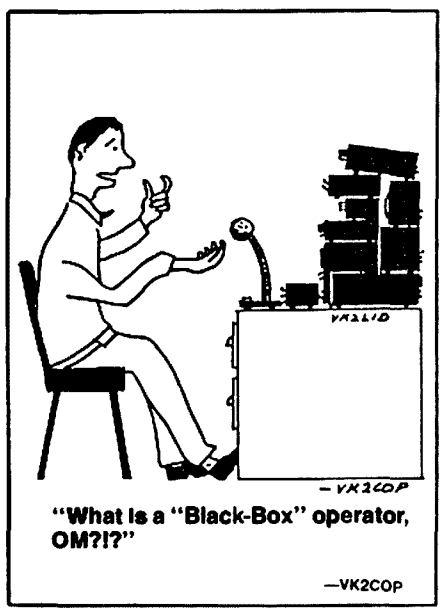


"Yes OM — You are my 100th country on phone!"

—VK2COP



"What is a "Black-Box" operator, OM?!?"

—VK2COP

DEADLINE

All copy for inclusion in the **January 1988** issue of *Amateur Radio*, including regular columns and Hamads, must arrive at **PO Box 300, Caulfield South, Vic. 3162,** at the latest, by **9 am, November 9, 1967.**

Hamads

PLEASE NOTE: If you are advertising items FOR SALE and WANTED please write **each** on a separate sheet of paper, and include all details; eg Name, Address, Telephone Number, on both sheets. Please write copy lor your Hamad as clearly as possible. ***Please do not use scrape of paper.***

- Please remember your STD code with telephone numbers
- Eight lines free to all WIA members. $9.00 per 10 words minimum for non-members
- Copy in typescript, or block letters — double-spaced to ***Box 300, Caulfield South, Vic. 3162***
- Repeats may be charged at lull rates
- QTHR means address is correct as set out in the WIA current Call Book

Ordinary Hamads submitted from members who are deemed to be in the general electronics retail and wholesale distributive trades should be certified as referring only to private articles not being re-sold lor merchandising purposes.

Conditions for commercial advertising are as follows:
$22.50 for four lines, plus $2.00 per line (or part thereof)
Minimum charge — $22.50 pre-payable

Copy is required by the Deadline as indicated on page 1 of each issue.

TRADE ADS

AMIDON FERROMAGNETIC CORES: Large range for all receiver and Transmitting Applications. For data and price list send 105 x 220 mm SASE to: **RJ & US IMPORTS,** Box 157, Mortdale, NSW. 2223. (No inquiries at office . . . 11 Macken Street, Oatley). Agencies at: Geoff Wood Electronics, Lane Cove, NSW. Webb Electronics, Albury, NSW. Truscott Electronics, Croydon, Vic. Willis Trading Co, Perth, WA. Electronic Components, Fishwick, Plaza. ACT.

EXCHANGE — NSW

HAZELTINE MODEL *2000* COMPUTER TERMINAL: in good working order to exchange lor Video Monitor, suitable for Microbee, or sell for $200 ONO. Also, Yaesu FT-290R or Trio TR-7950 (like Kenwood TR-7950) to exchange for IC-02AT, IC-04AT, FT-23R, FT-73R, or AR-2001. Lew VK2ZIP. Phone (02) 467 6733/6738 9.30 am — 6.00 pm Mon-Fri.

FOR TENDER — VIC

DECEASED ESTATE: Tenders are invited for each or all of the following equipment — by November 11, 1987. (1) One 9-15m *Nally* wind-up, fold-over tower complete with TH6DXX 10, 15 & 20m beam, CDE HD Rotator and controller, Balun, Drake 3300 LP Filter and Coaxial cable. Tower Computations available. As is/where is and to be removed by the successful tenderer. (2) One Yaesu FTDX-400 tcvr S No 584454, SWR Meter, with spare valves, Aslatic D104 Mic, owners manual, Heathkit Dummy Load, HB Antenna Tuner and HB clock. (3) One Yaesu FTDX-400 tcvr S No 805425. Extras to each successful tenderer. Items 2 and 3 Licenced Amateurs only please. For further details and inspection please ring (03) 221 6594 AH.

WANTED — NSW

AEA MORSEMATIC MM-2 KEYER: preferably with memory expansion. New or near new condition. VK2BRC, QTHR. Ph: (063) 65 3123.

HF MOBILE TRANSCEIVER: Consider any brand, any age, fully transistorised model. Minimum 20 and 40 metres. Ring VK2AZT with price and condition. Ph: (069) 42 1392.

LINE OUTPUT TFMR FOR HMV OBERON: Model V6-9D B&W TV (Part No 9080771) new or used. Large single winding tor 25 inch screen, has 9 lugs (6 & 3) & cap. VK2AFU, OTHR. Ph: (02) 53 5774 or (047) 82 1617.

RACK: 19 inch rack to suit old-style equipment. Must be able to support 100 kg weight. John VK2DVW, QTHR. Ph: (02) 57 6567 AH.

VIBROPLEX KEY: or electronic keyer. At VK2AXR, QTHR. Ph: (02) 477 6275 or 477 4947

WANG PC: Preferably with a hard drive, floppy drive, monitor & keyboard. Gareth VK2ANF Ph: (02) 427 5090 anytime.

YAESU YM-38 & YD-148: Golf ball on goose-neck desk mics. Bob VK2CAN. Ph: (02) 46 3727.

WANTED — VIC

DC POWER SUPPLY: for FT-200/250. Bill VK3CB. Ph. (03) 241 4154.

QSL CARDS: of any description. Pre-war, rare DX and QSLs of artistic design especially appreciated. These are wanted urgently for the WIA (Vic Div) QSL collection now being established. Please contact the Hon Curator, Ken VK3TL, on (059) 64 3721 and arrangements will be made to pick up the cards whether you live in Melbourne or in the country. You can also leave QSLs at the WIA rooms in Fitzroy. Please help us make it a really fine collection.

SPLIT STATOR CONDENSER: Ceramic ends approx 1¼" x 1¼" about 4 stator, 3 rotor plates per section. VK3FT QTHR.

TV TRANSMITTER & MODULATOR: for self-help broadcasting of signals from AUSSAT as I want to transmit on band 5 UHF with about one watt output. Gil VK3CQ, QTHR.

WANTED — QLD

CIRCUITS: for WWII Wavemeter Class D No1 Mk2 James Knight frequency standard FS344 (USA). UZ12C (19) tube for YT189 (JA Navy) tcvr. Details of metal octal tube MC804 used in Type 17-13118 (JA) WWII aircraft rec. Appreciate help. VK4EF, QTHR. Ph: (07) 366 1803 AH.

DUPLEXER: consisting of 6 cavities if possible, to suit two metre repeaters. Darling Downs Radio Club. Ph: (076) 35 2735 or (076) 34 4276 AH.

IC730, 735, 751 or KENWOOD TS-130SE: Required in good condition. Details to John VK4SZ, QTHR. Ph: (070) 61 3286.

INFO & CIRCUIT FOR TECH MODEL TE-15 GRID DIP OSCILLATOR: Also copy of book by Edward Noll W3FQJ, 73 Vertical Beam & Triangular Antennas. Will pay costs. Fred VK4NMA, QTHR. Ph: (07) 396 3521.

WANTED — TAS

HF LINEAR AMPLIFIER: Capable of 400 watts on 80, 40, 20. Will consider commercial or home-brew. Going, or in need of repair. Particulars to Bob VK7KZ, QTHR. Ph: (002) 34 9780 from 6 pm onwards, weekdays or weekend.

FOR SALE — ACT

BUILDING BLOCK MODULES: PCBs & Kits of components. Contact the Secretary, Frankston and Mornington Peninsula ARC, PO Box 38, Frankston, Vic. 3199.

FOR SALE — NSW

BUILDING BLOCK MODULES: PCBs & Kits of components. Contact the Secretary, Frankston and Mornington Peninsula ARC, PO Box 38, Frankston, Vic. 3199.

NEW AUTO SCANNING RX: FM 76 to 108k, AM, SSB, CW 154 to 30 MHz. $295. New Walkman Sport. AM, FM & Cassette player. $195. Valves (8) Type 813. All okay, $25 each. Al VK2AXR, QTHR. Ph: (02) 477 6275 or 477 4947.

CODEMASTER CW610 CW, RTTY, ASCII, DECODER: Morse practice $170. Emtronics noise bridge **ENB1** $90. Part assembled PCBs ETI 725 $20. ETI 446 $10. AR 1975 B/Blocks ABCD $lot. VK2KSD, QTHR. Ph: (02) 456 1577.

MECHANICAL TTY SELLOUT: 2 Model 15s, Model 14 typing reperf, tape reader, RS232.TTL interface manuals. $50 ONO. VK2AEJ. Ph: (02) 92 4025.

SHACK CLEARANCE: Azden PCS-2800 10m FM, Belcom LA-106 2m amp (needs repair). Belcom LS-202E 2m H/H. Icom IC-4E 70 cm H/H. Kenwood **TM-401A** 70cm **FM**. Microwave modules **MMT** 28/144 2m to 10m xvtr. Tokyo Hy-Power HL-32V 2m amp. Yaesu FT-203R 2m H/H. Pearce Simpson Leopard Mkll UHF CB. Dick Smith VZ-200 & RTTY module. Colin VK2COL. Ph: (068) 42 2305.

TRANSMITTER/POWER SUPPLY: parts in cabinet. Originally 10kV, 1-2A C-V, C-I power supply, 3-phase input. Includes Eimac 3CW5000 H3 tube, all transformers, fan, control circuits, metering, rectifiers. $4000 ONO. Contact C Horwitz. Ph: (02) 697 4027 BH.

TRANSVERTER: Microwave modules MMT-432/285. The cheapest way to 70 cm all-mode. Perfect condition, little use. $270. Larry VK2EOY. Ph: (02) 949 3124.

TRIBAND BEAM TH3MK3: Complete with KR-400 rotator, controller & tilt-over pipe mast. $350 ONO. George VK2OH, QTHR. Ph: (02) 771 3116.

YAESU FT-207R 2 METRE HANDHELD: 144-148 MHz, with two 12 volt car cradles, earphone, charger, reasonably new rechargable battery. $250. 28 MHz handheld transceiver with crystals, rechargable battery. $40. Gareth VK2ANF Ph: (02) 427 5090 anytime.

FOR SALE — VIC

BUILDING BLOCK MODULES: PCBs & Kits of components. Contact the Secretary, Frankston and Mornington Peninsula ARC, PO Box 38, Frankston, Vic. 3199.

COMMUNICATIONS RECEIVER: Icom ICR-71A. Original packing and handbook. $700. Bob VK3AQK, QTHR. Ph: (057) 44 1676.

DIAWA ROTATOR 7600R: Heavy duly with round controller. Brand new, never used. $450. Shortwave frequency directory, World-wide edition. $20. All Werner Wulf beams, 3 el-20m, $150. 3 el 10-15m duobander. $140. 6 el 6m $100. 2 x 9 el 2m beams $55. All in VG condition, prices negotiable. Must sell. Contact Steve VK3DQL, QTHR. Ph: (050) 37 2391.

HEATHKIT REGULATED POWER SUPPLY: Model IP-2715 13.8 volts (adjustable) 20 amps. Fully metered. $300. VK3VF, QTHR. Ph: (059) 75 1475.

ICOM IC-720A: $725. Also complete Drake station of well-known DXer T-4X Tx, R-4B Rx, matching spkr/pwr sup, speech processor. Ameco preamp PCL-P, RFE 100 Digital readout, many spare tubes for Tx & Rx. $850. Bill VK3WK, QTHR. Ph: (055) 67 1048.

JRC HF TRANSCEIVER: Model JST-100D, all solid state 100W plus tcvr, incl all WARC bands, With NBD-500G, 20A peak fully regulated power supply. NFG-97 antenna tuner & NVA-88 extension speaker & Voicecraft desk mic. All matching equipment with many features incl manual & original cartons. Suit new equipment buyer. All in excellent condition, beautiful performer. $2300 ONO. Prefer not to separate. Paul VK3CGR. Ph: (03) 359 1450.

SHACK CLEANOUT: Lifetime collection includes variable capacitors for transmit, linears, ATUs, also for receivers & instruments. Hy Power Supply incl reg screen supply. Heavy duty HV, chokes & transformers. AWA carphone W/xtals. Cabinets, meters & many more unavailable parts & hardware items. Inspect by appt, SSAE for list. VK3ZB, QTHR. Ph: (03) 459 8365.

TRIO CO-1504 OSCILLOSCOPE: Perfect condition. Ideal general purpose trouble shooting unit or as deluxe station monitor-scope. Price $200 ONO. Robot 800C RTTY/CW TU with HF/VHF tones & split-screen video. Multiple baud rates. Centronics printer port or teleprinter loop. Price $200 including Siemens T100 at no extra cost. VK3IH, QTHR. PH: (03) 584 1610.

YAESU FT-101E TRANSCEIVER: Fair condition with mic, book. $100. Drake r/l filter TV-3300-LP $30. Ant tuner EAT-300 $40. H/b dig freq meter 0-50 MHz $30. Junk box Rs, Cs, transistors, etc, bound AR magazines 1972-1987 given away free. Harry VK3AVQ, QTHR. Ph: (056) 74 1110.

YAESU YO-901 MULTISCOPE: with instruction book hardly used. $300. VK3DND. Ph: (051) 57 0236 or Vic Lonsdale, Tambo Crossing, Vic. 3893.

FOR SALE — QLD

BUILDING BLOCK MODULES: PCBs & Kits of components. Contact the Secretary, Frankston and Mornington Peninsula ARC, PO Box 38, Frankston, Vic. 3199.

FOR SALE — SA

BUILDING BLOCK MODULES: PCBs & Kits of components. Contact the Secretary, Frankston and Mornington Peninsula ARC, PO Box 38, Frankston, Vic. 3199.

CW TX: 3PS, 6V6 (osc), 6V6 (doub), 6V6 (doub), 807 (PA drive), all on one panel. Upper panel 829B final, 160m to 6m. Tx tubes — 4-65A, QE3-300, 4E27, 815, 829B & socket, VCR 139 & S. 5 Vintage radios B/C Grundig Reel to Reel Recorder. Please submit your tender by mail. VK5LC, QTHR. Ph: (08) 271 6841.

FOR SALE — WA

BUILDING BLOCK MODULES: PCBs & Kits of components. Contact the Secretary, Frankston and Mornington Peninsula ARC, PO Box 38, Frankston, Vic. 3199.

PAIR OF 813 VALVES: with sockets $80. Crystal filter 9 MHz SSB with both carrier crystals. $50. Panel meter 2½" 1 mA $10. John Kitchin VK6TU, QTHR. Ph: (09) 349 9342.

FOR SALE — TAS

BUILDING BLOCK MODULES: PCBs & Kits of components. Contact the Secretary, Frankston and Mornington Peninsula ARC, PO Box 38, Frankston, Vic. 3199.

YAESU FRG-9600 VHF-UHF ALL MODE SCANNING RECEIVER: with PRG-965 HF converter to provide 500 kHz-905 MHz continuous coverage, $900. Also Saiko SC-7000 VHF-UHF 70 channel AM/FM scanner. $425. Arnie VK7KR. Ph: (002) 71 7599 BH.

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Advertiser's Index

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IT HAD TO HAPPEN!

BUILD-IT-YOURSELF 'AT' COMPUTER!

At last! The perfect opportunity for the hobbyist to build the perfect computer... Perfect because it has in it what YOU want! All the features of the "AT" - blinding speed, high expandability, and so on - but you put it together yourself - and $ave!

There's more: each board or module comes with a full 12 month warranty PLUS individual, professionally prepared manuals - no Jinglish to decipher!

And best of all, you don't have to buy it in one hit: add what you want, when you want it (and when the pocket allows it!)

Look at the features:

SUPERB QUALITY HINGED CASE

"Baby AT" case in heavy gauge steel, heavily covered in damage-resistant bone crinkle finish. The lid is hinged and locks up for instant internal access - no more undoing screws! Large enough for expansion - but features a footprint of just 430mm square! Cat X-1005

ONLY $175

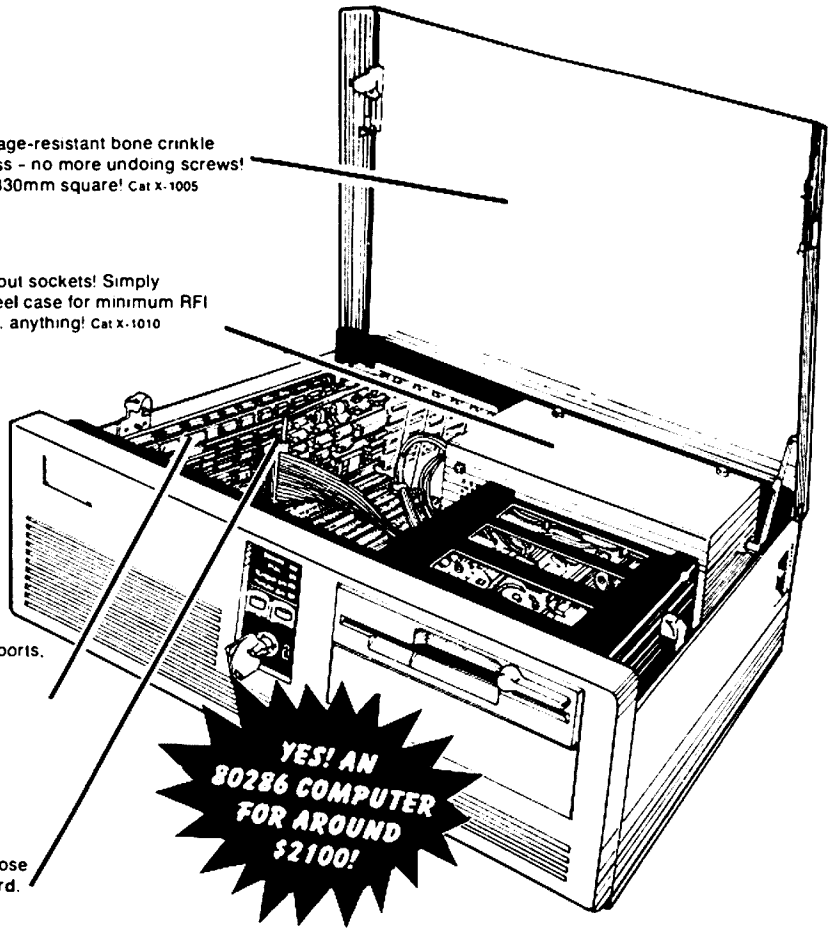
200W POWER SUPPLY

Completely pre-assembled - even to the on/off switch and input sockets! Simply slots into place in cutouts provided in case. Heavily plated steel case for minimum RFI with integral whisper-quiet fan. 200W capacity is ready for . . . anything! Cat X-1010

ONLY $275

"BABY AT" MOTHERBOARD

Again, completely pre-assembled. No risk of dry joints - you just connect appropriate cables (as described in detailed manual included). On-board capacity for 1Mb RAM and 8 slots for expansion in true"AT" format. Offers 6, 8, 10 & 12MHz speed (switch & software selectable) giving outstanding software compatability PLUS blinding speed when you need it, and time & date memory with battery back-up. Cat X-1000 **JUST $995**



PLUG-IN CARDS

Cards for the various graphic standards, printer ports, serial ports, etc etc. Choose the one that suits your requirements - and remember, you can always upgrade later!

CGA plus Parallel Printer Card Cat X-2010 **$129**
MGA plus Parallel Printer Card Cat X-8141 **$149**
EGA Card with Hercules compatability Cat X-2013 **$399**
Serial/Parallel/Game Card Cat X-2012 **$139**

DISK CONTROLLERS

Your choice of hard/floppy or floppy disk controller card: choose the one that suits your needs best. Both plug in to motherboard.

Floppy Controller (2 disk drives) Cat X-2014 **$129**

Hard/Floppy Controller (2 of each) Cat X-2008 **$399**

DISK DRIVES

Also include appropriate cables.

1.2Mb Floppy Disk Drive Cat X-2014 **$269**

20Mb Hard Disk Drive Cat X-2201 **$795**

(Other higher capacity Hard Disks available if required)

KEYBOARDS

Two types available:
84 Keys with top quality "Alps" keyswitches Cat X-3820 **$129.00**
101 Keys - with numeric keypad Cat X-3821 **$149.00**

WHERE ELSE BUT

DICK SMITH ELECTRONICS

PTY LTD

DSEB450/RT1087

BAD NEWS FOR ANYONE WHO EXPECTED BIG THINGS FROM ICOM.

The biggest news in hand held transceivers is actually very, very small.

It's the new generation ICOM IC-μ4AT and its midget twin, the IC-μ2A.

Both pack all the performance and reliability you expect from ICOM into a tiny package. And although they weigh next to nothing, they're not light-on for features, as you'll see.

The IC-μ4AT has built-in power saver circuitry that uses as little as 8 mA of current flow during standby. So it will last up to four times longer than some older equipment. Yet it measures only 58mm wide by 140mm high by 29mm deep with optional BP-22 battery pack.

It also has a DTMF pad, 10 memory channels with convenient digit up/down switches, subaudible tone encoder, and a comprehensive LCD display with special backlighting that turns off when not being used.

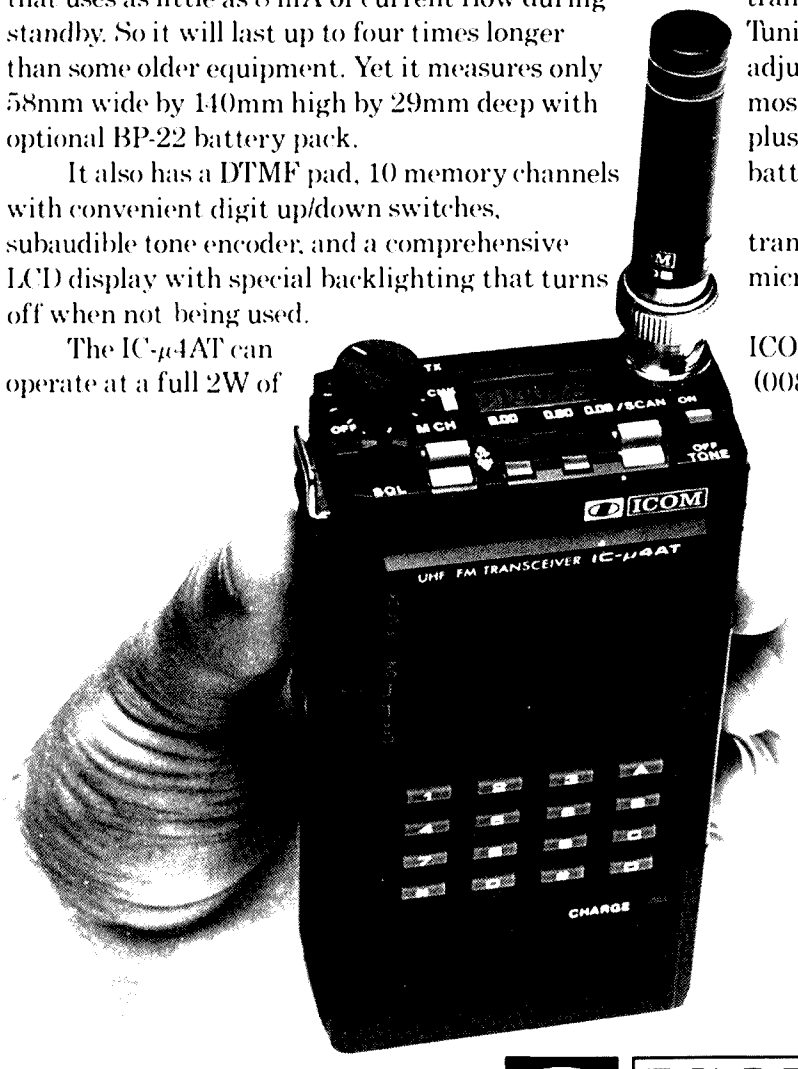
The IC-μ4AT can operate at a full 2W of output power from the optional BP-24 or optional converter with 12V battery. And its durability makes it ideal for operating in rugged outdoor environments.

The IC-μ2A also has 10 memory channels and the top panel LCD for easy readability and puts out up to 2.6W of output power from the BP-24 battery pack.

Like its counterpart, this 2 metre transceiver features Digital Touchstep Tuning for fast shirt-pocket frequency adjustments. And of course, both can use most existing ICOM hand held accessories plus a new line of long life nicad battery packs.

So if you want big things from a small transceiver, get your hands on the ICOM micros soon.

For details of your local dealer phone ICOM on Melbourne (03) 529 7582 or (008) 33 8915 from elsewhere in Australia.



ICOM

Amateur Radio

JOURNAL OF THE WIRELESS INSTITUTE OF AUSTRALIA
VOL 55, No 12, DECEMBER 1987

ANNUAL AR INDEX

BUILDING BLOCKS
– Parts 5 & 7

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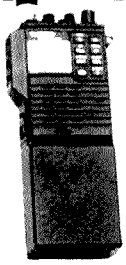

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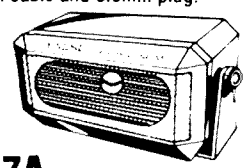

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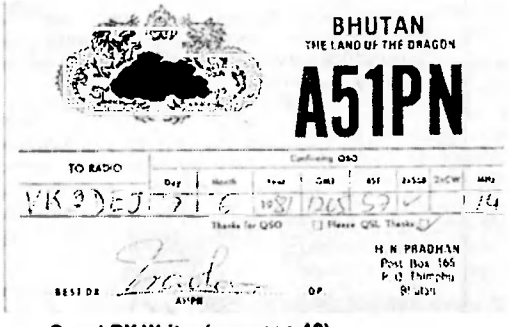
Amateur Radio

FRONT COVER: Hot Air Ballooning provides an interesting alternative to the early Peak Hour Traffic! (see story page 9).

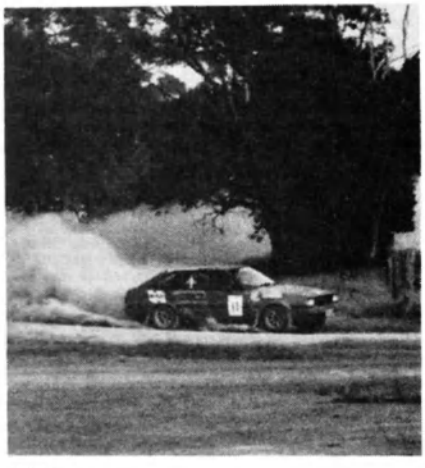
Special Features

Technical Features

New Equipment available from Icom (see page 52).



Guest DX Writer (see page 40).



WICEN Exercise (see page 55).

Regular Features

DEADLINE

All copy for inclusion in the February 1988 issue of Amateur Radio, including regular columns and Hamads, must arrive at PO Box 300, Caulfield South, Vic. 3162, at the latest, by 9 am, December 29, 1987.

Amateur Radio

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PO Box 300,
Caulfield South, Vic. 3162.

Material should be sent direct to PO Box 300, Caulfield South, Vic. 3162, by the 20th day of the second month preceding publication. Note: Some months are a few days earlier due to the way the days fall. Check page 1 for deadline dates. Phone: (03) 528 5962.

HAMADS should be sent direct to the same address, by the same date.

Acknowledgment may not be made unless specifically requested. All important items should be sent by Certified Mail. The Editor reserves the right to edit all material, including Letters to the Editor and Hamads, and reserves the right to refuse acceptance of any material, without specifying a reason.

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Editor's Comment

THE PAST AND THE FUTURE

Only a few weeks before writing this I was one of a party of four on a rented sailing boat, all of us thoroughly enjoying ourselves in what has often been called a "yachtsman's paradise", the Whitsunday Islands of North Queensland. We also spent a few days in and around Brisbane, before reluctantly returning to Melbourne's capricious Spring. Oddly, what we came back to was more like Summer, but it didn't last. Back to Winter again after a few warm days! Still, it does keep one on one's toes and prepared for anything!

One thing for which I was not quite prepared was to find a rumour circulating that there was to be no January AR. Like all rumours, this had some foundation in fact. In view of the difficulties we have been experiencing with finance, a suggestion was made that we could save some money by not publishing a January magazine. Unfortunately, this was circulated prior to discussion by Executive which decided at its next meeting that the January issue should be published.

Reverting (no persuasion needed!) to holidays, I have not forgotten that our 1985 trip to Cairns, Alice Springs and Darwin was going to become a story in AR, but hasn't! Then in 1986 we went back to Cairns, plus a few days in Townsville before going home. Still no story! Now, in 1987, the Whitsundays and Brisbane. It's going to be some travelogue when it happens! I do sincerely hope to be able to write it in 1988, as there is at least one good reason why more time should be available. I have retired! In other words, I no longer spend five days a week in another place and hold out a hand on pay-day. Instead, I collect a regular pension, comfortable if not generous, and if necessary I can spend all my time editing AR! However, I would also like time in the shack (maybe even on the air?), and there are a few hundred other things I had been putting off until retirement. You've heard of the newly-retired person who wondered how he (or she) has ever found time to go to work? It's true!

Every year in December, we all (Executive, Committee, Office, Producers and whoever else) wish you the traditional greetings for a Merry Christmas and a Happy New Year. Again this is our pleasure, and hopefully yours too. But this time it will be a rather special New Year. Two hundred years since the First Fleet landed at Sydney Cove on January 26. May we all enjoy a thoroughly memorable Bicentennial New Year, and may amateur radio (and Amateur Radio) play an even bigger part in the future than it has in the past!

73 from Bill Rice VK3ABP
Editor

"QRX one, OM — Just had a lightning strike here!" — VK2COP

PRESIDENTIAL

CHRISTMAS MESSAGE

As we draw close to 1988, a special year in the history of Australia, the 200th Anniversary of the arrival of the First Fleet in Sydney, it is impossible not to be aware of the vast advance in communications that have taken place since those first European settlers arrived here 200 years ago.

As you are no doubt aware, the WIA has negotiated with the DOTC for some very special call signs in order to celebrate the occasion. These call signs, one for each State and Territory, commence with the prefix VI88. These call signs do not conform to the internationally allowed amateur call sign format prescribed in the International Radio Regulations. As a special favour to the WIA, the DOTC sought, and received, permission for their use from the ITU. We thank the DOTC tor their co-operation.

For those who wish to use it, the prefix AX will be available as a substitute for the usual VK prefix during 1988.

In our 75th anniversary year, 1985, we had good reason to look back at our own WIA history, and the progress amateur radio has made over our 75 years of existence.

This year, let us look to the future, the future of the Amateur Radio Service, the future of the WIA. One of the features of current days is the move to extensive deregulation with its implied self-regulation. Many of the past regulations which we considered an impediment to the progress of amateur radio have been removed. This deregulatory move, is also being applied to other radio communication services in Australia.

In the light of this, co-operation between all users is essential if we are to avoid spectrum anarchy.

It has been the unfortunate experience of the Amateur Radio Service in the past, that its existence has been endangered by other users with vested interests.

The requirements of the Amateur Service are simple and not excessive. It is only courtesy that these be given full consideration when spectrum planning decisions are being made. However, if we are to be credible, we must keep our own house in order. Cases have been observed where behaviour by some stations on the amateur band leaves a lot to be desired, and does our cause no good at all.

The discussions that the WIA has with the DOTC has always been carried on, bearing in mind advances in communications technology which, when tried by amateurs, should not be hampered unreasonably by regulation.

There are many exciting advances happening in the tele-communications field, let us make the most of them. It is the amateurs who do things just because they are there to be done, and the reward is the pleasure they get out of just participating in the activity.

TO A RATHER SERIOUS MATTER

There seems to be a distinct possibility that there will be an ITU conference in 1992 with the frequency allocations of limited parts of the spectrum on its agenda. All this is speculation at the moment, but the areas of concern are in the bands, HF around 7 MHz, and UHF 1 GHz, plus and minus.

It is convenient that there will be a Region 3 IARU Conference in 1988 (to be held in Seoul just after the Olympic Games), as this will give the IARU societies, in the Region, a chance to prepare their unified position, particularly in the light of regional concerns. This Region 3 Conference will also provide an opportunity for Australia, one of the world's major amateur societies, to tender its views on a number of important issues, such as the promotion of amateur radio in the region, the IARU Constitution, the possible provision for a plenary meeting and financial matters such as funding of IARU representation at an ITU conference.

The sunspot cycle has turned the corner. Conditions on the HF bands will improve, our new bands at 18 and 24 MHz will become more useful, particularly as 1989, the date set for their clearance from non-amateur stations, approaches.

In conclusion, on behalf of the Executive, I would like to wish you all the best of Seasons Greetings and may 1988 increase your amateur radio horizons.

David Wardlaw VK3ADW
Federal President

Seasons Greetings

FEDERAL NEWS

DEADLINE DATES

I'm writing this column in readiness for the producers of AR, who have specified November 2, 1987 as the deadline date for my copy for the December magazine. There have been a few queries regarding why I'm talking about the Executive Meeting of September 22, in the November magazine.

The Executive Meetings are held on the fourth Tuesday of every month, and the October meeting was on October 27, and the November magazine was printed and ready to be posted on October 21, 1987. Labels were printed on the computer in this office on October 21, 1987, for Automail to place on the flysheets to go inside the plastic cover of the magazine. So, as you can see, the deadline dates preclude me from discussing the November meeting in the December issue!

EXECUTIVE MEETING, TUESDAY OCTOBER 27, 1987

There was an Executive Meeting on Tuesday, October 27. Following is a brief outline of this meeting.

The meeting was chaired by David Wardlaw, and attended by M Owen, A Foxcroft, P Gamble, W Rice; apologies being received from W Roper, R Burstal, S Phillips and R Henderson.

Areas of discussion included Amateur Radio Limited, finance, special call signs for the Bicentennial Year, *Amateur Radio* magazine, Call Book, devolvement of examinations, FTAC report, Standards report and IARU report, etc.

The details of the acquisition of the company, Amateur Radio Limited, from the VK3 Division are being finalised.

The President noted that the membership subscriptions were down slightly, but that we could still make budget for 1987. The Secretary reported that the debtors are the lowest for some time.

The DOTC forwarded a letter outlining the issuing of special call signs for the Bicentennial Year.

The Department is in the process of putting the finishing touches to the paper on devolvement of examinations which will go to the Minister. There will be a Joint Meeting between Executive and DOTC in Melbourne. An official from the Department will then visit Divisions to explain the position in general terms and seek information on details of local conditions in each State. The time scale envisaged at the moment is for devolvement to be phased in over 18 months — which would be approximately the middle of 1989.

In the Standards Report, Alan Foxcroft reported on Wireless Video Transmitters. The DOTC and the WIA are still "crossing swords" on this; there is no clear statement from the DOTC when protection would be afforded to the amateur services. There is need for an agreement on principles. We continually preach the theme that amateur radio is an internationally recognised radio communication service, and should have automatic protection from outside devices which are not recognised as bona-fide spectrum users.

The next Executive Meeting is scheduled for Tuesday, November 24, 1987.

ITEM OF INTEREST

An item of interest was a letter received in this office during October, re the Irish Radio Transmitters Society and a link-up with all the *Dublins* in the world to celebrate 1000 years of Dublin, Ireland as a city. Australia's Dublin is situated in South Australia.

SAVE AR FUND

Due to the fact that AR is under review and the establishment of a special purpose fund is inappropriate to our accounting methods, the Executive states that it has not established a Save AR Fund.

UPDATING OUR RECORDS

Even though there will not be a Call Book published by us this year — this office asks you to please keep us up-to-date with you and your non-member amateur friends movements. Any upgrade of call sign or change of address will be gratefully received by our Membership Secretary, Mrs Helen Wageningen. Do not address this particular mail to the Editor — only to the Membership Secretary.

Only articles for publishing and letters for *Over to You!* should be addressed to the Editor.

PAID UP LIFE MEMBERSHIP

Paid up Life Memberships are now available to members who decide that this is the method of payment suitable to them — $750 in one payment or, alternatively $275 each year for three years. Please apply to the Federal Office.

MAGPUBS

Elsewhere in this magazine is a list of publications, available from the Divisional Bookshops. If you are thinking you cannot remember the last time you saw a list of books and prices and AR — you are right! But the reason is that the Divisions each have their own Bookshops and they each publish a list of books, etc, and there are differing prices depending on where you live within that Division — with or without postage. But we thought our members should be able to read the list of publications this Institute offers at very good discount prices — it is a membership benefit! RSGB have increased the price on most of their publications dramatically — and with the immediate status of the $A, the prices are correct at time of printing, but will need to be reviewed from time to time. Please support your Divisional Bookshop.

1988 MEMBERSHIP SUBSCRIPTION RENEWALS

Elsewhere in this issue you will find a list of the new subscription rates for 1988 in your Division, and a few words of explanation on the status of membership. Please forward your subscription renewals as promptly as possible, as this office will be closed from December 23, 1987 and reopening on January 4, 1988.

MAILING HOUSE

Every month several magazines just do not arrive at their destination. If this happens to you please do not write to, or ring, Automail Pty Ltd, our mailing agent. They do not have stocks of ARs, they are couriered to this office after the magazines have been posted. So, please write to this office and we will forward another magazine immediately.

GOODS FROM OVERSEAS

We receive many calls in this office from members going overseas wanting to know how they will fare with Customs on re-entering Australia with amateur equipment. I refer members to two articles previously published on import duty — *Amateur Radio* February 1984 and September 1985.

After a 1983 bylaw was implemented allowing the importation of amateur transceivers at two percent levy ***subject to these transceivers being certified by the Federal body of the Institute as not capable of transmitting outside the amateur allocated frequencies,*** a Technical Committee was formed for this purpose. However, this was initiated for the importers, and is not suitable for individuals importing a single item, as the transceiver, plus handbook must be forwarded to the Technical Committee before any certificate can be issued, and a fee is charged for this service. This procedure allows the purchase of amateur transceivers at retail outlets at a much lower cost than otherwise would be the case.

Amateurs travelling overseas and wishing to bring accompanied equipment back to Australia with them have not experienced any difficulties. But, since July 1, 1987, there is a limit of $400. Whereas there used to be a whole range of concessions for individual items, most of these have been removed and the general concession has been doubled from $200 to $400 a head. It would be wise to check with a travel agent who will have copies of *Australian Customs Information.*

We have also heard from members who have ordered transceivers (a single item) from overseas to be delivered to them here in Australia, who have been informed, when the item arrived, that not only duty, but also sales tax was payable, making their purchase expensive.

On behalf of the Federal Office I would like to extend to all members and their families the best of Christmas wishes and a Happy New Year.

Compiled by: Ann McCurdy
Federal Office Secretary

The VK2AWI Packet Radio Bulletin Board

Andrew Keir VK2AAK

Packet radio is growing rapidly in popularity all over the world where licensing administrations permit packet radio operation for amateurs. The development of packet radio parallels somewhat that of dial-up data communications using the switched telephone network, where dial-up 'bulletin boards' provide the 'glue' that binds the enthusiasts in the group. On-air open access packet radio bulletin boards serve a similar purpose on the amateur bands.

IT'S NOT CERTAIN whether the NSW Division of the Wireless Institute of Australia was the first Division to introduce a packet radio bulletin board, but it is strongly suspected that this is the case. In view of the fact that this system is now well established and gaining popularity, it may be a good time to describe exactly what it is and what it does.

A little history

The VK2AWI bulletin board first went on air in March 1987 under the call sign of VK2AAK. This was a "public" system for all amateurs and was set up by Andy VK2AAK, at Seven Hills, New South Wales, in an effort to clear some of the congestion which was apparent on the primary Sydney area frequency of 147.575 MHz. Several bulletin boards were active on that frequency and because of the large amount of traffic being handled, many users experienced frustration when trying to access them. For this reason, VK2AAK was established on 147.600 MHz to serve the local packet community whilst leaving existing systems on 147.575 MHz to handle more of the "trunk" traffic from interstate and overseas.

Although the equipment and software were available to provide "gateway" facilities to HF channels, a deliberate decision was made not to do so in keeping with the concept of a "local" system.

The choice of frequency proved to be quite an advantage, with many users finding that they could read messages or download files without heavy congestion of the channel causing the system to slow down or "retry-out". The biggest disadvantage in using 147.600 was that there were no dedicated digipeaters to extend the range as there were on 147.575 MHz. This meant that, initially, there were some areas of Sydney which had difficulty in accessing the system.

In early April, Andy VK2AAK, went to work at *Australian Electronics Monthly*. It was immediately apparent that the location of the Magazine's office in South Wahroonga, a northern Sydney suburb, high on a ridge not far from Pierce's Corner, offered an excellent VHF site with high elevation and an almost clear take-off in all directions. The decision was made to move the system to the magazine's premises. Once this was done, coverage improved markedly and popularity started to climb.

At about this time, one of the topics being examined by the VK2 Divisional Council of The Wireless Institute of Australia was the establishment of a packet radio bulletin board. It did not take long to realise that the simplest solution was to make use of an existing system and Andy, who was a member of the council, volunteered the use of VK2AAK. This was accepted and in mid-May, the system became the "official" VK2 Division bulletin board. The call sign was changed to VK2AWI on June 1.

So, what does it do?

For those who are not familiar, a packet bulletin board is a system along similar lines to the many telephone bulletin boards which have become popular over the last few years. It allows users to connect to the system and read or leave "mail" or general bulletins. Files containing items of interest such as satellite predictions or even computer programs can be uploaded to, or downloaded from the board.

Where a packet system differs from the telephone system lies in the fact that access is via radio instead of telephone lines. Any suitably licenced amateur station who has a computer and packet terminal node controller (TNC) can gain access.

To avoid tying up the channel unnecessarily, the prompts and system messages generated by the bulletin board are short and to the point. Packet radio bulletin boards are far less verbose than their telephone counterparts, although systems such as VK2AWI provide extensive "help" files which can be requested by the user.

One of the major assets of packet radio bulletin boards is their ability to forward messages or bulletins to other similar bulletin boards. If, for example, a Sydney amateur wanted to send a message to an amateur in Newcastle, he could send it to his local bulletin board addressed to the board nearest the Newcastle amateur and the message would be automatically forwarded. This system will also work on a far greater scale, as by sending messages to bulletin boards providing HF facilities, messages can be sent all over the world!

Because VK2AWI was established on 147.600 MHz, the forwarding of messages to and from other systems on 147.575 MHz presented a problem. This was overcome by modifying the transceiver to change frequency automatically under the control of an external timer. In the wee small hours, the transceiver changes to 147.575, the system sends any messages it has for the other system and then automatically requests any messages the other system has for VK2AWI or it's users. When all the forwarding has taken place, the transceiver is switched back to it's normal operating frequency. The same thing could have been accomplished by using a second TNC and radio, but in view of the extra cost and complexity, it was decided to take the cheaper and easier alternative.

What's it used for?

The original concept of the bulletin board was as a local message system. Because of the ease of access and the fact that one of the frequent users of the system was the VK2 Division's broadcast officer, it became a "de-fact" destination for Wireless Institute news and broadcast items. Since becoming VK2AWI, the system is used by many clubs and individuals for leaving items for the weekly broadcast as well as an efficient medium for the distribution of information from the Institute. Messages can be left on the system for the VK2 Division although users are encouraged to send formal correspondence via the regular mail system to the Institute's office.

Many other items of general interest are carried, including satellite predictions, coming events and reprints of the weekly broadcast. Satellite bulletins taken directly from UO-9 and UO-11 are stored on the system and interesting items downloaded from the WIA federal division telephone bulletin board are often made available.

The system also stores a good number of public domain programs of interest to radio amateurs. These include such things as propagation forecasting, satellite tracking and antenna design. A deliberate decision was taken not to store "game" type programs as disk storage is limited and this type of software is easy to find on most telephone bulletin boards.

The mail system handles all sorts of diverse messages, covering a wide range of subjects. A good example was the recent debate on extended novice privileges. The system was running hot as users sent their views on the subject to each other. Although the system is run under the auspices of the WIA, there is no discrimination as to who can use the system and what subjects can be discussed. VK2AWI packet BBS is a resource open to all suitably licenced amateurs and should be regarded in much the same light as a WIA-sponsored repeater. Use and enjoy!

WIVK2A MailBox/GateWay Statistics 870901|0215 Thru 870919|0904

Connects vs. Hour vs. Date

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4	1	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	.	1	3	1	3	2	3	15
5	.	.	1	.	.	1	.	1	1	.	5	.	1	1	.	2	2	3	2	2	5	4	.	.	31
6	1	.	.	1	1	1	.	.	.	1	.	.	.	2	2	1	3	5	3	2	1	3	1	1	29
7	.	.	.	.	.	.	1	.	.	2	3	.	.	.	1	.	1	3	1	4	4	3	5	2	30
8	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	1	3	2	7	4	5	6	3	32
9	.	.	1	.	.	.	.	.	.	.	1	1	1	.	1	2	1	1	.	.	4	7	4	.	24
10	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	3	3	1	4	2	2	.	1	17
11	.	.	1	.	.	.	.	.	.	1	.	.	.	1	.	.	.	2	2	1	4	8	1	.	21
12	1	.	1	.	.	.	1	.	.	1	2	.	2	.	.	3	3	6	2	.	4	.	2	1	29
13	.	.	1	.	.	.	.	.	1	1	2	3	1	.	1	2	2	1	1	.	2	2	8	1	29
14	2	.	.	1	.	.	2	1	.	1	3	1	.	.	.	.	.	1	3	1	5	2	4	.	27
15	.	.	.	1	.	.	.	.	1	1	.	.	.	.	.	1	.	.	1	3	2	4	2	1	17
16	.	.	1	.	.	.	.	.	.	1	.	.	.	.	3	1	1	1	4	3	6	1	2	1	25
17	.	.	1	.	.	.	.	.	.	1	.	.	.	2	1	2	.	2	1	2	5	1	1	.	19
18	.	2	1	.	.	.	.	.	.	1	2	1	.	.	.	2	.	2	.	3	1	1	.	1	17
19	1	1	.	.	.	.	.	2	2	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	6
20	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	0
21	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	0
22	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	0
23	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	0
24	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	0
25	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	0
26	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	0
27	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	0
28	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	0
29	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	0
30	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	0
31	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	0
	6	3	12	4	1	2	4	4	6	12	18	7	7	7	9	18	18	37	27	45	59	52	45	18	421

System Time: (IHH:II)

Online	410:49		Messages Received	138
Sysop	22:58	5.6% of Online Time	Messages Forwarded	12
Available	387:50	94.4% of Online Time	Trafic Received	0
Connected	43:37	11.3% of Available Time	Traffic Sent	0

This printout shows the statistics for VK2AWI for the month of September. It shows connects versus hour versus date and clearly points out the peak times of use. The WA7MBL software keeps a very comprehensive log of the bulletin board activity and is very useful in analysing the system's performance.

The hardware and software

The computer which runs the system is a PC XT compatible with 640k RAM and a single 20 megabyte hard disk. The software currently in use is the WA7MBL version 3.20 code which provides extensive forwarding and message handling facilities as well as supporting multiple TNCs and radios.

The system runs under true multi-tasking software so that the computer is not tied up at all times just running the bulletin board. As an example, this article is being written using a word processing program whilst the bulletin board is running simultaneously in the background.

The primary TNC is a GLB TNC2-A although an AEA PK-232 is available as a standby. The transceiver is a much modified commercial unit which runs approximately 25 watts to an omni-directional vertical collinear of about 3 dB gain. As the station operates unattended for the majority of the time, extensive precautions have been taken to ensure that failures do not cause interference. Apart from the internal "watch-dog" timer in the TNC, a separate monitor is provided which detects the presence of RF and shuts off the power supply if the transmitter stays on-air for more than two minutes.

Both the transceiver and the computer are arranged so that they will re-initialise in the event of a mains power failure. The computer will automatically reload and execute the software and the transceiver automatically returns to 147.600 MHz. Backups of all the current messages are made when the system is started from the local console so that users are not inconvenienced in the event of a major crash.

System management

In common with all bulletin boards, the system is maintained and managed by a system operator or "sysop". In the case of VK2AWI, this is Andy VK2AAK. The software also allows any user to be nominated as a "remote sysop". This is useful with a system such as VK2AWI, allowing undesirable messages to be deleted or system parameters to be changed without having to actually be present at the main computer.

```
Local> W
13CMNEWS.TXT   5849  313USER.DOC     27K  A010KEPS.TXT    531  ASIANET.MAP   3672
AWARD.TAS      2198  XZZMSG.TXT     5321  BC0927.TXT      17K  BC1004.TXT     13K
BC1011.TXT      15K  BEACON.LST      11K  BULLETIN.OFS   7640  DUALTNC2.TXT  4384
EASTNET.MAP    1262  FORUM.TXT      1239  KEPLER.106     1330  KISS.DOC      7775
LINTHAR.TXT    6144  OSC11BUL.105   5360  OSC11BUL.106   5267  OSCAR10.TXT   2249
PK232.MOD       594  ROSTER.DOC     1797  ROSTER.TXT     1673  RPTRCALL.LST    21K
RPTRFREQ.LST    21K  RTTY0609.BCT    10K  RTTY1309.BCT    11K  RTTY2009.BCT    11K
RTTY2308.BCT    10K  RTTY2709.BCT   9518  RTTY3008.BCT    11K  STOLEN.EQP    8846
STOLEN.TXT     2179  TNC2.RFI       2827  TNC2V2-1.DOC    33K  USER.DOC      3325
VK1MD.PAP       18K  VK2AWARD.TXT   1265  WARNING.YAP    1627  WIANEWS6.TXT  1856
WIANEWS7.TXT   3402  EASTOZ.MAP      17K  OSC11BUL.107   5392  RTTY1110.BCT    11K
OSC11BUL.108   5386  BC1018.TXT      15K  RTTY1810.BCT   8826
  6938624 bytes free.

Local>
WA7MBL BBS v3.20 - 07/22/87

                                                    N:1192  A:63   F:10
```

Here is an example of some of the "files" stored on VK2AWI. These are items that are of general interest but may be too long to leave as messages or bulletins. Also stored here are items such as recent satellite bulletins or RTTY broadcasts. There is a separate "directory" on the system which contains a selection of public domain programs of interest to the radio amateur.

```
Local> LL 17
 Msg#  TS  Size  TO       @ BBS   From    Date    Subject
 1191  PN   121  VK2BYY           VK2AWI  22-Oct  Federal matter reply
 1190  PN   347  VK2KFU           VK2AWI  22-Oct  CONF OF CLUBS
 1189   N    60  VK2KFU           VK2BYY  22-Oct  VK2RWI
 1188   N   917  VK2TPH@VK2XY     VK2BYY  22-Oct  VK2RWI
 1187  PN   166  VK2KFU           VK2BYY  22-Oct  Subs list
 1186  PN   459  VK2KFU           VK2PJ   22-Oct  aus.jokes etc
 1185   N   588  ALL              VK2DUP  22-Oct  DISPOSAL.
 1184   N   732  VK2KFU@VK2AWI    VK2TPH  22-Oct  RWI AGAIN.
 1183  PY   426  VK2DAY           VK2KFU  21-Oct  Your broadcast item
 1181  PN   684  VK2TSO           VK2KFU  21-Oct  Re: JOTA
 1178  PN   509  VK2AAK           VK2TSO  21-Oct  Call sign et al
 1173   N  5501  VK2XZZ           VK2AAK  21-Oct  PROPOSED FREQUENCY CHANGE
                                  AFILE: XZZMSG.TXT
 1172  BN   324  ALL              VK2AAK  21-Oct  DISPOSAL
 1169   N   312  ALL              VK2AAB  21-Oct  TNC220 mods.
 1167  PY   186  VK2TSO           VK2KFU  20-Oct  JOTA
 1163   F   226  VK2TPH@VK2XY     VK2KFU  20-Oct  Re: VK2RWI ENQUIRY
 1160   N   353  ALL              VK2BQ   20-Oct  WANTED  VIC20  MANUAL

Local>
WA7MBL BBS v3.20 - 07/22/87

                                                    N:1192  A:63   F:10
```

This is a screen dump from VK2AWI showing some of the messages which have been left on the system. The various columns provide information about the messages. The first column is the message number. This is followed by the 'type', eg: "PN" means that it is a "private" or "personal" message (P) and the "N" means it has not been read by the intended recipient. A "BN" in this column indicates a bulletin. The next column shows the size of the message, followed by the "TO" column and the "@ BBS" column (all blank in this example) which would contain the call sign of a BBS to forward this message to. The final column contains a short description or title for the message.

Many aspiring sysops would possibly change their minds if they knew how much time and effort was required to maintain a system. In the case of VK2AWI, this usually takes 30 minutes to an hour each morning to read and answer the mail, delete old or duplicate messages, check the content of messages for possible infringements of the regulations etc. On top of this, the sysop needs to keep an eye on files which have been uploaded and check for sufficient remaining disk space. Failures and crashes have to be dealt with and these often occur when installing new versions of the software. You can imagine the work involved in a large and very popular system which handles interstate and overseas mail as well as local traffic!

The future

The establishment of VK2AWI as the NSW Divisional packet bulletin board was initially something of an experiment to see if such a system would be popular. Over the past few months, the experiment has proved to be a great success with a regular user base of some 80 amateurs and many hundreds of messages being handled each month.

The success of the system is very gratifying, but considering it's status as the NSW Divisional packet BBS, it seemed to the Council that we were neglecting all those amateurs who didn't live in the Sydney area and thus could not access the system. As a result, the

VK2 Council has decided that the "experiment" is over and the system will be expanded in an attempt to serve all NSW amateurs. The expansion of the system will be made in a number of steps and the first of these will be a change in the frequency of the VHF port from 147.600 MHz to 144.850 MHz on December 1, 1987.

The new frequency has been chosen in accordance with the agreed band plan for packet radio systems, but also has a number of other advantages. By moving to the low end of the band, the frequent problem of pager interference which is common at the top end of two metres will be avoided. The other significant advantage is that the expansion plan calls for the relocation of the system to the NSW Division's transmitting facility at Dural. By choosing a frequency at the low end of the band, it should be possible to diplex the system onto the antenna used for the Divisional repeater VK2RWI on 147.000 MHz without causing conflict or desensing.

To serve the country areas of New South Wales, a second TNC and transceiver will be fitted to allow operation in the 80 metre band. Once suitable equipment has been obtained, tests from the Dural site will be conducted. Experiments by other groups with packet radio on 80 metres have proved quite successful and it is hoped that many of the more isolated groups, clubs and individuals in New South Wales, who are known to have packet capability, will be able to take advantage of the facility.

Perhaps in the future, other Divisions of the Wireless Institute will set up similar systems and an Australia-wide network can be established. Apart from being a lot of fun, packet radio lends itself to the efficient distribution of news and information and with a bit of thought and planning, amateur radio operators can build a network which would be the envy of many organisations.

This article is printed in conjunction with *Australian Electronics Monthly*. Thanks are extended to Roger Harrison and Andrew Keir.

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OVER MELBOURNE

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Do you have a problem getting to work? Are you tired and frustrated with your present method of transport? Do you feel like getting above the traffic and not having to worry with the hustle and bustle of suburbia and the metropolis? Would your work mates or boss believe you if you told them you floated into work today?

It is possible, as Gil VK3AUI/BM, has done it and enjoyed a couple of QSOs during a trip across the city of Melbourne whilst on his way to the office.

Floating above the morning traffic snarl whilst you watch the sunrise over the city — a peaceful start to the day. A colourful envelope of ripstop nylon billowing above holds a bubble of hot air which lets you float over the city.

Two metres springs to life. A hand-held gives contacts far and wide. There is no electrical noise to mar reception. Acoustic noise during burner operation blots everything out. Transmissions are timed against the burner.

There are other radios on board. The pilot must talk to Air Traffic Control and to the chase vehicle. A hand-held radio is great as it is easily carried and may be held out over the edge of the basket. This takes it clear of the steel cables and ones fellow passengers.

Contacts must be quick as you only have a limited time aloft. The dreamy floating of the flight is governed by the available gas from the cylinders that are onboard.

The balloon is made of ripstop nylon. Tapes run along the seams from top to bottom serving the purpose of carrying and equally spreading the load. In the top of the balloon is a large vent hole that is 'plugged' by a parachute. The pilot is able to remove the parachute, thus opening the vent and allowing the hot air to escape which aids the control of descent.

The hot air comes from a burner (fed with LPG) mounted over the heads of the balloonists in the basket, where the gas cylinders are stored.

A wicker basket is used. For all of the high technology materials that are available this old but proven material combines the two major essentials, lightness and strength.

Unpacking the Balloon.

Inflating the Balloon.

Balloon instrumentation is basic. A temperature gauge with a sensor at the top of the balloon, an essential, as no one wants to melt the balloon. The other instrument is an altimeter that indicates to the pilot the rate of ascent and descent. Two transceivers are carried — a small air-to-ground unit and a CB unit for a link to the chase vehicle.

The flight begins before dawn with a meeting at the launch site. Preliminary tests for wind direction and velocity are calculated by releasing small balloons. If all is favourable and a flight is possible the main balloon is laid out and the basket and burner assembly are connected. When all is ready and checked a petrol engine driven fan is used to blow air into the balloon to pre-inflate it. Two of the balloonists then hold the mouth of the nylon encased capsule open to allow the burner to inflate it. When the balloon is vertical, the passengers jump into the basket, the gas control is further opened to give a grater blast of hot air and the balloon commences to rise.

After the Air Traffic Control formalities are completed, the two metre operation can proceed and as the balloon rises a few hundred feet, signals are good. Unfortunately amateurs are not the earliest of risers as I have carried a hand-held on a number of flights but unfortunately have only had contacts on a few occasions. Since radio was not the prime purpose of the flights I have not been disappointed.

Ballooning is a totally different experience to other forms of flight. The balloon is a capsule of air, floating in the air where the winds determine the course of the flight. The pilot may, by selecting different winds at various altitudes have some influence of the direction one will be taken, but at all times the pilot must monitor very subtle changes in the weather and air conditions.

When a landing site has been selected and one is again on terra firma, the crew generally celebrate with a tradition as old as ballooning, a toast to the flight with champagne.

There are a number of balloon operators who conduct flights throughout Australia and a number of balloons proudly bear the label 'Made in Australia.'

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BUILDING BLOCKS REVISITED — Part 7

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This article describes a medium power amplifier which, when fed by the pre-driver described in Part 6, will output 50 watts PEP on any amateur band for an input of less than one milliwatt.

To a certain extent this amplifier breaks new ground in that the active device is a power FET and a 28 volt supply rail is used.

This shift from the conventional 12/13 volt supply and bipolar transistors has been made primarily because the industry trend is towards higher supply voltages — with a consequent easing of matching problems — and the use of FETs with their reduced drive requirements, absence of thermal runaway and, not least, their improved close in noise characteristics.

Figure 30 gives the circuit diagram, Figure 31 the component layout on the 150 millimetre by 38 millimetre single-sided PCB and Figure 32 gives detail of the broadband output transformer.

The 50 ohm input is reduced to 12.5 ohms by T51. This transformer is bifilar wound on an Amidon BN 73-202 balun core. It is exactly the same as T43 described in Part 6 of this series.

DC bias is provided by means of the 1k0, 4k7 and the two 220R resistors from the 28 volt supply rail to the FET gate. These resistors give 4.0 volts DC at the gate of the FET under no signal conditions. This bias level gives a quiescent drain current of 0.2 amps so that the device is operating close to Class AB1 conditions.

Heavy negative feedback from drain to base is provided by the 330R two-watt resistor. An 0.1 μF DC blocking capacitor in series with this resistor prevents interaction with the gate DC bias supply.

The output impedance of the MRF 138 power FET averages about 11 ohms over the HF range and the 4:1 impedance step up of the output transformer T52 gives a nominal 50 ohm interface to the signal output filter.

Without the filter, the amplifier has a power output which is substantially flat between 1.5 and 30 MHz. However, the total harmonic content tends to be high at the LF end of this range, falling somewhat as the frequency increases, so that the real "flatness" is less than the above statement might imply. Because of the inherent harmonic content, the amplifier must never be put on air without a filter appropriate to the frequency in use.

The filter used here is a two section pi-network and is exactly the same as that used in the preamplifier of Part 6. Only the component numbering is different. Filter information for the various amateur bands is given in Table 2.

With a 14 MHz filter installed the amplifier — driven by the preamplifier of Part 6 — gave the following results:

Table 1.

Driver Input dBm	P Out Watts PEP	Drain Current Amps
0	0	0.2
-14	10	0.75
-11.5	20	1.0
-9.5	30	1.2
-8.5	40	1.4
-7.5	50	1.6
-6.0	60	1.7
-2.5	70	1.9

These figures indicate that the linearity of the system is quite acceptable up to 50 watts PEP, and that there is little to be gained (except a more distorted signal) by operating in excess of this level.

With the MRF138 drawing some 200 mA of quiescent current the standing dissipation is 5.6 watts. When operating at 50 watts PEP out, a further 20 watts or so of heat has to be dissipated. In short, the amplifier must be mounted on a good heat sink. A 150 mm length of *Minifin* is recommended and has the additional advantage of having a 40 mm central flat "valley" into which the 38 mm wide PCB fits snugly. The MRF138 bolts directly on to the heat sink through a suitably shaped hole in the PCB.

The broadband output transformer, T52, warrants some detailed discussion and reference to Figure 32 will be of assistance.

This type of transformer has a one turn primary and a secondary having two, three or four turns. The number of secondary turns is determined by the impedance ratio required. In this design there are two secondary turns to give an impedance step-up of four.

The single turn primary consists of two lengths of brass tube soldered between two end plates made of single-sided PCB material. One end plate (End 1 of Figure 32C) had the copper removed so as to isolate the two tube ends, while the other, (End 2 Figure 32C) connects the two tube ends together to make a single U-shaped turn.

On its own this "one turn" primary has insufficient inductance to be of practical use. The inductance is raised to a usable value by placing ferrite toroids over the brass tubing. In this design two Amidon FT-50-B77 toroids are placed over each brass tube to raise the inductance to around 10 microhenrys. The detailed design procedure is not over-complicated but is outside the scope of this article.

Both end plates have extensions to the copper to allow the finished transformer to be soldered onto the main PCB. End Plate 1 has extensions to allow one end of the primary to be soldered to the 28 volt supply rail and the other end to be soldered to the FET drain pad on the main PCB (pads A and B on Figures 31 and 32). End Plate 2 has two isolated pads (C and D) which have no electrical part to play and serve only as mechanical connections to the main PCB.

The secondary winding is done with well insulated flexible wire. A length of wire stripped from a piece of PVC covered power cable will do nicely. Two turns are required for T52 with "one turn" being defined as a passage of the wire through both tubes.

CONSTRUCTION

Construction begins by using the circuit board as a template to mark out the exact positions (on the central flat valley of the heat sink) of the two three-millimetre end mounting bolts and the two three-millimetre FET mounting bolt holes. The heat sink is then drilled three-millimetres.

Before bolting the PCB onto the heat sink it is easier to mount all other components except the FET. Just bend component leads so that they fit neatly between the appropriate pads on the circuit board and solder in place.

Then, place the board onto the heat sink with three-millimetre nuts and bolts but do not tighten the nuts at this time. Place a dab of heat conducting compound onto the base of the FET and bolt it firmly into place on the heat sink through the cut-out in the circuit board. The end mounting bolts can now be tightened. Finally, the FET leads are bent down and soldered to the appropriate pads on the circuit board. Ensure the gate and drain leads do not touch the (earthed) body of the FET.

COMMISSIONING

The amplifier should first be terminated into a 50 ohm power meter and connected to a source of 28 volts through a 0-2 amp meter. The signal input should temporarily be shorted.

On applying power the current drawn should be 200 mA plus/minus 10 percent. Most individual FETs should draw quiescent current in this range. In the unlikely event of the quiescent current falling outside the 180-220 mA range, it will be necessary to adjust the 4k7 bottom bias resistor. To reduce the quiescent current, the value of the resistor will have to be reduced (try 4k3 or 3k9) and vice versa (try 5k1 or 5k6).

The amplifier can now be connected to a signal source. It is almost certain that current model signal generators will have insufficient output to drive the amplifier to anything like full output so that it will be necessary to connect the pre-driver described in Part 6. With the pre-driver in place, input/output figures similar to those given in Table 1 should be obtained.

Some comments on the power rating of this amplifier will not go astray at this stage.

The 50 watt PEP rating implies use on modes such as SSB where the *average* power into the load is considerably below the *peak* power of 50 watts. Indeed a SSB speech signal of 50 watts PEP has an average power (totalled over, say, a few seconds) that does not exceed 5-10 watts. The exact total power will depend almost entirely on the individual voice characteristics.

If a continuous signal (say from a signal generator) is used, then the average power is more easily defined and is half the PEP level. Since most amateur power meters are calibrated in RMS power a reading of 25 watts will indicate a PEP level of 50 watts.

This amplifier is rated at 50 watts PEP — or an average power of 25 watts. This means that if it is to be used on modes having a continuous carrier — such as AM or FSK — then the output must be limited to 25 watts RMS.

The next article will begin to describe a digital dial that can be used with the modules so far described, but which can be used as a stand-alone digital frequency meter.

ar

TABLE 2 FILTER DATA

L51/51 TOROID FORMER		AWG WIRE GAUGE			
		No TURNS			
BAND	µH				C51-54 pF
160	3.76	27	26	T50/2	1500
80	2.05	20	26	T50/2	820
40	1.08	15	24	T50/2	430
30	0.75	13	24	T50/6	300
20	0.55	12	24	T50/6	220
17	0.40	10	22	T50/6	160
15	0.37	10	22	T50/6	150
12	0.30	9	22	T50/6	120
10	0.25	8	22	T50/6	100

NOTES:
0.40 mm enamelled wire can be used in place of 26 AWG wire.
0.50 mm enamelled wire can be used in place of 24 AWG wire.
0.80 mm enamelled wire can be used in place of 22 AWG wire.

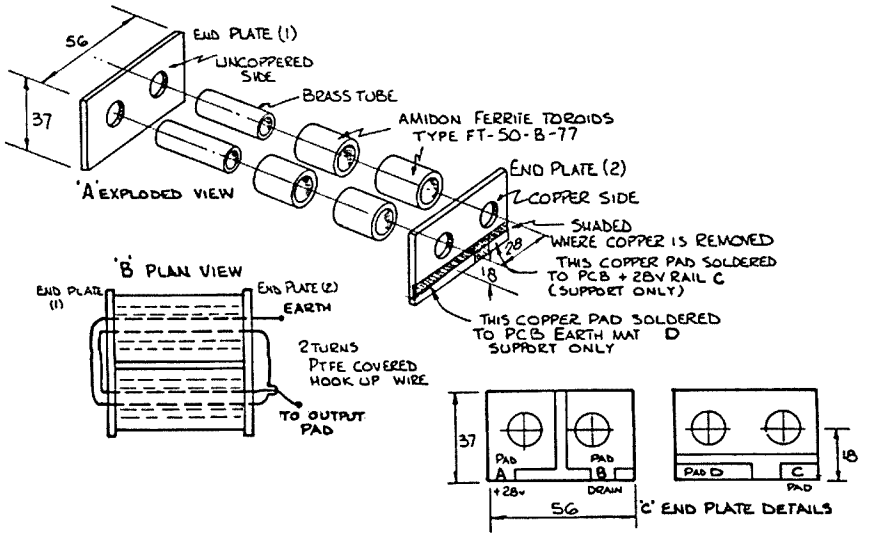
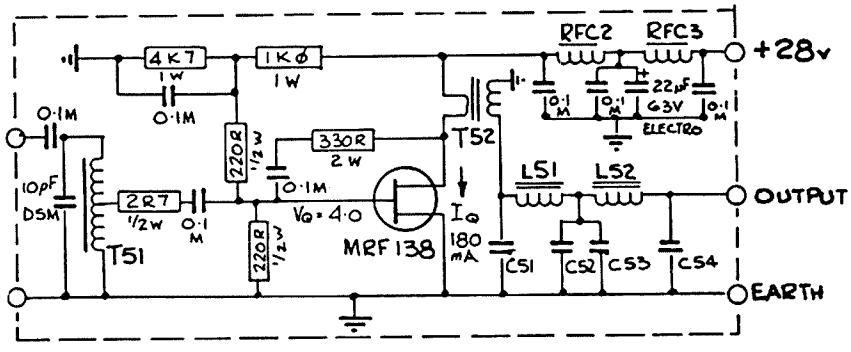


Figure 32: T52 Detail.

Figure 30: 40 Watt PEP Linear.
NOTES:
T51 — Seven turns No 26 AWG Enamel (0.4 mm) on Amidon BN 73-202 Ferrite Balun Core.
T52 — See text.
RFC1 — 15 Microhenry moulded RFC.
RFC2, 3 — 2.5 turns on Ferrite Bead — Philips No 4312-020-36700 or Amidon FB-43-5111.
CHI-44, L41/42 — See text for various amateur bands.
M — Monolithic Ceramic Capacitor.



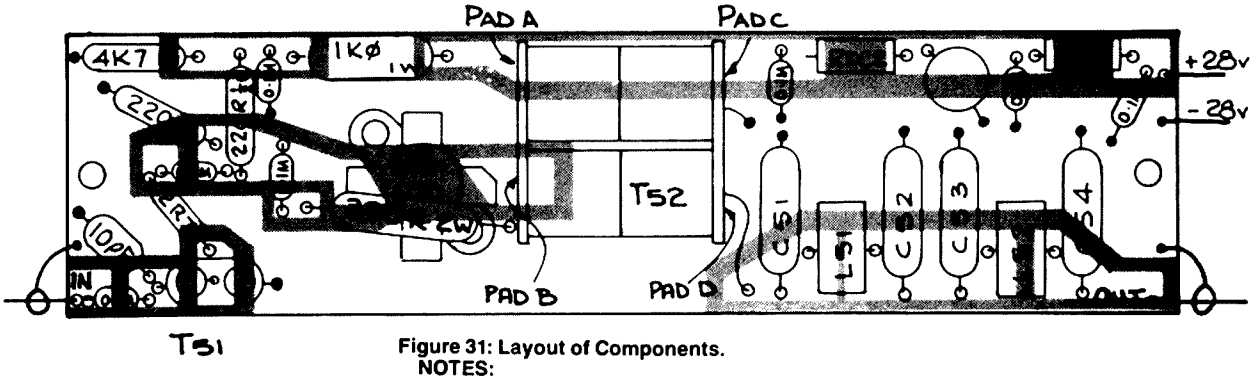


Figure 31: Layout of Components.
NOTES:
Shaded portions denote no copper
X denotes component lead soldered to pad
● denotes component lead soldered to earth mat
0.1M denotes Monolithic Ceramic Capacitor

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VHF/UHF BUILDING BLOCKS — Part 5

John Day VK3ZJF
5 & 7 Old Warrandyte Road, Donvale, Vic. 3111

This article explains how to build a complete six-metre transceiver and also has some ideas and corrections applicable to boards shown in Part 2 of this series.

MODULE G — SIX-METRE RECEIVER INJECTION OSCILLATOR

In Part one of this series mention was made that a synthesised injection oscillator for a six-metre transceiver would be described.

As readers may be aware, synthesisers are not easy to design when they are required for high performance. Unless a synthesiser is very carefully designed, it will fail to meet the standards of the remainder of the modules described in the *Building Blocks Revisited* and also this series. Readers may rest assured that work is definitely being undertaken on synthesised injection oscillators for HF and VHF/UHF use, but they will not be published until they meet the exacting standards of the designers.

Meanwhile, the injection oscillator, which has been used most successfully for a six-metre transceiver built using the *Building Blocks* and other modules, will be described. As pointed out earlier, it is essential that an oscillator has a very low phase noise or jitter so that reciprocal mixing products are kept to a minimum and the receiver sensitivity is put to best use.

OSCILLATOR DESIGN

When designing equipment, it is natural to think of VFOs for variable oscillators and crystals for fixed oscillators. The design of VFOs is fraught with danger. The necessary stability can usually only be achieved at low frequencies unless sophisticated laboratory equipment is available. Conversely, injection for a six-metre transceiver should be derived from an oscillator with as high a frequency as possible to avoid "birdies" and other spurious responses in the receiver and to avoid radiating signals out of band from the transmitter.

Whilst variable crystal oscillators have been around for some time, many require the use of components now almost impossible to obtain, such as split stator variable capacitors. Due to crowded band conditions, VCXOs have become popular in Europe for use in two-metre equipment and a number have been described in the European journals.

After trying many designs with various combinations of parts, the design presented here, adapted from that of Gerd Otto DC6HL, in *VHF Communications*, was the most successful tried. One of the major problems in designing a VCXO is that they cannot really be designed. The mathematics involved in predicting the operation is extensive to say the least, so it is necessary to apply the "trial and error" approach.

MODULE G1 — VCXO ASSEMBLY

This oscillator is basically a Clapp or modified Colpitts design (note the similarity with the VK3AFO design in *Building Blocks Revisited — Part 4*), with a crystal inserted in series with the tuned circuit. As the control voltage fed to the varicap diodes G1D1 and G2D2 increases, the capacitance falls thus increasing the frequency. The amount of frequency swing depends on several variables, the range of capacitance swing available with the diodes used, how far below series resonance the crystal has been moved and the crystal itself.

The capacitance swing available from the series connected BB909 diodes chosen is more than adequate for the job in hand. As regard the second point, the amount of frequency shift should be kept as low as possible. The further a crystal is moved from its nominal resonant frequency, the less stable and "noisier" it becomes, as its effective Q drops.

Obviously the crystal is the most important part of the whole circuit. Crystals should be operated on their fundamental for best range and performance when shifted. The available swinging range is much greater in fundamental mode.

This circuit and values have reliably produced 50 kHz swings with fundamental mode crystals in the range 20-24 MHz. As fundamental frequencies for crystals are usually only available economically up to 26 MHz or so, it will be necessary to double the VCXO output frequency before it can be used for injection on six-metres. Module G1 contains the VCXO and its buffers. The signal can then be doubled and filtered on a modified local oscillator board from Part 2 of this series. This is done by using the multiplier, filter and amplifier sections appropriately modified.

For a given range of output frequencies, the crystal frequency can be determined as follows:

for a range of frequencies Fmin to Fmax, such that:

$$(Fmax - Fmin)/2 <= 50\ kHz$$

$$Fx = (Fmax/2) - 2.5\ kHz.$$

As can be seen from this, most of the movement is on the low side of the crystal. It is possible to make the variation more symmetrical if higher voltages are available to drive the varicaps, but given the need of a clean supply and the fact that all of the low level modules in this series operate from nominal 12 volt supplies, it was decided that nine volts would be the maximum available.

ALIGNMENT

Once the correct crystal is located, it is necessary to do some calculations before beginning. The two frequencies will need to be determined as follows:

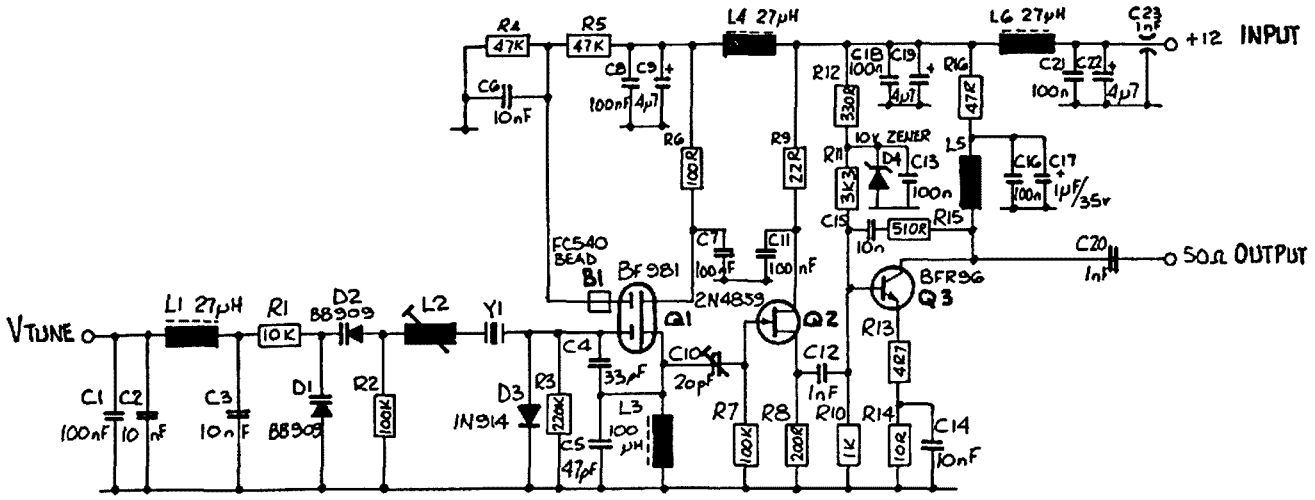
$$Fx(min) = Fx - 47.5\ kHz$$

$$Fx(max) = Fx + 2.5\ kHz$$

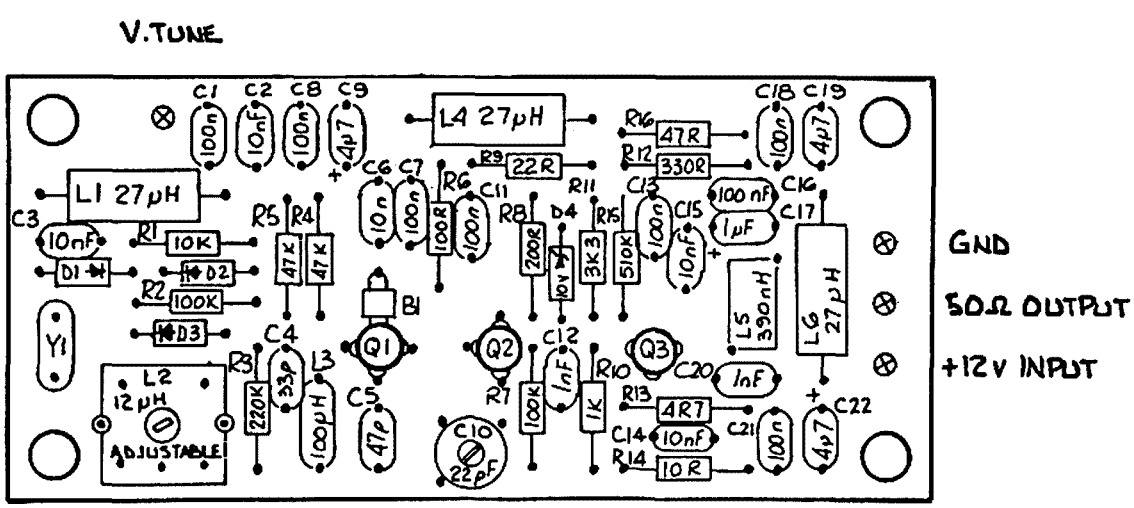
Now, armed with a digital frequency meter or a well-calibrated *receiver*, a multimeter *and* **non-metallic** aligning tool (an old knitting needle is wonderful when filed down), proceed as follows:

1. Connect the regulator PCB as shown on the diagram, and with 12-15 volts applied, check for an output of no less than 8.9 volts.
2. Set the slug of G1L2 flush with the top of the can and the rotor of G1C10 at approximately 25 percent meshed and apply power to the VCXO.
3. Set the main tuning pot to its counter clockwise (minimum frequency) end and adjust RV1 on the regulator for approximately 0.6 volts on the wiper of the pot.
4. Adjust the slug of G1L2 until the frequency is a little, say 1-2 kHz, below Fx(min).
5. Set the main tuning pot to the fully clockwise (maximum frequency) position and adjust RV1 for a frequency 1-2 kHz above Fx(max).
6. Now, return to the minimum frequency and adjust RV2 for the same Fx(min) as above.
7. Return to the maximum frequency and adjust RV1 for the same Fx(max) as before.

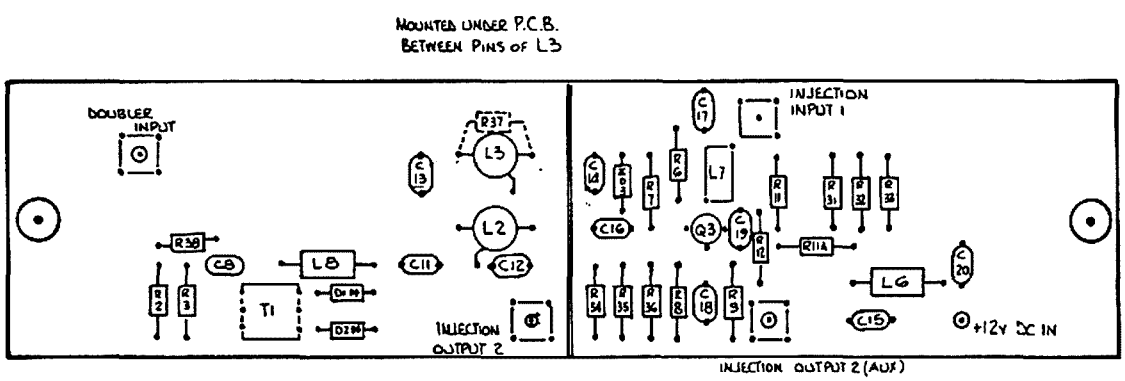
The last two adjustments may need to be repeated several times as they do interact. Trimmer capacitor G1C10 can now be used to set the output level at approximately +10 dBm and the alignment is completel This method should ensure that you will have the appro-



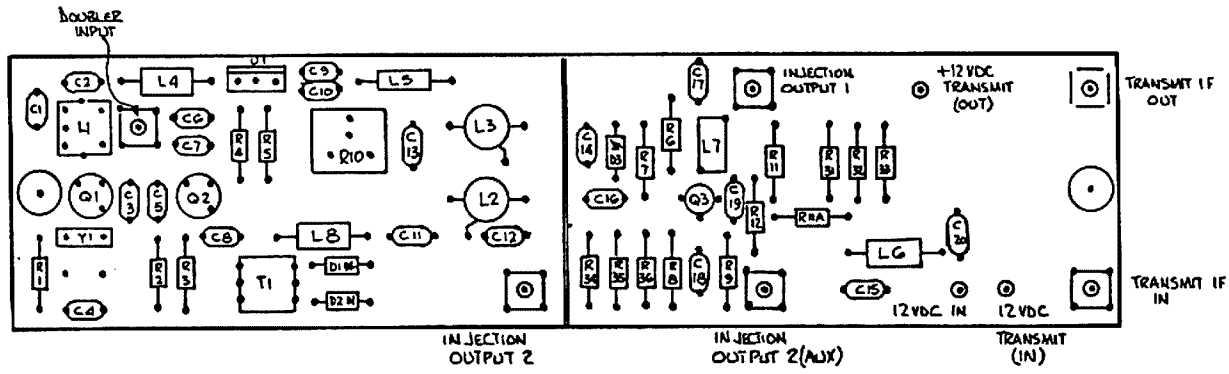
Module G — Sub-assembly 1, VCXO and Buffers.
Note: All prefixes designated with G1.



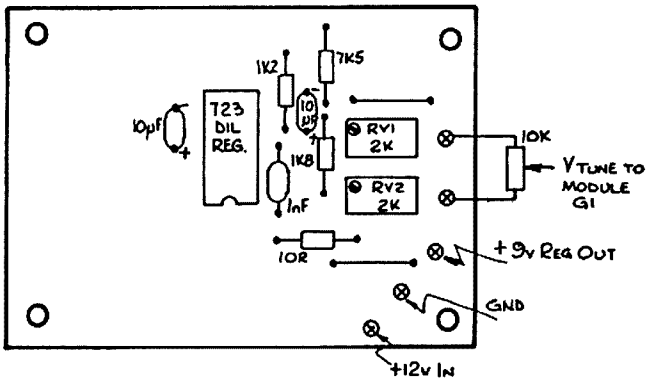
VCXO and Buffer Module — Component Layout.



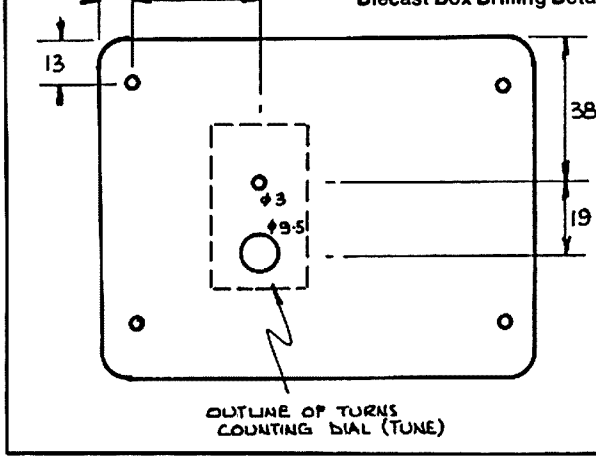
Module A1 — As Doubler, Amplifier.

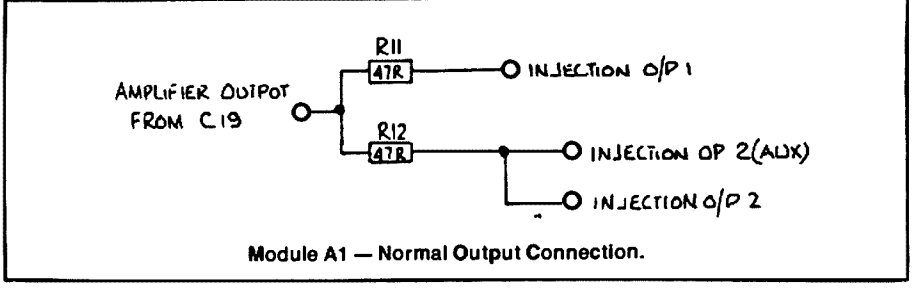


Module A1 — As Crystal Oscillator, Doubler, Amplifier.

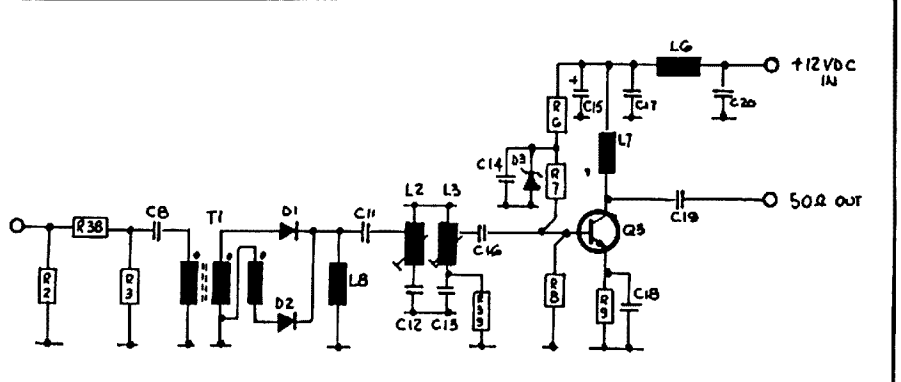


Reference Component Layout.





Module A1 — Normal Output Connection.



Module A1 — Modified for Doubler/Amplifier Operation.

priate level at the input of the multiplier/amplifier assembly.

The following table gives frequencies for crystals needed for a variety of input and IF frequencies.

Crystal Frequency versus Input and IF Frequencies

INPUT (MHz)	IF (MHz)	CRYSTAL (MHz)
50-50.1	8	21.025
	9	20.525
	10.7	19.675
52-52.1	8	22.025
	9	21.525
	10.7	20.675

TUNING VOLTAGE GENERATION

In Part 2 of *Building Blocks Revisited,* Harold Hepburn described a compact voltage regulator board for use with varicap tuned oscillators. For these oscillators to perform well they need a source of stable voltage with extremely low noise. The voltage regulator portion of Module 9 is thus ideal for what is required here (and means one less board is required).

A revised layout diagram of this board is included here showing changes made for this application. Changes of value were made to change the output voltage to nine volts as discussed above, and components associated with receiver incremental tuning have been omitted.

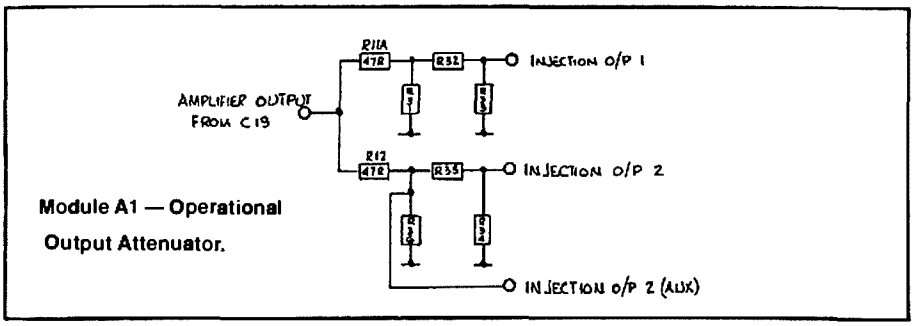
MULTIPLIER/AMPLIFIER

Once the VCXO assembly is complete and tested, a doubler and amplifier module will be required to generate the final injection frequency. For this purpose, Module A1 (local oscillator) from Part 2 of this series has been adapted. Several changes have been made to the PCB to allow this to be done more easily. Firstly, let's look at the circuit.

A connector position has now been provided on the PCB to allow easy access to the doubler input. For improved flexibility, an attenuator can be fitted at this input, in this application this is not necessary so a wire bridge is used instead of A1R38. The doubler is exactly as described earlier and thus it is not necessary to discuss it again.

The filter section following the doubler obviously needs to be modified for the much lower frequencies involved. This is achieved by increasing both inductance and capacitance values as shown in the Parts List. A minor modification has been found necessary to allow the output power level to remain constant with changing frequency, a resistor A1R39 is soldered across the pins of A1L3 on the underside of the board. This is used to purposely lower the Q of the tuned circuit A1C13/A1L3 and to reduce the input level at the amplifier.

Because the amplifier stage was originally designed for use at a much higher frequency, it poses the next problem. Unmodified, the oscillator was prone to oscillation near the desired frequency due, largely, to coupling between A1L7 and A1L3, despite the screening panel between them and their relative orientation. As this stage was designed for higher frequencies, no provision for negative feedback was provided on the PCB nor was provision made for the emitter resistor to be partially bypassed. Obviously, the easiest method of reducing the gain was to reduce the value of A1C18 to reduce the gain at low frequencies and to define the gain somewhat better at the frequency of interest. With the values as specified, it was found that A1C18 should require a reactance (Xc) of 15 ohms which is approximately 200 pF The prototype was fitted with a 180 pF ceramic plate capacitor which worked perfectly, suppressing all tendency to oscillation and providing an output variation of less than 1 dB over the required range.



Module A1 — Operational Output Attenuator.

OTHER CHANGES TO MODULE A1

Several other minor changes have been made to Module A1 since Part 2 of this series was prepared.

1. Provision has been made for a connection point to allow easy operation of the doubler with external drive. Located immediately to the right of A1L1 it can clearly be seen on the new layout drawing.
2. If necessary. A1R2, A1R38 and A1R3 can form a low power pi-network attenuator to reduce the drive level to the doubler. This type of doubler functions best with 0 — +10 dBm of drive and this particular one is usable with output frequencies to approximately 400 MHz. If the attenuator is not used, a wire bridge should be used in place of A1R38.
3. An output power splitter and attenuators were shown on the original layout but not described, the description is to be found later in this article.
4. Terminal or connector access has been included for the transmit IF signal crossing the board.
5. Whilst the 12 volts DC transmit line is not used on the board, it is possible for it to be carried across the board for tidier and easier equipment layout.

OUTPUT CONFIGURATIONS

Although the *output* power splitter and attenuators were shown on the original layout, an explanation of their operation was inadvertently omitted from that article.

Output from this board is available at three connectors either with or without attenuators. These outputs can be used in several ways:

1. Single Output, Unattenuated

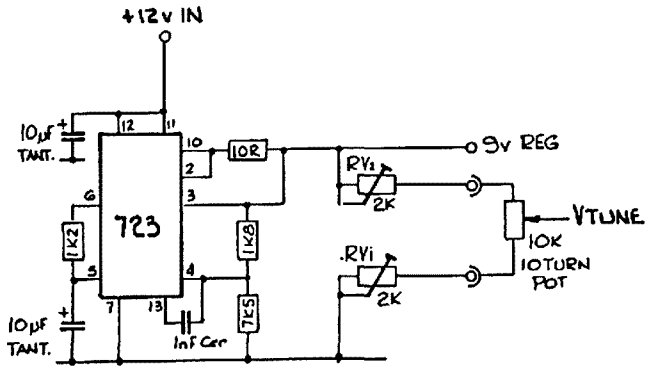
1. A1R31 — 1R36 and A1R11 and A1R12 are all omitted.
2. A wire link in place of A1R11 will take output to injection output 1.
3. A wire link in place of A1R12 will take output to injection output 2 and Injection output 2 auxiliary.
4. *Only one* output should be used at any time. Because of the absence of the power splitter, power levels of 100 mW or more are available.

2. Two Outputs, Unattenuated

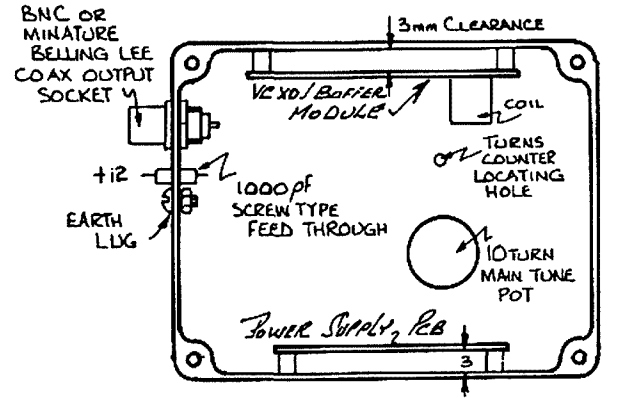
1. A1R31 — A1R36 are all omitted.
2. A1R11 and A1R12 are 47 ohm quarter watt resistors.
3. One output is available at injection output 1 and the other at injection output 2 and injection output 2 auxiliary.
4. Both outputs should be either used or terminated in 50 ohms if not needed.
5. Output at each port will be 6 dB below that obtained in 1. above.

3. Two Outputs, Attenuated

1. Remove A1R11 and fit A1R11 and A1R12, 47 ohm quarter watt resistors instead.
2. Cut the PCB track which will be found beneath A1R35.
3. Select appropriate values for A1R31 — A1R33 and A1R34 — A1R36 for the desired attenuation value. The chart in Part 3 of this series may be useful.
4. Injection output 2 (auxiliary) should not be used. Both outputs should either be used or terminated in 50 ohms.



Tuning Voltage Regulator.



VCXO/Power Supply.
Placement of Components and PCBs in 6908P DCB.

PARTS LIST — Module A1 modified for six-metre injection

A1C8	InF	Ceramic Plate
A1C11	1 nF	
A1C12	39 pF	NPO Ceramic Plate
A1C13	39 pF	
A1C14	10 nF	Ceramic Plate
A1C15	4.7 uF	16V or greater Tantalum
A1C16	10 nF	Ceramic Plate
A1C17	100 nF	Monolithic Ceramic
A1C18	180 pF	Ceramic Plate (see text)
A1C19	1 nF	Ceramic Plate
A1C20	100 nF	Monolithic Ceramic
A1D1	5082-2800	Hot Carrier Diode
A1D2	5082-2800	Hot Carrier Diode
A1D3	10V	400 mW 10 percent Zener Diode
A1L2	.27 — .35 uH	Miller Coil 48A317MPC
A1L3	.27 — .35 uH	Miller Coil 48A317MPC
A1L6	27 uH	Moulded RF Choke
A1L7	.59 uH	Miller Coil 75F597MPC
A1Q3	BFR96S	Do not substitute
A1R2		See text
A1R3		See text
A1R6	330 R	Five percent 0.25 watt
A1R7	3k3	
A1R8	1k	
A1R9	33R	
A1R11	47 R	or R11A
A1R12	47 R	
A1R31		See text
A1R32		See text
A1R33		See text
A1R34		See text
A1R35		See text
A1R36		See text
A1R38	OR	Wire Link (See text)
A1R39	10k	
A1T1		Seven turns Trifilar 26 SWG on Amidon T25-43 core or MCL T4-1 Transformer

PARTS LIST — Module G: VCXO and Buffer Assembly

G1B1	FC540	Ferrite Bead
G1C1	100 nF	Monolithic Ceramic
G1C2	10 nF	Ceramic Plate
G1C3	10 nF	Ceramic Plate
G1C4	33 pF	NPO Ceramic or Styroseal
G1C5	47 pF	NPO Ceramic or Styroseal
G1C6	10 nF	Ceramic Plate
G1C7	100 nF	Monolithic Ceramic
G1C8	100 nF	Monolithic Ceramic
G1C9	4.7 uF	35 volt Tantalum Electrolytic
G1C10	22 pF	Philips Film Trimmer
G1C11	100 nF	Monolithic Ceramic
G1C12	1 nF	Ceramic Plate
G1C13	100 nF	Monolithic Ceramic
G1C14	10 nF	Ceramic Plate
G1C15	10 nF	Ceramic Plate
G1C16	100 nF	Monolithic Ceramic
G1C17	1 uF	35V Tantalum Electrolytic
G1C18	100 nF	Monolithic Ceramic
G1C19	4.7 uF	35V Tantalum Electrolytic
G1C20	1 nF	Ceramic Plate
G1C21	100 nF	Monolithic Ceramic
G1C22	4.7 uF	35V Tantalum Electrolytic
G1C23	1 nF	Ceramic Feed-through on Case
G1D1	BB909	Varicap Diode
G1D2	BB909	Varicap Diode
G1D3	1N914	Silicon Signal Diode
G1D4	10V	400 mW 10 percent Zener Diode
G1L1	27 uH	Moulded RFC
G1L2	9110	J W Miller Adjustable Coil 5.35-13.5 uH
G1L3	100 uH	Radial Lead RF Choke
G1L4	27 uH	Moulded RFC
G1L5	390 nH	J W Miller 75F397MPC Moulded Coil
G1L6	27 uH	Moulded RFC
G1Q1	BF981	Dual Gate MosFET
G1Q2	2N4859A	High Current JFET
G1Q3	BFR96	Transistor
G1R1	10 k	Five percent 0.25 watt Carbon Resistor
G1R2	100 k	Five percent 0.25 watt Carbon Resistor
G1R3	220 k	Five percent 0.25 watt Carbon Resistor
G1R4	47 k	Five percent 0.25 watt Carbon Resistor
G1R5	47 k	Five percent 0.25 watt Carbon Resistor
G1R6	100 R	Five percent 0.25 watt Carbon Resistor
G1R7	100 k	Five percent 0.25 watt Carbon Resistor
G1R8	200 R	Five percent 0.25 watt Carbon Resistor
G1R9	22 R	Five percent 0.25 watt Carbon Resistor
G1R10	1 k	Five percent 0.25 watt Carbon Resistor
G1R11	3K3	Five percent 0.25 watt Carbon Resistor
G1R12	330 R	Five percent 0.25 watt Carbon Resistor
G1R13	4R7	Five percent 0.25 watt Carbon Resistor
G1R14	10 R	Five percent 0.25 watt Carbon Resistor
G1R15	510 R	Five percent 0.25 watt Carbon Resistor
G1R16	47 R	Five percent 0.25 watt Carbon Resistor
G1Y1		Series Resonant Crystal (see text)

INTERNATIONAL TRAVEL HOST EXCHANGE

Ash Nallawalla ZL4LM/VK3CIT
INTERNATIONAL TRAVEL HOST EXCHANGE FEDERAL CO-ORDINATOR
PO Box 539, Werribee, Vic. 3030

As a result of publicity in *Amateur Radio* 11during 1987, the International Travel Host Exchange (ITHE) scheme has gained about a dozen volunteers in Australia. (See AR, May 1987). The list is growing slowly, but we need many more volunteers to share the pleasant task of meeting or hosting our overseas visitors. Some participants live away from tourist haunts, and Sydney is the only major city not yet represented in the ITHE. "Come on, lend us a hand. . ." (to borrow a phrase from the Bicentennial advertisements)!

Speaking of which, it is hoped that you will mention the Bicentenary to DX contacts during 1988. Expo 88 will receive its own promotion in the form of VI88EXPO, a special-event station which will be manned by volunteers from the VK4 Division.

The purpose of the ITHE is not merely to help overseas amateurs who are visiting Australia, but also to help us in our travels within our country and abroad.

In future articles I would like to share the travel experiences of WIA members, together with some helpful tips and ideas. A list of sights seen is not suitable for this column, but we would like to hear about the amateurs you have hosted or who hosted you. Have you any amusing travel anecdotes? What are your needs as a traveller? Have you any tips to pass on to prospective hosts/travellers? Are you planning a trip to a radio event such as the Dayton Hamvention, or the YLRL Convention in Hawaii during 1989?

Join the ITHE scheme and make your holiday more memorable. Complete a copy of the following proforma on plain paper and send it to me — address as above.

If your spouse is also an amateur, mention both names.

INTERNATIONAL TRAVEL HOST EXCHANGE

Registration Form

Mr/Mrs/Ms/Miss: .....
Preferred Name/s: .....
Surname: .....
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Address: .....
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Telephone: ..... *(H)*
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Languages Spoken: .....
.....
.....
Able to accommodate visitors under some circumstances: Yes/No

PAPER 4 — A PROPOSAL TO RESTRUCTURE AMATEUR RADIO LICENCING

by the Future of Amateur Radio Working Party

The Working Party Membership includes:
Ron Henderson VK1RH
Gordon Bracewell VK3XX
John Aarsse VK4QA
Stephen Phillips VK3JY

BACKGROUND

The Australian amateur radio licence structure is not a static system. Changes which have occurred since amateur radio was reintroduced following World War II have included the limited licence in 1954, the novice licence in 1976, multiple choice examinations and subject credits of limited, and now indefinite duration for partially completed examinations.

Of recent times, several amateurs have addressed the licence structure. J Linton and R Harrison raised the matter in their article *Amateurs Radio — Future Direction* in AR February 1986. G Bracewell took up the novice issue in particular in *Novice Licensing into the 21st Century* in AR August 1986. Linton and Harrison returned with a revised proposal in July 1987 and the 1987 Federal Convention provided guidelines to the Federal Executive to satisfy a need caused by the Future of Amateur Radio Working Party's inability to meet during 1986.

With the reforming of that Working Party recently by the Executive, the matter of amateur radio licensing again comes under scrutiny.

AIM

To propose a detailed licence restructuring option, tested against perceived constraining factors.

FACTORS INFLUENCING OPTIONS

NATIONAL AUTHORITIES

A suitable starting point is the influence of the National Authority (Department of Transport and Communications) on any proposed licensing restructuring. Incidentally, the influences external to Australia (that is ITU considerations) have, for convenience, also been aggregated into this grouping.

Two major National Authority responsibilities emerge. The requirement to satisfy internationally the amateur licensee's competence to operate, and the requirement to be able to communicate in Morse code. These are requirements of the ITU Radio Regulations to which Australia has subscribed.

Australia has chosen to establish competency by examination and the scope of that testing is a national decision. Overseas the CERN licence for the EEC and some IARU resolutions establish a uniform standard of knowledge required for licence grades. Australia nationally, as distinct from the amateur radio national society (the WIA), has no obligation to follow these agreements.

A similar situation prevails for Morse code. Australia has chosen a particular speed and examination style for the national tests and it is very difficult to exactly equate standards worldwide. WARC 92 may vary the requirement for Morse code in the ITU Radio Regulations, however, for the present we must accept the constraint that examinations, including Morse, will continue using a national syllabus whose scope may be open to some negotiation.

EQUIPMENT AVAILABILITY

Recent FTAC band planning papers have stressed that commercial equipment availability and commercial pressures should not distort sound band planning. Nevertheless, equipment characteristics must not be neglected. Table 1 summarises the key characteristics of modern commercial amateur equipment and suggests several trends which it would be foolish to ignore in any licence restructuring. These trends are:

a. Transceivers are now the norm and split frequency operation is generally possible.
b. HF transceivers are multiband, frequency agile within bands and to some extent multimode, ie CW and SSB.
c. HF transceivers have output powers up to about 100 watts PEP although a lower power category of about 25 watts PEP exists in lesser quantities.
d. With the addition of unpretentious linear amplifiers most nations legal output power limits can be reached.
e. VHF/UHF transceivers are generally single band, frequency agile and frequency multimode, ie CW, SSB and FM.
f. Power outputs at VHF/UHF fall into two groupings; low power up to five watts average for portable self-contained battery powered equipment, ie hand-helds and "hand bag" radios, and 25-40 watts for vehicle battery powered sets.
g. Add-on linear amplifiers boost VHF/UHF transceiver outputs to about 100 watts average.

In contrast kit-set or home-built equipment is generally single band, may not have all modes and has relatively low power output frequently necessitating the use of linear amplifiers.

Emerging trends are the three power levels, namely:

★ low power up to five watts average or 25 watts PEP
★ medium power 25-40 watts average or 100 watts PEP
★ high power about 100 watts average or 400 watts PEP

The last being achieved through the addition of an unpretentious linear amplifier. These definite power levels could be related to levels of operating privileges in any restructured licence proposal.

The existence of frequency agility within any amateur band brings about difficulty in policing constrained band segments for differing grades of licence, in contrast to assigning or not assigning a complete band.

A similar argument can be advanced for emission modes, for where a transceiver is so fitted the potential (or temptation) to use all available modes exists.

This suggests that emission modes may be divided into those commonly available on commercial equipment and those available only through external modems.

In essence, the underlying theme in these equipment considerations is to match privileges to available facilities. Incidentally, it is unlikely more extensive facilities will be made available within the transceiver unit, however digital interfacing and improved software will more easily provide them external to the radio and probably on an enhanced PC. The most complex of error correcting digital signals is normally transmitted as a series of frequency modulated tones or a frequency shifted carrier.

LICENCE GRADES

The major requirements when considering licence grades are:

a. An upwards progression, with increasing privileges for increasing qualifications.
b. A range of entry points to satisfy the varied interests of those entering the Amateur Radio Service.
c. An obvious delineation between licence grades, which suggests retaining the "simple approach" with not too many grades. The five grades in the USA appear confusing to Australians because of their partitioning of HF band segments across the grades.
d. Licence grades which match user requirements. The unpopular Canadian digital class licence is an example of mis-matching perceived needs.
e. No grade shall have a theory examination level lower than the existing novice licence. This assumes the defined novice syllabus will remain stable and "on air" training can be given as "second operators" under supervision of qualified licensees.

Table 1: Equipment Characteristics.

	SOURCE	FREQ COVERAGE	MODES	POWER
HF	Commercial	Multi-band	CW/SSB	Medium
	Kit-set	Single band	CW/SSB	Low
	Home-built	Single band	CW/AM/SSB	Low
	Linears can be added to all to give higher power			
	Power:	Low 25 W PEP	Medium 100 W PEP	High 400 W PEP
VHF / UHF	Commercial	Single band	FM or CW/SSB/ FM	Low/Medium
	Kit-set	Single band	FM	Medium
	Home-built	Single band	FM	Medium
	Linears can be added to all to give higher power			
	Power:	Low 1-2 W	Medium 25 W	High 45-100 W average

The practicalities of the situation dictate that delineation between licence grades should be achieved using combinations of the existing three examination subjects; theory, Morse code and regulations.

The addition of a practical test is not seen as an examinable matter at the hobby level of amateur radio (although it is acknowledged examinable for commercial certificates). Indeed tuition in the correct practical application of amateur radio skills is seen as falling fairly and squarely into the province of local radio clubs and individual experienced amateurs.

EXAMINATIONS

It is inevitable that the Department of Transport and Communications will devolve the conduct of Amateur Certificate of Proficiency examinations to suitable bodies seeking accreditation. To this end the WIA has sought such accreditation, but in so doing has recognised the cost aspects of this action. Indeed, in endorsing the action at the 1987 Federal Convention, the Federal Council resolved that examination operations would be conducted on a full cost recovery basis. Even so there will most likely be added service to candidates through increased examination frequency, reduced lead times and more convenient examination session times.

An obvious deduction from this is that the number of different examination subjects must be minimised, to reduce both costs to candidates and administrative effort by the administering body. Many subjects means greater overhead costs hence more costly subject examination fees. Also, many subjects mean many examinations to progress from the entrance certificate to the full qualifications.

The 1987 Federal Convention, in its guidelines to the Federal Executive, identified the value of mix and match qualifications based upon multiple levels of theory and Morse code and a single regulations examination. That guidance follows closely the G Bracewell model of AR August 1986, and may be represented by the two by three matrix of Table 2 below:

Table 2: Combinations of Examination Subjects.

Theory		Basic	Full
Morse	Nil		Limited
	Slow	Novice	Combined
	Fast		Unrestricted
Regulations		One test subject	

Table 2 shows the examination subject combinations possible and the existing licence grades arising from the certificates of proficiency awarded. For completeness one could imagine a no theory column where a no theory, no Morse, no regulations, ie "no test" licence is the current CB licence.

At this stage, it becomes necessary to introduce a concept alluded to earlier both in this paper and in the earlier *Frequency Bands and Emissions* paper.

If we acknowledge the direct relationship between permitted emission modes with associated power levels and the level of theory qualification (for it is not unreasonable to require more knowledge to employ more sophisticated signal processing) then the examination theory level sets the permitted emission modes and power. As discussed earlier, most equipment is multi-mode with basic Morse (CW) and voice (SSB and/or FM) capabilities. It is also of medium power output, hence these become the permitted basic level transmission emissions and power. Bear in mind that no constraints are (or could be) placed upon reception, so the self-improvement capacity remains active.

Upon upgrading theory, the licencee is permitted to transmit on all authorised modes and at an increased power level. This is achieved in most cases by interfacing, external modem units and linear amplifiers to the basic transceiver, a task calling for greater understanding or theoretical knowledge to radiate good quality signals.

The corresponding relationship between Morse code speed and authorised frequency bands is a little more tenuous, but still clear in principle. ITU Radio Regulations confine "no Morse" qualification licencees to above 30 MHz, whilst the current novice licencee is allocated HF band segments in some amateur bands. Hence, it is argued that no Morse qualifies for frequencies above 30 MHz, slow Morse qualifies for designated band segments and fast (or should it be full?) Morse qualifies for all frequency allocations.

One perceived difficulty noted earlier is the allocation of band segments whilst equipment is frequency agile across the whole band. Should this create a problem, some adjustments to band segments are possible to ease the situation. Further, should WARC 92 eliminate the Morse requirement, the two grades "no Morse" and "slow Morse" combine into one. A more radical change might be to retain only two licence grades, novice and full.

In summary, theory qualifications determine emission modes and powers, whilst Morse code speed determines authorised frequency bands/band segments.

The proposal as presented so far offers only the current four entry points and must be enhanced to maximise that quality.

If we ascribe to the current novice licensee some VHF/UHF frequency band/s and, in keeping with the ITU Radio Regulations, offer that added privilege without HF to a "Morse-less" novice, we flesh out all feasible squares in Table 2; for the fast Morse, basic theory option is only a repeat of novice conditions.

We have in the above discussion, created five levels of licence, VHF novice, novice, limited, combined and AOCP. These could be redesignated to show the graduation in several ways as shown in Table 3.

Table 3: Licence Grades and Titles.

CURRENT NAME	NEW STYLE	ADVANCED STYLE
"VHF" Novice	VHF Novice	VHF Novice
Novice	Novice	Novice
Limited	VHF Intermediate	VHF General
Combined	Intermediate	General
Unrestricted	Unrestricted	Advanced

The Advanced Style provides a licence without any need for change or re-qualification by existing amateurs. The perceived feeling of the amateur community is there is no place/requirement/case for an "advanced licence", hence the "New Style" nomenclature is adopted for the remainder of this paper.

THE PREFERRED OPTION

In review then, Table 2 can now be fleshed out and rewritten in the form of Table 4 below and this becomes the preferred option.

Table 4: The Preferred Option.

Theory		Basic	Full
Morse	Nil	VHF Novice	VHF Intermediate
	Slow	Novice	Intermediate
	Fast		Unrestricted
Regulations		One test subject	

DETAILED PRIVILEGES FOR LICENCE CLASSES

So far, detailed privileges have not been specifically linked with licence classes or grades, although a number of considerations have been alluded to earlier. It is proposed now, to develop these characteristics in three groups (emission modes, output power and frequency band allocations) but taking note that the first two are linked for examination qualification considerations.

Emission Modes

Earlier, a distinction was observed between emission modes available from the transceiver unit proper and those possible using external signal processing modems. This situation is not confined to commercial equipment and (if anything) is more pronounced for kit-set or home built equipment. Consequently, it is proposed that CW, AM, SSB and FM modes be associated with the basic theory examination level and all other emission modes be aligned with the full theory qualification.

Output Power

Three distinct output power levels were identified earlier and it is proposed to follow the approach above for emission modes and align the basic transceiver output power (medium power) with the basic theory examination and associate the employment of linear amplifiers (high power) with the full theory examination. An alternative alignment of low power with basic theory and medium or high power with full theory has been rejected principally on grounds of matching proposals to reality. Modern multi-band solid-state HF transceivers do not readily lend themselves to power reduction modifications like the removal of one power amplifier valve did in the past.

Frequency Bend Allocations

The first consideration (ie the no Morse situation), is easily satisfied — for ITU Radio Regulations stipulate no operation below 30 MHz. Slow Morse speed, ie "Novice" and "Intermediate" HF considerations are also not difficult. There is a case for allocation of all of the 3.5-3.7 MHz band to avoid band segment difficulties and there are complaints of overcrowding in the novice segment, however, the low sun spot cycle activity has contributed in part to this. Also, the WARC 79 amateur exclusive bands become genuinely exclusive in July 1989 and may ease pressure on novice segments. In the light of a WARC 92 position to seek additional band space above 3.7 MHz, it is proposed the "Novice" and "Intermediate" segment be extended to take in the entire 3.5-3.7 MHz band.

The second "Novice" and "Intermediate" HF band allocation worthy of adjustment is the 28 MHz band. There is no compelling reason why, with the FM emission mode available, this allocation should not be extended to take in all of the band permitting FM and repeater operation in the upper portion of the band.

The allocation of VHF/UHF spectrum to "Novice" and "Intermediate" licence grades is an issue which has been subject to much soul-searching in recent times. One outcome has been the near unanimous agreement on the need for a common band for all licence grades. As the 144 MHz band is the only allocation which can become a true common band, due to its utilisation and the proliferation of voice repeaters, it is recommended the full band be allocated, noting that emission mode and output power constraints identified earlier will apply.

To provide an alternative band and, to some extent, populate the 420 MHz band, it is proposed the CW, SSB and FM portion of that band from 432 to 440 MHz be also included in "VHF Novice" and "Novice" frequency allocations.

Whilst these allocations may appear at first considerable for "VHF Novice", the substantial difference between that proposed grade and the proposed "VHF Intermediate" remains a worthwhile incentive to upgrade.

TESTS AGAINST CONSTRAINING FACTORS

The preferred option above meets all National Authority requirements, furthermore, it is easily modified should WARC 92 vary the international Morse code considerations. It is well matched to equipment characteristics and does not offer great temptation to abuse mode, power or frequency constraints. It satisfies the requirement for a progressive series of licence grades with substan-

tial incentives for upgrading; it calls for a minimum of expensive testing and, in so doing, provides a range of entry points to match candidates qualifications and anticipated usage. Finally, the relationship between examination subject qualifications and licence privileges is clearly defined even though the precise details will need to be negotiated with the National Authority.

CONCLUSIONS

A detailed amateur radio licence restructuring option has been defined which satisfies all perceived constraining factors. It is simple, has a minimum number of grades, yet progression is clear and substantial incentives are provided for upgrading.

RECOMMENDATIONS

It is recommended the WIA adopt the preferred option for amateur licence restructuring identified above and seek its implementation at the earliest opportunity by the National Authority.

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Telecom is taking action against a 13-year-old boy caught in the act of vandalising a public phone box in Western Australia.

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FULL (COUNTRY)	"C"	39.50	37.50	49.00	40.00	40.00	37.00	38.00
ASSOCIATE	"A"	39.50	35.50	42.00	40.00	38.00	36.00	38.00
PENSIONER	"G"	30.00	30.50	35.00	30.00	33.00	30.00	34.00
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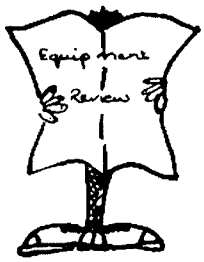

Equipment Review

Gil Sones VK3AUI
30 Moore Street, Box Hill South, Vic. 3128

MASPRO 144 MHz and 432 MHz YAGIS

The aerials presented for review were an eight-element 144 MHz Yagi, the 144WH8, and a 15-element 432 MHz Yagi, the 432WH15.

Assembling an aerial is often a trying and time-consuming task. Packets of screws and nondescript parts must be sorted and accounted for. Delightfully vague lists and drawings make the task even more difficult and invariably pieces are missing or the assembly sequence is incorrect!

The Maspro aerials are definitely not in this category. They are a lesson to other manufacturers in how to finish and package an aerial. The nuts have keepers and there are even a couple of spares thoughtfully provided for the absent-minded constructor who accidentally misplaces one.

The aerials fold and fit together with ease and a coaxial connector and sealing tape is provided. This is very useful for keeping water out of the coaxial cable.

These amateur aerials are fine examples of Maspro's workmanship and attention to detail. Maspro also produce a range of excellent television aerials.

The gain claims for these aerials are modest. Gain is rather difficult to measure, consequently no attempt was made to test the gain, however, results with the aerials were of the order expected.

The directivity, sidelobes and front-to-back ratios were all as one would anticipate and expect.

The standing wave ration was low within the amateur bands. On two-metres, an SWR of 1.1:1 was obtained and on 432 MHz the SWR was below 1.15. Both were in the narrow band mode area of the bands. Spot-checks within the well used areas of the band did not yield significantly higher SWR figures.

A Bird Model 43 Throughline Wattmeter with appropriate elements was used for the SWR checks.

Power rating of the aerials is given as 50 watts, but this would appear to be conservative. Operation at 100 watts did not show any distress or overheating.

The power rating is probably due to the use of thin cable between the coaxial connector and the actual aerial feed-point. A higher power rating could be possible if Teflon coaxial cable were used.

Both aerials have series UHF connectors for connection of the feedline. The reviewer feels that Type N connectors would be more appropriate. This is particularly so for the 432 MHz aerial.

Maspro have produced a pair of excellent aerials. They are delightfully simple to assemble. Packaging and design are first class. As a general station aerial they "fill the bill". Leave the Meccano sets to the weak signal specialists!

Both aerials are in the $100 price range.

There are Maspro agents in a number of States. For your nearest distributor contact Maspro Transbeam on (03) 762 6455.

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HERITAGE 200

Heritage 200 is a program developed and funded by the Australian Bicentennial Authority to pay tribute to Australians, both living and dead, who contributed most to making Australia what it is today. The nomination is to be accompanied by a brief summary of the person's achievements and supporting material.

A committee of three ex-WRANS were appointed to prepare and present a nomination of Mrs F V Wallace OBE, (Radio amateur 2GA, VK2FV).

The nomination was lodged with the Authority with 60 supporting items, including testimonials, certificates, newspaper cutting and quotations from other publications. In acknowledgment, the Authority stated that "the Committee intends to complete the selection process before the end of 1987".

SUBMISSION: Mrs Florence Violet McKenzie (nee Wallace), OBE, ASTC (Elec Eng), FAIN, RNARS, JP, lived for 90 of the 200 years we are now celebrating (1891-1982). She crammed many achievements into her lifetime and should be honoured in the bicentenary year for her very significant contributions to this country during peace and war. She was a pioneer in her chosen field of electrical engineering and the first woman in Australia to qualify as such in 1923.

She was widely respected by her peers and developed a firm friendship with Professor Albert Einstein who used to correspond regularly until his death in 1955. She played a major role in educating the community in both the dangers and advantages of electricity through publications and broadcasting. A pioneer in amateur radio, she was the first licensed woman radio operator and used her own station to contact other enthusiasts in islands throughout Oceania. This led her to explore all forms of communications. In 1939, when war was imminent, she could see how critical communications would be in world conflict and that many trained operators would be needed in a great hurry. She formed the Women's Emergency Signalling Corps, and when war broke out six months later, she had a fully operational school with 120 teachers and hundreds of others under instruction. Due to her foresight, Australia was more prepared for war than it would otherwise have been.

Her influence on the war effort is legendary — how she managed to cope with an ever increasing stream of servicemen, anxious to acquire vital skills in W/T communications before they could be accepted as trainee pilots leaving for Europe, or soldiers off to fight in the Middle East. When she realised the Navy was short of telegraphists, she harried the Royal Australian Navy into accepting some of her highly trained girls, thus forming the nucleus of the Women's Royal Australian Naval Service. Altogether she trained over 12 000 servicemen (including American, Dutch, Greek, Indian, Norwegian, Filipino and Chinese), in Morse, visual signalling and international code. She also trained 3000 girls, 1000 of whom went into the three Services. All tuition was free of charge and no financial support was ever received from Government sources. After the war the need for specialised training was just as urgent, as thousands of servicemen returned jobless and found that their skills did not fit them for the commercial world. Back they came to Mrs McKenzie who taught experienced fighter pilots to brush up on their Morse to be acceptable to Qantas and other airlines, also seamen who had to study for mate's and master's certificates for the Merchant Navy — in fact, anyone who needed these qualifications in a hurry. As always, where she saw a need she filled it — even studying and passing an examination in navigation as well as obtaining a First Class Radio Telephony Operator's Licence as some of the men required tuition in these subjects. She continued to give all this service free for a further 10 years until finally the airlines established their own school and the Government added a signal section to technical colleges. Mrs McKenzie has done it alone for 16 years! Her ability to open doors for thousands of young people, to train, guide and be mentor to them, has left her mark on the Australia we know today. She inspired all who passed through her hands and instilled qualities of dedication, loyalty and discipline which they in turn carried into their own fields of endeavour.

Mrs McKenzie was a true patriot and a great achiever who graced the 20th century and enriched it while adapting to the changing times. She used her extraordinary talents in the way she could see was best for her country and her contribution can never be measured.

—Reprinted from EX-WRANS DITTY BOX with thanks to Mrs Marjorie Taylor (Printer) and Mrs Heather Starr (Editor) for their permission to use this material. Contributed by Moira Millgate VK8NW (one of Mrs Mc's girls)

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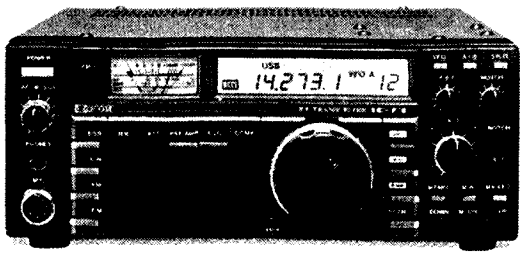

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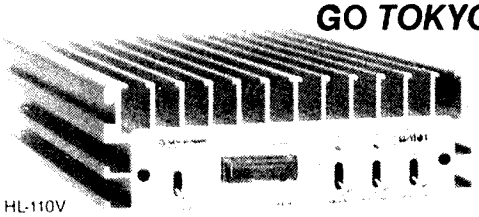

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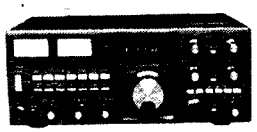

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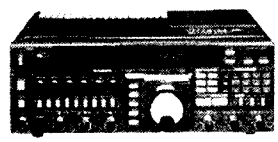

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CNW-419 TUNER 1.8-30 MHz Continuous. 17 Bands. 200W CW (3.5-30 MHz) 100W CW (1.8-3.4 MHz). — Was ~~$459~~ Now $299
CNW-518 TUNER 3.5-30 MHz. 8 Bands. 1kW CW. 50% duty cycle 20/200/1kW. — Was ~~$790~~ Now $499
PS-120 POWER SUPPLY 3-15V DC. 8A max. 12A max. — Was ~~$299~~ now $270
LA-2155H 2m LINEAR (144-148 MHz). Preamp gain 15 dB. Power Low 1.5W. High 25W. (In 25W — Out 150W) 13.8V. — Was ~~$559~~ Now $459
LA-4090 (430-450 MHz) Gain. 15 dB. In 10W — Out 85W. (In 25W — Out 90W) 13.8 V DC/25. — Was ~~$669~~ Now $529
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HB 23M 2 el 3 band (20, 15, 10) Beam — Was ~~$359~~ Now $299

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AMSAT UK/UOSAT SPACE COLLOQUIUM

July 17-19, 1987

University of Surrey, Guildford, Surrey, England

Graham Ratcliffe VK5AGR
AMSAT-Australia National Co-Ordinator
PO Box 2141, GPO, Adelaide, SA. 5001

At 11.30 am, Wednesday, July 8, I departed Adelaide, 28 hours and 55 minutes later I arrived at London Heathrow after brief stopovers in Sydney, Singapore and Muscat.

I was met at Heathrow by James Miller G3RUH, with whom I spent the next five days at his home in the village of Coton, a few kilometres south-west of Cambridge. James is a well-known figure to those interested in the Amateur Satellite Service as the designer of an excellent range of satellite telemetry decoders for UoSAT OSCAR 9 and 11, OSCAR 10 and Phase IIIC, and a modem fro Fuji OSCAR 12. He is also recognised for his software lor tracking OSCAR 10 (PLAN10) and a wide range of support software for determining spacecraft attitude and solar illumination planning. It was primarily for this reason that I took the opportunity to spend a few days with James prior to returning to London to spend the next three days with Ron Broadbent G3AAJ, Honorary Secretary of AMSAT-UK.

When I left for London on an economy airfare, with a 20 kilogram baggage limit, I had 13 kilos of amateur satellite equipment in my suitcase, namely, an OSCAR 10 Integrated Housekeeping Unit (IHU, alias computer), an Atari 800XL Command Computer, an AMSAT Atari Cassette Interface and a Cassette Recorder. The purpose of toting this equipment halfway around the world was to help James understand what is involved in commanding OSCAR 10 and Phase IIIC after launch in early 1988. As previously mentioned, James had already written a large suite of Command Station support software and, I hope, as a result of demonstrating Command Station activities first-hand he will develop even more sophisticated software for the support of Phase IIIC activities, particularly in the area of telemetry capture, storage and analysis on an IBM-PC, not only for Command Stations, but any interested individuals.

At the end of five days I am sure he had a much greater understanding of Command Station activities and requirements. Since my return from the UK, I have received an excellent program for decoding OSCAR 10 and Phase IIIC Phase Shift Keyed (PSK) telemetry using the ever-popular Commodore 64, from James. For further details on this software, send an SASE to AMSAT-Australia, C/- Box 2141, GPO, Adelaide, SA. 5001.

On Tuesday, July 14, I caught a train from Cambridge to London to spend the next three days helping Ron prepare for the Colloquium. Well, within minutes of arriving at Ron's home at Wanstead Park he had me collating the handouts and name badges for the 180 attendees at the Colloquium. The next project was to collect together literally a truckload of books, software, badges, ties and other AMSAT-UK paraphenalia for sale at the Colloquium. This kept us both extremely busy for the next three days but gave us both the opportunity to discuss the problems and frustrations common to supporting an amateur satellite user community whether in the UK or Australia. Ron gave me many good tips on how to handle a wide range of different inquiries and potential sources of various information.

One evening, Ron arranged a visit to the shack of Trevor Stockhill G4GPQ. This visit was rather rewarding for AMSAT-Australia as Trevor donated an IBM-PC mother-board, multi-function, monochrome and EGA graphics and a floppy disc controller card for a VHF Remote Bulletin Board Service (RBBS) to be set-up in the Adelaide area. This will allow me to leave messages down-loaded from the Digital Communication Experiment (DCE) on UoSAT OSCAR 11 and receive messages for up-loading to the DCE. This project is well underway and, by the time you read this report, messages for transfer to the UK, US and New Zealand via the DCE can be forwarded to your local VHF BBS who will then forward them to the Adelaide BBS via the HF BBS Network. The ability to send packet *messages via my* station acting as a 'DCE Gateway' has been operational since April 1987, and many VK amateurs have already availed themselves of the opportunity to send messages to other amateurs in the UK. At the time of writing this report, a typical path to me would be via VK4BBS, VK6AGC, VK2TOP or VK3BSR BBSs to VK5ZK BBS, all on HF to VK5AGR BBS on VHF and then to the DCE on UoSAT OSCAR-11. The VHF RBBS in Adelaide will replace VK5AGR BBS with Garry VK5ZK, still acting as the HF Gateway to the Adelaide RBBS.

On Friday, Ron and I set off for the University of Surrey (UoS), at Guildford, in a light commercial van bursting at the seams with Amateur Satellite information. After negotiating the rather hectic London traffic we had a relatively leisurely drive through the English countryside to Guildford. Upon arrival at the UoS we unloaded what had taken three days to accumulate, and in three hours we had set-up an AMSAT-UK stand in a room near the main lecture theatre. We concluded just in time to start registration of the first attendees who arrived about 6 pm. Right from the outset it was obvious that, although this was an 'amateur' function, the whole weekend was run very 'professionally'. It is heartily recommended that, if you ever have the slightest opportunity to attend an AMSAT-UK Space Colloquium, make every effort to do so as you will never regret it.

Accommodation was provided on campus in the student quarters which were extremely comfortable and more than adequate for the few hours sleep afforded amongst all the activities. The only criticism of the entire weekend was the perennial "you could not be in two places at the same time." By this I mean that on a number of occasions there were two sessions being conducted concurrently as there were so many topics to be covered. As a result, the next Colloquium will be held over three days.

The individual sessions were excellently structured so that each session began with an introductory presentation. This presentation ensured that even the *newcomer* to a particular aspect could understand the following presentation — quite an achievement.

For instance, the first session began with a presentation by Craig Underwood G1WTW, entitled *Introduction to Amateur Satellites in Practice*. In this presentation Craig set the scene by explaining most of the dialect used by amateur satellite operators and went through the meaning of all those dreadful acronymns the keep appearing which most newcomers find rather baffling. This was followed, logically, by a presentation on *Tracking Topics* by James Miller G3RUH. The next step was to cover *Operating on Mode B, J and L Transponders*. This was my presentation and was particularly directed at helping the newcomer. (If any readers would like a copy of the transcript of this presentation, please send an SASE to the above address).

The second session after lunch (the food was excellent!), described the amateur satellites. Jacky Radbone G1WJN, began the session with an overview of the UoSAT Spacecraft Operations and Results of Experiments on UoSAT OSCAR-9 and 11. Then Dave Rowan G4CUO gave a presentation on the building and launching of Fuji OSCAR-12, accompanied with colour slides. Dave had to step in at very short notice when Miki JR1SWB could not attend the Colloquium. Karl Meinzer DJ4ZC concluded this session by presenting an AMSAT Phase IIIC/D Status Report. Karl did not spend very much time on the Phase IIIC project because, at that stage it was on hold pending the successful launch of the next Ariane rocket. Also, Karl was rather eager to present the new and exciting Phase IIID project. During Karl's presentation you could hear a pin drop as everyone in the auditorium was enthralled. Suffice to say that many listeners would now prefer that Phase IIID, rather than Phase IIIC was scheduled for launch early in 1988! (If you would like a copy of the AMSAT-DL Phase IIID brochure, send an SASE to AMSAT-Australia).

Briefly, Phase IIID is planned to be launched into a 63.4 degree inclination orbit with a perigee height of 1500 km and a period of 720 minutes and it will have a high-powered Mode L transponder which should enable operators to work Mode L mobile.

The post-afternoon session was divided into two streams — the A-stream continued on from the previous session, ie the Future Amateur Satellites, while the B-stream covered Satellites in Education. I chose to attend the A-stream which began with a most entertaining and informative presentation on the Soviet Space Program, by Geoff Perry, of Kettering Boy's School fame. Transcripts of this presentation are available from AMSAT-Australia for an SASE as above.

Next, Martin Sweetin G3YJO, discussed the UoSAT-C program, another in the UoSAT educational and scientific satellites. The final presentation before dinner was given by Vern Riportella WA2LQQ, President of AMSAT-North America, on the AMSAT Phase IV Plans. Rip was standing in for Jan King W3GEY, the AMSAT-NA Vice-President of Engineering who unfortunately could not attend due to last-minute work commitments.

Rip gave an excellent presentation, however, it was almost immediately obvious from audience reaction that the Phase IV Project (ie two geosynchronous satellites) offering 24 hour service using a hand-held, was not a welcome concept to the majority of Europeans attending the Colloquium. Most equated the Phase IV Project with a repeater in the sky, and this was the last thing the European community needed. Also, to my surprise, the concept of justifying the Phase IV Project on the basis of providing emergency communications seemed to be rather alien to the European community. The main justification for the Amateur Satellite Service in the eyes of the European community is for education purposes and to provide operators with some challenges.

After dinner, the AMSAT-UK Annual General Meeting was held in the auditorium, and lasted

less than 30 minutes. The meeting was then thrown open for general discussion which immediately centred on Phase IIID versus Phase IV. Ironically, neither Rip WA2LQQ or Karl DJ4ZC, were present so the discussion was quite open. With few exceptions, most countries represented favoured Phase IIID in preference to Phase IV. This rather 'heated' discussion went on for at least two hours and left no doubt in my mind that the Phase IIID project was preferred in Europe and throughout most of the world. Other than obvious support from attendees from the US, I can only recall South Africa and South America supporting the Phase IV project.

On Sunday, the A-stream dealt with digital data transmission techniques and the B-stream covered RS Satellites — Propagation, UoSAT-OSCAR-9 Orbital Decay and Weather Satellites. I attended the A-stream which began with Jeff Ward G0/K8KA, giving an Introduction to Packet, James Miller G3RUH on Modulation Schemes and Modems, and a most enlightening lecture on Using RUDAK on Phase IIIC, by Hanspeter Kuhlen DK1YQ. This session concluded with an AMSAT OSCAR-10 Status Report, by Ian Ashley ZL1AOX. Jeff Ward concluded the digital data transmission presentations after lunch by *The Digital Communications Experiment* (DCE) *Gateway Network*. Again, I have information on all of these topics which may be attained by sending an SASE to AMSAT-Australia.

The rest of the afternoon was scheduled for open discussion, and once again it centred on the pros and cons of Phase IIID and Phase IV projects. This time both Karl and Rip were present and it gave them both an opportunity to debate the topic point for point. Once again Karl's approach fitted the European way of thinking whereas Rip's ideas seemed only to alienate most. I was very pleased not to be in Rip's shoes, having to face such formidable opposition to the Phase IV proposal. I did ask Rip as to the proposed source of the US$10 million to conservatively finance such an ambitious project. His answer left most in doubt as to the availability of such funds except from "selling off" space on these satellites to non-amateur groups, which again was not received well by the European community.

I was very impressed by the presentations at the Colloquium but I felt that the real benefit of attending the Colloquium came from meeting and exchanging ideas with attendees from the many different countries around the world. I cannot recall exactly how many countries were represented, but there were attendees from Germany, Italy, Austria, Sweden, Yugoslavia, South Africa, North and South America, Hong Kong, New Zealand and Australia to name a few.

Already, since my return, I now receive reciprocal newsletters and magazines from a number of different countries. However, the weekend, like all events, was too short and I did not have time to speak with as many as I would have liked. This was made particularly difficult because, as a presenter, many of the attendees wanted to "pick your brains" which left even less time to catch up with other speakers myself. I did, however, manage to have discussions with Craig Underwood and Jeff Ward to arrange exchange between schools in the UK and Australia, via the DCE on UoSAT OSCAR-11.

I also arranged with Martin Sweeting to obtain CCD Camera decoding software for the IBM-PC as soon as the bugs have been ironed out at the UoS.

Finally, I arranged to meet Karl in Marburg for a couple of days prior to returning home.

After returning to London and helping Ron unpack and stow away all the remaining AMSAT-UK paraphenalia from the Colloquium, I departed for Marburg on Tuesday, July 21. I flew to Frankfurt and then caught a train to Marburg. To my surprise, when I arrived at the AMSAT-DL Laboratory, I was met by Frank VK6DM, from Albany. This turned out to be rather fortuitous as Frank had brought his video camera and with Karl's permission and Werner Haas DJ5KO, as our guide, we were allowed to photograph Phase IIIC in the 'clean room.' Thanks to Franks efforts, AMSAT-Australia has an excellent 15 minute video with me describing all the systems on Phase IIIC, which it is hoped will be of interest to readers. To obtain a copy of this video (VHS format only) send a blank 30 minute VHF cassette and return postage, plus a small donation, payable to AMSAT Australia.

During the Colloquium, several plaques were presented for services to AMSAT and OSCAR-10 command. Graham was one of the recipients. From left: ZL1AOX, DK1YQ, DB2OS and Graham VK5AGR.

The next day Frank left to continue his trip around Germany, which left me with the opportunity to discuss many topics with Karl in the relaxed atmosphere of Marburg. Of top priority was Karl's request that I produce a paper on the significance of the Phase IIID versus the Phase IV orbit with respect to operations for those in the Southern Hemisphere and, in particular, Australia. This paper is currently under preparation and has already brought to light some interesting possibilities. On that subject, Karl suggested, that as the perigee will occur in the Southern Hemisphere, that Phase IIID could be used for special experiments to take advantage of perigee operation. In particular, Karl would like to see a proposal from amateurs in Australia and/or New Zealand for an experiment to utilise Phase IIID during the perigee part of the orbit. If you have any such ideas, however wild they may seem, let me know as there is an excellent chance that such an experiment could fly on Phase IIID. The experiment does not necessarily have to be complex but something new and innovative would be an advantage. Karl has also asked me to see if I could investigate the degradation of the solar panel efficiency on OSCAR-10 over its lifetime from launch to when the PSK telemetry failed. To do this I need good quality tape recordings of raw OSCAR-10 PSK telemetry — any starters?

Karl and I also discussed what PIIIC will mean for those located in the Southern Hemisphere. In particular, depending on the final argument of perigee, ie 225 would be much more preferable than 270. To sum up my discussions with Karl, I would say that Karl is very conscious of the wishes of the Australian amateur satellite operator and would be very pleased to see Australian amateurs provide an experiment to fly on Phase IIID.

After Marburg, I returned to London for a few hours before departing for home, via Singapore and Perth. Fortunately, I was able to have a seven day stopover in Perth, which gave me the opportunity to visit Albany and give a presentation on Phase IIIC to the local radio group. Similarly, I had the opportunity to give a similar presentation on OSCAR-10 to members of the WA VHF Group, in Perth. I would like to thank both groups for their excellent hospitality.

Finally, I would again like to recommend that, if you ever have the opportunity to attend n AMSAT-UK Colloquium, do not let the opportunity pass. You will not regret the decision to attend!

Also, as mentioned several times in this report, I have collected quite a number of "bits and pieces" and photocopies are available for any particular item from AMSAT-Australia for the cost of an A4 size SASE with a 95 cent postage stamp (ie 100 gram Airmail postage). In this report I have only had the opportunity to briefly mention most topics, therefore, if you would like to discuss any topic you are welcome to contact me on the AMSAT-Australia net any Sunday night at 1000 UTC, on 3.685 MHz, or alternatively out of working hours on (08) 297 5104.

ar

QSP

AIRCRAFT PHONES

Telecom plans to have an in-flight telephone service started by the end of 1988.

Initially air travellers will be able to make telephone calls from above south-eastern Australia to anywhere in the world.

Using a telephone handset from a unit mounted either on a wall of the plane or in a seat, a passenger will pay for their calls using a plastic credit card.

The service is expected to be especially attractive to business people, who were the main users of aircraft telephones in Canada and the United States.

Current cellular telephones are not permitted to be used on Australian aircraft because they interfere with aircraft navigation and communication equipment.

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MORSE CODE

NEW PRODUCTS

NOVICE NOTES with Drew Diamond VK3XU

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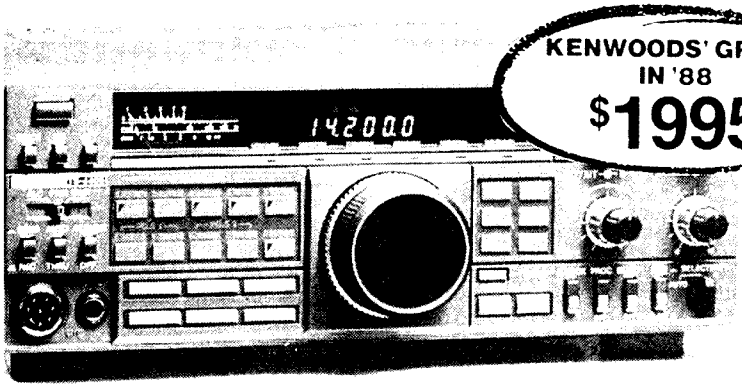

TS-440S
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The TS-440S is an HF transceiver designed for SSB, CW, AM, FM and AFSK modes of operation on all Amateur bands including the new WARC bands. It is the ultimate in compact size with the automatic antenna tuner built-in and featuring a highly efficient final amplifier cooling system. It incorporates a 100 kHz to 30 MHz general coverage receiver having superior dynamic range. Advanced digital technology controls the various functions, including dual digital VFOs, 100 memory channels, keyboard frequency selection, memory and programmable band scan, and RIT plus XIT.

TL-992
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KENWOODS' GREAT IN '88
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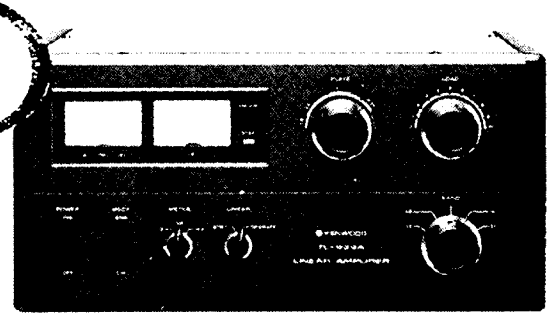

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TS-680
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Includes all the above features for the TS-140S
PLUS

Covers Amateur bands.
Six metres to 160 metres.
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KENWOOD

SUPER SUMMER SPECIALS

RZ-1 WIDEBAND RECEIVER

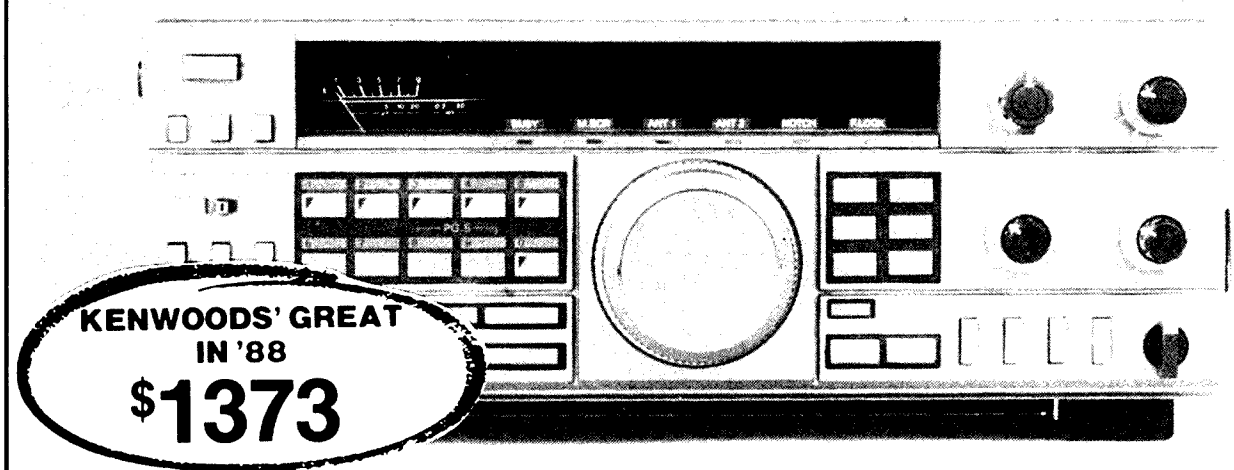
Features: Wideband Frequency Coverage (500KHz — 905MHz), including FM Stereo Broadcast and Multi-Channel Television Sound. 100 Easy-To-Operate Multi-Function Memory Channels with Message Capability. 10-Band Programmable Capability. Keyboard Frequency Selection. Auto-Mode and Auto-Step Operations. Multi-Scan Function. Easy-To-Read Large LCD Display. Compact and Lightweight. Auto-Selectable Dual Antenna Terminals. Built-in speaker. Front-mounting phones jack. Easy-to-operate, illuminated keys. Accessory terminals are Line Out/Video Out/External Speaker Terminal. Squelch circuit for FM (narrow) mode. UP/DOWN Keys for VFO and memory channel.

Specifications Frequency Range: 500KHz — 905MHz Mode: A3[A3E] (AM), F3[F3E] (FM) Circuitry: AM, FM(N) = Triple conversion system FM(W) = Double conversion system Sensitivity: AM (S+N/N = 10dB) = Less than 5 uV (BC band 10uV). FM (N) = 12dB SINAD less than 6uV (500KHz — 60MHz) less than 3uV (60 — 905MHz). Operating Temperature: -10° - +60°C. Audio Output Power: 2W (at 8 ohms load 10% distortion). Current Drain: Less than 1A (audio power output 1W). Antenna Impedance: 50 - 300 ohms. Power Requirement: 13.8VDC ± 15%. Dimensions: 180(W) x 50(H) x 158(D) mm. Weight: 1.5kg.

R-5000 COMMUNICATIONS RECEIVER

The R-500 is a competition class communications receiver with superior dynamic range, having every conceivable feature, and is designed to receive all modes (SSB, CW, AM, FM, FSK) from 100 kHz to 30 MHz. With the optional VC-20 "VHF Converter Unit" coverage of the 108—174 MHz frequency range is provided.

Advanced microprocessor technology controls various features, including dual digital VFOs, 100 memory channels, memory scroll, memory and programmable band scan, superb interference reduction and other features for ease of operation to enhance the excitement of listening to stations around the world.



KENWOOD

SUPER SUMMER SPECIALS

TR-751A TR-851A

2 METER **70CM**

ALL-MODE TRANSCEIVERS

The new TR-751A 2-m and TR-851A 70-cm all-mode transceivers deliver superior performance and "All Mode Mobility". Packed with all the most often needed features including auto-mode selection, dual digital VFOs, 10 memories plus "COM" channel, programmable CTCSS tone, various scan functions, all-mode squelch, noise blanker, RIT, DCL (Digital Channel Link) and easy-to-operate front panel layout. And, designed with the latest state-of-the-art technology, this compact rig is the one to choose for VHF or UHF stations on-the-go.

KENWOODS' GREAT
TR-751A **IN '88** TR-851A
$963 **$1122**

TS-711A TS-811A

2 METER **70 CM**

ALL MODE TRANCEIVERS

Features enhanced ease of operation through the use of new microprocessor technology that permits the incorporation of the widest range of innovative features in a very compact package. These features include KENWOOD's new, exclusive DCS (Digital Code Squelch), 10-HZ step dual digital VFO's, a new, multi-funtion fluorescent tube digital display, 40 multi-function memory channels, programmable band scan, memory scan, mode scan, auto mode function, "Quick-step" main tuning dial, IF shift, speech processor, all-mode squelch, noise blanker, and an easy-to-operate front panel design.

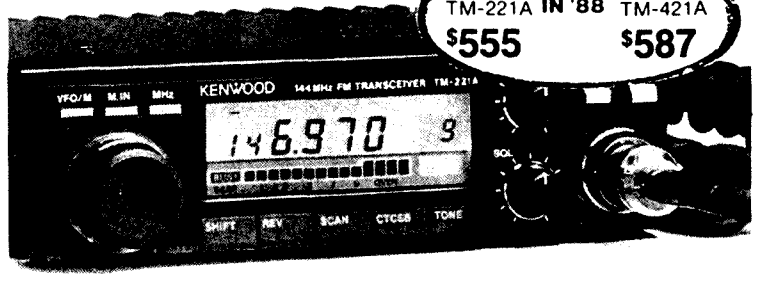
KENWOODS' GREAT
TS-711A **IN '88** TS-811A
$1620 **$1885**

TM-221A TM-421A

2 METER **70 CM**

FM MOBILE TRANSCEIVER

Specifically designed to condense maximum performance and operating convenience into an ultra compact package, allowing maximum flexibility in automotive installations.
In addition to a powerful 45 watts (TM-221A) and 35 watts (TM-421A) of RF output power, convenient key features include a large new easy-to-read LCD display, digital VFO with frequency step size selection, 14 multi-function memory channels, extended frequency coverage, pre-programmed automatic offset (TM-221A), memory scan and programmable band scan, memory shift function, and others for ease of operation and added versatility.



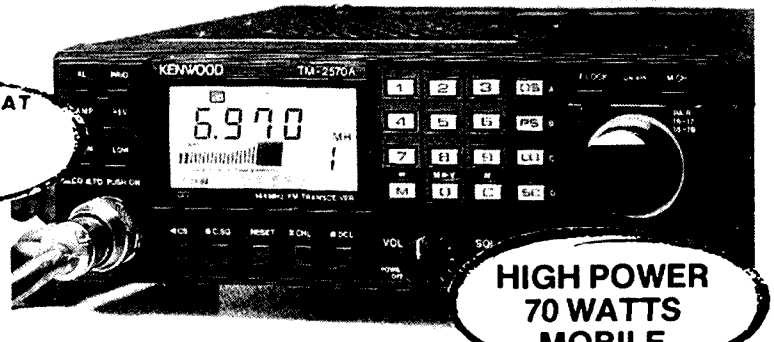
KENWOODS' GREAT
TM-221A **IN '88** TM-421A
$555 **$587**

TM-2570A

2 METER

FM MOBILE TRANSCEIVER

Has been designed to satisfy the needs of the most demanding 2m mobile operator. A wide range of innovative features have been incorporated in the basic design, including a large, new, easy-to-read LCD display, 23 multi-function memory channels for storing frequency, offset, telephone number and auto-offset.



KENWOODS' GREAT
IN '88
$910

HIGH POWER
70 WATTS
MOBILE

KENWOOD

SUPER SUMMER SPECIALS

TH-205A TH-405A

2 METER **70CM**

FM HANDHELD TRANSCEIVERS

FEATURES	TH-205A	TH-405A
POWER OUT	5 WATT	5 WATT
FREQUENCY	144 MHz-148 MHz	430 MHz-440MHz
MEMORY CHANNELS	3	3
KEYBOARD ENTRY	NO	NO
UP/DOWN SCAN	YES	YES
FREQUENCY LOCK	YES	YES
EXT. SPEAKER/MIC.	YES (OPTION)	YES (OPTION)
12 VOLT CIGAR PLUG	YES (OPTION)	YES (OPTION)
WEIGHT	350 gms	350 gms
SIZE	70W x 180H x 400	70W x 180H x 400
SUPPLIED ACCESSORIES	AA BATTERY PACK AERIAL	AA BATTERY PACK AERIAL
OPTIONS (see your dealer for prices)	NICAD PACK CHARGER	NICAD PACK CHARGER

TH-215A TH-415A

2 METER **70CM**

FM HANDHELD TRANSCEIVERS

FEATURES	TH-215A	TH-415A
POWER OUT	5 WATT	5 WATT
FREQUENCY	144 MHz-148 MHz	430 MHz-440MHz
MEMORY CHANNELS	10	10
KEYBOARD ENTRY	YES	YES
UP/DOWN SCAN	YES	YES
FREQUENCY LOCK	YES	YES
EXT. SPEAKER/MIC.	YES (OPTION)	YES (OPTION)
12 VOLT CIGAR PLUG	YES (OPTION)	YES (OPTION)
WEIGHT	350 gms	350 gms
SIZE	70W x 180H x 400	70W x 180H x 400
SUPPLIED ACCESSORIES	AA BATTERY PACK AERIAL	AA BATTERY PACK AERIAL
OPTIONS (see your dealer for prices)	NICAD PACK CHARGER	NICAD PACK CHARGER

TH-25A TH-45A

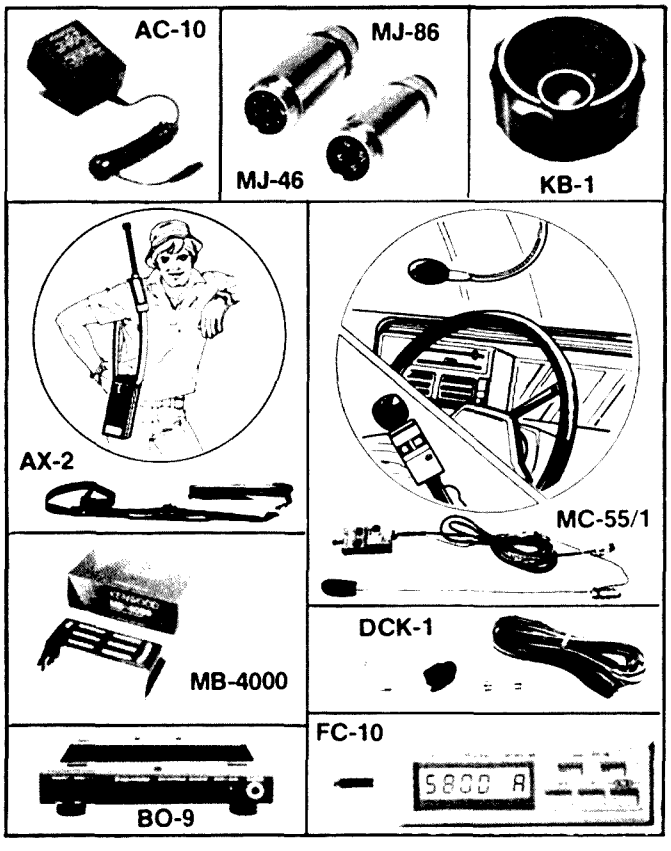
2 METER **70 CM**

FM POCKET TRANSCEIVERS

Ultra compact, slim and lightweight FM pocket/hand held transceivers designed to condense maximum performance and operating convenience into a single compact package.

SEE YOUR DEALER FOR FULL DETAILS

KENWOOD SUMMER CLEARANCE



AC-10	AC Adaptor for the CD-10	$10
AX-2	Shoulder Strap for Hand Held Transceivers with Antenna Base	$10
BO-9	System Base for TR-9000/9500	$10
BS-5	Adaptor to connect TS-520 series to SM-220	$25
DC-25	DC Converter for TR-2500/2600	$25
DCK-1	DC Cable Kit for R-600/2000	$5
FC-10	Frequency Controller TM-201/401	$25
IF-10A	Computer Interface for TS-711/811	$50
IF-10B	Computer Interface for TS-940	$50
KB-1	Deluxe VFO Knob TS-830/530 VFO-240	$5
KS-038	Clamp for KR-400 Kenpro Rotator	$5
MB-4000	Mobile Mount for TW-4000	$10
MC-55/1	Mobile Microphone	$40
SWC-3	Coupler for SW-2000 1.8 — 54MHz	$20
MJ-46	Mic. Plug Adaptor (4 Pin — 6 Pin)	$5
MJ-48	Mic. Plug Adaptor (4 Pin — 8 Pin)	$5
MJ-64	Mic. Plug Adaptor (6 Pin — 4 Pin)	$5
MJ-68	Mic. Plug Adaptor (6 Pin — 8 Pin)	$5
MJ-84	Mic. Plug Adaptor (8 Pin — 4 Pin)	$5
MJ-86	Mic. Plug Adaptor (8 Pin — 6 Pin)	$5

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VHF UHF — an expanding world

Eric Jamieson VK5LP
8 West Terrace, Meningie, SA. 5264

All times are Universal Co-ordinated Time and indicated as UTC

AMATEUR BANDS BEACONS

FREQUENCY	CALL SIGN	LOCATION
50.010	JA2IGY	*Mie*
50.022	ZS6PW	*Pretoria* [1]
50.075	VS6SIX	*Hong Kong*
50.090	KH6EQI	*Honolulu*
52.013	P29BPL	*Loloata Island*
52.100	ZK2SIX	*Niue*
52.200	VK8VF	*Darwin*
52.250	ZL2VHM	*Manawatu*
52.310	ZL3MHF	*Hornby*
52.320	VK6RTT	*Wickham*
52.325	VK2RHV	*Newcastle*
52.330	VK3RGG	*Geelong*
52.345	VK4ABP	*Longreach*
52.350	VK6RTU	*Kalgoorlie*
52.370	VK7HST	*Hobart*
52.418	VK0MA	*Mawson*
52.420	VK2RSY	*Sydney*
52.425	VK2RGB	*Gunnedah*
52.440	VK4RTL	*Townsville*
52.445	VK4RIK	*Cairns* [2]
52.450	VK5VF	*Mount Lofty*
52.460	VK6RPH	*Perth*
52.465	VK6RTW	*Albany* [3]
52.470	VK7RNT	*Launceston*
52.485	VKSRAS	*Alice Springs*
144.022	VK6RBS	*Busselton*
144.400	VK4RTT	*Mount Mowbullan*
144.410	VK1RCC	*Canberra*
144.420	VK2RSY	*Sydney*
144.430	VK3RTG	*Glen Waverley*
144.445	VK4HIK	*Cairns*
144.445	VK4RTL	*Townsville*
144.465	VK6RTW	*Albany*
144.470	VK7RMC	*Launceston*
144.480	VK8VF	*Darwin*
144.485	VK8RAS	*Alice Springs*
144.550	VK5RSE	*Mount Gambier*
144.565	VK6RPB	*Port Hedland*
144.600	VK6RTT	*Wickham*
144.800	VK5VF	*Mount Lofty*
144.950	VK2RCW	*Sydney*
144.950	VK3RCW	*Melbourne* [4]
145.000	VK6RPH	*Perth*
432.066	VK6RBS	*Busselton*
432.160	VK6RPR	*Nedlands*
432.410	VK6RTT	*Wickham*
432.420	VK2RSY	*Sydney*
432.440	VK4RBB	*Brisbane*
432.445	VK4RIK	*Cairns*
432.445	VK4RTL	*Townsville*
432.450	VK3RAI	*MacLeod*
432.535	VK3RMB	*Mount Buninyong*
432.540	VK4RAR	*Rockhampton*
1296.198	VK6RBS	*Busselton*
1296.420	VK2RSY	*Sydney*
1296.445	VK4RIK	*Cairns*
1296.480	VK6RPR	*Nedlands*
10300.000	VK6RVF	*Roleystone*
10445.000	VK4RIK	*Cairns*

1. Advice has been received from Hal Lund ZS6WB, that a new six-metre beacon will be operating from September 20, 1987, on 50.0225 MHz running 60 watts to a six-element Yagi at 50 feet with CW identification "ZS6PW" for about six seconds, followed by six seconds of carrier. After TEP tests to the north conclude on November 1, 1987, the antenna is to be turned towards Australia for the Es season. (VK6 stations in particular should keep an ear open for this one as a possible Es distance especially late afternoon time!). Hal's telephone numbers are — Office (012) 45 5566 and 45 5567 from 0800 to 1700 South African time
Home (012) 46 6544 or 46 4725.
ISD connections will be needed, of course. Hal's address is PO Box 27746, Sunnyside, South Africa, 0132.
2. Confirmation has now been received that the Cairns six-metre beacon is operational and this completes the first part of their project. Ian Baty, Secretary of the Queensland Tropical Region VHF Association, and who is VK4AFC, also comments if the Cairns and Townsville beacons remain on the same frequencies they may have to consider time-sharing.
3. Karl VK6XW, in Albany, has written to say the VK6RTW six-metre beacon has been off the air for a while but hopes it will be operating for the December period. Therefore, I have left the beacon listed and hope that it is back on the air by the time you read this epistle. The Albany two-metre beacon is still operating. See further comments from Karl's letter elsewhere.
4. Ian Stanley VK3CIS, has written because apparently no one else did (!), to say there is a beacon in Melbourne, VK3RCW, on 144.950, which transmits Morse at five and 10 words per minute using FM. This is probably a similar arrangement to VK2RCW. Thanks Ian, for writing. Also, a note has been received from Kathy Gluyas VK3XBA, Repeater Administrative Co-ordinator, which, in effect, reports that VK3RMV, at Hamilton is no longer operating.

Apparently there are problems with the power bill for running the beacons and the advice received here dated 9/9 indicates the beacon is to be switched off. It will go on again, presumably, if those who want it are prepared to pay something towards its operation. So, VK3RMV on 52 MHz and 70 centimetres has been removed from the list.

NEWS FROM SOUTH AFRICA

The September 1987 issue of *VHF News* from South Africa has arrived on my desk, per favour of Hal Lund ZS6WB. (Hal and I have had an exchange of correspondence previously).

Amongst matters discussed in the *VHF News* is that relating to the six-metre beacon which I have already told you about. Other uses for this beacon are propagation tests between South Africa and Malta. The call is 9H1SIX on 50.085 MHz and running 10 watts to a five-element Yagi.

One of the problems the South Africans have, and I mentioned this when I last wrote about South Africa, is the difficulty of completing Es contacts due to the way their population is distributed; there are very few opportunities due to the way their population is distributed; there are very few opportunities for contacts at the prime Es distances. On two-metres recently, ZS4AAB, in Lime Acres (KG11) completed a 900 km contact with ZS6BPJ/6 at Klerksdorp on CW. Other distances have been 775 km and 580 km. ZS4AAB was reported heard in Bulawayo, a distance of 1050 km.

To activate little known areas, the amateurs go out portable. They are very keen on using Grid Squares and hence travel around to activate those without local amateurs on VHF. They even *have* a small pool of loan equipment which can be made available to operators without appropriate equipment if travelling to a rare location.

As I said following the beacon list, VK operators may have opportunities again to try working a ZS6 as the Cycle 22 slowly makes its way up the scale. I well remember hearing ZS6LN on 50 MHz one afternoon and trying to make it a cross-band contact from 10 metres, but without success as the big hill to the west of me at Forreston dropped the signals and I could not compete with stronger stations. With nothing in the way at Meningie even I might have a better chance this time!

ALBANY SPEAKS

I was pleased to receive a letter from Karl VK6XW, outlining the present status of Albany on the VHF scene. The 10-metre beacon on 28.266 MHz is up and running well with four watts to a vertical dipole. As reported earlier, two-metres is okay, but six-metre seems to be the main problem.

All the beacons run from Karl's QTH in the town of Albany on the slopes of Mount Clarence about 50 metres above sea level, with a clear run to the east. He said no one loves the job of Beacon Officer because no one wants to really live with them in your back yard! At the moment the only stations operating on six-metres are Bob VK6BE and Karl VK6XW. One of the problems they do have is that the incentive to get on six is prejudiced due to lack of openings on that band during the Es period. I have heard this comment on air before today. One does wonder, however, in the light of the generally accepted situation, how many of the Albany stations are well set up for six metre operation? Operation from Esperence seems to have been moderately successful but I accept it is about 500 km closer to the eastern area than Albany.

Karl is not active on two-metres as he is right in the firing line of Aub VK6XY and Wally VK6WG, when the band is open, and they virtually wipe him out. Also, the beacon generates quite a problem when it is operating from about 16 metres away!

Karl asks me if I packed up my 60 dB hill and took it with me to Meningie. I can assure him and everyone else, I was glad not to have to pack it as it had already caused enough problems in the past!

VHF DXING

Charlie VK3BRZ, has drawn my attention to a special article in *ham radio* magazine for July 1987, written by Joe W1JR (a world renowned VHFer) covering various aspects of VHF DXing. It certainly should be required reading if you can lay your hands on the article. As Charlie says, a lot of it is only relevant to the North American Continent, but there is still enough in it for us to read it through again.

Charlie writes "You may find W1JR's definition of a QSO interesting, as I did. He makes no mention of a signal report as being necessary in order to establish a confirmable two-way contact. This seems sensible to me as too often signal reports are meaningless either because of the DXers syndrome where everyone is 5x9 or because, as in the case of Es contacts, QSB makes a simple signal report deceptive. Exchanging grid square references might be a better idea. Okay, after several contacts you get to know the other station's grid square, but you learn his call sign too! VHFers are basically honest and anyone hoping to be sneaky soon gets found out! And in the end, it is just a hobby and claiming false contacts requires that you first fool yourself."

I consulted the article again and from it learned just how keen many amateurs are on the Maidenhead Locator System of Grid Squares and how the grid squares can be used for "activity days" or "night" I suppose! Charlie suggests it may be worth considering a once a month activities period using the grid squares to see if it generates more interest than seems to be around at present in many places. I certainly think it may be worth a try and hopefully some club will see the virtue of this and try and set the ball rolling. And if the Ross Hull Memorial Contest this year includes reference to

the grid squares in the scoring, then this could be a good place for it to be tried.

As a matter of interest, the ARRL VUCC Award requires 100 grids on 50 MHz and 144 MHz; 50 on 220 and 432 MHz; 25 on 902 and 1296 MHz; 10 on 2.3 GHz; and five on all the bands above 2.3 GHz. You might also note that there are 32400 grid squares covering the whole world! As many of these are in the oceans, it will be some time before anyone works them all I am sure!

For comparison purposes with what goes on in the Southern Hemisphere, you might be interested to know there is a full table of all North American VHF and above claimed DX records in *ham radio*. I am sure they will not mind if I refer to it especially if it creates some further interest in the VHF and above spectrum.

On 50 MHz, records have been omitted since the primary mode is often hard to distinguish. Also, long-path QSOs exceeding 12 433 miles (20 004 km) were reported during solar cycles 19 and 21. Omitting EME, the two longest distances on 144 MHz are TE between KP4EOR and LU5DJZ established on 12/2/78 on SSB over a distance of 6328 km (3933m); and by ducting KH6GRU and WA6JRA on 29/7/73 at 4161 km (2586m).

On 432 MHz the longest contact was via ducting with KD6R and KH6IAA/P on CW 28/7/80 at 4103 km (2550m); and tropo WB3CZG and WA5VJB SSB 29/11/86 at 2121 km (1318m).

On 1296 MHz ducting KH6HME and WB6NMT SSB 13/8/86 4068 km (2528m); tropo WB3CZG and KD5RO CW on 29/11/86 2070 km (1287m).

On 2304 MHz tropo KD5RO and W8YIO CW 29/11/86 1531 km (940m).

On 3456 MHz tropo WA5TNY/5 and WB5LUA/5 CW 19/10/86 464 km (288m).

On 5760 MHz tropo K5PJR and WA5CIW/5 CW/SSB 22/11/86 459 km (285m).

On 10.368 GHz tropo WA4GHK/4 and WD4NGG FM 7/8/84 478 km (297m).

On 24.192 GHz LOS WA3RMX/7 and WB7UNU/7 SSB 23/8/86 186 km (115.5m).

On 47.040 GHz LOS WA3RMX/K7RUN and WB7UNU/W7TYR/W7ADV SSB 7/3/87 8.72 km (5.42m).

No report for 76 to 149 GHz.

On 474 GHz LOS K6MEP and WA6EJO Laser 9/6/79 24 km (15m).

A comment was made that ducting was suspected when the path was mostly over water. No efforts have been made to separate out ducting on overland paths, they are grouped under tropo.

VK stations now have some idea of what lies ahead of them if they want to make any challenges!

THE NEW SOLAR CYCLE

Very soon, I had intended saying a few words about the approach of Solar Cycle 22, which is fast approaching us. Bill Tynan W3XO in *QST The World above 50 MHz* has beaten me to it. Bill obviously has access to much more scientific information that I have so I see no reason why I should not pass on to you some of his thoughts.

"Those who were around for the peak of Solar Cycle 21 fondly recall the sometimes fantastic conditions it produced. For several years beginning in the fall (autumn in Australia. . .5LP) the months from October through April provided legendary six-metre openings. Many accomplished WAC. In the West and Midwest, Japanese and South Pacific stations boomed in. Much of the country had a crack at the South Africans and many South Americans fired up on the band. A few stations operated from Europe, some legally and some not. Among the legal one, ZB2BL Gibraltar, and EI2W, EI6AS and EI9D in Ireland were widely worked. Also, fairly active was Icelandic station TF3SG, later changing his call to TF3T. Occasionally, a station would appear that could be classified as rare DX, one such was 5B4AZ on Cyprus." (In Australia much good DX was also available but we were severely limited due to not having the use of the 50 MHz region of the band. But many countries were worked from the Pacific Islands, plus, of course, Japan, USA, Mexico, Alaska, the Caribbean area, plus India, Hong Kong, Indonesia, Brunei, etc, etc. . .5LP).

"It is too early to predict whether the new cycle will be as good to us as the last one, but even if it falls short, some F2 openings are certain to return to six-metres over the next few years. Yes, by almost everybody's estimate, it seems sure we have seen the bottom of the solar cycle and are on the way up the curve. The NOAA Space Environment Laboratory in Boulder, Colorado, estimates the minimum of the cycle, and hence the end of Cycle 21 and the birth of Cycle 22, took place in September 1986, so *we are a year or more into it* and climbing.

"NOAA states in their report of June 17, 1986, that the average time between minimum and maximum is about four years. At the time, they were predicting the minimum to be about February 1988 and were estimating the maximum of Cycle 22 would occur in mid-1991. However, since the minimum was most likely either June and September 1986, the maximum will occur probably sometime in 1990. But we should not have to wait until then for the six-metre DX to return. Scattered six-metre F2 openings began to appear in October 1978, only two years after the beginning of Cycle 21. Based on this reasoning, there is a chance we may encounter some six-metre F2 about a year from now.

"In addition to elevated F2 maximum usable frequencies (MUF), other propagation modes should come in for improvement. Some of these will affect the higher VHF bands in addition to 50 MHz. Transequatorial propagation (TEP) should begin to pick up for those closer to the Earth's magnetic equator. Recall that two-metre openings between the Caribbean and southern South America, as well as between southern Europe and southern Africa, and Japan and Australia, were quite common during the early evening hours a few years ago. It has been shown that frequencies as high as 432 MHz can be propagated by this mode, although a two-way contact is yet to take place on this band. When it does, it will represent a new terrestrial world DX record.

"The more immediate affect should be an improvement in the 10 metre band. The return of better 10 metre F2 propagation should also give six-metre operators a chance to get together on the established liaison frequencies, 28.885 and 28.385 MHz.

"The bottom line — better conditions are coming, and quite soon."

Thanks Bill for some interesting facts. This should suffice for the moment to satisfy those few who have written to me asking for an outline on what we can expect with improvement in conditions for Cycle 22. Another factor not mentioned is the tendency for F2 propagation to follow the sun, ie contacts with stations in the Pacific Ocean regions are more likely to take place in the mornings, Australian time, than later in the day. Many contacts were made to the USA and Mexico etc around 0000 UTC perhaps even earlier or maybe later, such are the vagaries of the system. Certainly, as the good conditions *approach*, *you* will be missing out on some good contacts if you lie in bed too late. But none of this can be taken too literally. Many contacts have been made during the afternoon, so it is really a case of being vigilant and calling and listening on the band as well as monitoring 10-metres if you really want those exotic contacts.

Please remember not to clutter the calling frequency of 52.050 which is now widely known throughout the world. The North American DX calling frequency is 50.110 and their national calling frequency is 50.200 MHz. But, keep in mind that we in VK have some restrictions on the use of 50 MHz, but what we have been granted so far will at least allow us to have access to a lot of areas which do not normally bother to look on 52 MHz. One major problem for overseas stations is that those with antennas designed mainly for 50 MHz often do not work too well on 52 MHz as efficiency usually drops off very rapidly on the high frequency side of the optimum frequency. That is why so many of our antennas cut for 52 MHz will work quite well at 50.110 MHz because of the slower drop off in efficiency on the low side. As long as you do not become too paranoid about a rise in the VSWR as you go down in frequency you will find you can listen quite well down there with not a great deal of loss in power. After all, 50 watts from your 100 watt amplifier will not really make a very great difference to what is heard at the other end unless perhaps you are working very marginal DX on CW!

Finally, it was good to read in Bill Tynan's notes that the North American boys had a ball this year on Es on both six and two metres. July 21 was a great day for VE1YX who worked 160 stations in Europe, working six call areas in G-land, plus EI and LA and cross-band six to 10 metres to F, DJ, HB and PA. Norwegian stations now have full use of 50 to 52 MHz with some power restrictions. Apparently, the French are getting a little snarly about how things are going on six-metres and have begun allocating subscription television to several stations right in the 50 MHz band. If these stations run high power they will put plenty of crud on the band and make it difficult for the G stations, whom the French have not been happy about having 50 MHz anyway!

Bill also said two-metres had been as wild as its 50 MHz cousin! VP5D worked 31 stations in the US. July 17, was a great two-metre Es day with WB9MSV having more that two dozen contacts over a four hour period while KD7IY had 62 contacts in two and a half hours. KH6HME has worked US State number 3 by working ND7M for a distance of 2528 miles (4068 km).

OTHER NEWS

A call from John VK4ZJB, says Nev VK4ZNC, is having another fling at a DXpedition this summer and hopes to operate from T2 Tuvalu, T32 Tarawa and C21 Nauru. I hope these locations are correct but that is the best I can get from the Call Book. In any case, it seems Nev will be going nearer the equator this time so should find it quite humid in December. Frequency will be 52.050 MHz. All operators are asked to be gentlemanly in their approach to contacts with Nev. If you have already worked him at a particular prefix then give others less fortunate a chance to contact him, or at least make your contact very brief.

John also said, with the change to stereo, there have been changes to the operating frequencies of Channel 0 — they are now 51.9140625 and 51.671875; the station will also be moving to Mount Mowbullan near Toowoomba, which is about 160 km west of Brisbane, this will provide some relief for six-metre operators in Brisbane, if only with the removal of some of the crud especially with one of the stereo frequencies so close to 52 MHz. Channel 10 will now operate from Brisbane which should cause less problems although there will be a need to keep your fourth harmonic level low or you may still cause some interference.

STOP PRESS:

Latest news from John VK4ZJB, is that Neville VK4ZNC, was to leave Brisbane on November 13, 1987, and anticipated spending 10 days at Nauru (C21), 10 days at Tarawa (T32)), and 10 days at Tuvalu (T2). There is also a possibility that the tour could be extended until about Christmas time.

Steve VK4KHQ, who has been running a keyer on 52.060 MHz, advises in a phone call he has changed jobs and this will keep him away from home during most weeks so the keyer will be largely off Monday to Friday, and with limited operation at weekends. This will probably mean some reduction in contacts to the Mount Isa area.

RADIO NAVIGATION SYSTEMS

I was interested to read in *The Western Australian VHF Group Bulletin* for September, of a new

navigation system being developed. I believe it is of interest to readers.

"Most readers will remember reading about the Syledis positioning system which operates in the 70 centimetre band and caused much concern during the America's Cup races. Syledis is still being used extensively for off-shore survey work where reliable and accurate position fixes are required.

"Some relief from UHF interference to our 70 centimetre band may be on the way with a new system called "SPOT" from Off-shore Navigation Inc, of New Orleans. This system operates in the medium frequency band between 1.600 and 1.800 MHz and is unique in being able to differentiate between the sky wave and the ground wave signals received by the mobile receiver. SPOT achieves this by the use of Pseudo-Random Code (PRC) modulation. The PRC code for a particular base station is stored in the microprocessor memory of the mobile receiver. During acquisition, the mobile receiver looks for a signal with the desired PRC, and the phase of the signal driving the code generator is constantly shifting until it agrees with the received PRC. When this occurs, a high correlation peak is generated indicating signal acquisition and code lock-on. Motion toward or away from the station can then be measured by observing the phase of the internal signal driving the mobile code generator. When the sky-wave arrives, a second and possibly larger correlation peak will be generated, but it is readily distinguished from any ground wave peak as long as any ground wave exists.

"The range of the system is limited only by the presence of a ground wave signal. Tests in the Gulf of Mexico have demonstrated stable ground wave coverage out to 400 miles (660 km).

"Another feature is that SPOT utilises spread spectrum transmission. SPOT actually transmits on 4000 discrete frequencies separated by 38 Hz in an overall bandwidth of 152 kHz (99 percent of transmitted power). A one watt transmission is therefore divided so that only 0.00025 watts will be transmitted on any given frequency.

"High accuracy relies on accurate time references at the transmitter and receiver. Each SPOT mobile and base station incorporates a cesium beam frequency standard, enabling one-way range measurements to be made. In the normal mode, only the base stations transmit. Every three to four hours the mobile station will initiate a round-trip transmission to eliminate any clock drift between the two cesium frequency standards that may have occurred since the last update. Relative drift will be well under one metre in this period."

Figures 1 and 2 give a visual outline of the operation of the SPOT System. (Drawings reproduced courtesy of *The West Australian VHF Group Bulletin*).

The South East Radio Group Bulletin reports an incident which occurred on 30/8 when the Novice Class had finished for the night and the students, with their "portable" room heaters tucked under their arms headed for the door and home. Ivan VK5QV, stayed behind to tidy up and close the building.

Before leaving, Ivan had the students return and shuffled sheepishly back into the room followed by a brace of armed gendarmes. They (the students) had been apprehended loading certain electrical appliances suspected of being stolen, into their vehicles!

Ivan was able to verify that they were, in fact, students and really did not look like criminals (not all of them, anyway!) and after some amateur radio PR, everyone went their way, free men.

At least this indicates the gendarmes are vigilant and it was probably worth making sure, especially when one considers the quantity of amateur equipment being stolen.

THE BEACONS

There are still many custodians who need to confirm the status of their beacons following my now repeated requests through these columns. Apart from the Albany note this month, and the extraction of information regarding a frequency change for the Busselton beacons, nothing has been heard from anyone in Western Australia. Canberra also is noticeably lacking in attendance to this matter as are the Tasmanians.

THE NEW LOCATION

Having settled in rather well at Meningie (housewise, that is!), I hope soon to be able to do something about getting some antennas in the air. I have completed all the shelving for the equipment in the shack and suffered hours of fumes from the heavy-duty wood finish they have been given. Every time I shut the room up and re-open it the next day the fumes are still there, but I suppose they do eventually dissipate!

I have been consulting with David VK3AUU, on possible antenna changes and, as it takes some time to build new ones, I may, for this year, content myself with using some of the former antennas. I really did not think anyone could be so busy after making a house change, there never seems a spare moment to get on with the amateur radio side of things!

I wish to thank everyone for being patient at the general absence of specific news items during the interim period, Once I get operational again I hope to exploit my better location and be able to tell you more about general band activities.

With this issue I commence my 19th year of writing these columns. Once again, I wish to thank all those good people who, over the years, have continued to provide me with so much valuable information. There have been changes of personnel writing In that time of course, but news from new sources is always of interest. I also want to thank those connected with *Amateur Radio* magazine for the continuing support they have given me. I don't normally single people out but I have found a very close affinity with Ken and Bett McLachlan and enjoyed so much the little notes penned by them from time to time. We are all going to miss their expertise associated with the production of the magazine, one which I have always found well worth reading.

BICENTENNIAL ANTARCTIC EXPEDITION 1987-1988

Don Richards VK2BXM, has written to say they are planning another voyage south in the *Dick Smith Explorer* vessel, leaving early December and sailing directly to the Antarctic where the shore party will be put ashore at Cape Hallett or Cape Adare, about 70 km from Mount Minto. In the event of bad weather, a helicopter can be used to transport the climbing party to the shore. The ship will then put to sea and continue a marine studies program.

Mount Minto is the highest point in the Admiralty Range, being 4163 metres ASL and has never been ascended though several attempts have been made and failed due to the poor weather. Two challenges exist, the first to cover the 70 km to the Mount and secondly, to climb it!

Don Richards is ship's master and radio operator and sailed as mate and radio operator to Commonwealth Bay in 1981/82, and was master and radio operator of the DSE in the *Project Blizzard* expedition of 1984/85. He will be taking HF equipment and will not be leaving the ship, nor will a shore station be set up. The climbers will carry the equipment necessary to keep in contact with the ship.

Don is hopeful that Kenwood will loan him one of their transceivers that carries six-metres SSB and FM. One problem is the rigging on the ship will largely preclude the use of a six-metre beam. He also says he could take two-metres again and try for auroral scatter.

So that is some preliminary information on a possible six-metre contact. Don has indicated he will be sending me additional information, so by next issue there may be more to tell. In the meantime, you have been warned!

CLOSURE

May I take this opportunity of wishing everyone the compliments of the season and may Christmas and the New Year be a very happy time for all. Transceivers are now too expensive to include in Christmas stockings but you may receive something you value equally — say a loving kiss and a hug from your spouse!

Closing with two thoughts for the month: *One of the greatest sources of energy is pride in what you are doing,* and *The measure of life is not its duration but its donation.* 73 from *The Voice by the Lake.*

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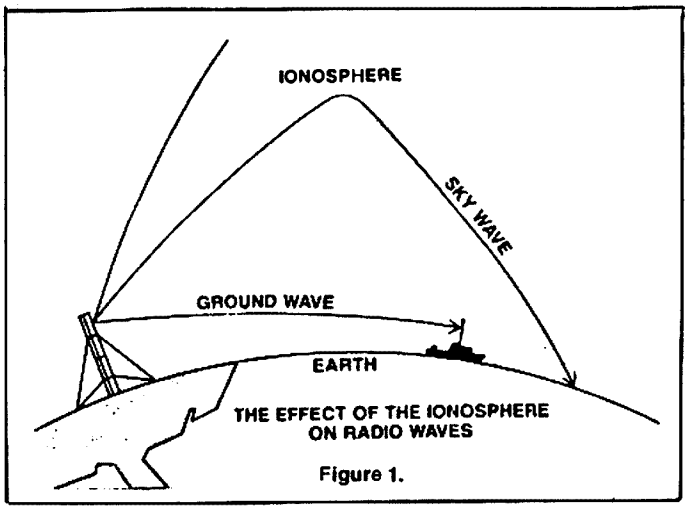

Figure 1.

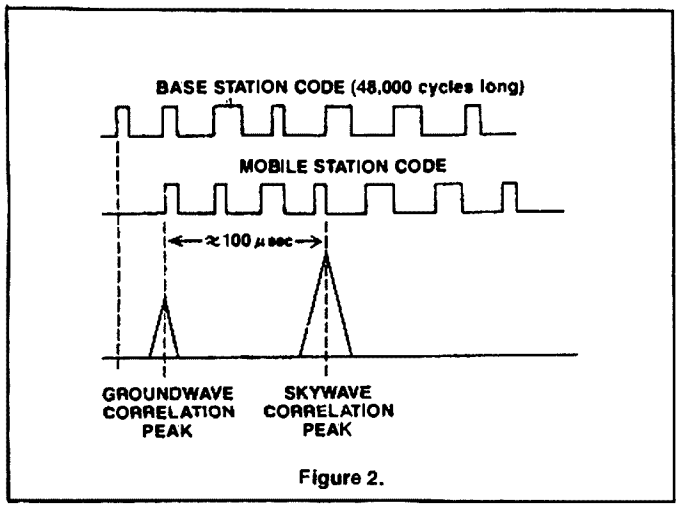

Figure 2.

Beacons & Repeaters

Tim Mills VK2ZTM
FTAC BEACON CO-ORDINATOR

The Federal Technical Advisory Committee (FTAC), maintains a national database of Australian Beacons and Repeaters. Access to this information is now also available on the Federal *Telememo* bulletin board. To keep the information up-to-date it is important that State technical committees, as well as the various groups, advise the Federal Office of any changes or additions. Send this information via *Telememo* or write to FTAC, PO Box 300, Caulfield South, Vic. 3162.

Work is proceeding on the various papers concerning beacons, repeater tone access and pagers for neighbours. Your input to the various discussions is most welcome.

During JOTA week in October, Australia's satellite organisation *AUSSAT* made available an audio channel via one of the transponders. This enabled a week-long hook-up to be made between VK6RTH 6800, in Perth, and VK2RMB 6875, in Sydney. It provided a most interesting experiment in long-distance linking.

Pager systems are still expanding their national coverage and it is unfortunate that their allocation is adjacent to the top end of the two-metre band. Several groups are having to come to terms with them and this is the reason for the investigation into 'pagers for neighbours'. In VK2, it was recently announced that Telecom installations would be made adjacent to the sites used by VK2RHR 7350 Mittagong and VK2RGN 7325 Goulburn. This problem is currently being addressed which could require the assignment of alternative channels to these repeaters. Not an easy task in that part of VK2 where almost every channel is used and accessible from the higher ground of the region. The Sydney Eastern Suburb System VK2ROT 7075 suffers from remotely generated intermodulation on its input. This system is expected to change to channel 7025. In the south-west region of Sydney VK2RLD which was on 7375, developed a pager for a neighbour and channel changed to 6625. This channel had been VK2RPI of RTTY in Newcastle, but had not been activated as Newcastle also has a RTTY repeater on RAN 6975. Pagers have not left Newcastle alone either and VK2RTZ 7100 has channel changed to 6775 and 7100 will be relocated to Muswellbrook as VK2RZL, a new system. Parkes and District ARC have had their VK2RWM 7100 off air for much of the year as a result of a lightning strike. They are currently building a UHF repeater to add to the site.

On the Beacon side of things, a six-metre unit is currently under construction for installation at Broken Hill. It will be VK2RBH and the channel should be 52.320 MHz. This is currently utilised by VK6RTT, so we will see if they are able to change to one of the VK6 allocations. The Queensland Tropical Region VHF Association are to establish a 10-metre beacon on 28.265 MHz. They are also constructing a 2304 MHz beacon. All Australian 10 metre beacons will have to change to a time slot, shared channel system from 1990. There has been some interest recently in the possible establishment of a 20 metre beacon in eastern Australia. This is unlikely as the 20 metre project is managed from America and the only slot available was planned for a possible system on the western side of Australia.

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Magazine Review

Roy Hartkopf VK3AOH
34 Toolangi Road, Alphington, Vic. 3087

G General
C Constructional
P Practical without detailed constructional information
T Theoretical
N Of particular interest to the novice
X Computer program.

QST July 1987 — Low Cost QRP Power Booster (C N). Simple Crystal Filters (P N). Vertical Antennas (G).

HAM RADIO June 1987 — Compact 20 metre Transceiver (C). Diode Leakage in Double Balanced Mixers (P N).

RADIO COMMUNICATION September 1987 — Antenna Construction (P). 1.8 MHz QRP Transceiver (C).

SHORT WAVE MAGAZINE June 1987 — Product reviews and general information for the shortwave listener.

ELECTRONICS AUSTRALIA September 1987 — Australia Rewards Hi-Tech Enterprise (G).

CQ August 1987 — Antenna Special (G N).

Break In August 1987 — ATV Special Issue. (G).

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Ionospheric Summary

The August summary from IPS Radio and Space Services contains the following information.

The monthly averages are 10 cm flux 90.3; sunspot number 38.6; A Index 13.5; I Index 27.2; and there were nine flares.

Solar activity in August was low except during the periods August 7 to 8, 13 and 22 to 23, when a number of weak M class flares appeared. The total of nine M class flares during the month is the largest number observed for any month since February 1986.

The activity arose from a number of solar regions, and there were regions visible for the whole of the month on the solar disc each day. The number of regions produced a high value for the month averaged solar flux of 90.3, the highest value since June 1984, and also a high value of 38.6 for the monthly averaged sunspot number. The yearly averaged sunspot number for February rose again strongly due to the higher sunspot number experienced over the last few months.

With regard to geomagnetic activity, August was a disturbed month with two strong disturbances and several other periods of lesser disturbance. The most disturbed period was between August 25 and 27, when there were two days on which the A index exceeded a value of 30.

The field was active on August 5, 12 to 16, 24 to 27, 30 and 31. There was a sudden commencement, an abrupt change in the strength of the field at 0941 UTC on August 24, and a major storm started at 0700 UTC on August 25, and remained that way until it abated on August 27.

When the new cycle begins, there are many and varied assessments from different sources of what the cycle number will peak.

VK2QL has received a document called *The Solar Update for Cycle 22*, from the US.

At present, IPS have not changed their initial assessment that the cycle will peak around 130.

There are already 31 reported predictions for cycle 22 smoothed sunspot number.

Those listed in the update are 107, 118, 120, 159, 170 and 185. All claim the maximum will be in 1990 or 1991. One of the predictions give the peak of the cycle to cover 1990 to mid-1991, instead of the usual short peak.

In their summary, IPS show the curve of cycle 21, which started in June 1976, peaking December 1979, and bottoms September 1986. The cycle ranks as the second highest ever recorded, the highest being cycle 19.

The summary has a graph showing the 12 month smoothed and one month average, and the peak monthly sunspot number towards the end of 1979 was 188, which was not far off the peak sunspot number of 201 for cycle 19.

—Contributed by VK2QL

VNG — SILENT KEY

On October 1, 1987, Australia's precise time and radio frequency service, VNG, ceased operation.

VNG had operated for 25 years and was used by astronomers, sailors, the scientific community, surveyors, the military, government departments and radio amateurs.

The closure meant the removal of a cheap and readily accessible time and frequency standard which was widely used throughout the Australasian-Pacific basin region.

The service gave the precise time through a series of tones and voice announcements, and could be used to determine geographic locations.

A Telecom spokesman said VNG cost $100 000 a year to operate and attempts during the past year to have it taken over by a government department were unsuccessful. It was consequently thought, in the circumstances, no longer appropriate to keep the service running.

VNG operated on a number of frequencies from Lyndhurst, south-east of Melbourne. Telecom last year said it had to vacate the Lyndhurst site and relocation of VNG could have cost about $1 million.

During the past year major government users of VNG were asked if they wanted to provide funds for the services on a user-pays system.

It said other systems were available to check time and frequency, and satellite technology, whilst more expensive, was now being used to determine geographic locations.

—Contributed by Jim Linton VK3PC

How's DX?

Special Guest Writer:
John Saunders VK2DEJ
8 Toni Crescent, Ryde, NSW. 2112

DX OPERATING

Whilst talking to a couple of friends who have recently obtained full calls, it became obvious that they were not aware of come of the established methods for, not only working that rare one, but also obtaining that elusive QSL card.

For the beginner in DX chasing I would recommend joining one of the established DX nets. This provides the opportunity for working DX even if you are only running barefoot (no linear amplifier) into a dipole. A net control station will come on air at a given time and frequency, eg ANZA (Australia, New Zealand, Africa) at 0500 UTC on 14.135 MHz and ask if there are any stations who wish to join the net. This results in a number of stations all calling in at once. The control station lists them, often in order such as Australia, Africa, etc. Then, when he has his list, he will start at the top and ask each station in form if they wish to work any of the stations listed. It may happen that you need a ZS3, and one has checked into the net. When you heard him check in you noted his report, say 5 and 7. When your turn comes you simply call:

"ZS3 this is VK-GAA, your report is 5 and 7,"

He will reply:

"VK-GAA, this is ZS3AA — thank you for the 5 and 7,"

You then confirm your report saying:

"Thank you for the 5 and 6 ZS3AA, this is VK-GAA, back to net control."

You have exchanged reports and that is the basic minimum needed for a contact.

Now that you have had a contact comes the hard part — the QSL!

In most cases use the QSL bureau. It may take time but it is cheap. If ZS3AA says that his QSL manager is WA3HUP, then you must send your card direct to that station and enclose in it a self-addressed envelope and return postage. Obviously, Australian stamps are no use so you pay a visit to your local post office and buy some International Reply Coupons (IRCs). At the time of writing this they are just under $1.00 each. Send a minimum of two and preferably three, which will enable the QSL manager to cash them at his post office to cover air mail postage for your card. Do not delay the net by asking for QSL information, etc. The net controller should mention it from time to time.

QSL managers donate their time and effort and deserve all the help you can give them. Do not expect them to pay out of their pocket for your card. Also, the addressed envelope makes things easy for them and they will return your card to you with the minimum delay. Do not expect it too soon, however, the station you worked has to send his copy of his log to the manager so that your contact can be verified. If he does this by radio it is fairly prompt, but if he sends it by mail then, some time may transpire between your contact and the manager receiving the log. Very few QSL managers will acknowledge cards sent to them via the bureau. If ZS3AA is only visiting the country, he may wait until he returns home before processing the cards so please be patient. Do not send multiple cards or irate letters.

Imagine if ZS3AA had 5000 contacts, when he eventually gets home he will certainly have a lot of mail to answer. It would cost him a fortune, on top of his air fares, etc so do not expect him to pay further. In some cases a DXpedition to a remote location will suggest that offers of financial help would be appreciated. This is fair and reasonable as it can cost thousands of dollars In some cases to get to rare sites such as Kerguelen Island. However, avoid those who demand X dollars for a QSL card. It is amateur radio and not a commercial operation.

Some people are against the use of DX nets, but I feel they have a place. First, they help the new operator and avoid the "dog-piles" (unruly calling masses!) that occur. Secondly, sometimes the DX station is not an experienced operator and he appreciates the help of a DX net control in handling the crowds.

On other occasions, an experienced operator will operate on his own. Often he will work simplex. That is, he will transmit and receive on the one frequency. This is fine if there is no great rush on him, but if a lot of stations are looking for him then he will operate split frequency. That is, he will call say on 14.195 MHz and say "This is YA7AA listening between 14.205 and 14.250". You then pick a frequency in his specified range and call him. If you are quick and listen for him for a time you may detect a pattern. He may start answering stations on 14.205 and then work slowly up to 14.250 then flip back or tune back slowly to 14.205 MHz. One of the worst cases can be if the DX station says he will listen on 14.205, 14.215 and 14.225. This causes three dog-piles and makes it difficult to have a contact if you are not using five kilowatts and a 10 element beam at 100 metres!

It pays to listen for a while and work out how he is working the crowd. Once you have a contact, make it short and snappy.

He knows his call sign quite well, do not repeat it or drag it out phonetically. He needs to know your call. Say it slowly and distinctly with phonetics. He is not interested in your name, your town, your equipment or your weather. Do not hold everyone up by asking his QSL information. He should announce it from time to time. The various magazines often print them and, if you are a real DXer, you will subscribe to one of the regular DX bulletins which publish all this information, plus details of anticipated events.

Advice is often given that the best way to work DX is to listen, listen and listen. This is good advice but by all means throw in a call now and then. I once called CQ Africa at 3 am local one morning and a 5R8 replied to my CQ. Directional CQs, such as above are handy if you are chasing one area or for example you can call CQ Nevada, or whatever.

It is also worthwhile to throw in a CQ on the empty band occasionally. You never know who may be listening. I have made a practice after a contact to listen on the frequency for a while. Provided the previous contact was not there first, then it is considered your frequency. Quite often anything up to a minute after your contact has ended a station, often low powered, will call. Sometimes you can land quite a rare one and, if during your contact you have been saying that you need a 5H3 contact above all else in this world, then for goodness sake listen on for a while as one may well appear, or someone else will call to let you know there is a 5H3 just up the band.

DXing is a 24 hour operation. After all, if you want South African contacts then it is no good calling if it is 1 am over there. You need to be aware of world times and even think in terms of UTC. All log book and QSL entries should be in UTC.

When you get that beam up then you start learning short paths and long paths at various times of the day, particularly on 10, 15 and 20 metres. I have often felt that *DXing is like fishing.* After a couple of days off air you come on air and everyone says "you should have been here yesterday — there were ZAs, etc 5 and 9."

On occasions you will hear someone say to a DX station "I'll send my card and a green stamp." You may well wonder what form of green stamp is being collected. A green stamp is a US dollar note that is often included in place of IRCs to cover the return postage.

You can obtain dollar notes from your bank or by from US tourists. Sending cash by mail is frowned on by many postal authorities so the IRC is the correct way to go. In some countries the recipient could get into great trouble if he were found out so you should take care if you indulge in this practice. Once, years ago, I heard of Australian dollars referred to as brown stamps.

Some countries do not recognise IRCs, so you have a problem trying to observe the conventions on postage. One way to show you mean well is to get a small parcel of Australian mint stamps up to a dollar — a recent philatelic release for example — and enclose that with your best wishes. This will often ensure a speedy return QSL.

Another technique that seems to help is to enclose a photograph of yourself and station. I finally had my photograph printed on the back of my QSL card. Every little bit seems to help. With Russian stations often being club stations, it helps to place the name of the operator you worked on the card — it apparently helps them sort out who was operating at the time. I usually put the operator's name on anyway as it shows you heard something through the QRM.

Sometimes, sending a photograph of yourself and the shack helps with the return of a QSL.

Sometimes it can take a year or two for your much-wanted card to appear. The postage system between Box 88 in Moscow and some of their outlying countries, such as UM8, etc seem to be very slow.

Remember that the final courtesy of a contact is a QSL card. If the other person has boxes full he may not be interested. If, maybe for some reason he does not care to QSL, then it's no bother. Often a card is wanted for an award or some purpose, so if you do not QSL, for goodness sake do not say "100 percent QSL here". Australian stations do not have a high reputation in this field and I think we should make it clear as to our intentions during a contact.

A few conventions worth remembering are:

a) No one owns a frequency.
b) Always ask if the frequency is in use — preferably twice before your first short CQ.

PERSONAL PER HATES

a) The DX station that gladly accepts your return postage and then returns to you via the bureau.
b) The operator who never QSL but say "100 percent QSL here."
c) The operator who can't wait for the end of the contact, but must break in to an established QSO. Reasonable in an emergency, but — just to tell me how hot it is today! ? !
d) The person who fires 5 and 9 and then needs three repeats to get your handle (name) and call sign.
e) The DX station that has 5 and 9 printed on their cards.
f) The operator who calls CQ for 10 minutes, often without announcing the call sign.

g) The character who calls "CQ longpath."
h) The person who says QRZ when they mean CQ.

And so it could go on but, all in all, it is a lot of fun. I hope you catch a few rare ones in the near future.

DX WORKED contributed by Steve Pall VK2PS

Aug 30, 1987:
Tom JW5E on SSB 14 MHz. QSL manager LA5NM.
Sep 6, 1987:
John BY4AOM on SSB 14 MHz from Shanghai. QSL to PO Box 227, Shanghai.
John is aged 68 and speaks excellent English as his mother was an English lady.
Sep 12, 1987:
Paul T32BE on CW 3.5 MHz. QSL via WC5P.
Sep 13, 1987:
Nick ZC4EE on CW 14 MHz from Nicosia. QSL via the bureau.
Sep 19, 1987:
CR6BWW a Special Call Sign for the 60th anniversary operating on SSB 14 MHz. QSL to CT4BWW.

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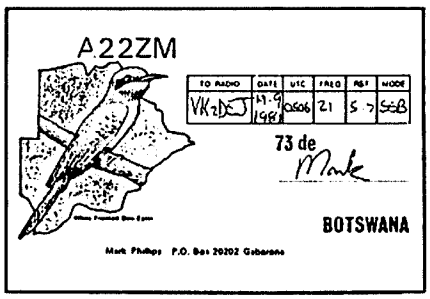


ODE TO AN EARLY BIRD

Now you early birds take great delight
At getting up at dawn's first light
To practice Morse — your keys a-tapping —
Well — I guess it makes a change from yapping.

Then again soon after tea
Once more your hands are on the key
Or — maybe now you're trying to read
Dots and dashes sent at speed
Trying not to miss a letter
Always striving to do better.
And it's funny how you never tires
Of changing all your poles and wires
Hoping that maybe you'll hear
Strange voices from the atmosphere.
Voices from lands far away,
My word! Wouldn't that just make your day.
All this sometimes causes strife
with your dear long-suffering wife
Who while your hands and tongues are wagging
Tries hard not to be a-nagging
For she knows you do enjoy
Playing with this noisy toy.

Well early birds I takes delight
In wishing you a Christmas bright
And may you all both far and near
Have a dot and dashing great New Year.

Joan Coles, wife of VK3DEG

ar

Intruder Watch

Bill Martin VK2COP
FEDERAL INTRUDER WATCH CO-ORDINATOR
33 Somerville Road, Hornsby Heights, NSW, 2077

It seems to me that I was only recently wishing readers a Merry Christmas, and here it is again! Time sure flies when you're having fun (?).

So, all the best for Christmas and the New Bicentennial Year to all who read this column, and, come to think of it, to those who don't. Let us make a bicentennial effort in 1988 to end in reports on those intruder stations you don't wish to hear using the amateur bands, who, after all, have their own frequency allocations.

IW statistics for August 1987: 108 AM stations reported; 178 CW stations; 49 RTTY stations; 74 intruders using other modes, and 35 supplied their call signs. Good help was received from VK2s BRC, DEJ; VK3s AMD, XB; VK4s AKX, BG, BHJ, BTW, DA, KHZ; VK5s GZ, TL; VK6RO; VK7RH; VK8s HA and JF.

The *big nuisance frequency* for August was 14.076 MHz, with many intruders reported by Norman VK4BHJ, mostly using tactical call signs. The *woodpecker* was busy on 7, 14 and 21 MHz.

As mentioned in the November AR column, I intend to talk a little about the various modes used on the air for the information of those who are not sure, or are perhaps new to the hobby. Last month we dealt with A1A mode, which is CW. This month we talk about radioteletype, or RTTY, which is one of the most widely-used modes employed by intruders, and one of the most difficult to identify, if one does not have RTTY capabilities in the shack.

You can establish if it is an intruder you are hearing by using the following method:

RTTY uses two frequencies — the mark and the space. Wind your VFO up to the high side of the signal and zero-beat it. Then very slowly wind down through the signal and you will hear the signal on the second frequency start to creep in. The difference between the two is the 'shift' of the transmission, and the point midway between the two is the transmitting frequency. Amateur operators are permitted shifts of up to 850 Hz, so if you measure a shift greater than that, then you are hearing an intruder.

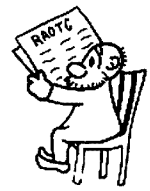
RTTY signals are **not** intruders on the 80 metre band, as this band is share; RTTY signals are intruders anywhere on the amateur segment of the 40 metre band; RTTY signals are only intruders on the 20 metre amateur band in the segment 14.000 to 14.250 MHz, as the segment 14.250 to 14.350 is shared; RTTY signals are intruder on any segment of the amateur 15 metre band and similarly are intruders on any segment of the amateur 10 metre band. We are, I stress, talking about ***non-amateur RTTY.***

So that will get you started on reporting Non-Amateur RTTY stations using our bands, and we will see you next month. 73.

Bill VK2COP

ar

Radio Amateur Old Timers Club



Kevin Duff VK3CV
PUBLICITY OFFICER
Radio Amateurs Old Timers' Club

The Victorian Branch of the Radio Amateur Old Timers' Club held its Annual Luncheon and Get-together on Wednesday, September 23, at the City and Overseas Club. This was very well attended with 68 members present. Our President, Bill Gronow VK3WG, was Master of Ceremonies and he welcomed all members and guests.

After the first course of the luncheon, the Royal Toast was proposed and members responded. During the luncheon, members had ample opportunity to meet old and new friends and to converse in a very convivial atmosphere. At the conclusion of the lunch, the President of the RAOTC commented on his report.

Firstly, reference was made to the passing of our old friend, Max Hull VK3ZS, and Bill took the opportunity of saying that Max's contribution to the organisation and development of the RAOTC will long be remembered — there was never a more willing and efficient worker. Everything he undertook, he did with dignity and style. He was a foundation member of the RAOTC (his membership number was 8), and he joined on February 16, 1976. Max's licence number was No 2307, dated 17/4/1939 and he was variously Committee Member, President, Editor of the OTN Journal and the MC at dinners and luncheons. He was one of the original, originating members and we are undoubtedly going to miss him very much indeed.

The President reported that the new members for the year totalled 33 and plans were in hand, by the Committee to recruit new members to maintain our numbers and increase them in the future.

All members were asked to bring the RAOTC to the notice of amateurs who they contact on the air. New club members are always welcome and membership is accorded to radio amateurs who have been qualified to hold an amateur licence for 25 years. Readers who would like to join as asked to send a stamped and addressed envelope to Harold Hepburn, 4 Elizabeth Street, East Brighton, Vic. 3187, for an application form.

The next OTN Journal will be issued about February 1988, and the Editor, Kevin Duff VK3CV, has some material in hand. However, if members have any interesting stories, anecdotes, cartoons, jokes, etc, that may be used in the Journal, he would be very pleased to see them. The address is 10 Stanley Grove, Canterbury, Vic. 3126, or telephone (03) 882 6431.

The Committee remains unchanged and the President took care to thank all members and everyone who had arranged the luncheon.

Our Secretary/Treasurer, Harold Hepburn was complimented for his efforts and our President said that Harold's assistance during the period of his office has been greatly appreciated.

John Tutton VK3ZC, was asked to make some comments about the RAOTC QSO Parties and John stressed the need for everyone to take an interest in this Club activity. Anyone requiring further details, and the rules, are advised to contact John.

Lay Cranch VK3CF was asked to speak and he introduced his guests, Ken Gott VK3AJU and Ric Hill VK3RC. Both of these gentlemen were very welcome and we trust that they enjoyed themselves.

The Wireless Institute is assembling a collection of QSL cards and Ken Matchett VK3TL, is looking after this. Ken spoke about this collection and stressed the importance of retaining and preserving OSL cards, particularly early A and OA cards. These are likely to be of considerable value to the WIA collection in the future. Ken would be very pleased to receive any QSL cards and they can be forwarded to him at his address, PO Box 1, Seville, Vic. 3139.

When the luncheon concluded, Chris Long, who is a freelance museum and archives researcher, showed some extremely interesting films. One of these films dated back to 1912, and Chris spoke about the advent of sound film or "talkies". Chris described this era very well and a transcript of his talk follows:

"All of my previous visits to RAOTC luncheons were at the invitation of the late Max Hull VK3ZS, and to some extent this talk also has grown out of one of Max's suggestions. About 12 weeks ago, I was having coffee with Max in his shop in Canterbury. We were talking about technical subjects and history and the subject of early talking pictures came up.

"About 10 years ago I had scripted a documentary on the beginnings of sound film in Australia. I interviewed quite a few RAOTC members for that series, Jack Murray VK3AJY, Arthur Forecast VK3AM and many others, and it struck me that there was a rather strong connection between the radio and film industries. That connection was cemented by the introduction of sound to the film after 1929, when radio techniques were suddenly necessary in an area which had previously only involved optics, mechanics and chemistry.

"The films which I have to show you today are among those which turned up 10 years ago in the course of my searches for program material for the ABC. Peter Wolfenden VK3KAU, worked closely with me on the project and I often used his old Pathe projector to screen through the old nitrate films which we located.

"The first of these films is one which some of you may have seen over ATV, but which hardly any of you will have seen projected on a screen. Peter Wolfenden and I had been searching for early footage of radio stations for some time, when the WIA's Federal President, David Wardlaw, mentioned that he had some old films at his home which originally belonged to his father. The films were of a very odd gauge — 28 mm in width — a home movie gauge introduced by the French Pathe Company in 1912, but only moderately successful. Fortunately, David had an old Pathe hand-cranked projector to try the films on and we were amazed to find that one of these was a documentary film on radio, obviously French and probably produced before 1913. When I checked through film lists of the British Film Institute and the Australian National Film Archive, I was amazed to discover that we had probably located one of the oldest radio documentaries surviving anywhere in the world. The film had originally formed a part of a home film library run by Herschells in the 1920s, a library situated in the Flinders Street Station buildings, about where Hearnes Hobbies, in Melbourne, is now.

"Now the final problem was to get a 16 mm film print made from the 28 mm original. Fortunately, Peter Lord, of Victorian Film Laboratories, was a novice operator and a member of the WIA, so we had a friend in the business to do the printing for us. Peter managed to find an old 28 mm projector movement which he fitted to a 16 mm printer especially for this job and here is the result.

"The next film is of particular importance in the history of sound film. In the early 1920s, Doctor Lee De Forest turned his inventive talents towards the perfection of a system of producing talking pictures. By using an electrically modulated glow tube in the camera, he was able to photograph the sound track down the side of the picture image onto the film itself. In other words, De Forest perfected the 'variable density' recording system back in 1922, and immediately set about producing short demonstration sound films in New York to demonstrate the system's possibilities.

"This De Forest Phono-Film system, as it was known, was introduced to Britain by an expatriate Australian radio engineer named Cyril Elwell. Late in 1924, Elwell set up a small sound film studio at Clapham Junction, in London, producing a series of demonstration sound films there for about four years. From 1924 to 1928, the tiny Clapham studio was the only sound-equipped film studio in England, and most of their films were short recordings of stage artists like Edith Sitwell, Sybil Thorndike and George Robey.

"The films usually lasted about 10 minutes or so, and were intended principally as an advertisement for the sound system. They were basically experimental films, and only a few city theatres were wired to show them in the silent film days.

"Late in 1926, De Forest Phono-Films, at Clapham, produced a few more ambitious dramatic talkies including the effort you are about to see.

"Now you have to remember that talking pictures were completely unproven in 1926. Nobody had yet produced a successful talking feature picture, and nearly all of the world's film production houses were, basically, scared stiff of the possibility of sound film. The cost of equipping all the world's theatres with sound was astronomical. Anyway, people seemed to be quite happy with silent films, and why should producers want to make their present silent films obsolete. These talkie experiments were almost totally ignored — until someone named Al Jolson came along.

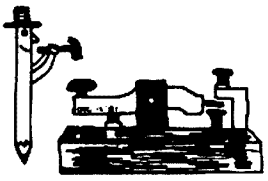
"De Forest Phone-Films, were experimental and their acting is very, very stilted. I want you to listen to the excellent sound quality they achieved — it is surprising — and I want you to notice the number of camera set-ups used through the film. The camera is quite mobile, as sound-on-film can be readily edited. When Warner Bros decided to use sound-on-disc, the camera was rendered immobile by comparison. This little film, made over 60 years ago is quite awful from a dramatic point of view, in fact the acting is absolutely hilarious. But the technology is a real credit to the technicians who made it in the winter of 1926 — and one of those technicians, Allen Butement, who did technical work on the glow tube in the recorder is with us today.

"The film, *The Antidote* was shown in Melbourne at the Majestic Theatre, in Flinders Street, 1927, which was specially wired for the purpose. Another two years were to pass before sound was generally introduced to Australian theatres.

"The last film was *Melbourne Today* (1931) the first talkie documentary on Melbourne, produced by Frank Thring Senior's "EFFTEE" film studios. The sole surviving nitrate print of the film was located by Peter Wolfenden VK3KAU, in the early 1970s, and has been copied by the National Film Archive in Canberra."

These films were very well received and a vote of thanks was given to Chris Long. This concluded the 1987 Radio Amateur Old Timers' Luncheon.

ar



Pounding Brass

Gilbert Griffith VK3CQ
7 Church Street, Bright, Vic. 3741

Gosh! I nearly forgot the deadline. I have just finished the VK/ZL/O Contest and have had no time to collate the results. The low bands were disappointing this year with plenty of noise, both atmospheric and SEC transformer noise, but I think everyone had fun on the higher bands, especially 20 and 15 metres, with a good chance, with a little luck, for DXCC in a mere day of operating.

ZL

I have received a letter from Gary ZL1AN, who is the author of the new *Morseman* column in *Break-In*. I was surprised when I wrote to *Break-In* that they did not previously have a Morse column, so congratulations Gary. Gary says, "I try to skulk at the bottom of 80 metres from about 2300 to 2400 NZST." When I figured out what that is in EST or UTC I'll see if I can make it.

G

Tony G4FAI, wrote asking if any Australian Knights know of the use of American Morse on Australian land-lines. He has discovered that one of the repeater stations on the line between Port Augusta and Albany has two sets of operators to interfere between two different Morse codes, presumably International and American. This was apparently at Eucla. Can anyone help? Just how extensively was American code used, and where? And when and how was it replaced by International code?

VE

Licence testing for the VE Morse test, effective October 15, 1986, from Moe Lynn VE6BLY, courtesy of Tony G4FAI.

"Tests are administered by three appropriately qualified amateur examiners on behalf of the Department of Communications, although candidates still have the option to be tested by the Department. There are two levels of examination. The Amateur Class requires sending and receiving at 10 WPM for three minutes, including plain language, figures, punctuation, O codes, and emergency signals. Candidates may send on a hand key, semi-automatic key, or an electronic hand key. When receiving, the text must be legibly copied by hand or by typewriter.

"The Advanced Amateur test has similar requirements, but at 15 WPM."

Morse is the only form of communication permitted on the lower part of most bands up to 144 MHz, not by 'gentleman's agreement' but by legislation. CW operating seems to have retained its status in VE and, although testing has been "modernised", it looks as though it would be easier than our present system in VK. Especially by encouraging the use of modern keyers and typewriters.

Phil VK3CDU and I were having a rag chew about the high-speed receiving test which was hopefully performed at the Ballarat Hamvention on November 1.

Reflecting that it is really a high speed writing test, we wondered if the use of a typewriter would be okay!

Bill ZL4QY, wrote me a letter in August, which I lost. Well, I found it, Bill! Bill asks me to pass on the following message; "I wish to thank the following amateurs and their wives, for their warm hospitality and great company afforded me during my last visit. Also, for showing me the various sights in so many locations: VK3s DXM, QU, CAL, CD, CVT, BPW, BRU, BUR, ADX, AIG; with greetings to BKU, BNO, AUN and VK7CW. Bill is a member of the Friday QRO net on 3.510 MHz at 9.30 pm EST.

8044ABM

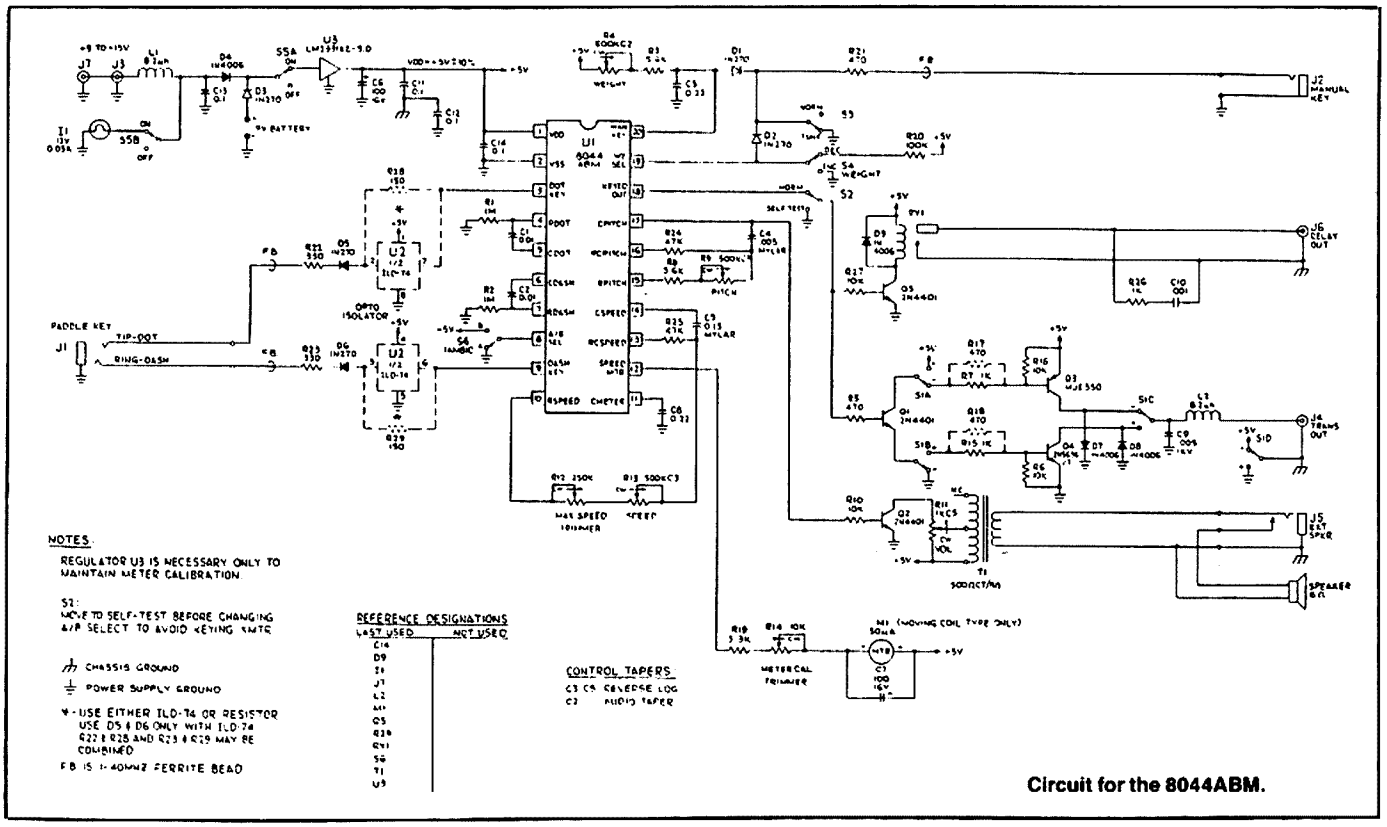
Last month I mentioned the new Curtis chip — it works! I finally built it up on an old piece of breadboard and the results are really spectacular. The positive weighting can be adjusted from zero to a complete absence of spaces, and the negative weighting from zero to a complete absence of dots. The speed control is excellent and the analogue meter works well. Dot-Dash memory can be disabled at the flick of a switch (old A or B types), and side-tone volume and pitch are adjustable with two pots.

I used BC547 transistors in place of the 2N4401s in the circuit and took the output to the rig straight from Q1. If anyone knows of a board which may be available, or if anyone with the expertise would care to make a few boards, please let me know, as there will be a market for them in the near future. Don't wait for a kit, though. The circuit is simple enough to build on veroboard, so, to anyone who can swing a soldering iron, have a go.

TWO-METRE MORSE

Since investing a lot in two-metre equipment I have found a general scarcity of CW on two-metres. Is anyone there? Am I on the wrong frequency, 144.025 and 144.100 MHz? How about Tuesday evenings for some two-metre Morse? I will be calling and listening for contacts. I don't get out well yet, but with a few to chat to I think it will be fun, and not as much QRN, QRM, either.

Best 73, Gil VK3CO.



Circuit for the 8044ABM.

Australian Ladies Amateur Radio Association

Joy Collis VK2EBX
PUBLICITY OFFICER, ALARA
Box 22, Yeoval, NSW. 2868

ALARA-MEET 1987

What a great weekend! It went like a well-oiled machine, with scarcely a hiccup — so smoothly in fact that it was easy to forget the months of hard work and planning that went on behind the scenes to make this get-together such an enjoyable event. The VK5 girls "did us proud" and thought of everything, down to the smallest detail.

Our program began on Saturday, September 26, at 9.30 am, when we arrived at Walford Anglican School for Girls, to be greeted by Maria VK5BMT and our VK5 hostess. We were issued with neatly printed name and call sign tags for easy identification, and a plastic bag of South Australian tourist information. Any initial shyness was speedily dissipated as we matched faces to voices, and it was a great feeling to be among friends, not strangers. (After all, we have already met many times on air, haven't we?).

Some had travelled very long distances. From New Zealand came Vicki ZL1OC, OM Colin ZL1CS, and daughter Angela (who currently lives in Melbourne). Poppy VK6YF and Les VK6EB made the trip from Western Australia; from Queensland, Margaret VK4AOE and OM Erwon. Nancy VK2NPG was accompanied by OM Dale, and a four-legged fluffy rug answering to the name of *BeePee*.

OM Dan and myself owe our thanks to Doug VK5PDT and Bev (now an ALARA member), who drove us to Adelaide from Renmark, giving us a chance to see a little of the South Australian countryside on the way down and back without having to worry about the traffic.

From Victoria, we had our President, Marilyn VK3DMS and Geoff VK3ACZ (who made the trip although he had not been well), Margaret VK3DML and George VK3AGM, Valda VK3DVT and Pat Stuart, Joan VK3NLO and Graeme VK3AGS and Muriel, accompanied by OM Neil VK3KNM and harmonics Simon and Charlene.

VK5 was, of course, well represented wit the VK5 Representative and ALARA-Meet Co-ordinator, Maria VK5BMT and Keith VK5MT, Jenny VK5ANW, ALARA Secretary, and President of the VK5 Division of the WIA, accompanied by daughter Wendy, Marlene VK5QO and Brian VK5CA. Denise VK5YL and David VK5RN, Joy VK5YJ, Gill (noted for her culinary prowess) and Bill VK5AWM, Christine VK5ZCQ and Geoffrey VK5TY, Carol VK5PWA, Meg VK5AOV and David VK5OV, and Sue VK5AYL, with her little son. Our photographer was Treva VK5ZIS.

On display were photographs, QSL cards, the famous Mouse House and unusual Cinderella Doll, and a very attractive ALARA logo in wood donated by Judy VK5BYL.

Most of the YLs wore ALARA badges, and many also sported the badges of DX-YL groups such as WARO, BYLARA, etc.

The lime slipped by as we talked our way through morning tea, group photographs, and a tasty lunch in pleasant surroundings.

After lunch the Mouse House special effort was won by Heather VK2HD. A somewhat perplexed David VK5OV won the Cinderella Doll (I am sure he will find a suitable use for it!).

Jenny VK5ANW, presented all ALARA members with an attractive Souvenir Notebook featuring Sturt's Desert Pea and the words *South Australia. ALARA-MEET 1987.* The OMs each received their choice of a bottle of wine, kindly donated by Wolf Blass.

Vicki ZL1OC, conveyed greetings from WARO to ALARA, and Colin ZL1CS, following a lucky numbers draw, presented WARO gift teaspoons to the winners, Margaret VK4AOE and Marilyn VK3DMS. Colin gave information about various ZL Awards, in particular the WARO Century Award (details October AR).

A tour of the city of Adelaide was organised with the minimum number of "locals" taking the maximum number of visitors. In this way we were able to relax and see the sights without the inconvenience of driving, and the risk of someone getting lost. Geoffrey VK5TY gave an informative and very interesting commentary on two-metres as we were chauffeured around the city. A map of the route, thoughtfully provided by Maria, showed us where we were at all times. I have been told that even some VK5s learned things about Adelaide they had not known before, and speaking as one of the visitors, I would say we could not have had a better guided tour.

Afternoon tea, hosted by the VK5 Division, was held at the Burley Griffin Building, surprisingly a former incinerator designed by Burley Griffin, and one of only four still in existence. The building, now listed by the National Trust, bears the stamp of his expertise, and it is hard to envisage it ever being used to dispose of rubbish! It is now headquarters of the VK5 Division.

Jenny donned her other hat and introduced us to members of the VK5 Council, and we were joined by other VK5 members, including Rick VK5BEG and his wife Gwen.

Marilyn officially presented the Florence McKenzie Trophy to the VK5 Division for safe keeping, and gave sprays of flowers to the VK5 girls who have worked so hard to make our get-together a success. Our visit concluded with an inspection of the building.

Dinner that night was held at the home of Meg VK5AOV and David VK5OV, and we talked our way through a truly sumptuous repast. The evening concluded with some rather unusual awards — ie for getting lost etc.

The weather was kind to us, too kind in fact. It was the hottest September night in Adelaide since records were first kept in 1857!

Sunday morning saw us gathering at Victoria Park Racecourse for a tour of the Grand Prix Circuit (no, not at 300 kilometres-per-hour), then our cavalcade headed towards the Adelaide Hills and the Cleland Native Fauna Centre, with spectacular glimpses of the city from Greenhill Road, and delicate wild-flowers providing splashes of colour.

We spent an hour or so at Cleland forming a nodding acquaintance with some of the animals and birds. Joan VK3NLO, struck up a friendship with a white cockatoo who seemed to like the YLs, but not the OMs. (Wonder why?).

Eventually, we were on our way again for a brief, rather hazy look at the city from the top of Mount Lofty, before heading for the QTH of Denise VK5YL and David VK5RN. Denise directed us to our parking places as expertly as any traffic warden!

A barbeque was prepared in their beautiful garden, more delicious food. Of course, we finally talked ourselves hoarse.

It was sad to make our farewells after such a wonderful weekend, but we have many happy memories, friendships, mementos, (and a little extra weight after all that good food), to remind us of it.

To the VK5 Division, we would like to express our appreciation of your hospitality.

To Maria and the VK5 ladies who looked after us so well we can only say a very big *thank you*. Yours will be a hard act to follow.

ALARA CONTEST — FIVE YEAR TROPHY

By the time you read this, the ALARA Contest, held on November 14, will be over.

An interesting feature this year is the finalisation of the Five Year Trophy, which will be awarded to the YL with the highest aggregate ALARA contest score from 1983-1987 inclusive.

Progress scores up to, and including 1986, are as follows:

See below...

NEW/OLD CALL SIGN

The following interesting item regarding Audrey VK4NAD has been received from the Brisbane North Radio Club:

When Alf Gover VK4NAD, became a silent key in December 1986, it was feared his call sign might be lost to the Gover family. However, Alf's widow, Audrey, continued her studies at Mount Gravatt TAFE and we are very pleased to report that Audrey was successful in the recent NAOCP examination.

DOTC has issued Alf's old call sign, VK4NAD, to Audrey, thus maintaining a sentimental link and tradition of radio communication in the Gover family.

Audrey intends to continue her studies and eventually upgrade to the full call. Audrey may be heard most weekdays on the Kingfisher Net with Alf VK4OL, on 3.586 MHz at 2330 UTC, chatting to Pat VK4NPR and sundry OMs.

NATIONAL PARKS FESTIVAL

On September 19 and 20, a special event amateur radio station was in operation from Chatsworth, in the Peak District National Park (England). This was to coincide with the Festival of National Parks. Her Royal Highness, the Princess of Wales was guest of honour on this occasion.

The intention of the special station was to have world-wide contacts with as many amateur radio stations as possible, situated in National Parks.

Kim VK3CYL	3501	Aimee FK8FA	704	Hisako JJ1LQI	233
Wendy VK4BSQ	2818	Marg VK2AHD	599	Marlene VK2KFQ	227
Gwen VK3DYL	2418	Connie VK4ATK	521	Ruthanna WB3CON	216
Joy VK2EBX	1969	Jenny VK5ANW	511	Pearl ZL2QY	214
Bev VK6DE	1956	Joyce VK2DIX	428	Celia ZL1ALK	200
Jill VK4ASK	1571	Shirley ZL1MY	419	Paula PA0ULA	163
Jan VK3HD	1412	Meg VK5AOV	403	Ethel ZL1BWO	163
Mavis VK3KS	1383	Eileen ZL1BRX	400	Bron VK3DYF	134
Val VK4VR	1215	Margaret VK6QM	325	Winifred ZL1BBN	121
Helene VK7HD	1209	Joan VK3NLO	287	Lesley ZL1BOR	113
Denise VK5YL	1072	Gail ZL1FY	268	Zdena OK2BBI	102
Elva ZL1BIZ	1038	Shirlee KQ7Y	265	Dot VK2NVQ	89
Freda VK2SU	1014	Maryanne WA3HUP	263	Clarrie ZL1BOZ	81
Margaret VK4AOE	939	Sue VK2PLG	258	Diana G4EZI	56
Valda VK3DVT	921	Valerie VK4VKT	258	Daphne VK2KDX	34
Marilyn VK3DMS	788	Bobbie VK2PXS	255	Anny DF2SL	10
Elizabeth VE7YL	712	Dorothy VK2DDB	242		
Poppy VK6YF	709	Betty VK2KYL	240		

One YL chosen to try and make the contact was Biny ZL2AZY, also an ALARA member. Unfortunately, conditions were atrocious, and the attempt was not successful. However, plans are afoot to run a weekend radio link with national parks throughout the world once a year and, hopefully conditions will be better next time.

Heather VK2HD, was standing by to relay, but was unable to hear England or New Zealand. (Conditions must have been bad, Heather, if you were unable to hear either station!).

—Contributed by Heather VK2HD

THE YL-YEAR 1988 AWARD

YLs world-wide are very active in the hobby of radio. The radio greeting 88 is well-known, and not to be thought away from the amateur bands.

YLs and 88 belong to each other. For that reason, we at DIG PA (the Dutch section of the Diplom Intressen Gruppe), want to give some special attention to the year 1988, and give YLs the opportunity to promote a unique award. This award asks for special attention during the whole year.

In the award rules everything revolves around the number 88.

Every licensed radio amateur and SWL can apply for the award. No band or mode restrictions apply, also mixed mode.

SWLs mention in their log "heard in contact with. . ."

Amateur and SWL YLs — try to be as active as possible!

RULES

CLASS 1: Contact eight YLs every month, during 11 months to gather 88 points — 11 (months) X 8 (contacts) = 88 points.

It is permissible to contact the same YLs in the second month as in the first month, etc, so one YL can be mentioned 11 times in the log.

Operators can decide for themselves which months they are active.

CLASS 2: Contact 11 YLs every month for eight months. Other rules the same as Class 1.

On February 29, 1988, Leap-Day, every YL counts as two points. A maximum of five of those contacts can be used as Joker Points, ie if a YL contact is missed one month these double points can be used. The points of Leap-Day can be used only once. This means, for example, if a YL is contacted on April 4, and not enough YLs are gathered in April, and the same YL was contacted on February 29, the same YL call sign can be used twice in April. This YL call sign then counts as three points and a maximum of five YL contacts from February 29 can be used. The reason why Leap-Day is special is that in bygone days YLs had special rights on this day, ie a YL was allowed to propose marriage to an OM!

The YLs in Holland will try to join in as many nets as possible, and hope YLs world-wide will try to do the same as every YL contact counts for this award.

Cost of the award is 10 IRCs.

It is not necessary to receive OSL cards — a log signed by two other radio amateurs will suffice. SWL YLs need to have QSL cards for verification.

Awards will be available until January 1990 (outwards postmark, December 31, 1989). Applications to be forwarded to: Award Manager, M Wolf-Wildeboer PA3CIS DIG 4055, Plotenweg 14b, NL-8303 E J Emmeloord, The Netherlands.

BITS AND PIECES

While taking a round-about route back to Yeoval from Adelaide, it was great to meet Ivan VK5NSI and Audrey, at Tailem Bend, catch up once again with Daphne VK2KDX, and have lunch with Mavis VK3KS and Ivor VK3XB. While there we also met Bron VK3DYF, our intrepid Newsletter Editor, and Gwen VK3DYL, and spent a pleasant time (yes, you guessed it) talking.

Thank you all for your hospitality, and making our first holiday in years so enjoyable.

Poppy VK6YF, Bev VK6DE, Peggy VK6NKU and other VK6 ALARA members chat on 80 metres at 1200 UTC, and would be very pleased to welcome any other YLs who would like to join them.

Congratulations to Elizabeth VE7YL, who gained first place in the CW section of the YLRL/OM 1987 Contest.

Our sympathy to Bobbie VK2PXS and Mavis VK3BIR, who both recently lost their mothers. To Maria VK5BMT whose father passed away, Trish VK6QL, on the loss of her OM, Harold VK6QD, and Gwen VK3DYL on the loss of her OM, Tom. Our thoughts are with you.

Congratulations to Grace, formerly VK7NNN, now VK7TN. I am sure you will give the new call sign a good workout!

During July, Bev VK6DE and Brian VK6AI, had an enjoyable four weeks trip to the Kimberley region of VK6, leading a group from the Geraldton Four Wheel Drive Club. They travelled through some wild country, saw spectacular scenery and wildlife, and travelled over 8000 kilometres, fortunately with no major vehicle problems. During the trip they had daily contact with Art VK6ART and the Travellers' Net. They also contacted amateurs in Geraldton and Albury. All voted it the best trip they had ever been on.

NEW MEMBERS

A very warm welcome to:
Bev, wife of Doug VK5PDT, Sue VK5AYL (was VK2DCR), Jasmine G4KFP, and Jeanette Arter, G/SWL.

Welcome back to Joyanne VK5BJH and Kay WA0WOF.

Great to have you all in ALARA.

CONTEST LOGS

Logs for the ALARA Contest must be received by the Contest Manager by December 31, 1987.

Marlene has changed her QTH and the new address is: Marlene Perry VK2KFQ/3, 218 Ninth Street, Mildura, Vic. 3500.

In conclusion, a very Happy Christmas to all.

Until 1988, 73/33,

Joy VK2EBX

ar

Education Notes

Brenda Edmonds VK3KT
FEDERAL EDUCATION OFFICER
PO Box 883, Frankston, Vic. 3199

One of the satisfying aspects of this position is that I occasionally receive reports back from students who have asked for help or information.

Most of my mail comprises requests for sample papers or CW tapes, or for information about classes, or text books. When controversial issues relating to educational matters are aired, I receive comments from a range of interested parties.

So it is very pleasing to receive the occasional letter thanking me for information or materials, and awarding me some credit for the candidate's subsequent examination success. It is, however, my firm belief that no amount of outside help can be of any value unless the candidate has the drive, enthusiasm ad determination to make a good effort on his/her own behalf.

A few recent letters have demonstrated these qualities and a high level of persistence as well. One VK5 wrote joyfully of having just received a full call after sitting every examination for more than 10 years. He is now in his late 70s.

A VK6, likewise, sat all full call examinations for about five years, and, at nearly 70, has now succeeded.

In other cases, students who had previously asked for sample Novice theory examinations have written in straight after gaining the Novice licence for sample papers for AOCP examinations. Many of these are in the "senior citizen" class.

We must not neglect the possibilities of recruiting new amateurs from the ranks of those at, or past, middle age.

Some of them may have had an interest in radio in their youth but not the time or funds to operate. Others once introduced to the hobby have seen it as an ideal pastime in retirement. Time and money are a little easier, and participation is not limited by the common problems of aging such as restricted mobility.

The "mature age" recruits have much to offer the hobby and the Institute. As well as their interest and enthusiasm, they bring in a range of technical, educational and managerial skills from their fields of employment, years of experience in problem solving and working with others and contact networks that have taken years to build.

It puzzles me, though, that in a number of cases these older candidates do not seem to be getting much support from their local groups. I try, where possible, to put potential amateurs in touch with the nearest group or club so that they can join in activities and get some assistance in their own residential areas, but on a few occasions I have heard back that no help was forthcoming from the club.

I do not have time to notify the clubs if I have passed on information, but it has usually been my experience that amateur groups are generally very welcoming and helpful to newcomers.

Perhaps we forget that the newcomers may be new not only to the group, but also to the hobby, and we do use terms and jargon that are a little daunting to the uninitiated. Remember how you felt when your doctor explained something in medical terms, or your teenagers tried to talk to you in their language?

In passing out this information I am, of course, restricted to the clubs listed in the directory in the Call Book. If there are clubs which are not listed, please could someone let me know about them, and especially if they offer classes whether regularly or occasionally.

In fact, I would be very pleased to update my list of classes all round, as I have not heard from some for some time.

I would also like to build up a list of amateurs who would be prepared to offer help to new recruits in areas without an active club. It is very difficult to gain a licence without any outside help.

Perhaps I could start up a "Penfriends" group for the really remote triers.

I would like to take this opportunity to wish all readers a happy and safe holiday season. May the November examinees all receive a nice new call sign for Christmas.

73, Brenda VK3KT

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Contests

Frank Beech VK7BC
FEDERAL CONTEST MANAGER
37 Nobelius Drive, Legana, Tas. 7251

DECEMBER

4 — 6 ARRL 160 metre CW Contest
5 — 6 TQPS 3.5 MHz CW Contest
12 — 13 ARRL 10 metre Contest
19 Ross Hull Memorial VHF/UHF Contest begins (Rules November issue)
27 — Canada Day Contest

JANUARY 1988

— 10 Ross Hull Memorial VHF/UHF Contest concludes (Rules November issue)
16 — 17 Hungarian DX Contest
29 — 31 CQ WW 160 metres CQ Contest
30 — 31 YL ISSB CW QSO Party

ARRL 160 METRE CW CONTEST

TIMES: 2200 UTC Friday to 1600 UTC Sunday, December 6.

This is the 18th year for this "Top Band" activity. Exchange is between US Stateside, VE and DX stations. DX to DX is not permitted for contest credit.

CLASSES: Single operator, and multi-operator, single transmitter.

EXCHANGE: RST and ARRL section number for W and VE stations. RST only for DX.

SCORING: Contacts between stations in W and VE count two points. DX is five points.

MULTIPLIER: DX stations use ARRL sections only.

FINAL SCORE: Total score times the number of ARRL sections.

AWARDS: Certificates to the top scoring station in each DX country and ARRL section.

ENTRIES: Deadline for logs is January 6, 1988. Send to ARRL Communications Department, 160 Contest, 225 Main Street, Newington, CT 06111, USA.

RESULTS OF 1986 CQ WW CW CONTEST

AUSTRALIAN RESULTS

VK2BQQ	All band	505 377
VK8AV	All band	192 468
VK3NI	All band	179 928
VI5AGX	All band	35 030
VK6HD	28 MHz	80 448
VK6SM	28 MHz	74 472
VK4SF	28 MHz	1 947
VK4XA	21 MHz	185 674
VK2APK	14 MHz	329 278
VK4TT	14 MHz	101 136
VK3AHQ	14 MHz	67 080
VK2EKY	7 MHz	96 560
VK3BEE	1.8 MHz	1 534

VK4TT is a trophy winner for his 14 MHz effort, in the single operator, single band section.

The winner of the single operator, all band section for Oceania was Philip David YB0ARA.

COMMONWEALTH CONTEST 1988

Participation in this contest will count towards the HF contest championship 1987-1988 for UK entrants.

TRANSMITTING SECTION

The general rules for RSGB HF contests, as published in the January 1987 issue of ***Radio Communication***, will apply.

Date and Time: From 1200 UTC on Saturday, March 12, to 1200 UTC Sunday, March 13, 1988.

Sections: Single operator entries only from members of the RSGB resident in the UK and radio amateurs licensed to operate within the British Commonwealth or British Mandated Territories. Entries from GB, aeronautical or maritime mobile stations will not be accepted. Entries may be single-band or multi-band. Single-band entries should show contacts on one band only: details of contacts made on other bands should be enclosed separately for single band awards.

Band and Mode: A1A only in the 3.5, 7, 14, 21, and 28 MHz bands. In accordance with IARU recommendations, contestants are requested to operate within the lower 30 kHz of each band, except when contacting novice stations that operate above 21.000 MHz and 28.100 MHz.

Exchange: Contacts may be made with any station using a British Commonwealth call sign except those within the entrant's own call area. UK stations may not work each other for points. A contact exchange consists of RST and three figure serial number commencing with 001 and increasing by one for each successive contact throughout the contest. Serial numbers when sent from non-competing stations, must be recorded.

Scoring: Each completed contact will score five points. In addition, a bonus of 20 points may be claimed for the first three contacts with a Commonwealth call area on each band. Call areas for use in the contest are listed in the accompanying table. All British Isles prefixes (G, GB, GD, GI, GJ, GM, GU, and GW) count as one call area, with the exception of GB5CC, the special event station. GB5CC will be active throughout the contest and will count as a separate call area for all contestants including those in the UK.

Documentation: Separate log sheets (HFC1) for each band must include UTC, call sign of station worked, RST/serial number sent, RST/serial number received and points claimed. Separate band totals should be added together and the total claimed score entered on the cover sheet. It is important that logs are carefully checked for duplicate contacts. Unmarked duplicate contacts for which points have been claimed will be penalised 10 times the number of points claimed, and logs containing in excess of five will normally be disqualified. Your entry should include a signed declaration stating that the rules and spirit of the contest and the terms of the entrant's licence were observed.

Name and Address for Logs: Logs should be addressed to the RSGB HF Contest Committee, Alan Gray G4DJX, PO Box 73, Lichfield, Staffs WS13 6UJ, England. All entries become the property of the RSGB. In the event of any dispute, the ruling of the Council of the RSGB shall be final.

Date for Entries: Adjudication of this contest will commence on Monday, April 11, 1988. Any entries received after this date may be excluded from the contest. Overseas stations are therefore advised to forward their logs by air mail.

Awards: The winner will receive the Senior Rose Bowl, and the runner-up the Junior Rose Bowl. The leading UK station will receive the Col Thomas Rose Bowl. Certificates of merit will be awarded to the a) first, second, and third placings in home and overseas multi-band placings, b) the leading home and overseas single-band entries on each band, c) the leading station in each call area.

Receiving Section: Dates and times as above. Only the entrant may operate his/her receiving station for the contest. Holders of a transmitting license for frequencies below 30 MHz are not eligible to enter.

To count for points, a station outside the entrant's own call area must be heard in a contest contact. CQ or test calls will not count for points. A station may be logged only once on each band for the purpose of scoring.

When both stations in contact are heard, they should be logged separately and points claimed for both entries, provided they are both outside the entrant's own call area. Each completed log entry will score five points. In addition, a bonus of 20 points may be claimed for the first three stations heard in each British Commonwealth call area on each band. All British Isles prefixes count as one call area.

A separate log is required for each band. Logs should show date/time UTC, call sign of station heard, RST/serial number sent by station heard, call sign of station being worked and points claimed.

The Receiving Rose Bowl to the winner. Certificates of merit to the leading entrant in each continent.

COMMONWEALTH CALL AREAS The following call areas are recognised for the purposes of scoring in the 1988 Commonwealth Contest.

A2	Botswana	VP8	S Shetland Is
A3	Kingdom of Tonga	VP9	Bermuda
C2	Nauru	VQ9	Chagos
C5	Gambia	VR8	Pitcairn
C6	Bahamas	VS5	Brunei
G*	See note below	VS8	Hong Kong
H4	Solomon Is	VY1	Yukon
J3	Grenada	VU	India
J6	St Lucia	VU7	Laccadiva Is
J7	Dominica	VU7	Andaman & Nicobar Is
J8	St Vincent	YJ	Vanuatu
P2	Papua New Guinea	Z2	Zimbabwe
S7	Seychelles	ZB2	Gibraltar
T2	Tuvalu	ZC4	Cyprus (UK Basaal
T30	W Kiribati	ZD7	St Helena
T31	C Kiribati	ZD8	Ascension Is
T32	E Kiribati	ZD9	Tristan da Cunha, Gough Is
V2	Antigua, Barbuda	ZF	Cayman Is
V3	Belize	ZK1	Cook Is
VE1	Maritime Provinces	ZK1	Manihiki
VE1	Sable Is	ZK2	Niue
VE1	St Paul Is	ZK3	Tokelau
VE2	Province of Quebec	ZL0	New Zealand
VE3	Province of Ontario	ZL1	New Zealand
VE4	Province of Manitoba	ZL2	New Zealand
VE5	Province of Saskatchwean	ZL3	New Zealand
VE6	Province of Alberta	ZL4	New Zealand
VE7	Province of British Columbia	ZL7	Chatham Is
VE8	North West Territories	ZL8	Kermadec Is
VK1	Australian Capital Ter	ZL9	Auckland & Campbell Is
VK2	New South Wales	3B6 /3B7	Agalega & St Brandon
VK3	Victoria	3B8	Mauritius
VK4	Queensland	3B9	Rodriguez Is
VK5	South Australia	3D2	Fiji
VK6	Western Australia	3D6	Swaziland
VK7	Tasmania	4S	Sri Lanka
VK8	Northern Territory	5B4	Cyprus
VK9L	Lord Howe Is	5H	Tanzania
VK9M	Mellish Reef	5N	Nigeria
VK9N	Norfolk Is	5W	Western Samoa
VK9X	Christmas Is	5X	Uganda
VK9Y	Cocos (Keeling) Is	5Z	Kenya
VK9Z	Willis Is	6Y	Jamaica
VK0	Heard Is	7P	Lesotho
VK0	Macquarie Is	7Q	Malawi
VK0/ VP8 /ZL5	Antarctica	8P	Barbados
VO1	Newfoundland	8Q	Maldive
VQ2	Labrador	8R	Guyana
VP2E	Anguilla	9G	Ghana
V4	St Kitts, Nevis	9H	Malta
VP2M	Montserrat	9J	Zambia
VP2V	British Virgin Is	9L	Sierra Leone
VP5	Turks & Caicos Is	9M2	W Malaysia
VP8	Falkland Is	9M6/8	E Malaysia
VP8	S Georgia	9V	Singapore
VP8	S Orkneys	9Y	Trinidad & Tobago
VP8	S Sandwich Is		

GB5CC RSGB HQ Station
G* denotes G/GB/GD/GI/GJ/GM/GU/GW

AMSAT Australia

Colin Hurst VK5HI
8 Arndell Road, Salisbury Park, SA. 5109

NATIONAL CO-ORDINATOR
Graham Ratcliff VK5AGR
INFORMATION NETS
AMSAT AUSTRALIA
Control: VK5AGR
Amateur Check-In: 0945 UTC Sunday
Bulletin Commences: 1000 UTC
Primary Frequency: 3.685 MHz
Secondary Frequency: 7.064 MHz
AMSAT SOUTH WEST PACIFIC
2200 UTC Saturday
14.282 MHz

Participating stations and listeners are able to obtain basic orbital data, including Keplerian Elements from the AMSAT Australia Net. *This information is also included in some WIA Divisional Broadcasts.*

ACKNOWLEDGMENTS

Contributions this month are from Bob VK3ZBB, VK5AGR BBS, VK5ZK BBS and the UoSAT Bulletin Board.

AMSAT-AUSTRALIA NEWSLETTER

This fine monthly publication published on behalf of AMSAT-Australia by Graham VK5AGR, now has 200-plus subscribers. Should you also wish to subscribe then send a cheque for $20 made payable to AMSAT-Australia and post to:
AMSAT-Australia, C/- PO Box 2141, GPO, Adelaide, SA. 5001.

The newsletter provides the latest news items on all satellite activities and is a must for all those seriously interested in amateur satellite activities.

FIRMWARE FOR TNC-2 FO12 OPERATIONS

Users of FO-12 are suggested to use the WA8DED V2.0 Firmware for TNC-2 instead of the originally installed TAPR Firmware.

After some experience with several stations using TNC-2, the DED Firmware operates more reliably on FO-12 Mode-JD operations (as well as on terrestrial packet). With the TAPR-Soft you are sometimes ignored by the satellite after logon into the mailbox, caused by a possible protocol bug.

Ask your local PR-Group for the TNC-2 WA8DED Firmware, which is public domain. I am using WA8DED-Firmware also on TNC-1 and it works well on FO-12 BBS.

Vy 73 Peter DB2OS
Member of NORD > < LINK Packet Group,
Northern Germany

In addition to my message above, (about better operations with TNC2-DED soft on FO-12) I must say, that this will not help all problems. I guess, you have high gain receiving antennas and a preamplifier directly under your antenna. You have a good transmitting system with the suggested 100 watts EIRP, or more? Your modem is okay and you have stored the right parameters for FO-12 access in your TNC (MAXFRAME, TXDELAY, FRACK).

Do you have problems with uplinking sometimes?

Over Europe it is often mysterious. . .for some minutes FO-12 does not receive anything from any station. In most cases, a few minutes later all is well again and Down/Uploading continues. It makes no difference how much power you are using! I have made some tests, together with DL1CF I am using less than 10 watts with my TS-700G, Heinz is using around 80 watts with a TS-711E, including a preamplifier for testing, like 10 dB more EIRP. We have discovered that when I get in trouble, he does also.

Could this be a problem due to heavy FM-voice stations in the satellite band? You can really hear them on .910 and .930 uplink when JA is on which may be a problem only in southern Europe! Or is it QSB at the satellite receiving antenna? Or maybe even a software bug in the FO-12 AX25 handler?

Many questions and no answers. . .

If any readers have made the same observations please send a report via FO-12 BBS.

73 Peter DB2OS

UOSAT SPACECRAFT

Several stations have inquired why the UO-9 VHF downlink appears to be 'stronger' than UO-11 on similar passes. Firstly, the UO-11 transmitter yields between 220 mW (eclipse) and 480 mW (sunlit) RF output dependent on battery voltage (the power taken by the VHF transmitter decreases as battery voltage decreases deliberately to avoid excessive discharge). UO-9 generally yields around 475 mW and is rarely in eclipse at present. Secondly, UO-11 is at 698 km and UO-9 at 478 km thus, when overhead, UO-9 is some 3.2 dB 'closer'! Consequently, but also dependent on the ground-station antennas used, UO-9 can be up to 6 dB stronger than UO-11 under certain circumstances.

UOSAT-2 DIGITAL COMMUNICATIONS EXPERIMENT

A significant step has been made in the UoSAT-2 Digital Communications Experiment (DCE) program. Whilst the DCE has been supporting digital store-and-forward communications for radio amateurs for almost two years, engineers at UoS have also been using the DCE to evaluate the electronic components which will be needed to build a full-scale store-and-forward satellite. As part of this study, Stephen Hodgart and Jeff Ward G0/K8KA, at UoS have been developing software error-correcting codes to detect and correct radiation-induced single event upsets (SEUs) in the DCE RAM.

The DCE carries 96 kbytes of RAM for message storage (as well as 28 kbytes for programs). This message store (called the RAMUNIT) is composed of high-density CMOS RAM ICs; each IC carries either two kbytes or eight kbytes of memory. It is impractical and inefficient to provide hardware circuits to detect and correct memory upsets on this much memory in such dense ICs. Hence, the need for software memory protection.

The new software, which has been loaded to the DCE over the last few weeks, implements error correction codes which can detect and correct up to eight bit errors in a 128 byte block of memory.

Although it will be a month or so before enough data is collected to make reliable statements, early indications are that this is more than enough correction capability to protect messages in the RAMUNIT from corruption.

In order to be able to engineer a RAMUNIT consisting of several megabytes of memory correctly — such as will be used on UoSAT-C, it is important to know how frequently and where in the satellite's orbit RAM errors occur. To achieve this, the new DCE software logs each error occurrence in a message which can be downlinked to any DCE ground station. This message contains complete information about the error location and extent, and a time stamp derived from the UoSAT-2 telemetry system real-time clock.

For UoSAT listeners, there is a new counter in the DCE status frame. This counter is labelled RAM=nnnn, where nnnn is the number of errors detected in the RAMUNIT since September 27. The other counter (EDAC=xx) counts the errors detected by hardware circuits on the program memory. (This counter has logged more than 20 errors since monitoring started a year ago).

HAPPY BIRTHDAY UOSAT-1

UoSAT OSCAR-9 (UoSAT-1) completed six years operation in orbit this week. UO-9 was launched from the WTR, Vandenberg Air Force Base, California, on October 6, 1981, on-board a Delta 2310 accompanying a NASA Solar Mesoshpere Explorer satellite. The spacecraft continues to perform well in orbit, supporting daily experiments on a weekly schedule under automatic control of the on-board computer.

UO-9 was launched into an initial 550 km sun-synchronous polar orbit, and the effects of atmospheric drag were expected to cause the spacecraft to re-enter the Earth's atmosphere and burn up around 1986/7. However, the orbital decay experienced over the last few years has been considerably less than expected and UO-9 will probably remain in orbit until 1991/2. The spacecraft on-board electronic systems continue to perform without noticeable degradation — well beyond the two years expected at launch!

The UO-9 mission has not been without its problems though — primarily caused by shortcomings in the communications links and the unreliability of the on-board computer command interface to the tele-command sub-system. The effects of these limitations, however, have been largely overcome by the use of a sophisticated software Diary for the on-board computer — originally developed for the later UoSAT-2 satellite!

FOOTNOTE

Without the UoSAT Bulletins, this particular column would not have existed over the last year, and I salute the UoSAT team for their dedication and application of UoSAT's 1 and 2 in the dissemination of current news and topics. News has not been readily forthcoming, primarily because by the time the magazine reaches the end-user the news is very much out of date.

The electronic bulletin boards available to most satellite users these days contain unlimited satellite information and news, and consequently are a valuable source of information.

Consequently, this column has degenerated to an archival source of "non-dated" technical information and newsworthy events from within the Amateur Satellite Service.

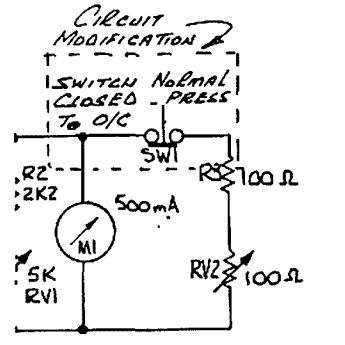
In closing this month, may I extend Seasons Greetings to all and at this stage 1988 promises to be another exciting year with the expected launch of Phase 3C early in the year.

de Colin VK5HI
ar

CORRECTION

Please refer to the circuit diagram in reference to page 18, AR October 1987. This modification clarifies the "Setting Up Precedure" in col 1, page 19.

Also, an error appeared in the diagram, Figure 1, page 22, of October AR. Note at the base of the coax should be 15 metres, not 80.



Awards

Ken Hall VK5AKH
FEDERAL AWARDS MANAGER
St George's Rectory, Alberton, SA. 5014

AWARDS ISSUED IN SEPTEMBER

WORKED ALL STATES VHF
172 Charlie Gnacearini VK3BRZ (two-metres).

DXCC
Phone 359 Harry Cox VK4OX

WORKED ALL BRITISH AWARDS
The overseas liaison officer, Bob Nash G4GEE, has written to say that Cyril Roberts VK6OE, has successfully claimed the WAB overseas introductory award and the WAB Bronze Award, the first issued to VK. Congratulations on this distinction are extended to Cyril.

CP5AA AWARD

Tribute to the Heroines of the Coronilla

This certificate is awarded by the Bolivian Radio Club of Cochabamba (Zone 5), to all licensed foreign, as well as Bolivian amateurs who can verify having had contacts with 89 foreign stations. The applicant, Bolivian or foreign, may not include contacts with other stations from his/her own country.

One OSL must be submitted for each letter and number of the following quotation in this manner:

For the letters	Use the first letter of the call sign's suffix (Ex CP5AA)
For the numbers	Use the zone number (Ex CP5AA or C56AA or 5W1AA)

The quotation to complete, in Spanish, is:

DIOS Y PATRIA HE AQUI EL ALMA DE LA MUJER COCHABAMBINA EL SECRETO DE SU HEROISMO Y SUS VIRTUDES MAYO 27 DE 1812

All QSOs submitted must be phone contacts only and have been made after January 1970, on any band authorised for amateur radio use. Anyone interested in this award (all are numbered), must send the application to: Radio Club Boliviano, Filial 5 Cochabamba, PO Box 1900, Cochabamba, Bolivia, SA — together with the following:

1. List of contacts in the word order to the above quotation including date, time, band, and RS reports.
2. Foreign stations need not send QSLs for verification, but must have his/her log certified by the authorities of the local radio club to which he/she belongs. Bolivian applicants must submit their cards with their logs when applying.
3. In both cases, foreign and Bolivian, applicants must include 10 IRCs to cover the cost of the award and mailing.

Brief History of the Heroines of the Coronilla

In May 1812, during Bolivia's war of independence with Spain, the men of Cochabamba were situated some kilometres away from the city awaiting an enemy invasion. Instead, believing Cochabamba was left unprotected, a large enemy force preceded towards the city via a different route. There, on San Sebastion Hill — the Coronilla — the women of Cochabamba fought valiantly with whatever implements were available, against much greater odds to maintain Cochabamba, the crossroads of Bolivia, in the hands of the patriots. Although independence was not attained until 1825, the women of Cochabamba provided a turning point in the hostilities on May 27, 1812. Today a beautiful monument stands atop San Sebastian Hill forever honouring the spirit, virtues and heroism of the Heroines of the Coronilla. A lovely four-colour photograph of this monument with the above quotation appears on the CP5AA Tribute Award.

SWEDISH AWARDS

WORKED ALL SWEDEN AWARD — WASA

WASA will be issued to licenced radio amateurs for verified contacts with Swedish counties and call sign districts, made after January 1, 1988.

Swedish applicants shall be members of SSA and overseas applicants shall be members of their own country's IARU affiliated radio society.

All contacts shall have been made from the same QTH and/or within a radius of 150 km from that QTH.

Each individual contact shall be made with the same band and mode.

The same station may be contacted on several different bands.

All contacts shall be made with land-based stations.

Contacts with earth-based repeaters are not permitted.

Separate diplomas will be issued for HF, 144 MHz, 432 MHz, 1296 MHz and satellites.

For HF, 1.8, 3.5, 7, 10, 14, 18, 21, 24 and 28 MHz are counted as separate bands.

Within every group, separate diplomas can also be issued for the different classes.

Stickers can be gained for two-way contact on CW, Phone, SSW and RTTY.

All contacts shall be verified with QSL cards or equivalent, on which there is sufficient information to accurately determine the county/call sign district worked.

Applications shall consist of QSL cards and a list of these with the county/call sign districts in alphabetical/numerical order.

Instead of sending QSL cards, overseas applicants may get their cards checked by the Diploma Managers in their own countries, if such a person exists.

The fee for each diploma is SEK30 (US$5 or 10 IRCs).

Applications to: WASA, Diploma Manager, SSA, ₸stmarksgatan 43. S-123 42 Farsta, Sweden.

Requirements:

WASA-HF (Applicants outside Europe) —
- Class 3, all call sign districts (0-7).
- Class 2, all counties.
- Class 1, all counties on two different bands.
- Shield, all counties on five different bands.

WASA-144 MHz
- Class 2, all call sign districts.
- Class 1, all counties.
- Shield, five different stations in each county.

WASA-432 MHz
- Class 2, all call sign districts.
- Class 1, all counties.
- Shield, three different stations in each county.

WASA-1296 MHz
- Class 1, all call sign districts.
- Shield, all counties.

WASA-Satellite
- Class 2, all call sign districts.
- Class 1, all counties.
- Shield, all counties in two modes each.

HEARD ALL SWEDEN AWARD — HASA

HASA will be issued by SSA to all shortwave listeners (SWLs) for verified reports of stations in Swedish counties and call sign districts for contacts made as from January 1, 1988.

The diploma is issued in the classes and groups corresponding to the rules for the Worked All Sweden Award (WASA).

No shields will however be issued.

SWEDISH LOCATOR AWARD — SLA

The SLA is issued by SSA to licenced radio amateurs for verified contacts made with the various locator squares in Sweden, as defined by the Maidenhead system, for contacts made as from January 1, 1988.

The diploma is also issued to SWLs on an equivalent basis.

Swedish applicants shall be members of SSA and overseas applicants shall be members of their own country's IARU affiliated radio society.

Contacts with earth-based repeaters are not permitted.

All permitted amateur radio bands may be used.

Requirements:

Basic diploma	25 squares
Sticker	35 squares.
Sticker	45 squares.
Sticker	55 squares.
Sticker	60 squares.
Sticker	all squares.

Endorsement can be obtained for individual bands and modes.

QSL cards shall have been received but do not need to be sent. Applications shall be made by means of a GCR list, verified by the applicant's national QSL manager.

The fee for the basic diploma is SEK30, US$5 or 10 IRCs, and SEK5, US$1 or 2 IRCs for each separate sticker application.

Applications to: WASA, Diploma Manager, SSA, ₸stmarksgatan 43. S-123 42 Farsta, Sweden.

FIELD AWARD

The Swedish Amateur Radio Society will issue the Field Award diploma to licenced radio amateurs and shortwave listeners for verified contacts with *fields*, as defined by the locator system adopted as from January 1, 1985, (Maidenhead Locator). Contacts on or later than this date are valid for the diploma.

The Field Award is issued in four classes:

BRONZE (basic diploma)	100 fields verified
SILVER (sticker)	200 fields verified
GOLD sticker	300 fields verified
PLATINUM (sticker)	all 324 fields verified

All amateur radio bands and modes are permitted. Endorsements will not be issued.

All contacts shall be made with stations on the surface of the earth.

Contacts shall be verified by OSL cards or their equivalent, on which the field or position is clearly stated with such accuracy that the field can be determined. The term "position" refers to latitude and longitude or to a place name.

If there is any uncertainty about a field, SSA may demand further information before approving the contact. If the uncertainty remains, then the contact will not be approved.

A random sample of individual QSL cards will be made, which must be sent for checking.

The application shall be made on a GCR list, containing the information from each QSL card which is required for approval. The GCR list shall be verified by the applicant's national diploma manager or other official in the applicant's national amateur radio society.

The fee is SEK 30, 10 IRCs or US$4.

Applications to: Field Award Manager, SSA, ₸stmarksgatan 43. S-123 42 Farsta, Sweden.

WORLD ATLAS

A world atlas, showing the new locator grid, has been produced by SM5AGM, which can normally be purchased from every National Amateur Radio Society.

The atlas can also be ordered from SSA by sending a SAE and six IRCs.

MOBILEN

The Mobilen award is issued by SSA to licence radio amateurs who have activated squares, as defined by the Maidenhead system, whilst mobile in Sweden.

Contacts made as from January 1, 1988 are counted.

In order for a square to be considered as activated, at least 10 other stations must have been contacted from that square within a period of 24 hours.

Basic diploma ..... 25 activated squares.

After this, stickers are issued for each fifth square up to 60. After this, individual stickers are issued for every new square.

Application shall be made by means of a verified extract from the station log book.

Applications to: MOBILEN Diploma Manager, SSA, Tystmarksgatan 43. S-123 42 Farsta, Sweden.

SSA ACTIVITY DIPLOMA

SSA issues the *Activity Diploma* (A + year) for each calendar year in order to stimulate the activity of Society members.

Each year's activities are determined by SSA's Committee by the October of the previous year and are published in the QTC Diploma Column by the preceding December, at the latest.

The Diploma costs SEK 10. The fee is sent without deduction to the WL fund (for disabled radio amateurs).

The application, in the form of a verified extract from the station log book, shall arrive at the SSA office by the last day of February in the following year.

THE CITY OF WAGGA WAGGA AWARD

As late 1986 to late 1987 is the 40th anniversary of Wagga Wagga becoming a city, the award is appropriately called the *City of Wagga Wagga* Award. Wagga Wagga is situated halfway between Sydney and Melbourne, by the banks of the Murrumbidgee River, on the Sturt Highway, in the Riverina Region of New South Wales. Wagga Wagga was discovered in December 1829 by Captain Charles Sturt. Wagga is an aboriginal term for crow, thus Wagga Wagga is the plural for many crows. The city is 185 metres above sea level and is rural in its setting.

This award certificate and its upgrades of silver and gold is presented by the Wagga Amateur Radio Club (WARC). The award is open to all amateurs and shortwave listeners throughout the world on 80 metres. To become eligible for the award, each participating station will have made contact with club station, VK2WG, (two points) and eight other club member stations (one point), making a total of 10 points. A station previously made contact with can be worked again after seven days for an extra point. Shortwave listeners and amateur stations need simply prepare a log extract.

Applications go to: The Awards Manager WARC, Barry Gilmour VK2MUZ, 58 Tobruk Street, Wagga Wagga, NSW. 2650.

The award meeting night will be Tuesday evenings at 1030 UTC, on 80 metres, 3.605 MHz ±QRM.

BASIC AWARD

Two points for VK2WG.

One point for contact with club member.

Ten points for award — log extract and $3 cost of award.

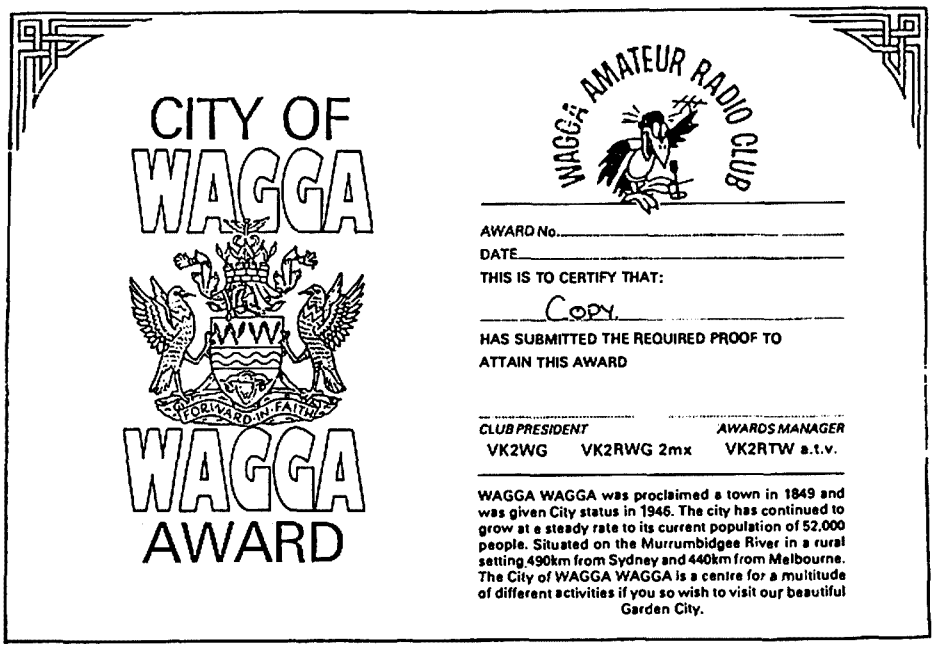
VK2WG can only be worked once for basic award.

SILVER UPGRADE

An additional 40 points for silver upgrade to the City of Wagga Wagga Award is required. The basic award must have been worked, applied for and received. For the silver upgrade there should be 24 hours between contacts with any WARC station who, on request, will give signal report and time of contact. No cost.

GOLD UPGRADE

The City of Wagga Wagga award and silver upgrade must have been applied for and received.



An additional 100 points are required for the gold upgrade. A holder of the silver upgrade is now worth one point towards the basic silver and gold awards, as from February 17, 1987.

A holder of the gold upgrade is now worth two points towards the basic silver and gold awards and, like club member stations, can be worked every 24 hours.

When applying for the upgrade, a station who has been worked as a silver or gold certificate holder and is not a WARC member, the certificate number must accompany the application for that point or points.

VK2WG can now be worked each Tuesday evening for a point towards any upgrade except the basic award. Cost of the gold upgrade is $1.

This is an honorary system for these upgrades.

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Electro-Magnetic Compatibility Report

An Effective High-Pass Filter

Hans Ruckert VK2AOU
EMC REPORTER
25 Berrille Road, Beverly Hills, NSW. 2209

EMC standards have to cover three different ways by which unwanted signals enter the television set affecting the performance.

1 Signals entering via the antenna and feedline.
2 Signals entering via attached cables (to VCR, etc).
3 Signals entering via the chassis due to lack of shielding, earth bonding and selectivity (test cell or Jacky test).

High-pass filters can only improve the immunity against unwanted signals, which would otherwise enter via the antenna or feeder (case No 1). How effective a high-pass filter is depends not only on its design (filter sections, shielding), but also very much on the way it is attached to the television set. The ARRL, the RSGB (Pet Hawker G3VA), and DARC (DL1BU), agree with this writer's finding that, by far, the best place for a high-pass filter is as close as possible to the tuner, soldering the filter case directly to the tuner case (no leads in between!).

In order to know how good a high-pass filter is required, we must first check the frequencies of unwanted radiation which affect the television set. This can be done with a Grid-Dip-Oscillator (GDO). A GDO with one watt DC input power would have about 0.3 watt of RF output power at the fundamental frequency and less at harmonics. The most critical television channel is Channel 2 (63.70 MHz) if one transmits on the 21 MHz amateur band. Other television channels and VHF or UHF transmission present similar, but usually not as severe problems, with the exception of six and two metre operation and adjacent television channels. A fairly typical colour television set (10 years old) showed the following susceptibility for Channel 2 and GDO transmission:

21.100 MHz x 3 = 63.300 MHz, low RFI Channel 2 from third harmonic.
16.400 MHz x 2 32.800 MHz, low RFI TV IF second harmonic.
12.810 - 13.430 MHz x 5 low RFI Channel 2, fifth harmonic 67.150 MHz.
12.810 - 13.430 MHz x 3 low RFI TV IF third harmonic 40.290 MHz.
21.280 MHz x 3 = 63.840 MHz, strong RFI Channel 2 third harmonic.
21.570 - 22.930 MHz x 3 = 64.710 - 68.780 MHz, strong RFI, third harmonic Channel 2.
33.140 MHz strong RFI TV IF on all channels. IF shielding? ? ?

The GDO coil was held close to the picture tube centre for these tests. Other positions around the television cabinet gave similar results, demonstrating the degree of RF pick-up by the chassis (compare the EMC Report in the Jack Test). The high-pass filter cannot help against RF entry via this chassis path (case No 3). But we know now where the filter cut-off frequency has to be since the GDO frequencies were checked with a frequency counter. We can see that the high-pass filter should have high attenuation from about 40 MHz and below, to cover the television IF It is interesting to see that some frequency sections are far less affected, especially near the low frequency end of the 21 MHz band. One could take note of the listed frequencies and avoid these for transmitter operation, especially at the high frequency end of the band.

The same exercise could be carried out for the other television channels and amateur radio bands, to reduce the danger of affecting the neighbour's television reception. With the GDO at 33.140 to 33.800 MHz, the colour disappeared on all television channels due to television IF breakthough.

THE FILTER

The filter to be described is a close copy of a high-pass filter developed by the *Telefunken* company (DL) and made available to customers who have susceptibility problems with their Telefunken television sets. The response curve achieved is nearly identical to that of the original filter. The circuit shows the layout size of the printed board. Ceramic MPO capacitors are used. The filter is completely shielded. The cut-off frequency can be moved to 60 MHz by spreading the nine-turn coils, to obtain even more attenuation of the lower frequencies (31-37 MHz TV IF). The capacitor leads must be kept as short as possible to reduce the response peaks at the pass frequencies.

Tests showed that even such a filter could not help, when the filter was plugged into the television antenna between feeder and television set. The 470 pF safety capacitors and the coaxial cable between the antenna terminal and the tuner picked up RF, bypassing the filter. Considerable improvement was only achieved after the filter was directly soldered to the tuner shielding can at both ends of the filter can. The internal coaxial feeder cable was now connected to the filter input point. Only two centimetres of coaxial cable connect the filter output to the tuner input terminal. High-pass filters with cut-off frequencies near 30 MHz do not help as they permit signal breakthrough to the television IF stages via the mixer. The PC board used had five millimetre wide strips of copper along both sides and 5 x 5 millimetre copper squares in three rows between the strips. The back of the board was copper covered and soldered to the upper edge strips. These, in turn, were soldered to small PC board pieces forming an enclosed box for the filter.

This filter, so installed, allowed for the first time at least some 21 MHz operation with a FT-707 transmitter, which has over 60 dB attenuation of its third harmonic. In addition, a low-pass filter was installed at the transmitter, adding a further 60 dB of harmonic attenuation. Running the transmitter

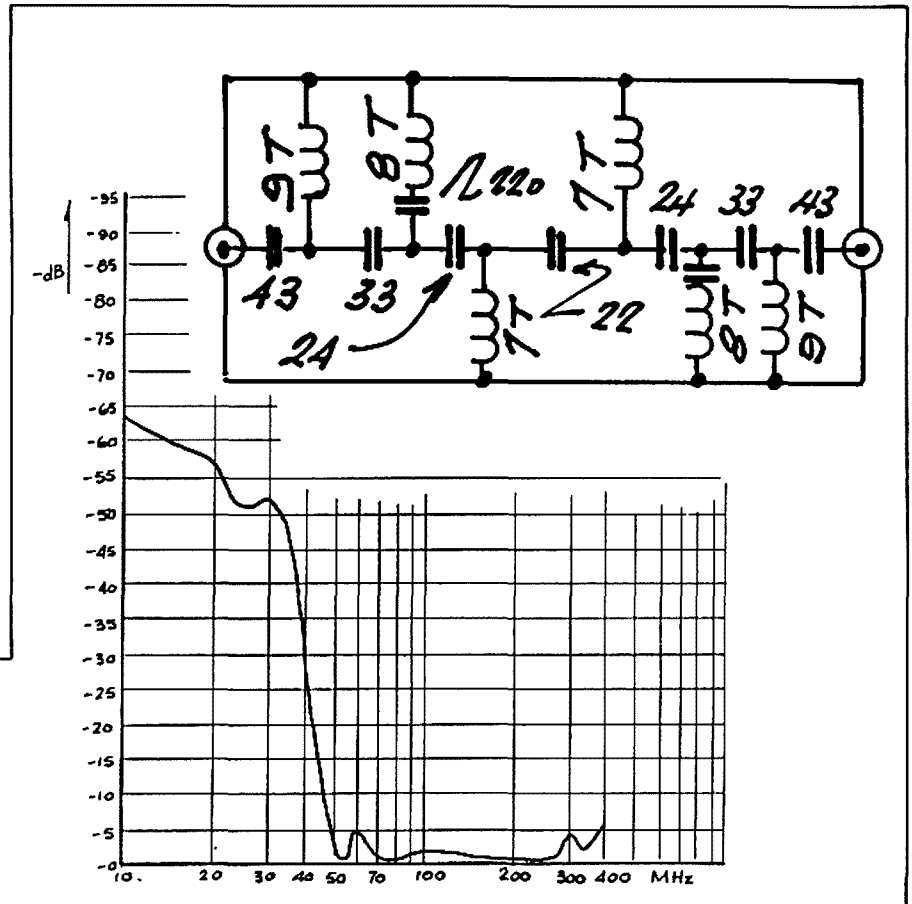

Figure 1: Copy of the *Telefunken* High-Pass Filter.
Coils: 9 turns 10 millimetre OD, on 8 millimetre ∅ drill
8 turns 8 millimetre OD, on 6.3 millimetre ∅ drill
7 turns 7.4 millimetre OD, on 5.5 millimetre ∅ drill
Wire: 0.5 millimetre diameter.
Capacitors in pF.
Circuit Board Layout 100 percent.

into a dummy load (Heath Cantenna) with 100 watts output resulted in no RFI with the television set standing next to the transceiver. This showed that the transmitter and filter were sufficiently well shielded.

Any RFI observed was now picked up by the television chassis only. Ferrite rings around the mains cable (three-core, with earth contact) made no difference, showing again that the chassis was the remaining problem (see EMC Report on improvised Jacky test). The television antenna stands 10 metres below and eight metres to one side of the three-element beam. And the televisions stands 14 metres below and eight-metres to one side of the beam. Pointing the beam side-on to the television allows running full power with an amplifier without affecting even this television set. Without the filter the signal picked up from the beam by the television feeder (and antenna) was so strong, that no 21 MHz operation was possible without affecting the television picture.

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MORSEWORD 10

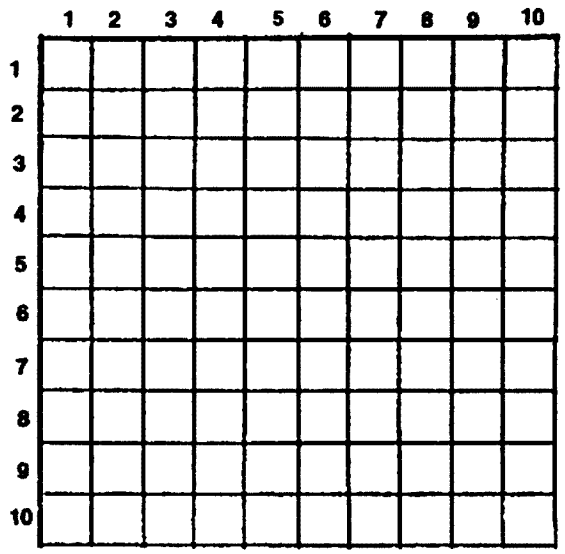
Compiled by Audrey Ryan
30 Starling Street, Montmorency, Vic. 3094

ACROSS

1 Begin to grow
2 a dog
3 Employer
4 Unable to hear
5 Edges of garments
6 .... Turner (actress)
7 Impulse
8 Chew
9 Cut
10 Girls name

DOWN

1 Narrate
2 Situated
3 Adapts well
4 Sieve
5 Shakespearean king
6 Flower
7 Express contempt
8 Prickly seed case
9 Vehicle
10 Male deer



Solution page 54.

USER TRAINING MANUAL

The *IPS User Training Manual* is a practical guide for all users of IPS services, and a general reference manual on HF communications.

This manual consists of three sections:

SECTION 1
— The ionosphere and its formation
— Reflection and absorption of radio waves
— Ionospheric variations
— Mapping and predicting the ionosphere

SECTION 2
— Oblique propagation of radio waves
— IPS predictions and formats

SECTION 3
— The Sun-Earth environment
— The main types of solar activity
— The terrestrial effects of solar activity
— The disturbance warning services provided by IPS

Copies of the User Training Manual may be obtained by writing to: The Assistant Secretary, IPS Radio and Space Services, PO Box 702, Darlinghurst, NSW. 2010.

Cost of the manual is:
$A12 including postage within Australia
$A15 including surface postage overseas
$A20 including airmail postage overseas

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TOTAL COMMAND OF THE AIRWAVES

Sports car enthusiasts feel it when they get behind the wheel of a Porsche 922; pilots feel it when they climb into the cockpit of a Lear Jet; now radio amateurs can feel it too — that feeling of total control.

Icom's newest all-mode HF transceiver, the IC-761, is designed for the HF operator who wants more than just a radio. Behind the controls of the IC-761, you are in total command of the air-waves.

It is not just that you have almost every conceivable control feature at your fingertips, or that the IC-761 is a true all-mode transceiver (SSB, CW, RTTY, AM, FM) or that the IC-761 responds predictably to every parameter change, or that inside the box is some of the most superbly designed, sophisticated, state-of-the-art circuitry ever seen in an amateur transceiver. It is more than that. It is much like sitting behind the microphone at the Voice of America or Radio Australia . . . when you talk, it seems like everyone on the band sits up and listens.

The Icom IC-761 is designed for total operator control. It is not just a radio, but a complete shack in the one package: HF amateur band transceiver, automatic antenna tuner, electronic CW keyer, general coverage communications receiver and 100 percent duty cycle power supply — all with full computer control capability and provision for connection of an external manual or automatic linear amplifier, external automatic antenna tuner, RTTY or AFSK terminal unit, slow scan television unit, etc. To power accessories 12 volts DC is available from a rear panel jack.

Inside the IC-761 are the results of Icom sponsorship of many amateur radio DXpeditions and the feedback received from the operators who have used Icom transceivers in some of the harshest locations on Earth. Major advances in circuit design that have produced increased dynamic range for better reception, and higher quality final amplifier circuits for maximum reliability and purity of signal output.

Icom involvement in Arctic and Antarctic expeditions has led to the development, for the IC-761, of a high stability crystal unit incorporating a built-in temperature compensating oven heater providing frequency stability of better than 100 Hz over a temperature range from -10 to +60 degrees Celsius. A full featured base station equally at home in the recreation room at Mawson Base or a station in the Simpson Desert!

For the DXer or contester, the IC-761 includes a low distortion speech compressor with full metering, long and short duration variable pulse level noise blanking, front-panel controlled VOX operation, receive and transmit incremental tuning, an ultra-deep (30 dB) notch filter to eliminate annoying carriers, true IF monitoring, 20 dB preamplification with minimal degradation of signal quality, switchable AGC, passband tuning, IF shift and switchable filtering.

The filter section selects different combinations of the second and third IF receive filters: FL80 and FL32A 9 MHz filters; FL44A and FL52A 455 kHz filters. Optional filters may also be added. A front-panel switch selects between two filter systems for SSB, CW, RTTY and AM operation. Internal preset switches select 2.4 or 2.6 kHz SSB filters, 2.4 kHz or 500 Hz CW/RTTY filters, 500 Hz or 250 Hz CW-N and RTTY-N filters, and 6 or 2.6 kHz AM filters. Change the combinations to suit your preference.

Add the optional SP-20 external speaker and a further four audio network filters become available to totally tailor received signals.

If your interests wander now and then to signals outside the amateur bands, you will appreciate the ultra-wide coverage of the IC-761 receiver circuit. Quadruple conversion (except FM) with high-side IF up-conversion under CPU control provide receive coverage from a very low 100 kHz to 30 MHz. Icom's unique Direct Feed Mixer (DFM) feeds the incoming signal directly to an Icom-developed high level first mixer producing superb spurious signal rejection, higher receive sensitivity and wider dynamic range, on and off the amateur bands.

In fact, the dynamic range of the IC-761 is nothing less than 105 dB. And, at 0.5 μV sensitivity (1.6-30 MHz, SSB/CW/RTTY) with the built-in preamplifier engaged, the IC-761 still produces a dynamic range better than 100 dB!

To store all those stations you find using the many scanning mode variations available, the IC-761 is provided with 32 full function memories storing frequency, mode and split. Memory 1 and 2 set the limits for programmed scanning between upper and lower frequency limits. Mode-S provides mode-selective scanning. Memory contents are selected by a rotary switch and displayed at the touch of a button. All backed up by lithium cells with a 10 year life span.

Add to this the flexibility of instant QSY via the centrally-located soft-touch keyboard frequency controller and you get some idea of the features you will find on the Icom IC-761.

Total command of the airwaves does not come cheap, but you will be pleasantly surprised by the price of the Icom IC-761.

See your nearest authorised Icom dealer for a demonstration of the IC-761 and feel the power of total command!

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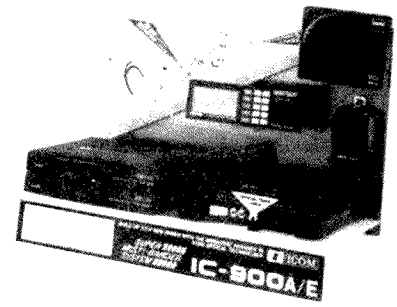
MARVELLOUS MODULAR MULTI—BAND MOBILE

Icom's new IC-900A series transceiver system is so logical, you must be left asking yourself. "Why didn't someone think of it before?"



Developing the suggestions of radio amateurs around the world, Icom has taken the latest in optical fibre technology and state-of-the-art circuitry and produced the first truly modular multi-band amateur radio transceiver.

The IC-900A is customised amateur band communications at its best:

- Mix and match band modules between 26 MHz and 1.2 GHz to suit your operating needs;
- Program your own frequency stepping rates for each module;
- Store your favourite operating frequencies on each band in each module;
- Monitor selected modules individually or simultaneously.

And the benefits of modular design do not end here! Because space is at a premium, in the interior of modern motor vehicles, the IC-900A remote control module, containing all the normal transceiver front-panel features, is just 150, 50 and 25 mm (WHD). Perfectly dimensioned for console installation and, weighing a mere 200 grams, not likely to stress delicate fascia panels.

As theft from motor vehicles is a real and everyday concern for the radio amateur, the sophisticated technology of the IC-900A has been removed from public view, tucked away in two slimline interface modules which, because they require no user intervention, can be securely mounted out of sight, making theft far more difficult.

Interface Unit-A caters for all external connections like microphone, external SP-8 speaker, standard OPC-095 thin power cable and the optical fibre link to the second interface unit.

This allows the remote control module to be mounted where you can easily see the display and comfortably operate the controls, while the Interface Unit-A can be installed closer to the operating position for easy microphone access.

Interface Unit-B can be even more securely positioned behind the rear seats or in the boot of the car, along with the separate band modules, to make theft even less attractive. Interface Unit-B contains the common power, preamplification, frequency, data and control circuitry for the individual band modules.

The individual band modules, up to six of them, are located with Interface Unit-B, secure and well-hidden from public gaze, where connections can be kept short to ensure maximum efficiency.

Each band module is parallel-linked to the second interface unit and contains its own frequency selection circuitry, memory section, power amplifier and antenna connector.

The UX-19A band unit covers the entire 10 metre amateur band. The UX-59A band unit covers the six-metre band from 50 to 54 MHz. Both feature selectable power output at 10 watts high, one watt low, with tuning steps of 5, 10, 15,

20 or 25 kHz selectable, and each has 10 memory channels.

The UX-49A 70 centimetre unit covers 430-440 MHz with selectable power output of 25 watts high, five watts low, selectable frequency stepping of 5 to 25 kHz in 5 kHz steps and 10 memory channels.

The UX-129A 1.2 GHz band unit covers 1240-1300 MHz with selectable power output of 10 watts high and one watt low, frequency stepping in 10 or 20 kHz steps, and 10 memory channels.

As each band unit is optional, the IC-900A modular system means you pay only for the bands you need, but retain the flexibility to upgrade as your interests or needs change.

With all five band units on board, the IC-900A provides full-featured FM operation on all amateur bands from 28 MHz to 1.2 GHz with a total of 50 memory channels. Full duplex capability means you can transmit and receive on more than one band at one time. The dual frequency display of the IC-900A remote control unit shows the status of any two band modules simultaneously for maximum control.

The IC-900A's advanced modular technology and sophisticated theft-deterrent design does not mean that you miss any of the traditional features that make Icom transceivers so popular.

Advanced scanning facilities provide programmed scanning between user-defined band edges of each band unit, or automatic scanning of the 10 memory channels in each band unit. temporarily unwanted memory channels can be locked out at the press of a button. Your favourite operating frequency on each band can be installed into the call channel memory for instant, one-touch access.

To make the initial set-up of the IC-900A a simple operation, Icom has provided *Set Mode* programming to logically program tuning steps, repeater offsets, sub-audible tone frequencies and band scan limits in one continuous cycle.

Optional extras for the IC-900A modular system include the SP-10 external speaker, MB-21 remote controller mounting bracket, CF-11 cooling fan kit, IC-PS30 AC power supply for in-shack operation, HS-15 flexible mobile microphone, HS-15SB microphone switch box, UT-28 digital code squelch (DCS) unit, and UT-29 tone squelch unit.

This advanced Icom technology is available for a very affordable price. See your nearest authorised Icom dealer for a demonstration or, for dealer information, contact Icom Australia, 7 Duke Street, Windsor, Vic. 3181.

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MAKE THE MOST OF 70 CENTIMETRES

Icom Australia has announced the availability of a 70 centimetre companion transceiver to the very popular IC-275A two-metre multi-mode transceiver.

The Icom IC-475A is set to become the new "bench-mark" for 70 centimetre transceivers, with many of the features that made the IC-471A one of the best selling UHF amateur transceivers ever made and all the features now gracing its two-metre companion.

The IC-475A is an SSB/CW/FM transceiver with a frequency range from 430-450 MHz with built-in 240 volts AC 100 percent duty cycle power supply and 13.8 volts DC mobile operation.

The IC-475A features the unique Icom Direct Digital Synthesiser (DDS) frequency generation circuitry, the modern successor to the now dated phase locked loop (PLL) circuit, completely replacing all PLL circuitry with an advanced, computer designed digital synthesis circuit for extremely fast (5 mS) lock-on to a selected frequency, fast switching for advanced digital modes like packet radio and AMTOR, and superb frequency stability through the mixing of DDS-generated source frequencies in an advanced double PLL system.

Inside the IC-475A is the same advanced HD64B180 ROP central microprocessor unit as is found in the IC-275A, providing 99 user-programmable memory channels to store frequency, mode, duplex direction (plus or minus) and offset and, where used, sub-audible tone data.

This advanced microprocessor also provides equally advanced remote control capability via a rear mounted RS-232C jack operating at 1200 Baud, providing computer control of frequency and mode selection and memory channel data via an appropriate interface.

Four independent scan modes provide easy and convenient monitoring of the 70 centimetre band. Programmed scan mode repeatedly scans a selected portion of the band between user-defined limits stored on memories 1 and 2. Memory scan cycles through each of the 99 memories with selectable stop-on-busy or stop-on-clear. Mode selectivity memory scan monitors only those memory channels containing the same mode information as the main display. Skip scan provides the facility to temporarily skip unwanted memory channels.

A high integrity, newly-designed liquid crystal display (LCD) with soft orange illumination provides maximum visibility even in bright sunlight. The IC-475A display unit constantly monitors the VFO in use, the selectable mode, the split or offset data, scan mode, memory channel, RIT offset, sub-audible tone (if used) and operating frequency.

However, the most important features of the Icom IC-475A are not to be found on the outside. Under the covers is a low noise, high gain, disc-type 3SK121 GaAsFET receiver RF amplifier designed for UHF applications. This is supplemented by a quadruple-conversion superheterodyne receiver design with a balanced mixer using a 2SC2026 UHF transistor with 2 GHz frequency characteristics for improved sensitivity and greater dynamic range.

Receive sensitivity is claimed to be less than 0.1 μV for 10 dB S/N (SSB/CW); selectivity is claimed at 2.3 kHz for -6 dB (SSB/CW) and 15 kHz for -6 dB (FM). Squelch sensitivity is a mere 0.14 μV (FM) and 0.56 μV (SSB). Although unstated in the specifications, the IC-475A receiver dynamic range is considered to be in excess of 105 dB.

Transmitter power is continuously adjustable from 2.5 to 25 watts from the front panel. For higher power applications, the IC-475H provides continuously adjustable power up to a very hefty 100 watts. Spurious outputs are suppressed more than 60 dB below carrier level, while carrier and unwanted sideband in SSB mode are suppressed by more than 40 dB (1000 Hz AF tone input test).

Your ventures into 430 MHz multi-mode operation does not mean that the comforts of HF are left behind. The IC-475A features IF passband tuning, deep notch filtering, noise blanking, selectable AGC, speech compression and optional enhancements like the CR-64 high-stability crystal unit, IC-AG1 waterproof masthead preamplifier, UT-34 tone squelch unit, UT-36 voice synthesiser unit, CT-15 AQS adaptor, FL-83 250 Hz narrow CW filter and IC-MB5 mobile bracket.

A rear panel AFSK jack supplies easy access for advanced mode operation and the IC-475A is equipped with a data switch to reduce PTT switching time for RTTY, packet and AMTOR to an amazing five milliseconds — another feature of the unique Icom DDX system.

Visit your nearest authorised Icom dealers and ask for a hands-on demonstration of this versatile, feature-packed unit, or contact Icom Australia Pty Ltd on (03) 529 7582 for details of your local Icom dealership.

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TOMORROW'S TECHNOLOGY TODAY

The future in commercial communications technology promises many new conveniences. Imagine a commercial UHF band transceiver smaller that two cigarette packets placed end to end. Imagine that this tiny transceiver could store and operate on up to 16 different channels. That each channel could be numbered non-sequentially from one to 99 according to preference. That this transceiver would know when there is no signal present and automatically shut down unnecessary circuitry to conserve battery power. That each communications channel could have a separate and distinct selective calling code to filter unwanted traffic. That all 16 channels could be scanned at the touch of a button. That this tiny package could transmit a hefty five watts of output power. Imagine that this transceiver could be programmed by a knowledgeable technician, then sent out into the field as a portable storage database, loaded with the information required to program hundreds of other similar micro-transceivers with just one simple connection.

Forget your imagination, the future is here now.

The IC-U16, from Icom Australia, is turning commercial communications upside down.

The Icom IC-U16, approved by the Federal Department of Transport and Communications for use on the UHF allocations between 450 and 490 MHz, is a fully synthesised 16 channel portable transceiver with advanced keyboard entry and the unique ability to instantaneously program, or clone, other IC-U16 transceivers in the field, transferring frequency data, CTCSS selective calling data, transmit inhibit data (for receive only channels), frequency offsets (for split frequency or repeater operation) and tones (for tone calling or tone access) by the simple connection of microphone jack to microphone jack with a mono-stereo connector cord.

With the ever greater demand for UHF band allocations, frequencies do change from time to time. While some transceivers seem to strive for planned obsolescence, locking in frequencies with outdated crystals or inflexible phase locked loop (PLL) circuitry, the IC-U16 plans for the future with frequency generation circuitry that can be updated instantly and without the inconvenience of returning all units to a factory, or even to a dealer!

When your problems cannot be solved by simple radio contact, the IC-U16 comes to the

rescue with optional DTMF dialling via the front panel keyboard to access 'phone-patch' facilities through a base station or repeater unit. The CTCSS selective calling can be installed with or without the DTMF facility.

With its rugged, all-metal chassis with stainless steel battery slide rails and a reinforced, diecast aluminium back, as well as moisture and dust resistant seals, the IC-U16 is made to take the roughest treatment. We do not actually recommend such treatment, but one careless owner of an IC-M8, similar in construction to the IC-U16, is reported to still be using the transceiver he accidentally dropped from the eighth floor of a construction site.

When you are away from base you will appreciate the full 2.5 watts of power from the IC-U16, or you can double that output with the addition of an optional IC-CM7 battery pack. And, at those hectic times when every transmission is important and the nearest charger is kilometres away, you will really appreciate the unique power-save feature of the IC-U16, dropping receive mode power consumption from around 160 milliamps to just 30 milliamps.

The Icom IC-U16 comes complete with BP8 very long-life battery pack, BC-18 SEC approved 240 volts AC wall charger, flexible antenna, belt clip, earphone, hand-strap, external speaker plug, externals microphone plug, rain-proof cap and DC power plug. Optional accessories include the IC-HM9 speaker microphone, HS-10 headset, HS-10SA voice operated microphone unit, CM-60A desk multi-charger and BC-36 desk charger.

Call in to your nearest Icom authorised dealer or contact Icom Australia, 7 Duke Street, Windsor, Vic. 3181, phone (03) 529 7582 or toll free on (008) 33 8915.

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RAAF RADIO BUTTERWORTH TO CLOSE

Radio station *RAAF Radio Butterworth*, otherwise known as the *Voice of the RAAF in Malaysia*, is to close after operating for the past 27 years, due to the RAAF winding down operations in Malaysia. The last broadcast will be on New Year's Eve.

There was a reunion/wake held in Butterworth over November 14-22, and all former volunteers were invited. A magazine of the highlights of this service will be available. Contact Neville Krogh, RAAF Radio Butterworth, Air Base, Butterworth, 12990, Malaysia, for further details.

Radio Butterworth operated on 1.445 MHz, with one kilowatt, and mainly relayed to Radio Australia and Radio Malaysia, with some local content

MORSEWORD 10 SOLUTION

Across: 1 bud 2 setter 3 user 4 deaf 5 hems 6 Lana 7 urge 8 gnaw 0 sawn 10 Vera
Down: 1 tell 2 sited 3 fits 4 sift 5 Lear 6 rose 7 boo 8 bur 9 jeep 10 hart

	1	2	3	4	5	6	7	8	9	10
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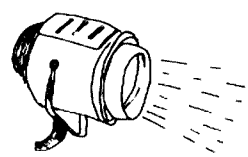

Robin Harwood VK7RH
52 Connaught Crescent, West Launceston, Tas. 7250

Spotlight on SWLing

Well, another year has passed and there have been several interesting developments on shortwave over the past year. There has been an increasing trend to co-operative endeavours between the various international broadcasting organisations, instead of competition and hostility. In April, NHK, the Japanese national service began broadcasting on a permanent basis from the Radio Canada International site, in Sackville, New Brunswick. From October 1986, they began a test period from the RCI site and were encouraged with the response from the North American west coast, which was a rather gray area as far as propagation was concerned. Now NHK are broadcasting up to four hours a day, via Sackville, in English and Japanese.

Next year, Radio Canada International are scheduled to begin broadcasting via the NHK transmitters in Yamata, Japan. This follows amendments in Japanese legislation to allow this as there was a law on the books that prevented broadcasters from other nations broadcasting from Japanese soil. Some readers may remember that the US Armed Forces' Network has been operational on shortwave for many years, but this goes back to the US Occupation after World War II and the Korean War, prior to Japan regaining her sovereignty in 1952.

The use of the Japanese site should significantly improve the signal from RCI within this region. Many older listeners may remember hearing Radio Canada's Pacific Service on the 49 metre band around the evening meal time. Many Canadian expatriates were upset at not being able to hear RCI broadcasting to this region, although the RCI programming to Europe comes in very well in the early morning period.

By now, the other co-operative venture in sharing transmitter sites should be well and truly operational. This is between Swiss Radio International and Radio Beijing. SRI have had severe difficulty in putting signals into Australasia during the minimum Solar Cycle and, conversely the Chinese into Europe. Consequently, the arrangement will benefit both. It was only a few years ago that Radio France International (RFI), in Paris, and the Chinese had an abortive agreement that only lasted for a few weeks, however the agreement fell through.

The need for co-operation between broadcasters has been largely brought on by necessity. The construction of high powered senders in highly populated regions, especially Europe, has been opposed by environmentalist groups worried by the effects of RF radiation. In Denmark it has caused a permanent halt to the construction of a new HF site for Danish external broadcasts and has even brought the future of the Danish shortwave service into doubt. Because of this problem SRI has elected to seek a co-operative agreement with another broadcaster, rather than go through the process of looking for a new site within Switzerland and face environmental objections. SRI has also commenced using the facilities of "Africa No 1" to transmit signals into South America from Gabon.

The other interesting improvement was the reduction in jamming from Soviet sources to western broadcasts. The new, more open policy within the USSR has seen the BBC, VOA and other western broadcasters get through with clear signals. However, not all broadcasts are getting through.

The programs from Radio Liberty/Radio Free Europe, in Russian, and various Eastern European languages now get the bulk of jamming signals. Also, Kol Israel is still jammed in both Hebrew and Russian. The only VOA programming that was jammed was in Polish, but this was likely to be lifted following recent domestic reforms within Poland.

We have seen jamming continue, particularly in the Middle East, where Tehran's Arabic programming, plus some Persian external programming is jammed. The jamming is distinctive, sounding like klaxons. There is reportedly also interference to some Arabic transmissions from western countries and Syria. Transmissions from Taiwan directed to the mainland are also jammed with what sounds like "white noise."

The other development concerned the coups in the Pacific, which is very close to Australia. The first one in May caught everyone off-guard, but the media was a little more prepared the second time around. With the domestic media under tight censorship, news on what was happening within the area mainly came from shortwave via the BBC, Radio New Zealand and, especially Radio Australia.

Because of the pressing need for the BBC to provide reliable signals into the Pacific area, arrangements were hastily made for the BBC signals to be fed via the RA Shepparton site. At the time I am writing this, the BBC via Shepparton is quite good on 15.105 MHz from 2245 to 0030 UTC. I don't know the length of this temporary arrangement, but I hope that the two organisations can continue to provide a good signal into this region at that hour.

At the end of September, the BBC Hong Kong Relay came on stream. I am hearing it well in the evening hours on 7.180 MHz, when they mainly carry the BBC Asian Service. The daytime service on 15.280 MHz has been disappointing, yet it should be remembered that the signals are being beamed to Japan and North China. The BBC Far Eastern Relay has been freed to provide a longer service to many in this area.

This year also saw the demise of Lyndhurst as a transmitter site. The ABC Domestic HF Service, VLR and VLH, from Melbourne closed down after 50 years of operation on June 12. Then on September 30, Time, Signal and Standard Frequency station, VNG, was closed down, with only 24 hours notice. This service will be missed by many, who particularly utilised the 7.5 MHz signal to calibrate the 40 metre section of their transceivers. The other development was the ABC MW Networks going to 24 hour transmission, with Radio National relaying RA programming between midnight and dawn. There has also been wholesale changes in the media scene generally within Australia, that 1987, in my opinion can be categorized as the *Year of Change!*

Until next month, all the very best for Christmas and a Happy 1988, which will be our Bicentennial Year, and good listening!

—Robin VK7RH

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WICEN News

Paul Walton VK3PW
3 Elgin Grove, Belgrave Heights, Vic. 3160

RALLYING TOGETHER AT HEATHCOTE

Heathcote. 8 am Saturday, September 19, and the quiet of the morning is broken by the sound of rally cars preparing for the day's event!

The *George Derrick Memorial Rally*, organised by the Car Club of the Royal Melbourne Institute of Technology, was to take place in the Heathcote to Pyalong area of Victoria. Over 50 drivers and their navigators were required to negotiate 20 stages of the event against the clock. The team with the least overall time for the event would be deemed the winner. With the temperature in the mid-20s, the day promised to be enjoyable for the officials and spectators, whilst dusty and fast for the competitors.

In an event of this type, safety, smooth operation and accurate up-to-date scoring are paramount to a successful rally in the eyes of the Rally Directors. To assist in these matters, WICEN has been providing a service to the larger of the rally events as they provide the basis for an excellent form of training exercise.

WICEN was required to cater for portable stations located at the start/finish of the stages, as well as for mobiles which would be traversing the rally trouble spots. To successfully service all these operators, the base station was to primarily operate on two-metres and 70-centimetres, through portable repeaters, VK3RWE and VK3RWP, with 80-metres reserved for those stations with no access to the repeaters.

Ross VK3JZ, operating HF at Heathcote Oval Base Station.

The dust flies as the cars negotiate a tight corner.

Roo VK3YML, and Andrew VK3KIR, at the Mount Ida portable repeater site.

Some members from Region 13 arrived at Heathcote on Friday night to erect the two repeaters on nearby Mount Ida. Keys were obtained from one of the local residents to gain access to the fire tower on the summit where antennas would be secured. The tower would also prove a convenient place to sleep, but with the gusting winds tugging at the tower sleep was something that escaped most members.

The repeaters proved their worth in covering the large area of the event. Few stations found it necessary to resort to HF to maintain their part of the network. Indeed, some operators found hand-held units sufficient to allow them to tag officials at check points and still see some of the racing action, too!

As is usual with these events, all the preparatory planning pays dividends for the directors in ensuring the rally runs as near to expectations as possible. Despite this, accidents do occur on the track, checkpoint officials do encounter minor problems and, even non-participating vehicles can be found on competitive sections of the rally (much to the surprise of the competitors!). Without radio communications, the directors would have to cancel stages of the event, or experience large time delays in dealing with these problems. Thankfully, only minor dramas, which could be rectified with a minimum of delay, were experienced. This was achieved through the Director's ability to quickly contact his roving officials.

Late afternoon saw Geoff Portman and Peter Gale taking race honours in their Datsun 1600. After a short presentation, it was off to a barbeque to relive the days more memorable moments. Rally Directors, Simon Brown and Ken Cusack, thanked Roger VK3BKR, and his team of operators from Regions 2, 13, 14, 21 and 22 for providing the much relied upon network.

Throughout the day's activities, Andrew VK3KIR and Paul VK3PW, filmed video footage of the event (and spent more than 20 hours in post production time) to produce a video tape for WICEN promotional purposes. It is hoped to show amateurs the fun that can be a derived from participating in such events. These exercises are one of the better ways to increase communications skills whilst having a great time too. It also provides public awareness of amateur radio which may result in new membership!

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Rally Director, Simon Brown, looks on as Mike VK3KMJ, receives messages.

REMEMBER

When inquiring about products published in AR always mention where you read of the product.

VK2 Mini-Bulletin

Tim Mills VK2ZTM
VK2 MINI BULLETIN EDITOR
Box 1066, Parramatta, NSW 2150

It does not take long for a year to go and members are advised that it will soon be time for the AGM and election of officer bearers for another year. Nominations for council will be called in February and the AGM will be held during April 1988.

The VK2 membership fee for 1988 for renewals and new members has been set as follows:

Full Member	$37.50
Associate Member	$35.50
Pensioner	$30.50
Student	$18.50
Family	$23.50

The VK2 Division, as previously advised, is to introduce a series of awards from the beginning of next year. The major one will be the VK2 — 1988 — Award, which requires the working and confirmation by log entry, of 200 different VK2s during the year. Also being introduced is a National Parks and a Shires Award. All contacts made on and after 0001 UTC, January 1, 1988, count towards the awards. During November, the Division will provide a special award as part of the Parramatta celebrations. The Divisional Office is located in the Parramatta municipality. On January 26, the Division will mount a special events station. A special QSL card will be available for exchange through the bureau.

During October, the Division received an excellent lecture from the IPS Service on HF propagation. This is the lecture series which is, or has been, given to other Division throughout the year. The lecture will be made into a video for release in 1988.

The two-metre FM Contest held in late September, had a very high level of participation. Over 100 stations were logged, including several country stations. It is planned to run a series of contest during next year promoting the various VHF and UHF modes. The rules will be tidied up to form a common set for all the local contests. Many operators discovered that there was a path from them to other stations without the aid of repeaters.

The last VK2WI Broadcast for this year will be on Sunday, December 20. The first broadcast for 1988 will be on Sunday January 10. Do not forget that, if you are unable to catch either of the Sunday broadcasts, then use the telephone recorded message on (02) 651 1489. This will be updated during the Christmas break as news comes to hand.

WICEN has been involved in several major exercises in recent months. This included the City to Surf, Car Rallies at Batemans Bay and Central Coast and the Hawkesbury Canoe Classic, resulting in about 2000 operator hours. WICEN in VK2 is currently being incorporated as a requirement of its VRA membership.

It is almost Christmas and, should you be dropping hints, but if the rest of the household can not think of anything, then contact the Division's Bookshop, at Parramatta. There may be a book you would like. If you are trying to find something for the younger or smaller members of your family, then we have several size 12 and 14 windbreakers at a discounted price.

The Divisional Packet Bulletin Board has been operating as VK2AWI on an experimental basis on 7600. From December 1, 1987, this will change to channel 4850 and later relocate to the VK2WI site to provide a greater service area. Consideration is being given to adding an 80 metre port to the bulletin board to provide country access.

The various VK2 repeater matters have been reported in this month's Beacon and Repeaters column. The Sydney ATV Group is currently rebuilding their transmitter for the repeater — VK2RTS — facility. In addition, they are looking for a new site, if possible, in the Sydney metropolitan area. Gladesville ARC have continued their Wednesday evening test video transmission. If you are a viewer, then call-in at intervals to provide a report on their coverage. They will be taking a short break during the holiday period from the live sessions and will do like the other outlets and provide highlights of the best of the year! The deferred AEM Modern Modes Symposium will be held at Amateur Radio House, on Sunday, December 6.

A reminder to members that some new titles have been added to the Division VHS video tape library.

The Divisional Council, at their October meeting, discussed some early submitted agenda items for the next Federal Convention. These have been forwarded to the Federal Office. They were, that the closing date for Federal Convention agenda items be altered to allow sufficient time to publish the agenda item in full in *Amateur Radio* to allow all members the chance to discuss and provide input on the matter. The other agenda item came from a submission prepared by Grahame VK2KZV, that the holders of combined call signs — K calls — having demonstrated their technical level by way of the theory examination be granted the mode and power level qualifications to their HF operation, currently available to them in their VHF and higher frequencies licence. These items will become agenda items for the 1988 Federal *Convention*.

A warm welcome is extended t the following new members who were in the October intake.

P Draxler Assoc	Macquarie Fields
D A Folkes VK2XDF	North Manly
R M Hanna VK2MDC	Mittagong
L K Ho VK2AKD	Castle Hill
J A Kentwell VK2XBR	Springwood
W A Miller VK2MWA	Eastwood
J A Pincock VK2MCT	Long Jetty
R D Smith VK2ARB	Frenchs Forest
J E Stedman Assoc	Lindfield

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VK3 WIA Notes

The WIA (Victorian Division) would like to express its thanks to the following for their contribution of QSL cards to the WIA QSL collection:
Jim VK3YJ, Allen VK3SM, Barry VK3XV, John VK3AJY, Mike VK3KTO, Bruce VK3SO and Andy VK3UJ.

We have avoided mentioning the number of QSLs donated to the contribution for we want to encourage all DXers to contribute, if possible, no matter what the number of QSLs, but we have to say that there have been some particularly generous contributions which have got the collection away to an excellent start.

As mentioned previously, we do encourage DXers to look through their old shoe boxes fill of QSLs collected over the years and pick out some duplicate copies of those rarer kind of prefixes and ARRL DX countries. They would be greatly appreciated. Please do not destroy any future QSL cards, but rather drop them into the WIA rooms in Brunswick Street, Fitzroy (Monday to Thursday before 3.00 pm), or leave a message for any cards to be picked up from your home.

—Contributed by Ken Matchett VK3TL, Curator

The September meeting of the Council of the WIA (Victorian Division) made several important decisions on the following items:

1988 SUBSCRIPTIONS

The Victorian Division membership subscription for 1988 will be increased by $5 for all classes of membership. The increase is $2 to cover rising costs, and $3 increase in the Federal component. The Federal increase was agreed upon at the 1987 Convention.

ZONE GRANTS

Zone grants will be paid in 1988. These grants will be at the rate of $4 per head for each full member who resides within the Zone. Grants will be paid to Zone Secretaries not later that the first week in April 1988.

Zone treasurers will provide the Victorian Divisional treasurer with a statement of receipts and expenditure and bank statements for the preceding year not later that February 28, 1988.

Failure to provide a proper record of Zone expenditure and receipts by the required date will render the Zone ineligible for a grant. No requests will be made by the Victorian Divisional treasurer for statements and the responsibility for timely forwarding will be that of the Zone.

REPEATER FUNDING

The Victorian Division will bear the cost of maintenance *and service* of a primary repeater network in Victoria. Zones will be required to pay for all associated costs including licence fees, site leases and power for those repeaters which do not form part of the primary service or alternatively are funded by WICEN.

Classification of repeaters will be undertaken in consultation with VTAC, WICEN and Zone representatives, and should be completed by February 1988. Zones will be able to exercise the option to retain or delete any repeater services they do not require, and which are not funded by the Victorian Divisional Council, or WICEN.

CHRISTMAS VACATION

The Victorian Divisional Office and Rooms at 412 Brunswick Street, Fitzroy, will be closed for the Christmas break from Thursday, December 17, 1987, until Monday, January 25, 1988. There will be no council meeting for the month of December.

—Contributed by Bill Trigg VK3PTW

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Five-Eighth Wave

Jennifer Warrington VK5ANW
59 Albert Street, Clarence Gardens, SA. 5039

On Friday, September 18, the usual monthly Divisional Council meeting did not start until 9.40 pm local time. No, we were not all running late. In fact, most of us were there at 8 pm, but we were conducting a Public Relations exercise!

As most readers know, we lease our Headquarters building from the Thebarton Corporation and we had heard along the 'grape-vine' that some of the councillors had expressed interest in our activities, and would like to find out more about what we did. We considered this to be a perfect opportunity to do some PR work and so, at the time mentioned, we welcomed Councillor Mary Linn, a young man whom we think was Mary's son, and Colin Shearing, who was the Mayor of Thebarton at the time of acquisition of the Burley Griffin Building.

Councillor David Mackellar had also hoped to be with us but, as he was not able to attend, we hope to show him around at a later date.

I think Colin Shearing was impressed with what had been done with the building as he would have seen it in its original state (as an incinerator). Mary Linn took copious notes and asked plenty of questions. She was very interested in our WICEN and other community-spirited activities. She also mentioned that they might ask us to be involved in some celebratory activities in Thebarton next year, particularly any amateurs who live in the Thebarton district. It might have made the meeting start very late that night but, all in all, we felt that it was time well spent.

Council was approached by ALARA to find out if we could house the Florence McKenzie Trophy for them. The VK3 Division had been approached but, as they may have to sub-let part of their headquarters building, did not feel that they were going to have any spare room. The VK5 Division did not see any problem in housing the trophy in the Burley Griffin Building so, on Saturday, September 26, around 3.30 pm, the trophy was duly handed over to me as Divisional President by Marilyn VK3DMS, the President of ALARA, in the Burley Griffin Building.

That weekend ALARA was meeting in Adelaide for its National Get-Together (of which you will be able to read more in the ALARA notes) and it gave us an excellent opportunity to have it brought to Adelaide from VK3 (thanks to Neil VK3KNM and his wife, Muriel). Part of the Saturday afternoon activities, after a guided tour around the City, was afternoon tea at the Burley Griffin Building and a chance for the ladies to meet, not only the VK5 Divisional Councillors, but also the Federal Awards Manager, Federal Video Tape Co-ordinator, immediate past Federal Contest Manager, and several others of whom they might have heard through AR etc.

Whilst on the subject of that weekend, I would like to thank the VK5 OMs for their great courtesy and forbearing. On the Friday, when we were listening for and talking-in many of the interstate visitors, we did take up a lot of 'repeater time' and for part of the Saturday and Sunday when we were travelling in mobile convoy we used Channel 50 as the liaison frequency, and not once did I hear a derogatory remark or a grumble. In fact, our interstate visitors were most impressed by the South Australian friendliness and hospitality.

As well as all the OMs who were involved in the weekend (mostly because they happened to be married to ALARA members) I would also like to thank Treva Slater VK5ZIS, who kindly took on the position of official photographer for the weekend, and an excellent job he did as you will see when samples of his work come to light in future issues.

There is no further news from our Bicentennial Committee, last I heard there are several members willing to form a committee, but no one wants to wear the co-ordinators hat!

Do not forget the Christmas Social on Tuesday, December 8, 8 pm at the Woodville Community Hall, 64c Woodville Road, Woodville (on the right-hand side between Port Road and the Town Hall after you cross Port Road). To date we do not have a speaker, and no one has volunteered to help with the catering, but do come along anyway and do not forget to bring your 'other half.' (YL, OM, or whatever!). Also, bring a plate of supper to augment that provided by the WIA.

Official ALARA-Meet Photographer, Treva Slater VK5ZIS, took time from his duties to pose with Christine Taylor VK5ZCQ.

Next month's column will either have a guest writer (or, if no one volunteers, will be absent!). At the time of writing I shall be 'snowed under' with preparations for a son's wedding. This was also part of the reason that I was unable to accept an invitation from the Darwin Amateur Radio Club to attend their 21st Birthday Celebrations. I hope that it was a most successful time, nonetheless, and that you will continue to be a strong and active club in the years to come.

In the meantime, I would like to wish everyone a very Happy and safe Christmas and New Year holiday period.

JUBILEE 150 AWARDS

1410	KA5YCM
1411	NS7J
1412	YC3FHN
1413	YU3DB

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Snapped at the ALARA-Meet 1987, are: Publications Officer John Gardiner VK5KJG, John's wife Wendy, Sylvia Hunt, wife of Ian VK5QX, Pam Bruce and (in front) her OM, Rowland VK5OU, VK5 Federal Councillor.

QRM from VK7!

John Rogers VK7JK
VK7 BROADCAST OFFICER
1 Darville Court, Blackman's Bay, Hobart, Tas. 7052

Since this is the first information bulletin from VK7 for AR for some time, it is obvious we have some catching up to do. This has been a rather busy season for WIA members in Tasmania, and that situation seem likely to carry-over into 1988.

WICEN exercises were successfully held in the Central Highlands in September; there was the control cover for a car rally in October; then a mini-exercise in November. Still further action is on the way for January when a WICEN exercise is invited by the SES as communications for a proposed orienteering international competition, but the operation to which the most public attention will be paid is that of organising the communications for the Westcoaster (Melbourne/Hobart) Yacht Race just after Christmas. This latter exercise will, it is hoped, incorporate a Bicentenary Special Event Station to create even more interest.

Last year's Westcoaster, for which communications were also provided by the amateur fraternity, received a comprehensive report in the American magazine *73* — a proud achievement. We hope to do at least as well this time. The practice should be extremely useful for when the special 1988 Tasmanian Amateur Radio Convention is held later in the year.

Do not forget to send in your application for the Tasmania Day Award, just recently the object of a great deal of activity. Yes, we know that it is only a few days since it ended, but our Awards Manager is straining at the leash to despatch all those certificates!

Please note that two packet radio stations are up and running, one in Hobart on 147.600 MHz, call sign VK7LT. The other has been set-up by VK7ZAP, in the north of the island, also on 147.600 MHz, simplex.

Official WIA Broadcasts now emanate from the Activity Centre, 105 Newtown Road, Hobart. The Branch is in the process of either buying or building equipment for itself (at this stage, the transmissions and relays are being carried out with equipment owned by individual members) so that anyone who is willing to originate the broadcasts is not inhibited by having no access to transceivers or patching units. A roster has been organised which consists of eight operators for an 80-metre relay, eight more for 40-metre and one each for 144.100 MHz SSB, 52.100 MHz and an experimental relay on 20-metres — to be exact, on 14.140 MHz.

The set broadcast time is 9.30 am local time on Sunday mornings, but now experiments are in progress for a taped repeat (with update) on Tuesday evenings at 7.30 pm local time, just preceding the Devil Net on 3.590 MHz.

Speaking of the Devil Net reminds me that Bob VK7NBF has recently sent out the 400th Devil Award Certificate. The lucky recipient, who also received a signed photograph of the Devil Net Organiser himself (?) was John VK3CWJ, from Mornington, Victoria. Certificate No 401, following closely behind, went to VK2KJK, from Woolgoolga, north of Coffs Harbour, New South Wales.

Repeater 2, 146.700 MHz, on Mount Wellington, Hobart, has been undergoing detailed maintenance, repairs (mainly weather-proofing external cabling), and rebuilding of the repeater equipment itself. If the results of the repeater workers' efforts match the quality and quantity of the work that they have put in, then repeater 2 should still be operating well into the 21st century!

Noel VK7EG, has for some time been publicising a scheme for assisting would-be novice amateur radio operators, firstly in the north and later it was adopted by other branches. His idea is to place information via schools, colleges, etc, that study guides on amateur radio would be made available to those who wished to begin to work for a qualification. Each applicant would be assigned a specific adviser to help sort out possible problems, assignments being made on a geographical basis.

It has already been said what a busy season is in progress, so it is no wonder we are looking for new members and Noel's scheme deserves a "fair go." When the ever-widening framework within which radio amateurs operate is considered — satellites, word-processors, packet, RTTY, even more Ultra-HF and so on — it makes our hobby an almost all pervading habit. And we need new recruits from the younger age brackets to keep abreast of such new developments.

Watch for a listeners guide to repeaters, coming soon in AR (UK version). If you want to know what GOBS, WUMS, Puckerus Sonicus, TOMS, the Nearly Man and Comets, not to mention Wallius Formerus, are, this article will put you right.

MONTH'S MEETINGS

At Penguin High School, on Tuesday, December 8, at 8 pm.

At the Activity Centre, 105 Newton Road, Hobart, on Wednesday, December 2, at 8.15 pm.

Recent talks and discussions at meetings include Cellular Communication Systems, by VK7AW, Need for Morse in order to Qualify as a Radio Amateur, by VK7ZRP, Patching Units, by VK7BJ, RTTY Mailbox, by VK7ZAP, and all about Federal Affairs, by VK7PF.

RADIO AMATEUR OLD TIMERS' CLUB

The Radio Amateur Old Timers' Club will be holding its December Get-together on Tuesday, December 8. It will again take the form of a counter lunch and rag-chew.

Attend from 12 noon at the usual location, the Waratah Hotel, Murray Street, Hobart. As this is a Christmas function, ladies will be very welcome, as will any prospective members (those who have held an amateur licence for 25 years or more).

Bookings or further inquiries should be made with Joe VK7BJ, QTHR.

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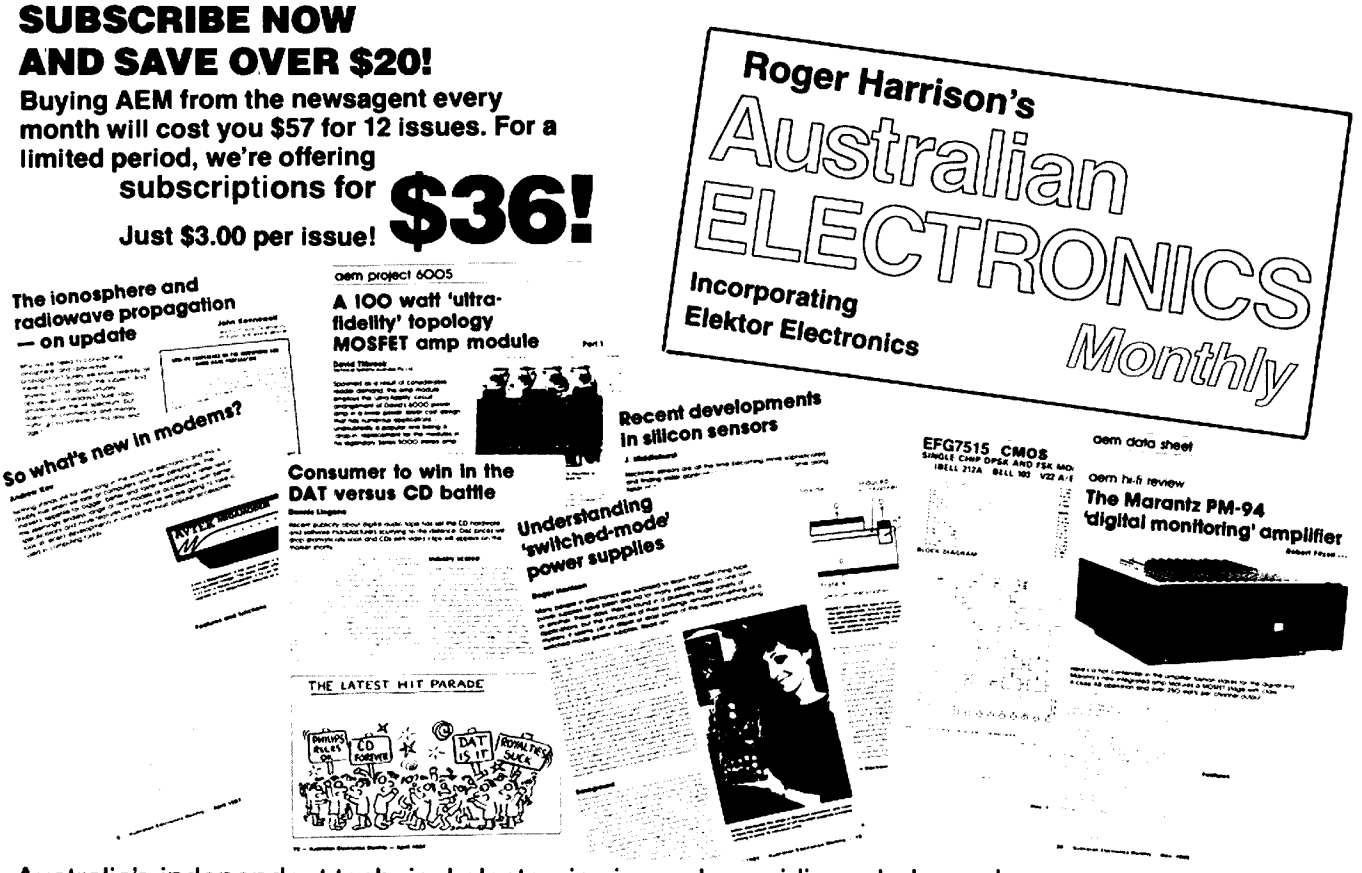

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Any opinion expressed under this heading is the individual opinion of the writer and does not necessarily coincide with that of the publisher.

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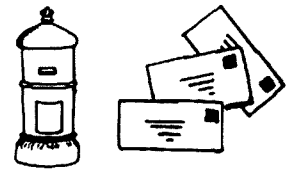

FUTURE OF AMATEUR RADIO

Further to the letter of Tony Lewis VK2EHL, in the October issue, pertinent to the future of amateur radio. I think he makes some very profound points.

I recently gave a talk on amateur radio to the members of one of my local clubs, whose professions range from retired bank managers to mining engineers.

From the questions asked of me at its conclusion, it was apparent that they had expected me to elucidate on a hobby, practiced in a broom cupboard under the stairs, lit by a 15 watt globe, which had remained dormant since Biggles days, when to make a contact with an overseas amateur, was written up by an excited editor of *Modern Boy* or *News of the World*.

That we were permitted to speak with Russia, Bulgaria, etc, etc astounded them ... which relates to the points made by Tony, that the vast majority of the public have no conception of how sophisticated this hobby has become, and of the vast number of men and women, throughout the world, from all walks of life, who are involved. Perhaps, to some degree we have ourselves to blame when we continue to describe our station as a shack, our equipment as a rig and ourselves as hams — shades of 1930 and Tony Hancock!

Let us get more involved with the public ... not just when a three line article on page seven of the press tells its readers that a "Ham Operator picked up a call for help from a lost Butterfly Collector in the Amazon Jungle!

How about a photograph of an amateur station on the front of the Telephone Book in all States ... surely we have a little clout in that area. Or can we get a 10 minute segment on the local State Affair Television Station?

Are we represented at the Royal Show annually in each State? I believe it would be a magnet for the young people whom we should be encouraging. At the recent Adelaide Show, the Army had a Leopard Tank, and the children were over it like swarms of bees, and lining up for brochures.

What about Expo in Brisbane in 88? This will be one of the largest ever staged in Australia with representation from many countries.

Individual amateurs could approach their community library to put in a static display. Our own library is always looking for an exhibit to complement books on the particular subject. I recently displayed some home-brew ship models and maritime bits and pieces I had collected as a ship's radio officer, which created considerable interest. The mind "boggles" with many creative ideas to focus public attention on our hobby, and, if we are to have a future, we cannot expect our "Head Office" to wave the magic wand. Our members have got to get off their seats to ensure we are still around in the year 2000.

Bob Clifton VK5QJ,
4 West Terrace,
Beaumont, SA. 5066.
ar

* * *

I AM PUZZLED!

For sometime I have been reading letters to the editors of AR, and other magazines, offering reasons why amateurs will leave, or will not join the WIA — really, I am puzzled.

Firstly, if the members fall too much, fees must rise to very high levels and lead to the possibility of the WIA ceasing to exist.

Please reflect on this situation!

Our band allocations under constant threat, and mainly preserved because there is a WIA and similar organisations in other countries, would be threatened with extinction, then if we want to still use our hobby, perhaps some CB channels will be available.

Reference is made to the advantages of city members compared to country members, presented by the WIA. Will someone please tell me — what are they?

If there is something we are missing out on, I am sure our East Gippsland Zone meetings will press for equality.

I cannot add to the reasons so often enumerated by the Editor and others, for being a member of the WIA, but remind everyone in case some do not know, the WIA is not a salaried group paid to tuck us into bed, etc, rather it consists of a large number of loyal unpaid volunteers who happen to value their licences, and who work hard and long hours keeping the service operating to the best of their ability.

Keith Scott VK3SS,
34 Henry Street,
Maffra, Vic. 3860.
ar

* * *

GENTLEMENS' AGREEMENT

I am one of the many amateurs who daily try to provide a service to other amateurs in the form of the *Travellers' Net*. This net takes place daily and has been doing so for about 20 years. Judging by the letters received and the complimentary remarks made on air, it is a service that is much appreciated, and — without going into details — it should be fairly obvious that quite an amount of emergency traffic has been handled from time to time and that we frequently pass messages that could not be delivered to the particular traveller by any other means. During the past five years well over 1500 different amateurs have made use of the net.

Due to the long establishment of the net, it is quite well known nationally and internationally and appears in foreign magazines in lists of nets.

Recently, however, we have been suffering some interference from packet radio, and the operators of these stations feel that we should *change our frequency. I have, in* fact, been told on more than one occasion that I have no right to be using SSB on 14.106 MHz, and in view of this criticism I would like to make the following points.

1. I fully agree that no one station or net can claim any exclusive right to a particular frequency at any particular time (I would have thought that this applied equally to packet radio), but I have, until now, always found a high degree of co-operation from anyone using the frequency if they are told that a net is usually held there and is shortly due to start. If approached in a friendly fashion they readily agree to QSY.
2. The Travellers' Net is not the only SSB user in this part of the band. Most mornings, a number of South American operators can be heard; there are many French speaking stations working there of an afternoon, and at any time various SSB QSOs can frequently be heard. Why, therefore, should the Travellers' Net be singled out for criticism?
3. Our continued use of this frequency is based on the IARU Band Plan for Region 3 as published in *Amateur Radio*, February 1986, page 22. From this it would appear that, under the Gentlemens' Agreement, the packet radio stations should not be working in this part of the band.
4. Packet radio operators have told me that they have established themselves on the lower end of the 20 metre phone band and they complain of interference from the Travellers' Net. I feel that this reasoning is the wrong way around. They have forced their way onto these frequencies without any international agreement or discussion and appear to want to force all other operators off *with a consequent de facto unilateral reduction in the* 20 *metre phone band*. They cause interference to us and the interference to them from SSB should have been taken into account when they decided on their frequencies.
5. To change our frequency, despite it being so long established and so well-known, could, of course, be done if proper notice were given, but if we change (say) to 14.115 MHz, how do we know that next week, next month, or next year we will not be told that there is no longer sufficient room for increasing packet radio operation in the segment at present being used and that they intend taking over a further 10 kHz or so of the phone band?
6. If the use of packet radio on these frequencies had been discussed and agreed on generally, I would have immediately abided by whatever decision was made. If I had been approached in a reasonable manner beforehand, I would have given any request made sympathetic consideration, provided it were in accordance with the band plan. But, the only direct communication I have had, apart from some criticism on air, was a telephone call some considerable time ago saying that there was insufficient room for packet radio below 14.100. They were going to start up in the next 10 kHz and I had better move or they would "blast me off the air". The same caller told me there was no way in which our transmissions would interfere with them! This reminds me of the anarchic start of CB with the resultant loss of 27 MHz to amateur radio.
7. I agree that new modes come about and have a right to band space, but I do earnestly request those behind such new modes to sort things out in a friendly discussion and not to force their way in without consideration for anyone else.
8. The American use of these frequencies for packet radio is readily understood. They do not have phone facilities there, so their phone band is not being reduced. This, however, is not an argument for the rest of the world to adopt the American band plan.
9. I can understand the use of unattended stations in a receive mode only, but if unattended transmissions are permitted, how can they listen before transmitting to make sure the frequency is free and how on earth can anyone demand silence in the event of a distress call being received?

I am a fairly old man. I was enjoying amateur radio and felt that I could still be of service to others. I thought I had outlived the time of petty squabbles and arguments, and could lead a peaceful life mixing with a fraternity of reasonable, friendly and considerate people. I hope I was mistaken, but I feel that, if for the sake of peace and quiet, I change frequency in advance of any changes to the band plan by the bodies concerned I am giving an open invitation to any group of people to ignore the gentlemens' agreements to the detriment of the majority. The same invitations would of course be given by a meek alteration of the band plan to accommodate a de facto situation. Before changes are made, it should be thrown open for general discussion to see whether or not the majority of operators are in favour of a reduction of the phone segment.

Incidentally, recently I have heard a couple of Americans in the Western Pacific saying that 14.111 MHz is the next logical frequency for the establishment of further Bulletin Boards. This strongly reinforces the points made under 5 above!

Yours faithfully,

Arthur C Oliver VK6ART,
9 Maycock Place,
Oretla, WA. 6167.
ar

* * *

AMATEUR RADIO MAGAZINE

AR is a quality magazine — it has improved considerably recently — keep the improvements coming. Some articles do wattle a little.

Under no circumstances reduce the size, content, frequency, etc. If it costs us more then that is the price we have to pay. It is a question of priority. Remember, the large team of contributors who give their best for no payments.

73,

Stan Dogger VK2KSD,
71 Lonsdale Avenue,
Berowra Heights, NSW. 2082.

ar

* * *

STANDARD OF AR

First let me congratulate you and your team on the fine magazine which AR is. I came up through the ranks of CB and used to purchase, from time to time, magazines that dealt with CB and amateur radio. These were the glossy local and overseas offerings which were, and still are, a lot dearer than AR. I gained a limited call and then upgraded with the help of the WIA Morse tapes. I began to use the QSL Bureau and saved a mint on what I had been spending sending QSL cards direct. I also note that the Book Sales service allows purchase of popular texts at prices considerably lower than any other source.

Why is it then that you seem to be continually apologising for the costs of providing all the services listed on page 2 of September 1987's edition of AR? In particular, the cost of producing AR seems to cause much heartache. If I did not subscribe to membership of the WIA I would have to purchase a glossy at a cost of at least $2 and maybe $3 per month. That would be between $24 and $36 per annum. I would have to pay full tote odds for any text books and have to bear the full cost of QSLing. I do not use repeaters but, if I did, I would not have the use of them without the WIA. So, I am streets ahead by being a member.

I strongly object to any reduction in content of the magazine. I do not approve of the change of the front cover from full colour to two colour. I would much prefer to see more colour content and more articles from members. I would be prepared and would expect to pay more for this but I expect for my subscription to the WIA to have the magazine. In other words, one of the reasons for my being a member is so I can have AR. It is valuable to me. If it costs more and more to produce, then I fully understand the reasons why. I am totally against the magazine being made into an inferior product just to remain within unnecessary cost constraints. If the magazine is of a high standard it will sell itself. Colin MacKinnon VK2DYM, said it all in September AR and I echo his sentiments.

Please find a simple program written in Basic for the computation of antenna dimensions which I wrote some time ago. I used it to design a beam and it is the first of a series of articles I intend to submit for possible publication to support my magazine.

Yours sincerely,

Dean Probert VK5LB,
RMD Verrall Road,
Hope Forest, SA. 5172.

Thanks for your comments, Dean. Your article has been passed on to our Technical Editors. —Ed

ar

* * *

THE WIA: MORE YET!

There has already been much said about WIA membership, the directions of amateur radio, etc, so a little more won't hurt.

The fact that the whole direction of amateur radio (and the Institute), appears to be in turmoil does not surprise me very much.

As an ex-member of one of the time honoured professions (not the oldest!), I was only too well aware, that, even since my student days, the executive of that professional institute were virtually disembowelling themselves analysing directions and generally trying to make their services more relevant to the public and current needs.

In fact, however, I resigned from that institute long before I retired from the profession, simply because the membership dues became too high. Whether the services provided were "good value" or not was largely irrelevant to me, I simply felt that the outlay for membership became too great.

What still does surprise me, however, is the apparent intolerance shown by various groups within the amateur fraternity to each other. The case of CW comes to mind, but there are others.

In the present issue there seems to be a vast gap in understanding between the "have" and the "have nots", the inference of many letters being that all one has to do is to forgo the odd drink or a packet of cigarettes to afford any increases in membership dues.

Fine, but what if one does not smoke, play the pokies and has long ago given up the odd drink as beyond one's means? (One's equipment could well be a relic of more prosperous days!).

The station licence and WIA membership now amount to about a dollar a week. But if one cuts out the membership it is only half of that. The "haves" may find it hard to imagine, but this could be an important consideration for some.

It has also been suggested that the Institute should adopt a harder marketing approach to "sell" itself, and perhaps, in this day and age, when national elections are decided on marketing strategies rather than national issues, this may well be the way to go.

Personally, I find it all rather sad, and slightly immoral, to sell something to people when they did not even know they wanted or needed the service or product.

Perhaps I am old-fashioned (certainly getting old), and probably very much in the minority, but I make a deliberate effort to avoid products and services that are heavily advertised or considered "up-market".

But, then there is little doubt that, if the WIA (and probably amateur radio as such), is to survive, it must keep up with the times and pander to the popular view of the majority, however unpalatable that may be to some, and irrespective of the fact that a few will be left behind, or simply cannot afford to keep up. (Good marketing strategies and glossy magazines don't come cheap).

So, if the Institute decides to go "that way" and become a sleek up-market organisation with a sophisticated marketing policy, it will make it that much easier for me to "forget" to pay my membership dues and have the odd drink instead.

So, good luck, and my sympathies to the Executive. Whatever you decide to do is going to tread on someone's toes, that is for sure.

73,

Dmitri Perno VK4BDP,
110 Panorama Drive,
Nambour, Qld. 4560.

Wise words, Dmitri. But we have no wish to become, or appear to become "sophisticated" or "up-market". All we are trying to do is to hold our place in a world where the passage of time makes it increasingly difficult. —Ed

ar

* * *

TECHNICAL CORRESPONDENCE — EARTH LEAKAGE

I refer to the article *Safety Around the Shack* by David A Pilley VK2AYD, in September 1987 *Amateur Radio*. The article is generally correct and quite informative; however, about halfway down the third column on page 10 it states — "It must be remembered that you no longer have an earth wire from the Distribution Board." This, of course, is not true, as current wiring rules in this country require an earth be provided at all power outlets and lighting points, and all portable ELCBs have the earth connection to the normal earth pin through the flexible lead, and must not be switched.

There is also no good reason to restrict earthed equipment in the area where ELCB protected distribution is used. In fact, the main use for portable ELCBs is with portable tools in outside locations, where the operator's body may be well earthed.

It should not be assumed that the tripping time for a normally commercially available ELCB is "around 30 ms" but it is generally closer to 100 ms as required in AS 3190 and is therefore not as safe as may be expected. Over the past couple of years, Telecom undertook the development of ELCBs that would operate at 10 mA and open the circuit within 30 ms. Clipsal are now marketing ELCBs that meet this criteria, and action is in hand with SAA to have AS 3190 tightened up with tripping time of 40 or 50 ms.

Figure 9 also indicates that no fault current protection is required if ELCBs are used. This is not correct. The regulatory authorities regard ELCBs as "Supplementary Protection" only, and not a substitute for the normal forms of protection.

I congratulate David on the preparation of this article.

Yours sincerely,

Bob Neal VK3ZAN,
11 Xavier Street,
Oak Park, Vic. 3046.

ar

* * *

UBIQUITOUS TWO PI

In reference to *Ubiquitous 2π*, July 1987 and the letter from Barrie Stevenson VK2ZSV, in September 1987 issue.

'Tis a favourite project of mine
A new value of pi to assign
I would fix it at three
For it's simpler you see
Than 3 point 1 4 1 5 9.

Quoted by W S Baring-Gould in *The Lure of the Limerick* 1970, Panther Books and attributed to Professor Harvey L Carter, Colorado College, USA.

Cheers,

K G England VK4JPE,
31 Morgan Street,
Rockhampton, Qld. 4700.

ar

* * *

COUNTRY MEMBERS

I refer to the letter from Ted Blackmore in October issue of AR. I am surprised that the attitude he has expressed still exists. I thought it had largely disappeared about 20 years ago after the State Conventions were transferred to country areas. Furthermore, it was, as far as I recall, policy for one or more members of the Divisional Council to attend Zone Conventions to discuss any problems with Zone members. As I have not been active in Institute affairs for some years I do not know if this practice is still followed, but I do know that I attended a number of zone conventions for that purpose. This action to some extent offset the inability of country members to attend Divisional meetings. Apart from not hearing speakers at meetings, it seemed that country members were not greatly disadvantaged and this situation probably still exists.

It was appropriate that you should draw Ted's attention to the September Editorial. Not all items listed would appeal or be of importance to everybody, but some at least should apply to him. If he is not impressed by your personal involvement with the Institute, I would invite him to attend a Tuesday Group meeting of the Moorabbin and District Radio Club, where I would be pleased to introduce him to 20 or so people who have between them devoted many thousands of unpaid hours to Institute affairs in both the State and Federal sphere during the last 60 years. Despite his attitude he will still be welcome because he is an amateur, be he a WIA member or not.

I am forced to wonder just what active participation Ted has taken in Institute affairs. Has he ever so much as submitted an Intruder Watch report? I am firmly of the opinion that one can get out of an organisation only as much as one puts in and I recommend this thought not only to country members, but to all members.

It is perhaps ironic that Ted's letter should appear in the same issue as the tribute to the late Max Hull. I would respectfully suggest that he re-reads that tribute, and then feels humble at his own small contribution, and at the same time, proud to be accepted among the members of an Institute that has been served for so long by such men as Max. I know I am.

Yours faithfully,

Ken PIncott VK3AFJ,
14 Dunacombe Avenue,
Ashburton, Vic. 3147.

ar

* * *

LICENSING STANDARDS

The future of amateur radio, with band plans, foreign reciprocal licence privileges, examination formats, etc, has occupied an unusual amount of space in our magazine over the last few months.

Much comment in these columns and articles in this magazine on the subject I can only describe as elitist, espousing privileges for the least valid reasons.

Let us start back at square one, with the assumption that the use of the communication facility is not a privilege that someone gives to us, but a right (by birth in a free country) that anyone can take up, with certain restrictions for the good of all.

Radio or "wireless" and the motor car have had a parallel life span. In the early days the only means of starting the horseless carriage was with a crank handle in the front, and the exciter was a trembler coil as in the Model T Ford. The equivalent to the crank handle in wireless terms was the Morse key and the exciter was a spark gap and coil. There were so few cars that you didn't need a licence to drive or operate them. As the road and the airwaves became more congested, so rules became necessary, and drivers and operators had to prove by examination that they could drive their car or operate their transmitter without interfering with others. And so we progressed until today we have state-of-the-art cars and transceivers. Of course you don't have to drive a car, you can use public transport and never need a licence. You don't have to use amateur radio, there are public alternatives which require no examination or licence. But, if you decide to drive you have to be tested for public safety, with various grades of licence available for cars, trucks, buses, etc, depending on your experience and the weight of the vehicle.

And, so it should be for amateur radio operators, the novice licence should be just that! To learn the basics, not forever, but to progress forward just like the P Plate Driver for a set period and speed limit. Progress to the next stage should not depend on how fast you can swing the crank handle (Morse speed send and receive) but technical and practical tests to prove that you can adjust your equipment correctly so as not to interfere with others. For most amateurs, that should be all that is required to have a full call licence equivalent to a class one car licence in New South Wales.

The sooner we stop kidding ourselves that there is something special about CW the better, it is now just another mode of transmission. Does anyone seriously suggest that, to operate RTTY, you should be able to pass a touch type test at 10 WPM? The argument that a knowledge of Morse should be mandatory for emergency purposes does not hold up anymore, because most amateurs have amateur band only transceivers. We just do not listen for ships, planes, etc in distress on their frequencies. The chance that your average trawler or plane has amateur bands fitted, let alone a key handy, is stretching things a little!

If it is really necessary to have a higher grade of licence equating to a truck on the road, then let it be by technical and practical merit. Such a test could be the ability to locate and repair a fault in a piece of equipment submitted by the testing authority, or by submitting a piece of home-brew equipment to demonstrate skill, or perhaps a demonstration in the correct use of test equipment such as a dip meter or CRO, but certainly not by the ability to send and receive faster CW.

To sum up: amateur radio has a future but only if we make it less restrictive to those who are interested for any valid reason. What does it matter if one person only wants to operate equipment he has home-brewed. Or a combination of say, a commercial rig with a home-brew transverter. There is room for all who wish to qualify provided we don't make it too restrictive.

To my mind we should not reduce standards any further and certainly not for another country's novices who wish to visit this country. Nor should that excuse be used to give our own novices an extra band unearned. If it is desirable to have a common band, it would appear that the fault lies with the LAOCP holders who have never made an effort to progress to AOCR It is not that hard to learn CW. I am told that during the war, shop assistants could be proficient in the Army in six weeks. But, perhaps we should lobby the DOTC and the next WARC to remove the HF CW requirement and encourage quality not quantity in our amateur ranks.

73,

Neville Chivers VK2YO,
51 Meeks Crescent,
Faulconbridge, NSW. 2776.

ar

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Club Corner

SUMMERLAND AMATEUR RADIO CLUB

A warm welcome is extended to the latest members of the Summerland Amateur Radio Club (SARC):

Bruce VK2LBW, Peter VK2XHR, Graham VK2FGI, Ron VK4MBJ, Bruce Greig and Alan Jackson.

Thanks to Gordon VK2AGE and Alec VK2BEV, the club has formed a packet society "SAPS". The following is an extract from the club newsletter.

SAPS has received site access approval to establish an experimental diglpeater for a six month trial period on the RTN-8 television tower at Mount Nardi, approximately 800 metres above sea level and 30 kilometres north of Lismore. The digital repeater is currently under test from the QTH of VK2AGE.

It is anticipated that the initial installation will be operational by this time using the call sign VK2AGE-1, pending the processing of a licence application, lodged with DOTC on August 19, 1987. Initial frequency in use will be 147.575 MHz (Channel 7575) with the addition of either a 70 centimetre frequency for local working or 147.600 MHz (Channel 7600) to enable working into VK4.

Hopefully, this coverage will be at least to Coffs Harbour in the south, Tenterfield to the west, and Brisbane to the north.

Stations intending to utilise this project — please do not forget we need your financial support, $10 per annum, to repay loans in respect of this repeater. We also welcome use of this equipment by all appropriately licensed amateur stations.

Finally, as the equipment becomes available, it is SAPS intention to establish a club packet station at the SARC clubrooms in Richmond Hill. Equipment surplus to requirements should be forwarded that way rather than towards the "depot."

At last, members of the SARC have a home — an identity — a set place to meet "anytime", to study, work and play.

Your time is needed each and every Sunday afternoon to make the clubrooms a place that visitors and members alike will want to return to.

Thanks to the hard work of members, much work has been done so far with cleaning, painting and building, but much more must be done and more members need to become involved.

Being a radio club, many members are not within a reasonable distance for regular visits, although that should not stop you from helping out occasionally.

Stools, carpets, blue metal, working radios, books, kitchen items, curtains, etc, etc, are needed.

There are many projects that can be built for the workshop and operating rooms. Unwanted test equipment, tools, etc would be appreciated — in fact, anything would help.

Most of all we need your help. Gratitude must go to members and friends who have helped so far, but we still need your help.

If you are proud to belong to this club and want clubrooms you can identify with and say that you helped to create, then contact Peter Richens VK2XHL, or Ric on two-metres 6800.

The club now boasts a membership of 103, believed to be an all-time high.

Each member of the SARC extends season's greetings to all other amateurs — A Happy Christmas and a Great 88.

—Contributed by Jim Cunningham VK2ESI, Publicity Officer

ar

AMATEUR RADIO CLUB "POLONIA" INC

The committee of the ARC Polonia, Melbourne are pleased to announce that the club was recently granted the use of the special call sign VI88ABC. This call sign will be used from January 4, 1988, in conjunction with the club's special activities during Australia's bicentennial celebrations.

In January, the club will mount an expedition into the Australian Alps during which time the special call sign will be used. The significance of the call (VI88ABC — Australian Bicentennial Celebrations) will be explained to overseas operators.

All contacted stations will receive a specially designed commemorative QSL card.

Amateur Radio Club "Polonia" is registered by the Australian Bicentennial Authority and the club's planned alpine expedition is listed in the Bicentennial Calendar of activities.

Further information is available from George Kaska VK3OO, on (03) 337 4903 (After Hours).

The club conducted a very successful operation with the call sign VI3PVA during the Papal Visit to Australia.

ar

Obituaries

JOCK CHRISTENSEN VK3DOJ

It is sad to report the sudden passing of Jock on October 12, 1987, after heart surgery.

We became good friends some 10 years ago, through many common interests, mainly amateur radio and journeys together over much of Australia in our four-wheel drive vehicles. (See AR, April page 30).

Jock was a true family man who always tried to take his wife Maude, sons, daughters and grandchildren, wherever he went. He was a clever man with things mechanical, automotive and radio, and enjoyed a love of the outback and bush. He was a great companion.

His young grandchildren who accompanied him on his journeys will never forget how he taught them to admire and love the wonderful works of nature shown to them through the great diversity of our country.

I express words of sympathy and fond memories, on behalf of our many mutual friends, to his wife Maude and all the family.

Keith Scott VK3SS
ar

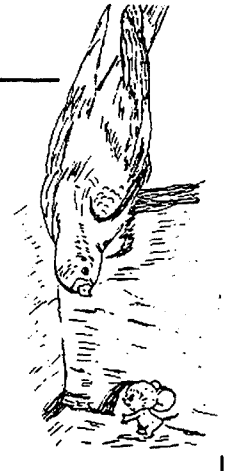
CEDRIC SMYTH VK3ACH

Cedric Smyth VK3ACH, passed away on June 17, 1987, whilst on holidays with his wife, Mary.

Cedric became ill in Alice Springs and was advised to return, however he passed away in South Australia.

Sympathy is extended to Mary and his family.

Reg Bulman
ar



DEADLINE

All copy for inclusion in the **February 1988** issue of *Amateur Radio*, including regular columns and Hamads, must arrive at **PO Box 300, Caulfield South, Vic. 3162**, at the latest, by **9 am, December 29, 1987.**

Silent Keys

MR JOCK CHRISTENSEN VK3DOJ
MR CEDRIC SMYTH VK3ACH

Hamads

PLEASE NOTE: If you are advertising items FOR SALE and WANTED please write ***each*** on a separate sheet of paper, and include all details; eg Name, Address, Telephone Number, on both sheets. Please write copy for your Hamad as clearly as possible. ***Please do not use scraps of paper.***

- Please remember your STD code with telephone numbers
- Eight lines free to all WIA members. $9.00 per 10 words minimum for non-members
- Copy in typescript, or block letters — double-spaced to ***Box 300, Caulfield South, Vic. 3162***
- Repeats may be charged at full rates
- QTHR means address is correct as set out in the WIA current Call Book

Ordinary Hamads submitted from members who are deemed to be in the general electronics retail and wholesale distributive trades should be certified as referring only to private articles not being re-sold for merchandising purposes.

Conditions for commercial advertising are as follows:
$22.50 for four lines, plus $2.00 per line (or part thereof)
Minimum charge — $22.50 pre-payable

Copy is required by the Deadline as indicated on page 1 of each issue.

TRADE ADS

AMIDON FERROMAGNETIC CORES: Large range for all receiver and Transmitting Applications. For data and price list send 105 x 220 mm SASE to: **RJ & US IMPORTS**, Box 157, Mortdale, NSW. 2223. (No inquiries at office . . . 11 Macken Street, Oatley). Agencies at: Geoff Wood Electronics, Lane Cove, NSW. Webb Electronics, Albury, NSW. Truscott Electronics, Croydon, Vic. Willis Trading Co. Perth, WA. Electronic Components, Fishwick, Plaza. ACT.

HELP WANTED — AUST

See over page...

GERMAN STUDENT OF ELECTRONIC/ELECTRICAL ENGINEERING: (6 sem), 26 years of age, with a good knowledge of English, is looking for a position as a probationer in Australia to complete a practical training semester. If possible from October 1988 to March 1989. Please contact Achim Klemmt DL3LBN, Bamtschowstrasse 2, 2000 Hamburg 65, West Germany. Ph: (040) 536 2302 or (0451) 59 3424. (ISO codes will apply).

WANTED — ACT

US MADE HF 4-BAND VERTICAL ANTENNA: Information & circuit diagram for Swan power supply, PSU-5. Write to Richard VK1UE, QTHR.

WANTED — NSW

DRAKE R7A, JRC NRD-515 RECEIVERS: Also old ARRL & RSGB handbooks wanted by SWL enthusiast. Will pay well. Tony. Ph: (042) 29 2573.

WANTED — VIC

ANY OLD HAM-M or HAM-2 (etc) ROTATOR: for spare parts. In any condition for wrecking. Bob VK3SK, QTHR. Ph: (03) 527 1861.

QSL CARDS: of any description. Pre-war, rare DX and QSLs of artistic design especially appreciated. These are wanted urgently for the WIA (Vic Div) OSL collection now being established. Please contact the Hon Curator, Ken VK3TL, on (059) 64 3721 and arrangements will be made to pick up the cards whether you live in Melbourne or in the country. You can also leave QSLs at the WIA rooms in Fitzroy. Please help us make it a really fine collection.

FT-7 HF TRANSCEIVER: 80-10 metres for novice use. In good condition, price $385-$400. Ph: (051) 27 4094.

HANDBOOK/CIRCUIT: for Yaesu Musen FRG-7 receiver — original or photocopy. Details & price to G Himolij, 118 Wilson Road, Newcomb, Vic. 3219. Ph: (052) 48 1410.

WANTED — QLD

5-30 W CW HF TCVR: VFO preferred. Suitable portable working. Must be good unit. Details to Jim VK4CBU, 14 Tristania Street, Everton Hills, Old. 4053.

EX SIG WANTS OLD ARMY WIRELESS SETS: 108, 109, 11, 22, 128, PRC10, xtal calibration No 10. Buy or swap 4321 Friden Mag Tape Recorders. CDC 9450 disk units, teletype 33A KSR (10 CPS) Cossor DID 400 VDUs. VK4EF, QTHR. Ph: (07) 366 1803 AH.

ICOM IC-745 HF TRANSCEIVER: with matching power supply. Would need to be in VGC. Interstate calls welcome. John VK4YX, QTHR. Ph: (076) 61 4877.

KENWOOD TS-520S HF TRANSCEIVER: All reasonable offers considered. Theo. Ph: (071) 71 6714 Bundaberg.

MORSE & OTHER SIGNALLING EQUIPMENT: Lamps, tape-readers & heliographs, etc. Contact Fred VK4NMA, QTHR. Ph: (07) 396 3521.

PS20 KENWOOD POWER SUPPLY: Interstate replies welcome. Mike VK4VIX, PO Box 471, Redcliffe, Old. 4020.

FOR SALE — ACT

BUILDING BLOCK MODULES: PCBs & Kits of components. Contact the Secretary, Frankston and Mornington Peninsula ARC, PO Box 38, Frankston, Vic. 3199.

FOR SALE — NSW

BUILDING BLOCK MODULES: PCBs & Kits of components. Contact the Secretary, Frankston and Mornington Peninsula ARC, PO Box 38, Frankston, Vic. 3199.

FT-102: in good working order. $800 ONO. TS-120, plus mobile cradle. $450. 8 amp power supply. $75. 100 watt HF linear. $200. Ph: 9065) 53 9607.

HYGAIN TH5DX BEAM: Ham II rotator with CDE controller, wind-up tower 20 to 35 feet. Prefer to sell as complete lot. Purchaser to arrange dismantling and removal. Offers in writing to VK2AGS, QTHR.

ICOM IC-730 HF TRANSCEIVER: Excellent condition $650. Neil VK2KCN, QTHR. Ph: (02) 634 1882 AH or (02) 50 8832 BH.

ICOM ML1: 10 watt linear amplifier for IC-2A hand-held, as new $85. Heathkit transistorised mobile power supply, HP-10. $50. Konrad VK2DFM, QTHR. Ph: (02) 621 1039 AH.

TELEQUIPMENT D61 DUAL BEAM 10 MHz OSCILLOSCOPE: Complete with manual and 1 probe. Excellent condition. $300. VK2HL. Ph: (02) 981 4762.

YAESU FT-209RH 2M HAND—HELD: with rubber duck & helical antennas. HL35V 2m linear amp. 2 nicad battery packs, speaker mic, manual & circuits. Mint condition. The lot $700 ONO. Vince VK2CVR. Ph: (02) 602 2085.

YAGI BEAM: 4 element triband TET HB34D. $225. Kenpro rotator KR600. $225. Yaesu desk mic MD1B, currently $160, sell for $75 plus post. VK2AOO, 38 Third Street, Blackheath, NSW. 2785. (not QTHR). Ph: (047) 87 7459.

FOR SALE — VIC

21 METRE, THREE SECTION, FREE-STANDING TRIANGULAR RADIO TOWER: $600. 21 metre three section guyed Hills telescopic radio tower. $300. Ph: (03) 754 7358.

BUILDING BLOCK MOODULES: PCBs & Kits of components. Contact the Secretary, Frankston and Mornington Peninsula ARC, PO Box 38, Frankston, Vic. 3199.

BATTERIES: Quantity of 6V 120AH lead acid batteries, suitable for stand-by power for shack, weekender or repeater, etc. Good condition, little use on float service for which they are designed. Eric VK3AX, QTHR. Ph: (059) 68 4202.

HY-GAIN TH6 DXX 6 ELEMENT TRIBAND ANTENNA: (20-15-10). Anti-corrosion treatment applied. Has worked 250 DXCC countries. Price $275. Dick Forrester VK3VU, QTHR. Ph: (053) 39 1001 BH or (053) 35 7663 AH.

ICOM IC-R71E COMMUNICATIONS RECEIVER: .0-30 MHz. 10 hours use, as new in carton. $1080. Philips FM747 10 channel UHF mobile. 5 amateur UHF repeater & simplex fitted. Remote telephone handset/spkr. Installation cradle. 15 watts 12 VDC. $385. VK3ADM, QTHR. Ph: (03) 592 2168 AH.

KENWOOD TS-520S HF TRANSCEIVER: with H/book $450. Kenwood DG5 digital readout with H/book $150. Kenwood QR666 comm rx with H/book $120 ONO. Himound hand-key $20 ONO. Dick Smith Electronic keyer. $35 ONO. All gear in good condition, working. Ex VK3NFU. Bruce VK3AIE, QTHR. Ph: (03) 758 5791.

KENWOOD TS-930S HF TRANSCEIVER: with auto ATU, mic, manuals, original carton, in as new condition. $1975. Sideband filters. Superior quality set of 2 Fox Tango filters (8.83 MHz and 455 kHz), 2.1 kHz bandwidth, designed for TS-930S, complete with installation instruction sheet, $165. 9 MHz, 2.4 kHz bandwidth, replacement xtal filter for FT7, FT7B, FT301, etc. $65. Yaesu FT7 HF transceiver. Professionally modified to include linear relay switching, variable drive control, 20 dB attenuator, fast/slow AGC, etc. In unmarked as-new condition, complete with mic, handbooks and cables, etc. $395. Tandy TRS80 colour computer 2B. 64k, true lower-case on screen, disc controller and 40 track drive 0, Graphicom joystick, 42 disks of business, games, utilities, amateur radio, and OS9 programs with instruction books, manuals and all required cables. $470 the lot. VK3ARZ, QTHR. Ph: (03) 584 9512.

SINCLAIR SPECTRUM COMPUTER: 48k with games programs. Can do SSTV & RTTY. Ex cond. $240 ONO. VK3ZR, QTHR. Ph: (060) 24 6430 BH.

STC 151 XTALS: New, over order, chan 7225. 3 sets. $19 per set. VK3QQ, QTHR. Ph: (03) 434 3810.

YAESU FT-107M TRANSCEIVER: Has FP107 power supply fitted, CW filter, YM35 scanning mic, FV101DM digital memory VFO, SP901 speaker. With manuals & cartons. $850. Ray VK3CDR. Ph: (03) 726 9222.

FOR SALE — QLD

BUILDING BLOCK MOODULES: PCBs & Kits of components. Contact the Secretary, Frankston and Mornington Peninsula ARC, PO Box 38, Frankston, Vic. 3199.

ICOM SERVICE MANUALS: New, as follows: 2 each IC-M12, IC-745, IC-125/T/TM. 1 each IC-740, IC-M80-, IC-27A/E/H, IC-4A/AT/E, IC-02A/AT/E. All $16 each posted. VK4FPW, QTHR. Ph: (079) 82 6756.

MORELLI FV20 MICROWAVE LINK SYSTEM: Complete with manual. Tcvr CTR 97. 960 telephone channels, 1 TV channel. Freq 2 GHz. Rack mounted 2100, 596, 381.5 (HWD mm). Offers please. Tom VK4BTW, QTHR. Ph: (076) 38 3828.

FOR SALE — SA

BUILDING BLOCK MODULES: PCBs & Kits of components. Contact the Secretary, Frankston and Mornington Peninsula ARC, PO Box 38, Frankston, Vic. 3199.

MBA-RC CODE CONVERTER. CW 3-99 WPM. Baudot RTTY 60, 67, 75, 100 WPM. ASCII RTTY 110 Baud. Fluro display 32 characters. Made by AEA Pdts. Manual, etc. Morse-A-Keyer keyboard. CW 5.45 WPM. Inbuilt osc. Can be used with MBA. Both in A1 cond. $400 for both plus freight. Eric Steele VK5PM. Ph: (088) 53 2091.

FOR SALE — WA

BUILDING BLOCK MODULES: PCBs & Kits of components. Contact the Secretary, Frankston and Mornington Peninsula ARC, PO Box 38, Frankston, Vic. 3199.

FOR SALE — TAS

BUILDING BLOCK MODULES: PCBs & Kits of components. Contact the Secretary, Frankston and Mornington Peninsula ARC, PO Box 38, Frankston, Vic. 3199.

ICOM IC04A: Almost brand new — used only on overseas trip. Complete with protective case, manual, spare battery case & gutter grip antenna mount. Approx $450. VK7AH, QTHR. Ph: (004) 24 5375 evenings.

WILSON 3 ELEMENT 10 METRE YAGI ANTENNA: $40. 7 element 2 metre Yagi antenna, $25. Tandy antenna rotator. $60. Jim VK7JO, QTHR. Ph: (003) 44 3314.

YAESU YC-221 DIGITAL DISPLAY: new unused, in original packing. $65. JVC Colour Camera GC-3300E, electronic view finder, 10m extension cable, 6X zoom lens, built-in mic, in CB-57U transit case. $490. VK7LR. Ph: (004) 24 2525.

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Advertiser's Index

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Coaxial Cable Specials

Low Loss VHF/UHF Cables

Description	Trade & U.L. Type Number	AWG (Stranding) Dia. in In. Nom. D.C.R.	Insulation & Nominal Core O.D. Inch	Insulation & Nominal Core O.D. mm	No. of Shields & Material Nom. D.C.R.	Nom. Imp. Ω	Nom. Vel. of Prop.	Nominal Capacitance pF/ft.	Nominal Capacitance pF/m	Nominal Attenuation MHz	Nominal Attenuation db/100 ft.	Nominal Attenuation db/100 m
	**9913** 80C	9½ (Solid) .108 bare copper .90Ω/M' 2.95Ω/km	Semi-solid Poly-ethylene .285	.724	Duobond II* + 88% tinned copper braid 1.8 Ω/M' 6.0Ω/km 100% shield coverage	50	84%	24	78.7	50 100 200 400 700 900 1000 4000	0.9 1.4 1.8 2.6 3.6 4.2 4.5 11.0	3.0 4.6 5.9 8.5 11.8 13.8 14.8 36.1
						Black PVC jacket.						

BELDEN 9913 low-loss VHF/UHF coaxial cable is designed to fill the gap between RG-8 to RG-213 coaxial cables and half-inch semi-rigid coaxial cable. Although it has the same O.D. as RG8/U coaxial, it has substantially lower loss, therefore providing a low-cost alternative to hard-line coaxial cable. Your special price from ACME Electronics is only $4.84 per metre.

BELDEN Broadcast Cable RG-213/U MIL-C-17D is only $5.23 per metre, or BELDEN 22385 YR Commercial Version RG213, the same specification as 8267, for only $2.14 per metre. *Prices do not include Sales Tax.

For more information about the above, or any other BELDEN cable, simply contact our resident amateur radio operator, Colin Middleton (VK3LO) or our sales department.

Coaxial Cables

Description	Trade & U.L. Type Number	AWG (Stranding) Dia. in In. Nom. D.C.R.	Insulation & Nominal Core O.D. Inch	Insulation & Nominal Core O.D. mm	No. of Shields & Material Nom. D.C.R.	Nom. Imp. Ω	Nom. Vel. of Prop.	Nominal Capacitance pF/ft	Nominal Capacitance pF/m	Nominal Attenuation MHz	Nominal Attenuation db/100 ft.	Nominal Attenuation db/100 m
 **RG-213/U MIL-C-17D**	**8267**† 1354 60C	13 (7x21) .089 bare copper 1.87Ω/M' 6.1Ω/km	Poly-ethylene .285	.724	Bare copper 1.2Ω/M' 3.9Ω/km 97% shield coverage	50	66%	30.8	101.0	50 100 200 400 700 900 1000 4000	1.6 2.2 3.2 4.7 6.9 8.0 8.9 21.5	5.2 7.2 10.5 15.4 22.6 26.3 29.2 70.5
						Black non-contaminating PVC jacket.						

ACME

ACME Electronics

205 Middleborough Rd, Box Hill. Vic. 3128.
Ph: (03) 890 0900.
Fax: (03) 899 0819

SYDNEY (02) 648 2255
ADELAIDE: (08) 211 8499
BRISBANE: (07) 854 1911
LAUNCESTON: (003) 31 5545
DARWIN: (089) 81 5411
PERTH: (09) 272 7122
HOBART: (002) 34 2811

ACME 709

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bail

NEW from YAESU

YAESU

FT211RH 2m 45W mobile **$699** FT290RII **$868**
FT690RII **$850** Linear Amps for these Mark II models
FL2024 **$219** — FL6020 **$199** FT23R with FNB11 (12V) nicad, and charger **$525**

FT-757GX in stock

Converters for FRH9600 V/UHF Receiver — FC965DX 20 kHz — 60 MHz **$184**
FC1300 to 1300 MHz **$284** FRG9600 with power adaptor **$999**
FRG8800HF Communications Receiver **$1125** *while stocks last.*

UHF Specials — FT703R **$395** FT709R **$479** both with FNB 4 (12V) nicads and chargers.

Diamond Trapped Vertical Antennas — HIDAKA HF Triband Beam
Katsumi Electronic Keyers, Power/SWR Meters.

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Stan Roberts and Staff — VK3BSR

BAD NEWS FOR ANYONE WHO EXPECTED BIG THINGS FROM ICOM.

The biggest news in hand held transceivers is actually very, very small.

It's the new generation ICOM IC-μ4AT and its midget twin, the IC-μ2A.

Both pack all the performance and reliability you expect from ICOM into a tiny package. And although they weigh next to nothing, they're not light-on for features, as you'll see.

The IC-μ4AT has built-in power saver circuitry that uses as little as 8 mA of current flow during standby. So it will last up to four times longer than some older equipment. Yet it measures only 58mm wide by 140mm high by 29mm deep with optional BP-22 battery pack.

It also has a DTMF pad, 10 memory channels with convenient digit up/down switches, subaudible tone encoder, and a comprehensive LCD display with special backlighting that turns off when not being used.

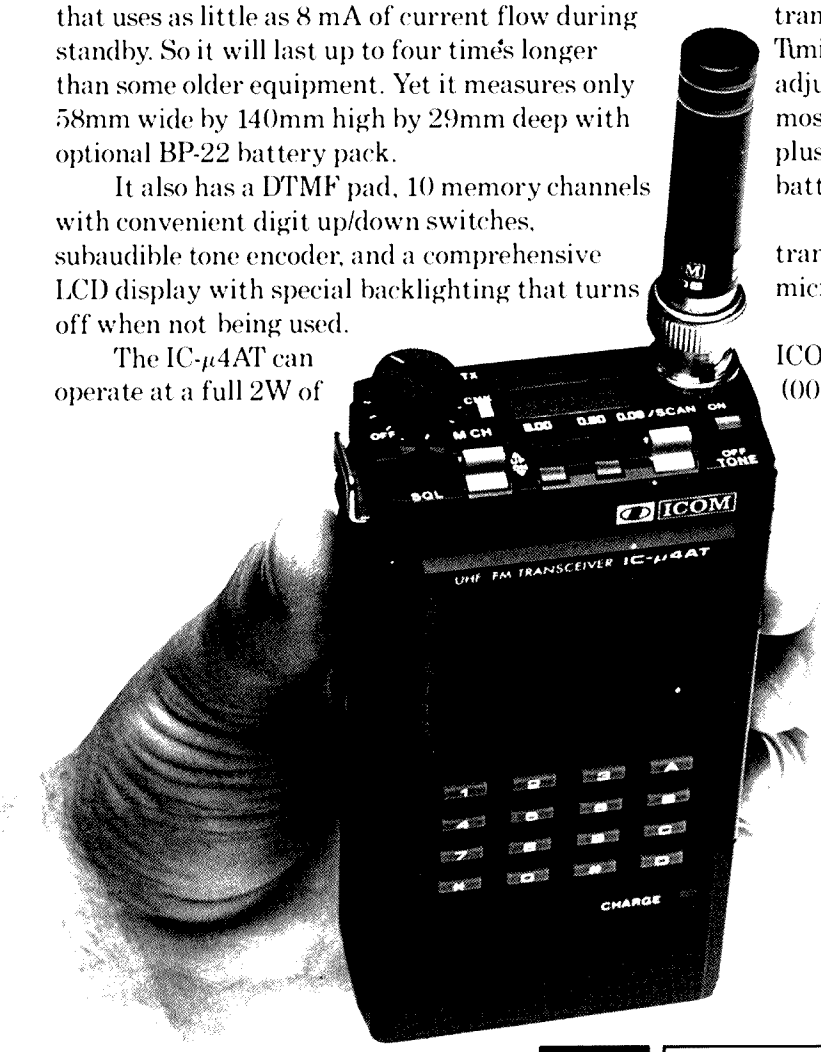
The IC-μ4AT can operate at a full 2W of output power from the optional BP-24 or optional converter with 12V battery. And its durability makes it ideal for operating in rugged outdoor environments.

The IC-μ2A also has 10 memory channels and the top panel LCD for easy readability and puts out up to 2.6W of output power from the BP-24 battery pack.

Like its counterpart, this 2 metre transceiver features Digital Touchstep Tuning for fast shirt-pocket frequency adjustments. And of course, both can use most existing ICOM hand held accessories plus a new line of long life nicad battery packs.

So if you want big things from a small transceiver, get your hands on the ICOM micros soon.

For details of your local dealer phone ICOM on Melbourne (03) 529 7582 or (008) 33 8915 from elsewhere in Australia.



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