January 1996
Volume 64 No 1

Amateur Radio

Journal of the Wireless Institute of Australia

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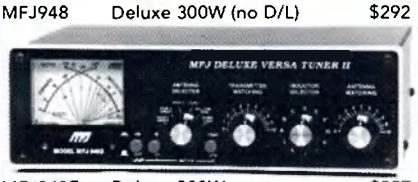

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CONTENTS

Cover

In mid-1995, eight year old Ved Kamat became Australia's youngest radio amateur with the callsign VK2LAD. Ved's parents, Gopal VK2WGY and Sarvita, proudly write that at the age of six, when Ved was given an Electronics Hobby Kit, to their amazement he wired up all the hobby projects with most of them working the first time. During 1995 Ved was in year four at the International Grammar School where, amongst other subjects, he was adding to his fluency in Marathi (an Indian language) by studying Japanese and Italian. Apart from amateur radio, Ved's hobbies include reading, karate, swimming, computers, chess and the piano.

Amateur Radio Service

A radiocommunication service for the purpose of self-training, intercommunication and technical investigation carried out by amateurs, that is, by duly authorised persons interested in radio technique solely with a personal aim and without pecuniary interest.

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Editor's Comment

Let Me Clarify That!

There are two items this month which have something in common, namely that I made a statement to someone which they later found hard to believe. One item concerns delays in publication, and the other is entirely technical. Both need clarification.

To begin with publication problems. An author who had not contributed to *Amateur Radio* until about six months ago has taken me to task about the fact that his first article has yet to be published. It will be, very soon, but why has it taken six months or more?

The reason is simply that material does not come to us in a smooth flow of (say) three technical articles and five general interest articles a month. That is roughly the rate at which we publish them. But they come in, from all you industrious experts, experimenters or thinkers, in a series of feasts or famines!

Sometimes, as my colleague Graham Thornton was fond of saying, we are "scraping the bottom of the barrel", but only a few months later we face a mountain of material which can't all be published at once!

The situation is rather like a diode rectifier, fed with intermittent pulses, charging a large capacitor. If the pulses are close enough and/or the capacitor large enough, the output will be reasonably steady DC. We want a steady DC output of 56 pages per month even though no input pulses come in some months and then several big pulses come at once! To complicate things we have another circuit feeding in a steady input of about 30 columns per month!

I won't try to stretch the analogy further to cater for articles with dozens of diagrams to be re-drawn or others which need extensive re-writing for various reasons. The end result is that some things are published quickly and others are not. We have some items still to be published which came in as much as two years ago.

The other topic also involved Graham Thornton. Some months ago he quoted me on the topic of breakdown voltage in air-dielectric capacitors, to the effect that even with very small air-gaps there will be no breakdown for voltages up to about 500. I could not produce a reference at the time. Now Gary Bold ZL1AN (in November 1995 *Break-In*) queries the statement. Since it has now become "international", perhaps I'd better "put up or shut up"!

One reference I found was in a textbook "Principles of Electricity and Electro-Magnetism" by G P Harnwell, published in 1938. In a chapter entitled "Electrical Conduction in Gases" there is a diagram (attributed to W R Carr) which plots breakdown voltage Vb against Pd (the product of pressure and gap) for air, hydrogen and helium.

There are two interesting features of this diagram. Firstly, that the product Pd, not either parameter on its own, controls the breakdown voltage (between "large plane electrodes", so a variable capacitor fits the specification). This fact is named in the text as "Paschen's Law". Secondly, the breakdown voltage for air is a minimum at Pd = 0.5 (pressure being in mm of mercury and gap in cm). Thus, for atmospheric pressure (760 mm) this means a gap of about 0.006 mm (a very small gap, indeed!), yet this minimum breakdown voltage is seen

Continued on page 3

Editor's Comment

Continued from page 2

to be about 350 volts. Yes, I was wrong! Not 500 volts, but 350. It's still surprising, isn't it?

To achieve much higher breakdown voltages, the gap must be greatly increased or the pressure reduced (as in vacuum variable capacitors). Space precludes me from going further, but I hope both Graham and Gary are now happier and the rest of us are better informed!

Bill Rice VK3ABP
Editor
ar

WIA News

New WIA Members

The WIA bids a warm welcome to the following new members who were entered into the WIA Membership Register during the month of November 95.

L10156	MR I LOWE
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WIA Divisions

The WIA consists of seven autonomous State Divisions. Each member of the WIA is a member of a Division, usually in their residential State or Territory, and each Division looks after amateur radio affairs within its area.

Division	Address	Officers			Weekly News Broadcasts		1996 Fees
VK1	ACT Division GPO Box 600 Canberra ACT 2601	President Secretary Treasurer	Rob Apathy Len Jones Alex Colquitt	VK1KRA VK1NLJ VK1AC	3.570 MHz LSB, 146.900 MHz FM each Wednesday evening commencing at 8.00 pm local time. The broadcast text is available on packet, on Internet aus.radio.amateur.misc newsgroups, and on the VK1 Home Page http://email.nla.gov.au/~cmakin/wiaact.html	(F) (G) (S) (X)	$70.00 $56.00 $42.00
VK2	NSW Division 109 Wigram Street Parramatta NSW (PO Box 1066 Parramatta 2124) Phone (02) 689 2417 Freecall 1800 817 644 Fax (02) 633 1525	President Secretary Treasurer (Office hours e-mail address: wainsw@sydney.dialix.oz.au	Michael Corbin Eric Fossey Eric Van De Weyer Mon-Fri 11.00-14.00 Mon 1900-2100)	VK2YC VK2EFY VK2KUR	From VK2WI 1.845, 3.595, 7.146*, 10.125, 24,950, 28.320, 29.120, 52.120, 52.525, 144.150, 147.000, 438.525, 1281.750 (*morning only) with relays to some of 14.160, 18.120, 21.170, 584.750 ATV sound. Many country regions relay on 2 m or 70 cm repeaters. Sunday 1000 and 1930. Highlights included in VK2AWX Newcastle news, Monday 1930 on 3.593 plus 10 m, 2m, 70 cm, 23 cm. The broadcast text is available on packet.	(F) (G) (S) (X)	$66.75 $53.40 $38.75
VK3	Victorian Division 40G Victory Boulevard Ashburton Vic 3147 Phone (03) 9885 9261 Fax (03) 9885 9298	President Secretary Treasurer (Office hours	Jim Linton Barry Wilton Rob Hailey Tue & Thur 0830-1530)	VK3PC VK3XV VK3NC	VK3BWI broadcasts on the 1st and 3rd Sunday of the month, starts 10.30 am. Primary frequencies 3.615 LSB, 7.085 LSB, and FM(R)s 146.700 Mt Dandenong, 147.250 Mt Macedon, 147.225 Mt Baw Baw, and 2 m FM(R)s VK3RMA, VK3RSH, VK3ROW. 70 cm FM(R)s VK3ROU and VK3RGL. Major news under call VK3WI on Victorian packet BBS.	(F) (G) (S) (X)	$72.00 $58.00 $44.00
VK4	Queensland Division GPO Box 638 Brisbane QLD 4001 Phone (074) 96 4714	President Secretary Treasurer	Geoff Sanders John Stevens John Presotto	VK4KEL VK4AFS VK4WX	1.825 MHz SSB, 3.605 MHz SSB, 7.118 MHz SSB, 14.342 MHz SSB, 28.400 MHz SSB, 29.220 MHz FM, 52.525 MHz FM, 146.700 MHz FM, 147.000 MHz FM, 438.525 MHz (Brisbane only), regional VHF/UHF repeaters at 0900 hrs Sunday. Repeated on 3.605 MHz SSB & 147.000 MHz FM, regional VHF/UHF repeaters at 1930 hrs EAST Monday. Broadcast news in text form on packet under WIAQ@VKNET.	(F) (G) (S) (X)	$72.00 $58.00 $44.00
VK5	South Australian Division 34 West Thebarton Road Thebarton SA 5031 (GPO Box 1234 Adelaide SA 5001) Phone (08) 352 3428	President Secretary Treasurer	Garry Herden Maurie Hooper Charles McEachern	VK5ZK VK5EA VK5KDK	1827 kHz AM, 3.550 MHz LSB, 7.095 AM, 14.175 USB, 28.470 USB, 53.100 FM, 147.000 FM Adelaide, 146.700 FM Mid North, 146.800 FM Mildura, 146.825 FM Barossa Valley, 146.900 FM South East, 146.925 FM Central North, 147.825 FM Gawler, 438.425 FM Barossa Valley, 438.475 FM Adelaide North, ATV Ch 35 579.250 Adelaide. (NT) 3.555 USB, 7.065 USB, 10.125 USB, 146.700 FM, 0900 hrs Sunday	(F) (G) (S) (X)	$72.00 $58.00 $44.00
VK6	West Australian Division PO Box 10 West Perth WA 6872 Phone (09) 351 8873	President Secretary Treasurer	Cliff Bastin Mark Bastin Bruce Hedland-Thomas	VK6LZ VK6OO	146.700 FM(R) Perth, at 0930 hrs Sunday, relayed on 1.825, 3.560, 7.075, 14.116, 14.175, 21.185, 29.680 FM, 50.150 and 438.525 MHz. Country relays 3.582, 147.350(R) Busselton and 146.900(R) Mt William (Bunbury). Broadcast repeated on 146.700 at 1900 hrs Sunday, relayed on 1.865, 3.563 and 438.525 MHz; country relays on 146.350 and 146.900 MHz.	(F) (G) (S) (X)	$60.75 $48.60 $32.75
VK7	Tasmanian Division 52 Connaught Crescent West Launceston TAS 7250 Phone (003) 31 9608	President Secretary Treasurer	Andrew Dixon Robin Harwood Terry Ives	VK7GL VK7RH VK7ZTI	146.700 MHz FM (VK7RHT) at 0930 hrs Sunday relayed on 147.000 (VK7RAA), 146.725 (VK7RNE), 146.625 (VK7RMD), 3.570, 7.090, 14.130, 52.100, 144.150 (Hobart) Repeated Tues 3.590 at 1930 hrs.	(F) (G) (S) (X)	$72.00 $58.00 $44.00
VK8	(Northern Territory is part of the VK5 Division and relays broadcasts from VK5 as shown received on 14 or 28 MHz).						

Note: All times are local. All frequencies MHz.

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■ Antennas

VHF Antenna in a Lunchbox — The Magnetic Loop on Two Metres

Lloyd Butler VK5BR describes how to build an unusual 2 m antenna for limited space situations*

Introduction

From time to time we have written about the small transmitting loop antenna, sometimes called the magnetic loop because its radiation is generated only from its magnetic field (and not any electric field). Much of the more recent design information is based on work carried out by Ted Hart W5QJR. This has been published in *QST* and in recent editions of the *ARRL Antenna Handbook*.

The articles I have seen concentrated on antennas for the HF bands and didn't appear to make any specific reference to the VHF spectrum. I thought it might be interesting to make a loop for the 2 metre band and see how it would perform. In the following paragraphs I describe how a 2 metre loop was assembled and adjusted and discuss the performance achieved.

The Loop

In describing the loop, I will refer to imperial measurements as well as metric. The reason for this is that the design formulae I have used, as given by Ted Hart, are in imperial form. The loop is circular with a diameter of 5.25 inches (133 mm) and made with 0.25 inch (6.4 mm) copper tube. The ring formed is open at the top to connect a variable tuning capacitor which is set to resonate with the inductance formed by the loop. To enable variable tuning of the loop, natural resonance formed by the loop inductance with its self capacitance must be at a frequency higher than the operating frequency. For the dimensions used, the loop resonates around 144-148 MHz with just 4 pF and, if the loop was a little larger, it would self resonate without added capacity at a frequency lower than 144MHz.

The larger the loop, the higher the radiation resistance and the higher the efficiency. Hence it is desirable to make it as large as possible. However, to allow tuning adjustment, the loop is about as large as it can go.

The copper loop can be considered as a one turn inductor which, when excited, has a magnetic field. As the field is not confined, energy from the circuit is lost in the form of radiation and shows up as a resistance called radiation resistance in series with the loop at its centre. At this point we might refer to figure 1 and see that the centre is the point designated C.

Also in series with the radiation resistance is a loss resistance resulting from the RF resistance of the loop conductor and losses in the tuning capacitor. Radiation resistance is in the order of only a fraction of an ohm. To maintain high efficiency, the ratio of loss resistance to radiation resistance must be kept extremely low, hence the need for a conductor such as copper tube with low resistivity and a large surface area. In a larger loop made for the HF bands, I used 0.75 inch (19mm) copper tube but I thought that this was a bit cumbersome for the small 2 metre loop and settled for the 0.25 inch tube.

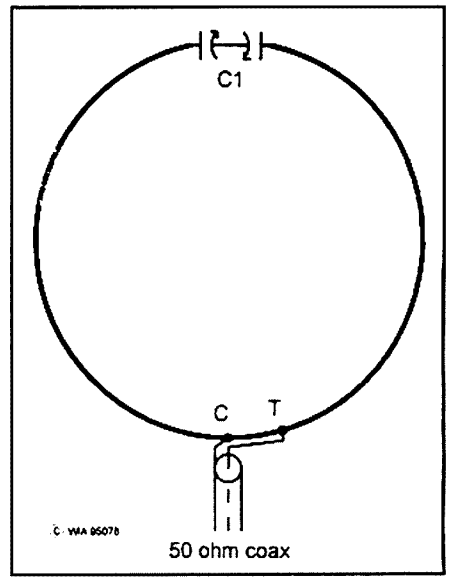

Figure 1 — Magnetic loop for two metres.
Loop diameter: 5.25 inches (133 mm).
Material: Copper tube 0.25 inch (6.4 mm).
C1: Butterfly capacitor with range across stators of 2 to 5 pF.
Matching tap: See text.

Another consideration is loss resistance in the wiper arms of the tuning capacitor. This is eliminated by connecting the loop across the two stator arms of a split stator capacitor so that the capacitance is the resultant value of the two halves in series. In this arrangement, the wiper arms float and are not in series with the tuned circuit. For this component, I used a small wide spaced nine plate butterfly capacitor which I measured to have a capacitance range of 2 to 5 pF across the stator plates and which nicely tuned around the 4 pF required. The wide spacing is also important as the loop operates at a very high Q and a high voltage is developed, even at quite low powers.

The constants for the loop have been calculated from formulae given in the material by Ted Hart:

Loop Inductance	0.24 μH
Distributed Capacity	1.1 pF
Tuning Capacity	3.9 pF
Radiation Resistance	0.35 ohm
Loss Resistance	0.06 ohm
Efficiency	85%
Loop Q	268
Potential across capacitor:	For 25 watts — 1200 V RMS For 100 watts — 2400 V RMS

If you are interested in the formulae used, they are published in the 15th edition of the *ARRL Antenna Handbook* (and possibly a later edition) and also reprinted with my article on these loops in *Amateur Radio,* November 1991.

Coupling

Assuming the loop is at resonance, a resistance can be seen between its centre C and a tap T part way up the loop. Its value is zero at the point C, increasing as it is moved up and becoming a very high value where it joins the capacitor. A point T is found where it reflects 50 ohms and at this point we couple in our 50 ohm feed line. Of course this is a classical gamma match which normally includes a series capacitor to correct for the inductive reactance of the length of lead from the coax line to the tap point.

For this application, I didn't think the capacitor was needed as a reactance correction would be reflected in resonating the whole thing as a unit. In practice I found that, provided the loop was properly resonated, the tap could be set to produce an SWR reading in the 50 ohm line of close to 1:1.

Assembly Detail

The general assembly of the loop and housing is shown in figures 2 and 3.

With such a high Q, tuning is very critical and some form of reduction drive, coupled to the variable capacitor, is essential to tune to resonance. I used a 6 to 1 vernier drive and, even with this reduction, adjustment is very critical and has to be finely set. With the capacitor used, the frequency range of 144 to 148 MHz is covered by seven degrees of shaft rotation.

To connect the butterfly capacitor, the copper tube was drilled to take the stator legs. These were solidly soldered in place with the aim of minimising loss resistance. The butterfly capacitor and its connection to the copper tube is shown in figure 4.

Two clamps made of copper strip were fitted for the matching connection. The one at the centre was soldered in place to ensure a low

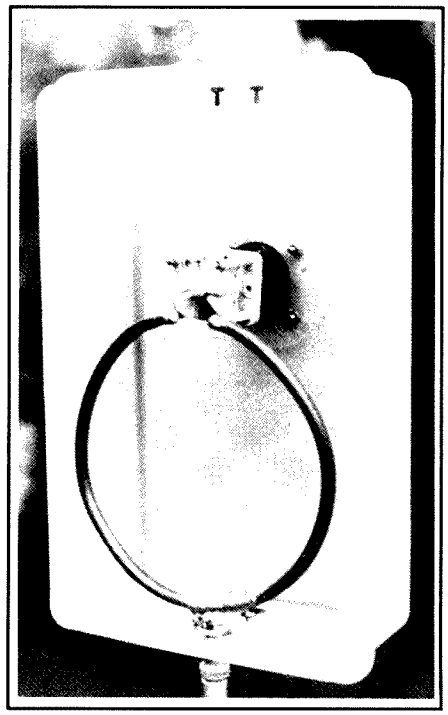

Figure 2 — The 2 Metre Antenna in a Lunch Box.

resistance connection. The other was made adjustable so that it could be moved along the copper tube to find the best position for low SWR. Once this was determined, the second clamp was also soldered in place. The 50 ohm feedline is connected via a BNC panel mounted connector. The

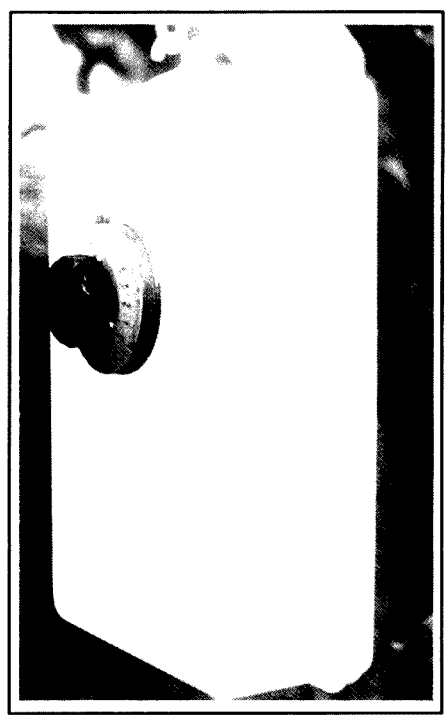

Figure 3 — The loop antenna — box cover removed.

outer part of the connector joins the centre clamp via a soldered lug. A stub wire is connected from the centre lug of the connector to tap T. Following tap adjustment, this ended up around 23 mm long and spaced out from the copper tube about 15 mm. A closer view of the coupling system is shown in figure 5.

I needed some sort of non metallic housing to mount the vernier dial and the coax connector and did a search of the local Big W and Target stores for a suitable box. I selected a nice polythene "lunch box" which measured 155 mm x 255 mm x 75 mm. As you can see from the photographs, the 255 mm dimension is quite a bit more than I needed but the other two dimensions suited me fine.

I liked the idea of the lunch box name for my antenna but the one selected is really more than that as it is suitable for microwave oven use. This is good because, if the material has low dielectric absorption at microwave frequencies, it will also have low absorption around the VHF antenna. The box idea is also useful for outside use as it can be sealed easily against the elements with a silicone sealer.

Components

Perhaps it is of interest to discuss the source of all the components used. The copper tube was left over from a household plumbing job. The butterfly capacitor was found in the spare capacitor box. A few of these often change hands at amateur radio trading marts and sometimes they fall into my hands. I think most of them were retrieved from early mobile TCA VHF transceivers such as the 1675 and 1677.

The nylon hook at the top of the box was found in my box of sailing boat spares. The vernier dial was given to me some 50 years ago by a gentleman who had taken it from a wartime Japanese transceiver he had dismantled. The BNC connector was one of a number retrieved some time ago from some discarded commercial gear. The box I have already told you about and this cost just under five dollars. To me, recycling whatever I can at minimal cost is much of what amateur radio is all about.

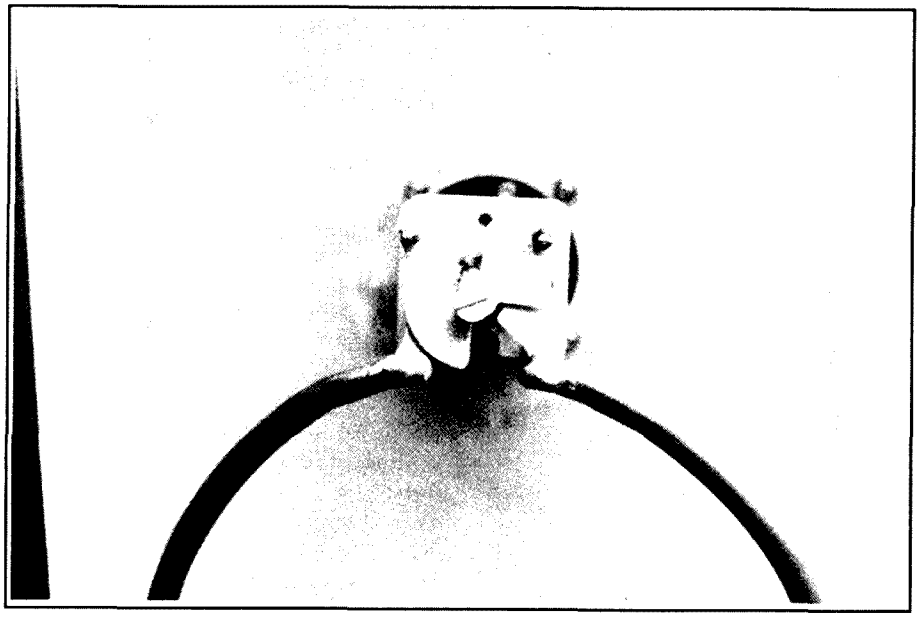

Figure 4 — C1, the butterfly capacitor and the conection to the loop.

Performance

The loop is mounted so that its plane is vertical and the antenna radiates a vertically polarised signal. The signal is bi-directional with lobes peaking in line with the plane of the loop. The lobes are fairly broad and the loop only needs to be oriented in the general direction required. However, fairly sharp nodes occur at right angles to the plane of the loop.

As indicated before, the tuning is very sharp and it can be put off tune by hand capacitance. To manually tune, one must be in visual distance of an SWR meter in the transmission line and the capacitance tuning dial is operated at arm's length to minimise body capacitance effects. Off tune, the SWR shows high — to resonate, carefully tune for a sharp dip in reflected power.

With the loop tuned properly to resonance and facing in the right direction, the results achieved seemed comparable with a J-Pole antenna used at the same height. On receiving, the two antennas gave comparable S meter readings.

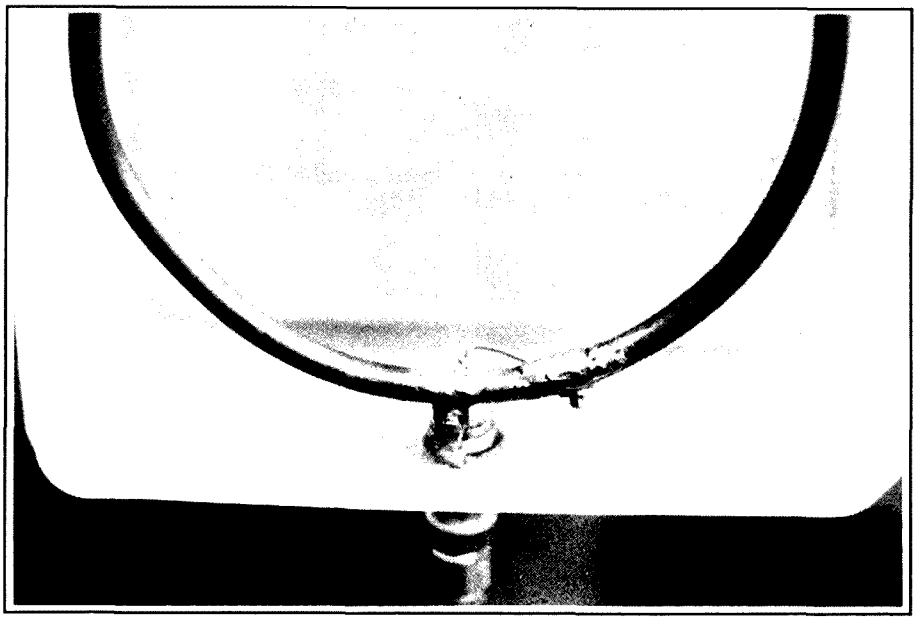

Figure 5 — The matching stub and BNC connector.

However, the problem with these loops is their narrow bandwidth. To maintain an SWR reading within 1.5:1, this one is limited to a band of little more than 100 kHz. To go beyond that, the butterfly capacitor must be retuned. There is no problem maintaining an SWR close to 1:1 over the whole 144 to 148 MHz but the capacitor must be reset for the particular limited section of the band used.

I had no problem working local repeaters with this antenna and I had adequate received signal fed to the transceiver. However, if the loop is tuned up nicely on the transmit frequency to trigger the repeater, it is way off tune on the receive frequency 600 kHz away and hence the receive signal is attenuated. This could be a problem where the signal from the repeater is of marginal strength.

Conclusions

The two metre magnetic loop is a compact antenna which can easily be hung up under the eaves, the carport, or any other place where space is limited including indoors. It is probably best suited to a situation where a dedicated transceiver operates on a fixed frequency such as a single packet channel. Properly tuned up for the single frequency and directed towards the other station, it appears to work as well as a full size vertical dipole.

However, in its static form it has a narrow bandwidth and has to be tuned to track across the band. This makes it less suitable to cover a general range of channels across the band and, to achieve this, remote motor tuning would need to be considered. It would seem to me that if this extra complication was the option, it would be far simpler to find space to fit in a J-Pole or other wider bandwidth antenna.

References

1. *The ARRL Antenna Handbook, 15th Edition, Chapter 5, Loop Antennas.*
2. *Lloyd Butler VK5BR — Some Experiments with the Small Transmitting Loop Aerial — Amateur Radio, November 1991.*

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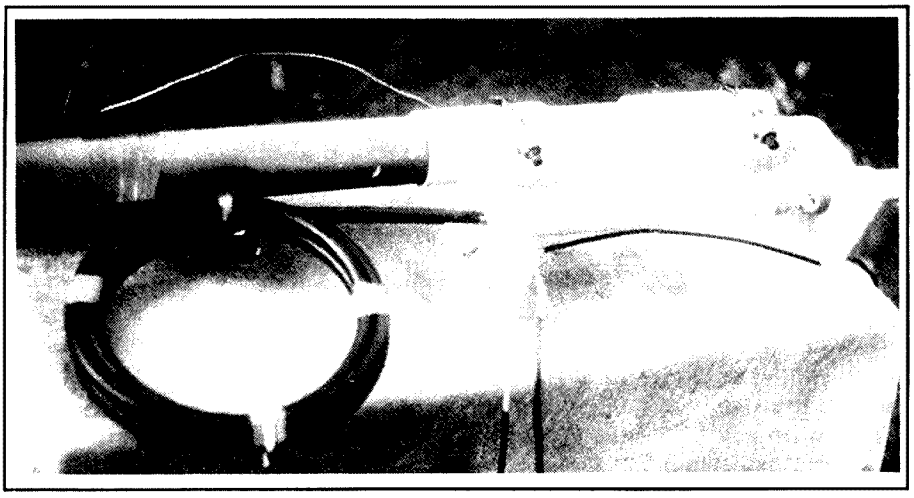
■ Antennas

The Ground Plane Antenna

Adrian Fell VK2DZF describes how to build an effective DX antenna.*



The feedpoint of the 20 m ground plane. The white PVC sections isolate the radials from the steel mast. The coil of coax is the RF choke.

A previous article written by the author, and published in *Amateur Radio,* discussed the differences between a quarter-wavelength-long vertical mounted on the ground and one raised into the air. Comparison tests were done between these two different designs. This article gives a more in-depth view of the Elevated Ground Plane.

In its simplest form all that is required to construct a ground plane (GP) is a length of aluminium (or wire) 0.25 of a wavelength long with two radial wires of the same length joined to the coaxial feeder braid at the feedpoint. It would not take very long to mount this to a length of timber and attach the whole device to a fence or even hang it in a tree.

This was very similar to the author's first GP and it worked quite well. If you give your GP a bit more commitment, better performance, and possibly less TVI, could be the result.

When the GP is located on or very close to the ground, then a lot of radial wires must be used if losses are to be kept low, as RF current will want to flow in the ground itself. This lowering of the antenna's efficiency will be especially noticed when lengths of 0.25 (or less) of a wavelength are used for the radiating element. The text books tell us at least forty radials must be used if the vertical is to have a high efficiency in these circumstances.

If the GP is moved up away from the ground, the effects of the ground become less until a point is reached when only three or four radials will be required for good efficiency. Three or four radials is quite common amateur practice at frequencies of 14 MHz and higher. The ground effect should not be ignored even at heights of 0.25 wavelength or higher. The experimenter may benefit by adding a few more radials.

At frequencies lower than 14 MHz it would take some good engineering and space to obtain the above mentioned height. The author knows of one or two amateur stations using a GP on 80 or 40 metres. A single linear or inductively loaded radial may be worth looking at if one is starting from scratch to build such a monster.

There can be a slight risk that the antenna will have some high angle lobes of radiation, adding to the low angle one already present, if the antenna is raised too high off the ground. Raising the antenna well off the ground may prove a great advantage in any case, as it will get the vertical section above surrounding objects such as houses, sheds or trees, etc.

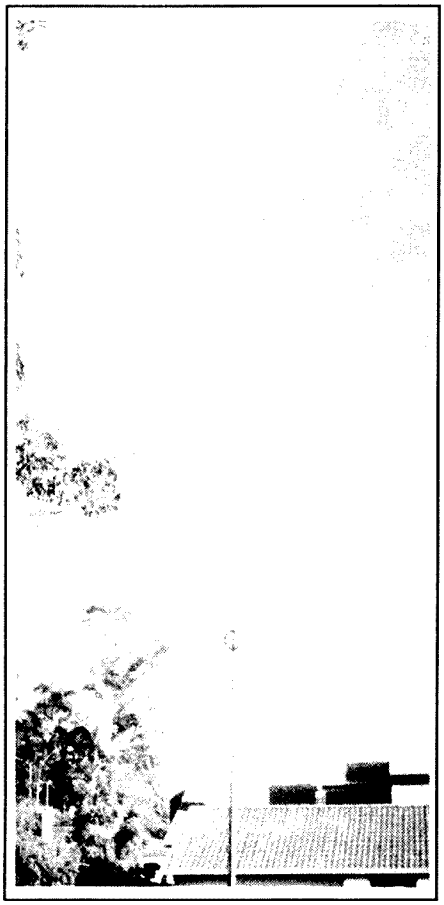
If the radials are run out horizontally the feedpoint impedance can be expected to be around the 30 ohm mark, giving a VSWR of 1.66 to 1 at resonance. Although the bandwidth will be excellent the VSWR will be higher at the band edges. Most valve final stages will easily tolerate such readings along with most solid state transmitters, but these figures can easily be improved for those who prefer to see better readings. However, it does not mean that the

antenna will work any better, so don't get too carried away in the excitement to get a 1:1 VSWR.

One way to do this is to make the radiating element longer, up to about 0.28 of a wavelength, thereby raising the feedpoint impedance up to 50 ohms. This will introduce some reactance which will need to be tuned out by an additional series tuned capacitor. There are other methods as well, like using a variable inductance, but these methods are rarely used in amateur circles.

The easiest method to raise the feedpoint impedance up from 30 to 50 ohms is to droop all the radials down to an angle of approximately 40 to 45 degrees. This will result in an excellent impedance match between the GP feedpoint and the coaxial cable. This is the most widely used method with amateur radio applications.

Care should be taken not to drop the angle of the radials too low in an attempt to get a perfect 1 to 1 VSWR as there is always a risk that the antenna will act more like a vertical dipole than a GP and a higher angle of radiation could result. It has been claimed that drooping the radials down gives the antenna some slight signal gain because the radials start to add to the radiation pattern. For the antenna to have a true RF ground the radials should not radiate any RF and this may mean using a lot of them in the horizontal plane, even with the GP located up away from the ground. In practice it's a matter of trade-offs and, for peace of mind, the author would prefer to see a slightly higher VSWR than 1:1 indicating an impedance lower than 50 ohms. After all, we want a ground plane and not a vertical dipole.



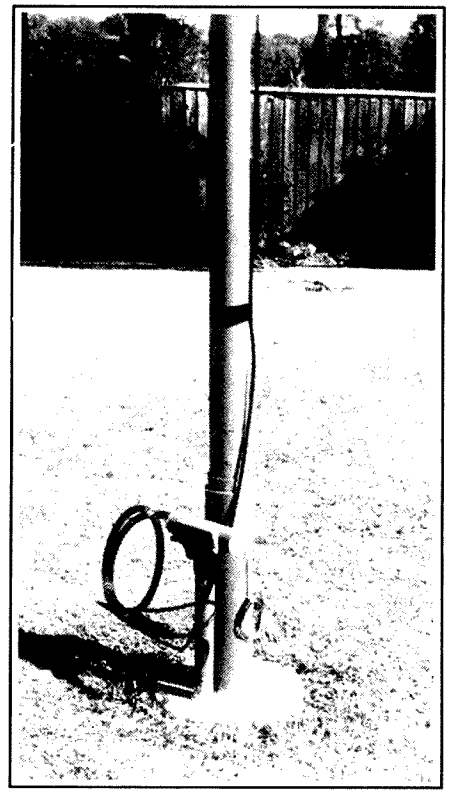
The 20 m ground plane in position. The feed point is 7 m above ground. One has to look hard to see the radials.

There will be some interaction between adjusting the angle for the best impedance match and tuning the radial lengths for resonance. The radials can be medium to heavy size solid, or stranded, copper wire and initially they should be cut to a length longer than required as they may need to be adjusted once the GP is up in the air. Black insulated wire is easy on the eye and helps keep the neighbours and XYL happy.

The overall electrical length of the GP is 0.5 of a wavelength, from the tip of the vertical to the tip of any one radial, and is fed at the centre. Care should be taken because physically identical lengths of aluminium, especially a tapered section, and wire may differ in electrical length.

A radial system for a GP at HF will more than likely use wire. The formula for a 0.25 wavelength of wire is 234/f in feet (f in MHz). This formula could also be used to obtain the approximate physical length of an aluminium radiator. In any case, proximity effects can affect such formulas.

From the author's experience a few factors can come into play. For example, using the same piece of aluminium vertical tubing, different lengths were required depending on its height above ground. With the antenna high in the air the tapering effect came into play. With the antenna at ground level the wire formula ended up being spot on. As a guide, any diameter 0.5 inch (12.7 mm) or smaller should use the wire formula 234/f (f in MHz) while, for larger diameters, the lengths should be multiplied by 0.98.



The base of the mast supporting the 20 m ground plane antenna.

Tapered elements are a special case. The tapered element is longer than normal. The amount of correction depends upon the amount of taper. The length of the tapered element is between the length obtained from the wire formula and that calculated for the base diameter.

Don't worry too much about all these findings as, in practice, adjustment of either radial or radiator length compensates for the other. In other words, if the vertical radiator is too short then the radials are made longer. The reverse is also true. The author has tried both ways with his GP and no difference in performance was noted.

Work on the formulas mentioned before and apply the one that is appropriate to the aluminium type used. No matter which way it's done, you are close to the mark when the radials measure 0.25 of a wavelength using 234/f. Mark a line on the mounting pole measured down from the feedpoint. The radial wires should be all the same length and these can be checked against this marker line.

It's very convenient to have a plug and socket at 0.5 of a wavelength from the feed point to check the VSWR.

The experimenter can try some of the following ideas for TVI reduction and performance tests. The background noise on your receiver can be noted also during any experimental stages and, in particular, when the radials are longer than 0.25. The radiator is then made shorter to compensate.

Increase the length of just one radial wire only. Start with about 15 to 30 cm on 20 m. Check the TV set for TVI from 20 m and check the TV set for TVI at different lengths as you go. An alligator clip and wire will aid this test.

Install either a current balun, or wind the coaxial cable through a suitable size toroid for three or four turns as seen in the photo. The coil should not be so small as to strain the coaxial cable.

Increase the length of the radials to 0.5 of a wavelength but retain one radial at 0.25 of a wavelength to maintain correct current feed.

Increase the radials to a length of 0.75 of a wavelength or, if you are really adventurous, try two full 1.0 wavelength loops as a radial system. These can be in a diamond configuration and joined to the braid at each tip of the loops. These loops would probably need to come down at a angle.

Use one very short radial, for example 0.25 of a wavelength long, load this with an inductance, then link couple the coaxial cable to this coil. The radial could be linear loaded instead. This method was tried by the author some time ago with success.

An antenna as simple as the old ground plane. Who would have thought you could do so much! Happy experimenting.

References

*Dx Vertical Up or Down; Adrian Fell VK2DZF; **Amateur Radio** December 1995 p15*

ARRL Antennas Publications

All about Vertical Antennas; William Orr W6SAI and Stuart D Cowan W2LX

HF Antennas for All Locations; RSGB; LA Moxon G6XN.

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■ Transmitters

The Garran 40 m CW QRP Transmitter

Peter Parker VK1PK describes a very useful homebrew QRP transmitter using a VXO.*

While one often sees designs for simple QRP transmitters in various magazines, a large proportion appear to be built, and then left to sit on the shelf after just a few torturous contacts. Several reasons exist for this situation. The rig may be crystal locked in a band which is either sparsely used or crowded with DX stations. Its power output may be insufficient given the antenna system being used. Or the transmitted signal may be riddled with clicks or chirps.

This transmitter suffers from none of these maladies. It includes a VXO to provide some frequency agility to dodge interference, while preserving good stability. Its one watt output is sufficient for solid interstate contacts during the day, and the use of buffering makes this transmitter sound "just like a bought one".

Unlike most homebrew QRP transmitters, this unit operates on 40 metres. During the day this band can be a QRPer's dream; no DX QRM, plenty of activity (at least in SE Australia), and yet enough band space in which to call CQ (even in the limited range provided by a VXO). Antennas can be smaller than on 80 metres, and portable operation during the day is practicable.

Design

This transmitter is of conventional design (see Fig 1). A Colpitts VXO circuit permits a frequency shift of 4 to 5 kHz with excellent stability. The oscillator signal is fed to a buffer stage to isolate the VXO from the driver and power amplifier stages, whose collectors are both keyed by a PNP transistor switch. This transistor also controls the antenna switching relay and the LED keying indicator. Harmonics are suppressed in the pi-network following the PA. Spectral purity is further enhanced through the use of a 7 MHz tuned circuit on the driver transistor's collector. During reception, the entire transmitter is switched off to prevent interference in the receiver from the crystal oscillator which runs continuously during transmit.

. . . this unit operates on 40 metres. During the day this band can be a QRPer's dream.

Component Procurement

All components used in this transmitter are obtainable by mail order. If all are purchased new, the total cost of the rig should not exceed $70 (including crystal). By making the box and using salvaged components, this cost can be significantly reduced. Appendix 1 gives a list of addresses from which the more esoteric components can be obtained.

The most expensive part used in this transmitter is the crystal. Crystals in HC6/U holders normally exhibit the most frequency shift in VXO applications. Order your crystal for a standard 30 pF load capacitance. A crystal of 7.020 MHz proved satisfactory in the prototype.

The next component which may be hard to obtain is the variable capacitor. The prototype used an air-dielectric unit plus a 6:1 vernier reduction drive. A small transistor radio plastic dielectric type, available from most outlets, should be satisfactory. The value of this is not especially critical. Because of the small VXO shift, typically 5 kHz, a vernier reduction drive is an unnecessary luxury. At the time of writing, air dielectric types with in-built reduction drives are available by mail-order from the *CW Operators QRP Club*. If you're not a member of this club, include $12 with your first order to cover annual membership and *Lo-Key* subscription.

Three toroids are used in this transmitter. Again they are available from the *CW Operators QRP Club*. If you do not have many toroids, you could substitute a 1 μH RF choke for the toroid in the pi-network. An RF choke could also be used for the VXO inductance in series with the crystal. Experiment with values between about 5 and 20 μH. The enamelled copper wire required for winding the toroids can be found in old transformers, or is available in small reels from most part suppliers.

A wire gauge of 0.5 to 0.8 mm would be satisfactory. Both the trimmer capacitor and ferrite bead can be purchased from normal part suppliers or salvaged from an ex-commercial VHF FM transceiver. The PNP keying transistor can be any medium-power type as it is not critical. Some experimentation with the PA transistor might be fruitful. Replacing the 2N3053 with a 2N3553 or BD139 might boost output power to two to three watts. This modification has not been tried.

Construction

The first step in building this transmitter is to obtain a suitable box. To provide proper shielding a metal case is suggested. A size of 6 x 15 x 12 cm is reasonably compact while allowing room for a direct conversion receiver which can be added later.

Any one of a variety of construction methods can be used to build the transmitter. It is hardly necessary to etch a printed circuit board though should this be your choice, the use of pieces of adhesive tape as a resist is practical. Another approach is the use of Drew Diamond's "Paddyboard" construction (*Amateur Radio*, February 1995). The prototype uses three small pieces of perforated matrix. On one board the VFO and buffer stages are mounted. The second board carries the driver, PA and pi-network. The keying transistor

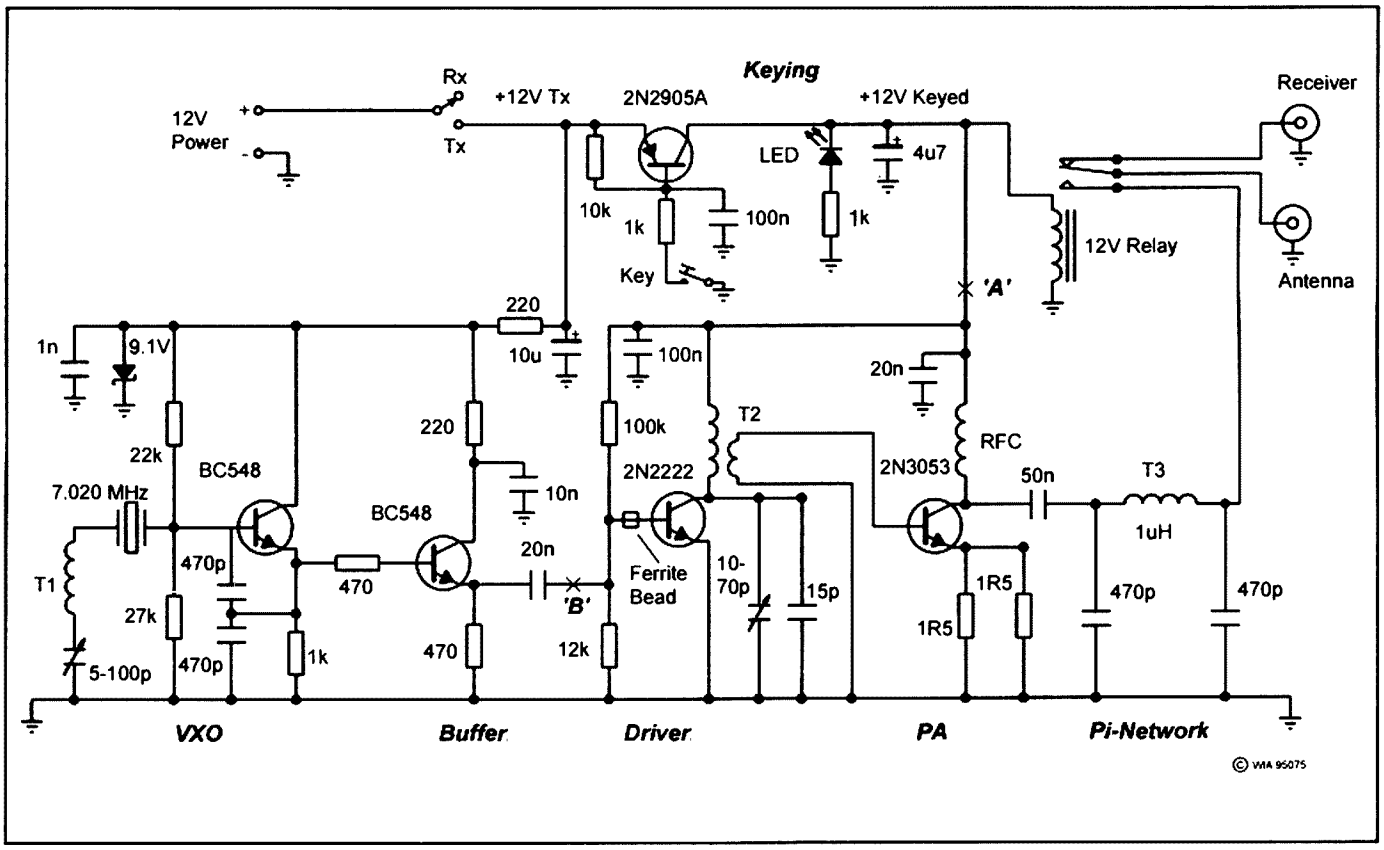

Figure 1 — Schematic diagram of the Garran 40 m CW QRP Transmitter.

Resistors:	**1/4 W 5%**
Capacitors:	**Below 1 μF, ceramic**
	Above 1 μF, electrolytic
	Variable, see text
Coils:	**T1 toroid 30 turns, see text**
	T2 toroid primary 17 turns, secondary 4 turns, see text
	T3 T50-2 toroid 14 turns, or 1 μH RFC, see text
Xtal:	**7.020 MHz, see text**

and relay are mounted on the third board. If blank matrix board is unavailable it can be produced by immersing veroboard in PCB etchant solution.

The VXO and buffer is constructed first. To maximise VXO range, it is recommended that no crystal socket be used; solder the crystal pins directly, but do not apply excessive heat. If using a printed circuit or matrix board use PC pins for all connections to panel-mounted sockets, the switch and LED, and other circuit boards. This facilitates construction, testing and trouble-shooting.

It might also be helpful to use PC pins for connections to the three toroids used in this project in case there is a need to vary the number of turns from those specified here. This is particularly true for the inductance in the VXO stage which should be experimented with to provide a good degree of shift with your particular crystal and variable capacitor.

The VXO and buffer stage can be tested by applying power (a 12 V gel battery is an ideal power source for this project) and checking for output with either a 40 metre receiver or digital frequency counter. Adjusting the variable capacitor should cause the output frequency to vary. The extent of frequency shift obtainable depends, among other things, on the inductance in series with the crystal and the minimum capacitance of the variable capacitor. Most shift in a VXO occurs near the minimum capacitance end of the variable capacitor's range. While the VXO toroid in the prototype contains 30 turns, you might achieve better results with a different number of turns. Aim for the maximum possible shift consistent with good frequency stability.

Next the driver and PA stages can be tackled. Firstly wind the driver and PA interstage toroid. Its primary contains 17 turns, while four turns are wound on the secondary. Remember to slip the ferrite bead over the base lead of the 2N2222A to minimise the risk of spurious oscillations. While the driver transistor runs fairly warm in this circuit, a heatsink is not required for normal CW service. The PA transistor, however, must be fitted with a heatsink; the type which presses onto a TO5 transistor case will be found suitable. The performance of these stages is dependent on the tuned circuit following the driver stage. It must be resonant on 7 MHz for the rig to work properly.

Following the PA is the pi-network.

The toroid for the prototype is an unknown 12 mm diameter powdered iron type. 22 turns were required to reach the desired 1 μH inductance. The commonly specified T-50-2 toroid would require 14 turns in this application. As mentioned previously, a small 1 μH RF choke would probably work as well, although this has not been tried.

At this stage of the transmitter's construction, a 40 m receiver, RF power meter and dummy load are necessary for testing. When power is applied, the signal produced in the VXO and buffer stage should be audible in the receiver. With the receiver's attenuator switched in, the application of +12 volts to Point "A" should cause some response in the receiver, and an indication on the power meter. Approximately one watt output should be indicated. If the output is significantly less than this, check the driver tuned circuit and experiment with component values around the driver and PA stages. If you are without a power meter you could try a 47 ohm, 1/4 watt resistor as a dummy load. If it gets hot when DC is applied to point "A", you can at least be sure that there is some output from the power amplifier.

It might be a good idea to tune your receiver off-frequency and listen for any broadband hash with point "A" at +12 volts. If this effect is noticeable, there is a need to make modifications to the driver and PA stages to curb spurious oscillations. Any of the following may help:-

- Ferrite bead on base lead of 2N3053.
- Low value resistor from 2N3053 base to ground — experiment with values from about 22 to 220 ohms.
- Increase value of 2N3053 emitter resistors.
- Insert low-value resistance in 2N2222A emitter.

The prototype required none of these modifications.

The most difficult parts of the transmitter have now been built. All that remains is to construct the transmitter keying stage. Its testing is very easy. With the power switched on, pressing the key should cause 12 volts to appear on the 2N2905A collector, activating the relay, LED, and the driver and PA stages. RF power should be measurable on the antenna socket with the key pressed. If there is no indication, look for wiring errors around the relay. With the receiver connected to the appropriate socket on the rear of the transmitter, normal reception of signals should be possible with the transmitter switched off.

Approximately one watt output should be indicated.

Operating

Once satisfied with the quality of the keying and the transmitter's frequency stability, it is time to connect it to a suitable antenna (via an ATU if necessary) and attempt to make some contacts.

If responding to a calling station, switch on the transmitter (without pressing the key) and adjust the VXO until a tone of the same pitch as that of the calling station is heard in the receiver. You are now on that station's frequency and may make your call. If using other than a superhet receiver with a good crystal filter, you should also check that both the calling station and the VXO signal zero beat on the same frequency; the "audio image" of simpler receivers can sometimes mislead the operator.

While a transmitter such as this is capable of reaching distances of up to 3000 km in the early evening, such contacts are often not easy because of interference from other stations. A much better time to operate 40 m is during the day when solid contacts of 600-800 km are possible with low power.

References

- O'Donnell, *Lo-Key*, June 1987, page 21.
- DeMaw/Hayward, *Solid State Design for the Radio Amateur*, 1986.

Appendix 1

List of Component Suppliers

- J & A Crystals,
20 Delville Ave,
Mentone, VIC 3194 Tel (03) 9583 4533
- Beacon Crystals,
24 Stanley St,
Leabrook, SA 5068 Tel (08) 9332 3031
- Max Howden Crystals,
PO Box 287,
Lilydale, VIC 3140 Tel (03) 583 4533
- CW Operators' QRP Club Kit-Set Centre,
C/o Don Callow VK5AIL,
5 Joyce St,
Glengowrie, SA 5044 Tel (08) 295 8112
- Dick Smith, Jaycar, Altronics, Rod Irving, Radio Spares, Force Electronics, etc — see electronic magazines and local Yellow Pages.

Appendix 2

Adding a Direct Conversion Receiver

This transmitter has been designed to easily permit the addition of a direct conversion receiver to form a complete transceiver. All that is required is to feed a small amount of signal from the buffer to the receiver's product detector via a 10 pF disc ceramic capacitor connected to Point "B". The 800 Hz transmit/receive frequency offset is accomplished manually by the operator adjusting the VXO when switching to transmit. The addition of sidetone and receiver muting features is a matter for personal choice.

***(Technical Editor's Note:** Those who find relays clicking in time with their keying annoying, should connect the relay to the 12 V line rather than to the keyed 12 V line.)*

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■ Technical

Technical Abstracts

*Gil Sones VK3AUI**

VFO with Automatic Level Control

A VFO with an Automatic Level Control was described in the October 1995 issue of the **Radio Society of Great Britain's** monthly journal *RadCom* by Jack Hardcastle G3JIR. This VFO uses ALC to stabilise the output level of the oscillator thereby minimising drift after frequency changes. Variation of output level results in small changes which show up as drift following a change of frequency.

The main cause of drift is thermal due to the circuit warming up and due to heat from sources such as final amplifiers. These can be minimised by good design.

The circuit described is a form of Vackar VFO using a low noise VHF Dual Gate MosFet. The circuit is shown in Fig 1. The control voltage for stabilisation of the amplitude of oscillation is applied to gate 2. A combination of air variables, silver mica and ceramic N750 capacitors are used to compensate the oscillator for thermal drift.

The oscillator inductor L1 is wound with 0.25 mm (0.01 in/32 SWG) enamelled wire on a 14 mm (9/16th in) ceramic former. The wire was wound whilst hot so that it would be a very tight winding and so the former would determine any subsequent thermal movement and hence drift. The wire was heated during winding by passing 4 amps through it.

Voltage on gate 2 controls the output level. Trimpot RV1 sets the output level. The range available is from the oscillator squegging, through normal oscillation, to the oscillator stopping. The trimpot should be set in the mid range to give a suitable output level without any undesirable side effects.

After adjustment of the temperature compensation the following drift rates were obtained while heating the oscillator five degrees C above ambient over a two hour period. At 4.0 MHz the drift rate was −22 Hz/°C with +28 Hz/°C at 4.35 MHz and +8 Hz/°C at 4.175 MHz.

The oscillator output was relatively pure with the second harmonic down 30 dB. The third harmonic was down 35 dB and the fourth and fifth harmonics were down 54 and 55 dB respectively.

Oscillator output was set at +8dBm and was used to drive an SBL1 mixer.

Pirate Radio

An item from the July 1995 issue of *Short Wave Magazine* may be of some interest. In the *Off The Record* column of Andy Cadier there is some information regarding a crackdown on FM broadcast band pirates in the London Borough of Hackney.

The Borough of Hackney has been assisting the Radiocommunications Agency (SMA equivalent) in a crackdown on pirate broadcasters. The pirates have been unwelcome tenants or squatters in tower blocks of flats owned by the council.

Pirate transmitters have been located in the tower blocks with the studio at a remote site. The transmitters have been concealed in a variety of places including lift shafts, water tanks, and sewerage pipes. The pirates have not been ideal residents and their operations have sometimes resulted in expensive damage to the blocks of flats.

The United Kingdom, Ireland and Europe have had many pirate broadcasters. The pirates usually try to fill a broadcasting niche and, in the past, broadcasting to a wide area on the MF broadcast band required quite a lot of expensive equipment. The modern pirates appear to be catering for small local audiences on the FM band. The equipment requirements are much more modest.

A recent episode of *The Bill* on ABC TV featured a modern FM band pirate. The transmitter was located in a vacant tower block flat and the studio was remote. The link was a simple gunnplexer microwave communicator system. When the police and the Radio Inspector finally burst in only the transmitter was to be found. This is no doubt that this was

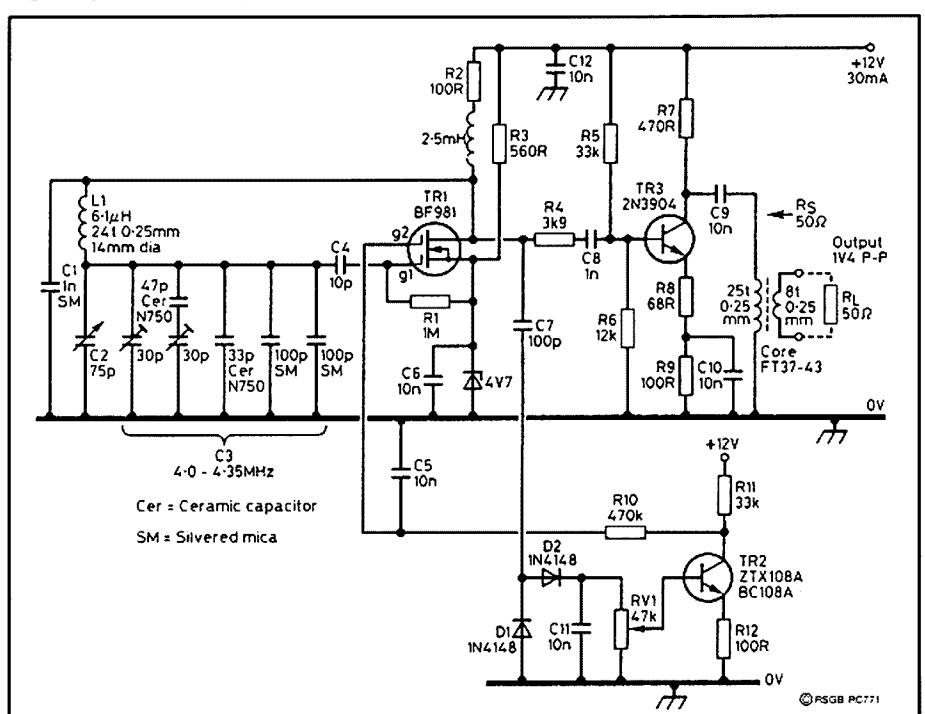

Fig 1 — Vackar VFO with ALC.

Table 1
Dual Band Handheld Transceiver Test

		Alinco DJ582T	Icom IC-Z1A	Kenwood TH79A(D)	Standard C568A	Yaesu FT-51R
Rx Sens dBm for 12 dB SINAD	146 MHz	-124	-123.5	-124	-124 (L) -120 (R)	-123.5
	440 MHz	-123	-123	-123	-122	-123
	1240 MHz				-117	
Rx AM Sens dBm for 10 dB(S + N)/N		-108		-114	-112	-114
Two Tone 3rd Order IMD Dynamic Range dB	146 MHz	63	60	62	66	62
	440 MHz	61	60	67	66(L) 61(R)	61
Adj Channel Rejection 20 kHz Offset dB	146 MHz	62	63	56	58	66
	440 MHz	58	61	53	51(L) 55(R)	58
Mute Sens dBm		-129	-126	-126(146) -129(440)	-131 to -122	-122
Rx Af OP mW into 8 Ω 10% Dist		210	190	211	202	151
Tx Pwr Watts Std Batty	146 MHz	3.5/1.6 /0.5	1.8/0.5 /0.02	3.2/0.4 /0.03	3.2/2.4 /0.4/0.07	2.4/2.0 /.5/0.03
	440 MHz	2.3/1.1 /0.3	1.6/0.6 /0.03	2.5/0.2 /0.03	3.6/2.0 /0.3/0.06	1.4/1.4 /.5/0.02
Tx Pwr Watts 12 V/13.8 V Nom Batty	146 MHz	5.2	5.2	6.4	5.4	5
	440 MHz	4.7	4.9	5.4	4.7	4.2
	#1240 MHz				0.05	
Tx Rx Turnaround Time PTT release to 50% Full Audio m/S 146 MHz	Squ On	140	160	205	160(L) 170(R)	125
	Squ Off	120	160	205	160(L) 170(R)	125
Tx Rx Turnaround Time PTT release to 50% Full Audio m/S 440 MHz	Squ On	100	160	205	160(L) 170(R)	110
	Squ Off	80	160	205	160(L) 170(R)	65

the sort of setup that is being chased in the London Borough of Hackney. The police in *The Bill* finally got their man due some other nefarious activities he was engaged in.

Comparison of Dual Band Handhelds

A comparison of Dual Band Handhelds was published in the July 1995 issue of the **American Radio Relay League's** monthly magazine *QST* in which five handhelds were compared. The author was Steve Ford WB8IMY and, in addition to the features and usage data, the handhelds were tested technically.

The handhelds tested were all purchased normally and were not special review samples. They would be representative of the sort of radio a user would obtain over the counter. This is standard for *QST* reviews and ensures that the test samples are similar to those which a normal purchaser could expect.

The performance figures obtained are given in Table 1. Some handhelds have AM detection when monitoring the aviation frequencies below the two metre band and the Standard provides a limited 23 cm coverage. The Standard also has a left and right side receiver which have slightly different characteristics.

The figures do need some interpretation. Sensitivity quoted in microvolts has been converted into dBm. Sensitivity is not the sole indication of good performance. Intermodulation has a great bearing on the ability to receive signals. The disturbance experienced from adjacent services is a frequent cause of complaint.

All the handhelds tested have intermodulation performance which could be improved. Bells and whistles should not be heard from the speaker of a radio due to disturbance from other services. The radio should be designed so that it can operate in the sort of RF environment that exists today. The problem of strong signals from services in adjacent bands is not solely an Australian problem.

The turnaround time gives some indication of the delay between transmit and receive. This is of importance to packet users and determines some of the TNC parameters. The major factor in these times is the settling time of the Phase Locked Loop. Good data cannot be handled until the PLL has stabilised. In many radios the PLL must shift frequency between receive and transmit and so must be allowed time to stabilise after each transition.

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■ Antennas

Random Radiators

*with Ron Cook VK3AFW and Ron Fisher VK3OM**

Not everyone can put up a full size antenna, especially at the lower part of the HF spectrum. Mark VK4MFX writes of his experiences with a very limiting QTH, that of a yacht.

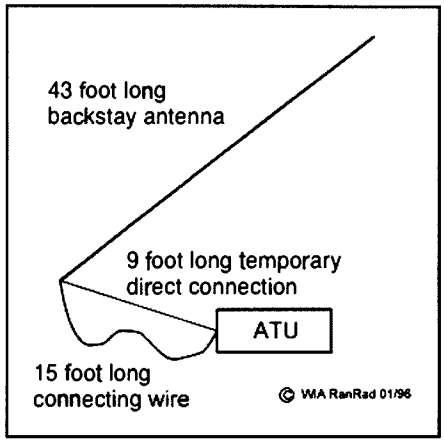
I found the Random Radiators *article in the June 1995 issue of Amateur Radio very interesting. Living on board a yacht, the antenna I use is a random wire, end fed, which I found worked very well on all amateur HF frequencies, plus the marine 4, 6, 8 and 12 MHz frequencies. The ATU I use is the MFJ948 "Deluxe Versa Tuner II". I've enclosed a section of wire which I've used as my antenna.*

Questions I would like to ask are:

1. *what is the capacity of the wire?* *and*
2. *what would be the impedance?*

*From my drawing (*Fig 1*) the 15 foot long connecting wire is the antenna wire coming into the chartroom. I found, when I am trying to operate this system on the 2.524 MHz marine frequency, that I am unable to bring the SWR down. As an experiment I rewired a line straight from the antenna to the ATU. This shortened the connection to the antenna by approximately six feet and the SWR on 2.524 MHz fell to 1:1. I called Townsville Radio for a report and was able to QSO on five watts. Although the connecting wire to the antenna was shorter, I can only put the improved performance down to the fact that the wire from the antenna to the ATU was at right angles to the antenna and pulled tight, whereas the other wire had a few turns, etc thereby raising the X_c of the wire. I can only assume that with the excessive X_c the ATU is unable to tune it out. Is this correct?*

Also in your article you talk of matching loads, ie "when matching loads of less than 25 ohms on 80 m ....". *I assume you are talking about impedances, ie a quarter wavelength vertical has an impedance of approximately 35 ohms.*



At present I have had to rewire the antenna connecting wire back to the original 15 foot length because to leave it as the direct nine foot line, the wire went right across the cockpit at waist height which was not very convenient (hi hi). This means, of course, I have lost 2.524 MHz. Although this doesn't present a problem, my question is why and how does this work?

In regards to R_R I would assume that you could use the formula $R_R = h^2/312$, where h = antenna length in electrical degrees. Of course R_R is going to vary over different frequencies.

As far as Zo is concerned, can the formula be $Zo = H°[ln(4h/d)-1]$, where H° = length in electrical degrees, h = length in inches, and d = diameter in inches (taken for the ARRL Antenna Handbook, 16th Edition, 2-39)?

Living on a yacht, one's antennas become very limited, either end fed wires or verticals; therefore, any help in these two areas would be very much appreciated. For now, however, I would like to concentrate on understanding end fed antennas coupled with the ATU.

Mark has raised an interesting practical point. Why, when the antenna was shortened, did it load up on the lower frequency?

In answer to his first questions about the wire, the answer is I don't know. The wire did not arrive with the letter.

The capacitance of a wire depends on its diameter, when in free space, and its proximity to conductors and dielectrics in a practical situation. In other words the capacitance of a wire above ground is influenced by its height above ground.

The impedance depends on the capacitance per metre and the inductance per metre of the wire.

Even if we could calculate these parameters very accurately, in the installation that Mark has, the results would be little more than academic. The first thing to bear in mind is that the antenna and the feed line are part of the antenna system. In this case there appears to be no feed line as the antenna wire comes straight to the ATU. I assume that the ATU is stoutly grounded to the hull of the yacht and that this is metal. The other possibilities will be considered later.

The total wire length is about 20 m of which about 13 m is the back stay radiator. When the wire goes direct to the ATU the whole wire will act as a short bent antenna. The ATU can apparently cope with this. When the wire is put into a more convenient position, it has some bends which will add inductance, but my guess is that it is closer to the metal hull and the sea and looks more like a transmission line of perhaps 1 kilohm impedance. This will transform the impedance of the back stay radiator to some new value at the ATU, which it apparently can't cope with.

Often we use this transformation property of transmission lines to arrive at a desired value of impedance, but if it was not planned then the result might be unhelpful. While it is possible to accurately calculate the effect for a transmission of constant impedance, it is probably impractical to even try for Mark's case.

The input resistance of the back stay will be about five ohms, but there will be a capacitive reactance which will be much greater in magnitude. Adding the extra 4.5 m of wire will increase the resistance to about nine ohms and the series reactance will reduce by about 25%. This is apparently within the capability of the ATU.

While it would be possible to more accurately calculate the impedances of the wires, not enough information is available in Mark's letter. The formula he gives for radiation resistance is a good approximation for short verticals in free space over a perfectly conducting ground plane. It will be in error for a sloping radiator and, of course, Mark's installation isn't quite free space. But for a ball park figure it will do. The formula can't be used when the wire to the back stay is not well clear of the deck. No simple formula can be applied, but some of the antenna analysis computer programs based on NEC (Numeric Electromagnetic Code) might do the job; however, as stated earlier, it still might be too difficult to be worth trying.

Alternatively the impedances could be measured using an RF bridge. Of course, even when the wire is arranged for a more direct connection, the five metre section can be still considered as a transmission line, albeit one that radiates. It will have a higher impedance than the lower and longer arrangement due to reduced capacitance to the "ground" side. It effectively transforms the impedance of the 13 m sloper section to a higher value which the ATU can more easily tune.

When the wire from the back stay is closer to the hull it does not produce quite the same result. Even though it is longer, the antenna system cannot be tuned by the ATU. It is inconvenient to arrange the feed any other way, so what can be done? There are several possible practical answers.

One yacht owner I have spoken to said that in most installations the ATU was located immediately below deck under the low end of the back stay. A short wire is run to the ATU, through a watertight insulator in the deck in some cases, to give the shortest practical connection. A length of 50 ohm coax is used to connect to the rig which is in the cockpit or other convenient sheltered position. As the ATUs are designed to be waterproof, the occasional splash or spray does no harm. The coax can be kept out of the way and its length is not critical as it sees the correct load from the ATU. Also, the risk of RF burns and shock are reduced as only the exposed back stay presents a hazard.

A land-based marine radio operator told me he uses a 13 m wire fed at the end with the centre of a 50 ohm coax line. The braid is connected to a two metre long counterpoise. He has several of these with different alignments to avoid problems with nulls in the pattern at the higher frequencies. His ATUs will match this on frequencies as low as 2.2 MHz. Of course the coax connection is weatherproofed.

This installation could be used on board a yacht or by an amateur with space restrictions. It might also be good for portable operation. The use of a coaxial cable in this manner still allows a convenient installation and reduces the electrical shock hazard for the crew. It suffers from the same problems as any other feed system when a short antenna is used, namely a high SWR and perhaps awkward impedances for the ATU. It does offer the possibility of having no high voltages in the cabin which is a hazard with single wire feeders.

As before, the ATU should be as close as possible to the feed point as practical. If the ATU is next to the rig, some RF may be present on the outside of the shield. Problems with this can be reduced by placing six to 12 small RF toroids over the coax immediately adjacent to the ATU. They should be protected from exposure to salt air and water.

If it is necessary to use the wire around the edge of the cockpit, or if with the coax feed the ATU cannot tune at the lowest frequencies, then the antenna must be made electrically longer.

An inductor could be switched into circuit at the ATU to make the system resonant or at least to present an impedance value that can accommodated by the ATU. The inductor could be wound on virtually any plastic former and placed in a metal box to avoid detuning effects when it is moved or the operator comes close. A toroidal core might be even better, but it needs to be one of the larger ones. The disadvantage is that it will need to be bypassed for the higher frequencies, and the switch must carry the full antenna current.

Another answer is to add some top loading to the back stay so that it looks longer at the lower frequencies. A weatherproof coil connected between the top of the stay and a metre or two of wire run down the mast or up the mast or to any convenient point would do. As it is not going to carry much current it can have a smaller toroidal core. The size of the coils can be determined by experiment.

Now what if the yacht is wooden or fibre glass? How can the ATU be "earthed"? A large sheet of copper foil on the inside of the hull below the waterline could be used to make a capacitive coupling to the sea. This can be almost as good as the metal hull connection.

Living on a yacht might have some complications, but I'm sure it has compensations.

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WIA News

EMC Standards Compliance Deadline, 1 January

The deadline for electrical, electronic, telecommunications and information technology equipment to meet set-down standards is upon us. From 1 January 1996, equipment which has to comply with Australian Standards covering RF emissions and RF immunity will have to begin carrying a special "CE" label to indicate compliance with the standards.

The EMC compliance regime parallels similar action in Europe, where it now acts as a "non-tariff" trade barrier to the importation of non-complying equipment. All equipment required to comply with the European standard, whether manufactured there or imported, now has to carry a special EMC "C" label.

The lack of mandatory Australian immunity standards had, in recent years, left the door open for television receivers to be imported, which are susceptible to interference from other signals, whether these arise from legitimate transmissions or unwanted electromagnetic pollution. Similarly, other items of equipment which generate electromagnetic pollution, or were susceptible to RF interference, had also appeared on the market in Australia.

There were concerns expressed by the Australian electronics and electrical industry that, with the announcement of the EMC compliance regime several years ago, Australia may become a dumping ground before EMC compliance took effect. However, few examples had been identified.

The current Australian Standards on emission compliance are: AS 1044-1992 on household electrical appliances, portable tools and similar electrical apparatus; AS 1053-1992 on sound and television broadcast receivers and associated equipment; AS 2064.1&2-1992 on Industrial Scientific & Medical radio frequency equipment; AS 2557-1992 covering vehicles, motor boats and spark ignited engine-driven devices; AS 3548-1992 on information technology equipment; AS 4051-1994 on electrical lighting and similar equipment; AS 4052-1992 on microwave ovens for frequencies above 1 GHz; and AS 4251-1994 which is a generic emission standard.

The RF immunity standards are: AS 4053-1992 covering sound and television broadcast receivers and associated equipment; and AS 4252-1994 which is the generic RF immunity standard.

■ Book Review

Test Equipment for the Radio Amateur

Publisher: *Radio Society of Great Britain (RSGB)*
ISBN 1 872309 23 2
Author: *Clive Smith G4FZH*
Reviewed by: *Bob Tait VK3UI*

The third edition of this ever-popular publication has been completely revised, and includes many new designs and a whole host of PCB layouts at the back of the book. It is pleasing to note that this edition has deleted many of the old and outdated techniques, replacing them with practical, up-to-date test equipment.

There is now a separate chapter on oscilloscopes. In the previous issue, oscilloscopes were combined with modulation monitors. That has now become a chapter on modulation measurements, and has been expanded to include a deviation meter to build for HF and UHF. This meter covers the range 3 MHz to over 450 MHz.

Also included are an automatic gain compression meter and a modulation meter for SSB. A few of the old favourites, like wavemeters, current probes, signal sources and dip oscillators, have been revamped using more modern and readily available components.

In the chapter entitled **Wavemeters and Analysers** is a new spectrum analyser to build, which covers 0 to 90 MHz and is designed to interface with most oscilloscopes. The analyser incorporates a marker generator to provide either one or 10 MHz markers on the display. All the PCB patterns are available in the back of the book, and detailed construction notes are provided for this and other projects.

Most of the equipment described in this book is easy to construct from readily available components. Much of the designs are simple and easy to construct making them more affordable to the average radio amateur.

This book is a must for any amateurs who want to build their own test equipment or for the active home-brewer who wants to tune and align his equipment.

The review copy was supplied direct from the RSGB. Supplies should be available from Daycom Communications Pty Ltd and WIA Divisional Bookshops next month.

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Amateur Radio Annual Index 1995

A tremendous amount of absorbing reading was published in the WIA monthly journal *Amateur Radio* during 1995, much of it being accounts of WIA members' experiments, construction projects and experiences.

If you see an item in this 1995 annual index which you want to read, and you cannot locate, or do not have that particular issue of *Amateur Radio*, back issues of the magazine are available from the WIA Federal Office to current members at $4.00 each, which includes postage in Australia.

If a back issue is no longer in stock, photocopies of articles are available to current members at $2.50 each (plus $2.00 for each additional issue in which the article appears).

The WIA is always looking for technical and general interest articles from members. For further details on how to write and submit an article about your latest construction project, experiment or amateur radio experience, refer to page 18 of the August 1992 issue of *Amateur Radio*, or contact the editors at the WIA Federal Office.

The Publications Committee wanted to publish a comprehensive five year index of *Amateur Radio*, covering from 1991 to 1995, but space is just not available to do this! However, if you would like a photocopy of that comprehensive five year index, it is available for $5.00 (including postage within Australia) from the WIA Federal Office.

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ALARA

Sally Grattidge VK4SHE, ALARA Publicity Officer*

Happy New Year Everyone

ALARA will be twenty-one this year. The ALARAMeet in Perth in September will be a special one, and there are rumours of a Special Event station to celebrate ALARA's coming of age.

A reminder to members who have not renewed their membership. Now is the time to pay up or miss out! What do you miss by not joining ALARA? For a start, you will not see the very informative and entertaining quarterly newsletter produced by Dorothy VK2DDB, so you will not know about all the fascinating bits of gossip which never make their way into this column. If you are thinking of attending the ALARAMeet in Perth (28 and 29 September 1996) important information regarding accommodation will be published in the January *Newsletter.*

For those YLs who are not members, why join? Why not? Membership is not expensive. Twelve dollars does not buy much these days but, for that amount, ALARA offers you a year of fun and friendship and an easy way to meet other YLs on the air. For a few more dollars, sponsorship means you can get to know a YL in another country even though you may not have been able to contact that country on air. Such friendships often start with letters which lead to skeds and eventually eyeballs.

ALARA Sponsorship Secretary is Gwen Tilson VK3DYL, 3 Gould Court, Mt Waverley VIC 3149. At this time there are YLs in New Zealand and the United States looking for sponsors in Australia. Contact Gwen if you are interested.

Many countries have associations similar to ALARA, and news about contests, nets and other activities is regularly exchanged. Some states and areas hold monthly luncheons, or find other ways to get together and enjoy each others" company. You do not have to be technically skilled to be a member. Some members certainly fall into this category, but many simply enjoy talking to friends on the air, and if you listen to YL nets you will hear conversations on many topics. You can even be a member if you do not have a call sign, joining the nets, etc as a second operator (OMs reading this, please pass this information on to your YL).

For information about membership please write to the Treasurer, Margaret Schwerin, PO Box 758, Dalby QLD 4405.

Official ALARA Net

The Official ALARA Net takes place on Mondays on 3.580 MHz (there has been consistent QRM on this frequency, so look above and below) at 1030 UTC (1000 UTC during daylight saving time). Other nets are listed in the newsletter.

Congratulations

ALARA YLs have many interests apart from radio, and for Marilyn VK3DMS that means stamps. Marilyn carries over her interest in radio to her stamp collection, and her "Radiomania" collection on the history and development of radio is becoming quite well known in philatelic circles.

Last October this collection was awarded a Large Vermeil medal and the Top Thematic Trophy at Sydney Centrepoint 95 National Philatelic Exhibition. This achievement was all the more remarkable as Marilyn lives in Mildura and rarely visits any of the cities, doing all her research and acquisitions via mail.

The Sydney event was the only national exhibition in 1995. The next one is in Melbourne in October 1996 where Marilyn hopes to go for Gold, if she does not take up an invitation to enter an International Exhibition at the same time in Taipei.

ALARA Contest

This took place in November, and results will be published as soon as available. From my location (North Queensland) conditions were not good, and 80 m was just about impossible. However, there was plenty of YL activity, and some very determined ladies planned to stay on air for the full 24 hours, so there should be some good scores.

JOTA

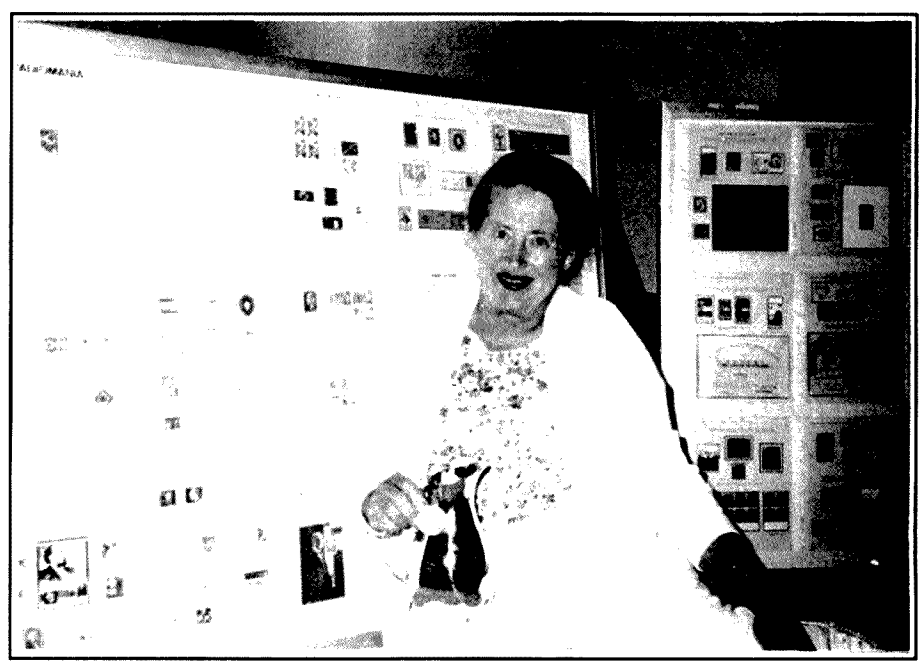
As always, ALARA was well represented at JOTA in 1995, but I have not heard any good stories. Maybe all were too exhausted after the weekend to send a report.

OX

Are there any members out there making interesting DX contacts? Please drop me a line (see address at foot of column) or send a packet message to VK4SHE @VK4RAT.NQ.QLD.AUS.OC. This column badly needs some DX input.

The 13th BYLARA Contest

Date: Thursday, 11 Feb 1996
Time: 19.00 to 22.00 UTC
Date: Saturday, 13 Feb 1996
Time: 10:00 to 13:00 UTC
Bands: 14.250 to 14.280 MHz; 21.350 to 21.400 MHz; 28.350 to 28.410 and 28.600 to 28.700 MHz.
Procedure: Call "CO BYLARA Contest". YLs work YLs and OMs; OMs work YLs only.



Marilyn VK3DMS with part of her prize winning "Radiomania" stamp collection (see "Congratulations").

Exchange: Callsign, RS, Serial number (starting at 001 each day), name, and if you are a BYLARA member, (year 1994/5).
Scoring: five points per YL BYLARA member; three points per YL non-member; two points per OM associate member; and one point per OM non-member. Only one period of operation counts for each entry (either day). Logs must show the station being worked.
Entries: National Society log sheet (or similar) showing claimed score, and including declaration that the entrant has abided by her Licence Regulations, application, IARU Band Plans and the above rules. Entries for the non scoring day are welcome as check logs.

Entries must be sent to Ella Tugwell G0FIP, 67 Upper Kingston Lane, Shoreham-by-Sea, Sussex BN43 6TG, England, to be received by 4 April 1996.

Silent Key

I am sorry to have to report that Phil Burstal VK3KYL became a silent key late November 1995 after a long illness. Although not very active on air, Phil had attended the last ALARAMEET at Castlemaine (for the Saturday only) and had regularly attended the VK3 monthly luncheons prior to becoming ill. She will be sadly missed by her friends. Our sympathy to husband Ross VK3CRB and family.

C/o PO Woodstock, QLD 4816
ar

WIA News

Victory for *Amateur Radio* at World Radio Conference

The Amateur Radio Service won an important victory in terms of international frequency planning at the recent World Radio Conference, WRC-95, while consideration of Morse code qualification for amateur licensee access to bands below 30 MHz gained a reprieve.

The WIA's ITU Study Group and Conference Co-ordinator, David Wardlaw VK3ADW, was a member of the official Australian delegation to the Conference, which ran over four weeks from 23 October to 17 November, 1995.

In the lead-up to WRC-95 the New Zealand Ministry of Commerce proposed suppressing the ITU regulation RR 2735 concerning the requirement for competency in Morse code as an amateur licence qualification for operation below 30 MHz.

David Wardlaw reports that the New Zealand proposal was introduced in one of the working groups of the Conference, and not discussed at the more formal committee or plenary levels as a proposal as the matter was considered to be beyond the terms of reference for WRC-95.

In the working group discussions, reaction to the New Zealand proposal was mixed and the outcome was that consideration of Regulation RR 2735 on Morse code qualification for amateurs should be put on the agenda of a later World Radio Conference. It is now to be considered for the agenda of the 1999 Conference when "Article 32", which covers the international regulation of the Amateur Radio Service, is to be reviewed as part of the on-going simplification of the ITU radiocommunications regulations.

So, the Morse code qualification wins a reprieve — for four years. With World Radio Conferences now held at two-year intervals, WRC-95 delegates regarded that putting this issue on the agenda of the 1997 Conference was too early for the world amateur radio community and the various country's administrations to give it full consideration.

An important victory was achieved for the Amateur-Satellite Service, which is only mentioned in the international frequency tables by way of a footnote for bands from 430 MHz to 10 GHz, as this reduces the visibility of the allocation and there is a danger that the Amateur Satellite Service may be overlooked when a country's regulatory authority is planning allocations. Indeed, there are examples of some "near misses" when amateur-satellite allocations were overlooked in the past, and that includes Australia, said WIA Conference delegate, David Wardlaw VK3ADW.

There are two footnotes in the ITU frequency tables regarding the Amateur-Satellite Service — these are footnotes 664 and 808. Footnote 808 indicates the 5830-5850 MHz band as a secondary amateur-satellite (space-to-Earth) allocation, and footnote 664 indicates amateur-satellite allocations at 435-438 MHz, 1260-1270 MHz, 2400-2450 MHz, 3400-3410 MHz and 5650-5670 MHz as "less than secondary" allocations, in that immediate shutdown is required in the event of harmful interference.

During the relevant Conference committee sessions, David Wardlaw successfully lobbied, with assistance from Wojciech Nietyksza SP5FM of the IARU and the support of the Australian delegation, to have footnote 808 included in the table. As fortune had it, an additional footnote, number 915 — regarding a secondary amateur allocation at 120 GHz — was included in the move into the frequency tables.

This achieved a number of things, even though only a couple of presently little-used bands are affected. Firstly, it improves the visibility of the Amateur-Satellite Service to regulatory authorities around the world, and secondly, it achieves the objective of ensuring at least the 5830-5850 MHz and 119.98-120.02 GHz band allocations are not overlooked in future.

Additionally, it sets a precedent that footnotes regarding the Amateur Service should be included in the ITU frequency tables. David Wardlaw said that having the footnotes included in the tables has been a goal since WARC-79.

While these particular bands may not be immediately important to many amateurs, "The Amateur Radio Service needs to be visible. Frequencies useful to us are also useful to others," David Wardlaw said. A goal for future conferences is to have footnote 664 included in the table, to improve the visibility of the other amateur-satellite service allocations at 70 cm and the bands above.

More than 1200 delegates from 140 of the 184 member countries of the International Telecommunications Union attended WRC-95. The main focus of the Conference agenda concerned the Mobile Satellite Services. Another important element of the Conference was discussion on simplification of the ITU Radio Regulations.

AMSAT Australia

*Bill Magnusson VK3JT**

National co-ordinator
Graham Ratcliff VK5AGR
Packet: VK5AGR@VK5WI
AMSAT Australia net:
Control station VK5AGR
Bulletin normally commences at 1000 UTC, or 0900 UTC on Sunday evening depending on daylight saving and propagation. Check-ins commence 15 minutes prior to the bulletin.

Frequencies (again depending on propagation conditions):
Primary 7.064 MHz (usually during summer).

Secondary 3.685 MHz (usually during winter).

Frequencies +/– QRM.

AMSAT Australia newsletter and software service
The newsletter is published monthly by Graham VK5AGR. Subscription is $30 for Australia, $35 for New Zealand and $40 for other countries by AIR MAIL. It is payable to AMSAT Australia addressed as follows:

AMSAT Australia
GPO Box 2141
Adelaide SA 5001

Six Monthly Amateur Radio Satellite Update

Here is a list of current amateur radio satellite frequencies and modes. I have simplified the list by removing all reference to satellites that are defunct and by listing only the mode A transponders on the three most popular Russian RS satellites. If you are an RS satellite buff you can refer to the January 1995 column for full details of all the transponder modes on the RS series.

EuroMIR and Safex-2 Operations

This mission looks like being extended for an additional month or so. The frequencies and modes were published in the October 1995 column. At the time of writing, the 70 cm packet gear was not operational.

AMSAT-OSCAR-10, AMSAT-OSCAR-13 Situation Report for Newcomers

Many newcomers to the AMSATs will be anxious to sample the high altitude birds, AO-10 and AO-13. If you are a recent starter, you may not have caught up on the current situation regarding these two important satellites.

First, a bit of history. OSCAR-10 was launched in June 1983. Yes, it's over 12

Satellite	UPLINK (MHz)	DOWNLINK (MHz)
Oscar 10 (AO-10)		
General Beacon (Carrier only)		145.808 (approx)
Mode B (SSB,CW-Inverting)	435.030-435.180	145.825-145.975
Do NOT use the transponder if the beacon signal is "FM-ing".		
Oscar 11 UoSAT-2 (UO-11)		
Beacon (1200 AFSK,FM) telemetry/bulletin		145.826
Beacon (1200 AFSK,FM)		435.025
Beacon (1200 AFSK,FM)		2401.500
Radio Sputnik 10 (RS-10)		
Mode A (SSB,CW-Inverting)	145.86-145.90	29.360-29.400
Beacon/Robot (CW)		29.357
Beacon/Robot (CW)		29.403
Robot Mode A (CW)	145.82	29.357 or 29.403
Radio Sputnik 12 (RS-12)		
Mode A (SSB,CW-Inverting)	145.91-145.95	29.410-29.450
Beacon/Robot (CW)		29.408
Beacon/Robot (CW)		29.454
Robot Mode A (CW)	145.831/.840	29.408 or 29.454
AMSAT-OSCAR-13 (AO-13)		
General beacon (400b PSK, CW, RTTY)		145.812
Engineering Beacon (400b PSK MA 0 to MA 40)		145.985
Mode B (SSB,CW-Inverting)	435.420-435.570	145.825-145.975
Mode S (SSB,CW,FM)	435.601-435.639	2400.711-2400.747
Mode S Beacon (PSK)		2400.664
Radio Sputnik 15 (RS-15)		
Mode A (SSB,CW non-invert)	145.858-145.898	29.354-29.394
Beacon (CW) 29.352.5		
AMSAT-OSCAR-16 (AO-16) Callsign = PACSAT		
Mode J (1200 BPSK BBS,FM-SSB)	145.90/92/94/96	437.025 or 437.050
Mode S (1200 BPSK BBS,FM-SSB)		2401.1 or 2401.1428
AMSAT-OSCAR-17 (DO-17) (Dove)		
Beacon 1 (1200 bps AFSK,Digital Voice,FM)		145.82516
Beacon 2 (1200 bps AFSK,Digital Voice,FM)		145.82438
Beacon 3 (1200 BFSK,Digital Voice,SSB)		2401.2205
AMSAT-OSCAR-18 (WO-18) (Webersat)		
Mode J (1200 BPSK,RC,SSB)	144.30-144.50	437.075 or 437.10
ATV (TV,AM)	1265.000	
AMSAT-OSCAR-19 (LO-19) Callsign = LUSAT		
(1200 PSK,FM-SSB)	145.84/.86/.88/.90	437.15355 or 437.1258
FUJI-OSCAR-20 (JAS-1b) (FO-20) Callsign = 8J1JBS		
Beacon JA (CW,Analog)		435.795
Mode JA (SSB,CW)	145.90-146.00	435.80-435.90
Beacon JD (CW)		435.910
Mode JD (1200 BPSK,FM-SSB)	145.85/.87/.89/.91	435.910
UOSAT-OSCAR-22 (UO-22) Broadcast Callsign = UOSAT-5-11		
BBS Callsign = UOSAT-5-12		
Mode JD (9600 Baud FSK,FM)	145.90/.975	435.120
KITSAT-OSCAR-23 (KO-23) Broadcast Callsign = HL01-11		
BBS Callsign = HL01-12		
Mode JD (9600 Baud FSK,FM)	145.85/.90	435.175
KITSAT-OSCAR-25 (KO-25) Broadcast Callsign = HL02-11		
BBS Callsign = HL02-12		
Mode JD (9600 Baud FSK,FM)	145.870	436.500
ITAMSAT-OSCAR-26 (IO-26) Callsign = I.T.M.SAT		
Mode JD 1200 baud PSK	145.875	435.867
	145.900	435.822

As always, the list is as accurate as I can determine at the time of writing. Please let me know of any errors or omissions.

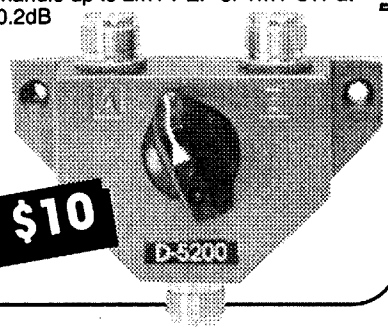
A Great Range Of Accessories!

2-Way Coax Switch

A heavy-duty, 2-way coax switch that's suitable for Amateur, CB or commercial applications. It's well constructed with a die-cast case and can handle up to 2kW PEP or 1kW CW at 30MHz with less than 0.2dB insertion loss.

Cat D-5200

$29.95



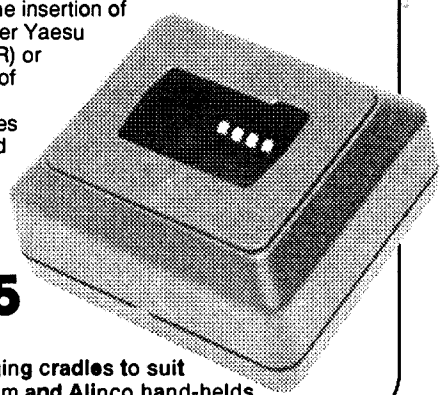
SAVE $10

Mastercharger 1 Fast Desktop Charger

Made in the USA, the Mastercharger 1 is a compact fast charger that operates from 13.5V DC and uses switch-mode technology plus a Philips battery charge monitor IC (with -Δ V full charge detection) to safely charge NiCad batteries between 6V and 13.2V. Suitable for the FT23/73, FT-411/411e, FT-470, FT-26, FT-415/815 and FT-530, its charging cradle can easily be replaced, allowing the insertion of a new cradle to suit other Yaesu transceivers (eg FT-11R) or different brands/model of hand-helds. The Mastercharger 1 requires 12-15V DC at 1.3A, and is supplied with a fused cigarette lighter cable for vehicle use.

Cat D-3850

$129.95



Now available - Charging cradles to suit various Kenwood, Icom and Alinco hand-helds.

SAVE $40

Revex W56ON HF/VHF/UHF SWR/PWR Meter

Quality Revex wide-band SWR meter, offering 2 in-built sensors for 1.8MHz to 525MHz coverage! Provides measurement of 3 power levels (3W, 20W, 200W), and SWR. Uses an N-type socket for the VHF/UHF sensor to ensure minimal loss. Measures 120 x 80 x 85mm.

Cat D-1375

$329

Rugged HF 5-Band Trap Vertical Antenna

The rugged 5BTV incorporates Hustler's exclusive trap design (25mm solid fibreglass formers, high tolerance trap covers and low loss windings) for accurate trap resonance with 1kW (PEP) power handling. Wide-band coverage is provided on the 10, 15, 20 and 40m bands (SWR typically 1.15:1 at resonance, <2:1 SWR at band edges) with 80kHz bandwidth typical on 80m at less than 2:1 SWR. An optional 30m resonator kit can also be installed without affecting other bands. High strength aluminium and a 4mm (wall thickness) extra heavy-duty base section guarantee optimum mechanical stability. At just 7.65m, the 5BTV can be ground mounted (with or without radials, although radials are recommended), or it can be mounted in an elevated position with a radial system. Unlike other antenna designs, the 5BTV can be fed with any length of 50ohm coax cable.

Cat D-4920

HUSTLER **$349**

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Yaesu stocks and some antennas not held at all stores, please contact your local store for availability, or phone 1800 22 6610

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***MAJOR AMATEUR STOCKISTS STORES SHOWN IN RED.**

years old! It had a design life of about five years. It failed to achieve the planned orbit and, as a result, spends more time than it should in the vicinity of the Van Allen radiation belts. Eventually the radiation damage to the computer memory made it impossible for the control stations to maintain stability and switch the transponders. It was put into mode B using the last few remaining bytes of memory and has been out of control since that time.

Once attitude control was lost, it was no longer possible to position the satellite so that the sun shone most favourably on the solar panels. Normally this is a most important (and constant) part of the controllers' work. Nowadays, when the panels are fully lit by the sun, the transponder springs into life. When the angles are unfavourable the transponder shuts down. It went through some lean years but recently the attitude has drifted such that operation has at times been almost as good as during its hey-day. Please take note, however, that you should listen carefully to the beacon on approximately 145.808 MHz. If it is showing signs of instability, or it changes frequency when you uplink a signal, it means that the power available is becoming marginal. **Do not transmit to AO-10 under these circumstances.**

OSCAR-13 has largely escaped the ravages of radiation damage due to a better orbit and a radiation hardened main memory chip. Unfortunately, it is nearing the end of its life for a different reason. It, too, failed to achieve the planned orbit. As a result the orbit is "oscillating". The perigee point has come perilously close to earth on a number of occasions and the next time it takes a dive it will come too close and burn up in the atmosphere. It is estimated that this will happen in December 1996.

Failure of the 70 cm transmitter some time ago caused the demise of modes J and L. Modes B and S are still fully functional. It is under control and the three control stations, G3RUH, DB2OS and VK5AGR hope to maintain it in a healthy condition until it makes its final orbit. It may well come to pass that the "ol' timer" OSCAR-10 will outlast its younger companion.

OSCAR-10's orbit is quite stable and its perigee is high enough to not pose a problem. Between them these two satellites have done an extraordinary job for the AMSAT community and for amateur radio. They have been responsible for bringing amateur radio to the notice of the public and for gaining respect in the commercial satellite community. Their success has helped to spawn an increasing commercial interest in "small" satellites. The construction of a new flag ship, Phase 3d is well under way. It is due for launch later this year. It will usher in a new era as did OSCARs 10 and 13. To the designers, the constructors and the future controllers, BRAVO! And thank you one and all.

BTW

BTW, the Phase 3d building fund, is still short of its target and it's not too late to contribute. Please consider contacting Graham VK5AGR with a donation. A few dollars from each user and potential user would put a big smile on the faces of all those largely unsung, faceless people who contribute their time and expertise to the building, testing, launching and commissioning of amateur radio satellites.

Yet Another Tracking Program

They're coming thick and fast, folks. As I mentioned in the September column, there seems to be a never ending stream of satellite tracking programs coming "on-line" these days. Most are in the whiz-bang category and are nothing more than a pretty face. Next month I'll review a good one, a beauty in fact. It's called **SatSpy for Windows.** I came across it in the astronomy section of CompuServe and it would be particularly useful if you are interested in watching satellites just before dawn and just after sunset.

*359 Williamstown Rd, Yarraville VIC 3013
Packet: VK3JT@VK3BBS.#MEL.VIC.AUS.OC
CompuServe: 100352,3065*
ar

WIA News

Heard Island DXpedition Put Back 12 Months

The proposed DXpedition to Heard Island has been postponed until 1996, probably for the month of November, according to advice from Peter Casier ON6TT.

The decision follows the collapse of the expeditioners' transport arrangements with the apparent disappearance of the vessel *Tallarook,* along with the owner and managing director of the shipping operator, Kris Mitchell of K&DM Transport, trading as Pioneer Cruises. A 5 December press report, in *Daily Commercial News,* said that the company has gone out of business.

Peter ON6TT, from Belgium, said in a fax to WIA Federal President Neil Penfold VK6NE, "... we mean business by delaying, not just "well, let's postpone (and) see what will happen. No, we are going ahead full speed!"
Peter praised the support and hospitality provided by the VK6 gang during the expeditioners' stay in Perth from late October through early November. He invited them to join the team of organisers for the 1996 expedition.

The WIA press release, issued to the print and electronic media on 4 November, bore fruit. The Perth-published *Sunday Times* carried a long story about the Heard Island expedition's plight on 6 November, which explained the disappearance of the *Tallarook* and the expeditioners' huge $AUS160,000 losses. The story was accompanied by a picture of Ralph Fedor K0IR with some of the expedition equipment. The *Daily Commercial News* article in December also made mention of the Heard Island expeditioners' loss, and said that the Federal Police fraud squad had been notified of the disappearance of Mr Kris Mitchell of K&DM Transport. The article also said the company was reported to have amounts outstanding exceeding $400,000.

In his fax to Neil Penfold, Peter Casier also said, "With your valued help and connections, our chances to succeed increase enormously."

The expeditioners have asked for assistance in finding another vessel, with new funding and sponsorship in Australia, preparation of certain equipment, and a PR campaign in Australia. WIA Federal is actively continuing with enquiries to find a new vessel, through President Neil Penfold VK6NE and Media Liaison Officer, Roger Harrison VK2ZRH.

Sign up a new WIA member today — use the form on the reverse side of the *Amateur Radio* address flysheet.

Club Corner

Ballarat Amateur Radio Group Inc (BARG)

1995 Ballarat Hamvention a Great Success

We promised you a great day at our '95 Hamvention and, judging from the comments we received, we were 99.99% successful. The new venue was a big improvement, apart from a small parking problem which is being addressed for next year. The weather was typically perfect and the fox hunters were hard at it all day Saturday working up an appetite for the Hamvention dinner which was attended by 70 people on the Saturday evening.

Apparently everybody remembered to reset their clocks for daylight saving time because the rush started very early Sunday morning as traders arrived to partake of the extremely popular free coffee before setting up 320 feet of trestles for stalls, and five prominent commercial trading tables. All stall holders reported good sales and seemed satisfied with the venue.

Once again the fox hunters were out and about with gusto as they got to know Ballarat and district the hard way. Nevertheless, we are assured that they enjoyed themselves and we promise them that fox hunting activity will be even better next year. We are already working on some improvements and sneaky ideas.

By mid-afternoon some 488 people had passed through the door and joined in the many activities and sampled the culinary treats produced by our ladies group. It was great to see old friends meet, and to meet up with new amateurs who, until then, had only been a voice on a loudspeaker or headphone.

Early next year we will be telling you about Hamvention '96. What an event that is going to be! Mark your calendar now for 26 and 27 October 1996, and book your accommodation early.

Doug Raper VK3VBA
Publicity Officer

Radio Amateurs Old Timers Club

As usual, there will not be a broadcast in January 1996.

Transmissions on 5 February and 4 March 1996 will be at 10.00 am EAST on 2, 40 and 80 metres. 20 metres beaming north will be at 0100 UTC; 20 metres beaming west will be at 0200 UTC.

Allan Doble VK3AMD
ar

AWARDS

*John Kelleher VK3DP — Federal Awards Manager**

There was an article in a Honolulu newspaper recently concerning the proposed attachment of several islands in the vicinity of the Hawaiian group. The main thrust of the article says that a proposed House Resolution (H602), was introduced in Congress to extend Hawaii jurisdiction over four more islands, two atolls and a reef with a patch of sand 133 feet long and an underwater footprint that stretches nine miles. Added to Hawaii would be Baker and Howland, Jarvis, Palmyra Atoll, Kingman Reef, Johnston Atoll and Midway. The whole package contains only seven square miles of actual land or sand, but it would give Hawaii 322,000 more square nautical miles. Except for Palmyra, all the land is Federal land. If this proposal is passed and accepted, it would mean the deletion of several "countries" from the DXCC list.

The ARRL will be abolishing the current DXCC program as we know it by the year 2000, and will be replacing it with the new **ARRL DXCC2000** where there will be a one time award for 100 countries, and no more multi-band, 5-band, Honour Roll or #1 DXCC, just a basic 100 country DXCC award with NO extras.

Those amateurs waiting on decisions regarding Pratas Island and Scarborough Reef will have to cool their heels a little longer. I will pursue these matters, and report when I have information. In the meantime, IOTA number AS-116 has been issued for Scarborough Reef.

VI75RAAF

This special event callsign, which will go to air on 1 February 1996 and conclude on 31 December 1996, commemorates the 75th anniversary of the RAAF. The station will be activated solely by members of the Air Forces Amateur Radio Net. The RAAF, in collaboration with AFARN, have produced a very attractive

QSL card and Certificate which, in my estimation, is a must for award collectors. See the *QSP News* item, on page 50 of last month's *Amateur Radio* for further details.

The Southern Cross Award

Many radio clubs make awards available to operators who satisfy the criteria for making contact with their Club station and/or a requisite number of club members. The Eastern and Mountain District Radio Club (EMDRC) offers just such an award, The Southern Cross Award.

Contacts can be made with VK3ER on Wednesday evenings at 2000 hrs local time on 3.585 MHz, and via VK3BNW on Sunday morning at 0930 hrs local time on 28.340 MHz.

The Awards Manager is Frank VK3COF. Applications for this award can be sent direct to him, or through the Club, at PO Box 87, Mitcham, Victoria 3132 enclosing a certified list of contacts, and a $2.00 redeemable voucher of some kind. Now for the important details.

Requirements

VK stations require a total of 10 points. DX stations (including VK9 and VK0) require five points.

Contacts

Each club member contacted is worth one point. A contact with one only of the Club stations scores two points. A contact with the alternative Club callsign (if included in the same application) is worth only one point.

Conditions

A member may be claimed once per application regardless of any change of callsign between successive contacts. The only exception to this rule is a member operating a Club callsign who may also be claimed under his/her personal callsign, if separately contacted.

Cross-mode and cross-band contacts may be claimed but not contacts made via a repeater.

QSL cards are NOT required.

A list of current members' callsigns will be forwarded to anyone requesting it on receipt of a stamped, self-addressed, business-size envelope for VK or two IRCs for DX airmail.

This award is issued by the EMDRC, and is available to all licensed amateurs and SWLs who obtain the requisite number of points for working club members on or after 1 September 1985.

As all can see, the EMDRC, a very recognised Radio Club, has provided information on their award. I would deem it a pleasure to publish information from other active Club Stations.

PO Box 2175 Caulfield Junction 3161

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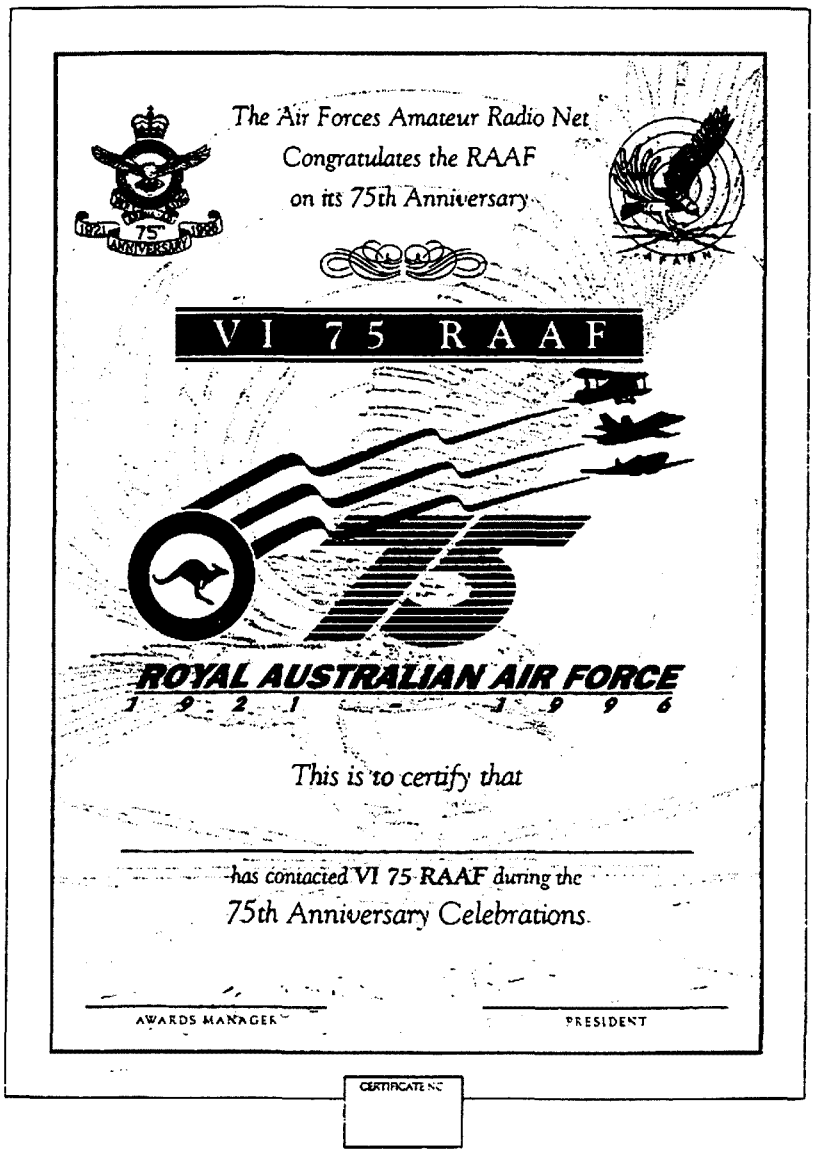

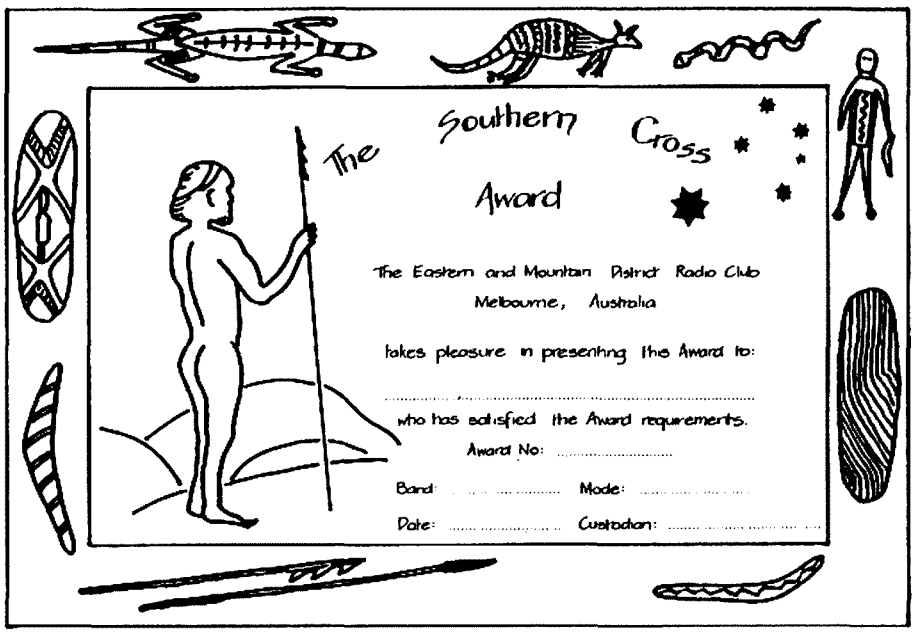

Contests

*Peter Nesbit VK3APN — Federal Contest Coordinator**

Contest Calendar Jan — March 1996

Dec 27 to Jan 27	Ross Hull VHF/UHF Contest	Nov 95
Jan 1	ARRL Straight Key "Night"	
Jan 6/7	ARRL RTTY Roundup	Dec 95
Jan 13/14	VHF/UHF Field Day	Dec 95
Jan 21	HA DX CW Contest	Dec 95
Jan 26/28	CQ WW 160 m DX Contest	Dec 95
Jan 27/28	UBA SSB DX Contest	Dec 95
Feb 10/11	PACC CW/SSB DX Contest	
Feb 10/11	Spanish RTTY Contest	
Feb 17/18	ARRL DX CW Contest	
Feb 23/25	CQ 160 Metre SSB Contest	Dec 95
Feb 24/25	RSGB 7 MHz CW Contest	
Feb 24/25	UBA CW DX Contest	Dec 95
Mar 2/3	ARRL DX SSB Contest	
Mar 9/10	BERU CW Contest	
Mar 16/17	WIA John Moyle Field Day	
Mar 16/17	Bermuda Contest	
Mar 16/17	BARTG RTTY Contest	
Mar 23/24	CQ WPX SSB Contest	

One of the benefits of this job is that it gives me an opportunity to periodically earbash everyone about the need to prepare for contests well in advance, so that, come the big weekend, the best possible effort can be made. (The fact that I rarely take my own advice shall not be mentioned here).

However, with the CW leg of the CQ-WW rapidly approaching, I thought it was time for more than the usual passing nod to my operational junk box this year, and actually make some improvements for a change. In true contest spirit this meant waiting until the weekend before the contest, and then launching into a complete station refurbishment. *Rule 1: Contesters should always wait as long as possible before commencing work on their station.*

First job was the transmitter. Having experienced the pleasure of full break-in for many years before getting the Drake, I thought it was time to replace the ageing T/R relay with something more modern. I was sick of all the clattering, bouncing, and time delays inherent in "semi break-in" (a contradiction in terms if ever there was one: it's either break-in or it isn't). Besides, the relay was on its last legs. So, out it came, and in went a few transistors. What bliss, full QSK again!

Next job was the antenna, a top loaded vertical with a very slow band-switch (ie a ladder and soldering iron). To accommodate the new matching network, and eliminate the 250 ml yoghurt container used for weatherproofing, I decided a metal box was needed. Much cutting, banging, and bending later, the box was finished. (The fact it was now Friday night is beside the point, because any true contester will tell you this left plenty of time before the weekend). I still didn't have a proper matching network of course, because I had been too busy building the box, but that could easily be done the next day after lunch. *Rule 2: Even on Friday night, there's still plenty of time before a contest.*

Rising early on Saturday, it seemed timely to start building a T/R switch, since the absence of a relay from the Drake meant that the receiver had no antenna. The quickest solution appeared to be to cannibalise an old valve converter, which I had built in the 60s from an EA design. The reasons for choosing the converter were that it had a ready made 180 V DC supply, and it had never worked properly anyway. Several hours later the T/R switch was finished (a grounded grid 6C4), and wonder of wonders, it worked! This was indeed a good omen for the weekend. *Rule 3: Good omens are a very bad sign.*

The rest of the afternoon was spent climbing up and down the ladder with a soldering iron, about 15,000 times, and still not being able to get the SWR right on 40 m. By now it was dark, and as 40 m had already been open for two hours, the choice was rapidly boiling down to 80 m single band or television. The television lost. *Rule 4: In a DX contest, only lunatics decide to go barefoot on 80 m single band.*

The time to burn up the band had come! After resetting the time on my PC, I typed "CT" to start the logging program, but nothing happened. So I typed "CD CT", to which the PC responded "Invalid directory". What's this? Hmm... nothing to worry about, maybe it's on the OS/2 partition? So I rebooted, looked for the CT icon (which struck me as odd because I couldn't remember ever creating one), but of course there was no such thing. Then it dawned on me that when I had changed the hard disk a couple of months earlier, I had not reinstalled CT. Grrr!! *Rule 5: When changing your hard disk, don't wait until the contest starts to reinstall your logging program.*

Having finally started, after the third QSO there was an almighty BANG! followed by lots of smoke and a terrible smell. The dog rushed in barking, followed by my wife (or maybe the other way around, the barking that is), and in the ensuing melee I realised that the upright electrolytic on my new T/R switch had exploded, probably because it had been sitting around unused for 30 years and I had not bothered to reform the dielectric. So, after rummaging around in the garage and finding some 20 year old replacements, I spent the next half hour twiddling my thumbs waiting for them to reform. *Rule 6: Anyone who uses thirty year old electrolytics for the first time in a contest, without first reforming them, is an idiot.*

Now any seasoned DXer will tell you that on a good day, 80 m can be very rewarding. Unfortunately, this was not one of those days, and in between the crashing and banging I could just hear the JAs going "QRZ UK3?" (sic) and "SRI OM NOT CALL HRD HI HI". My peak rate was a slow 19, and in the last hour it was down to a dismal 6, so I went to bed. *Rule 7: When the going gets tough, sometimes even the tough should go to bed.*

A run of Europeans early the next morning unfortunately persuaded me to stay in the contest, so, to retain my last shreds of sanity, I decided that a rickety old linear amplifier would have to be resurrected. However, it doesn't have a power supply, and although I have used the "mad lash up under the bench" construction technique in the past, I was not keen to have to extinguish the dog, should she walk into the shack and decide to investigate the mess under the bench. Luckily, a suitable supply had been sitting half finished in the garage for the last three years, so the rest of Sunday was spent on more cutting, banging, and soldering.

By Sunday evening the power supply was finished, but by then I was totally exhausted and could not face the inevitable sparking and fuse blowing which happens when you apply power to a box full of spiders, not to mention the

trauma of changing bands (the linear is one of those unique home made contraptions where to change bands, one has to remove twenty screws to get the cover off, and then resolder the taps on the plate coil with a soldering iron). Another problem with this particular unit is that several years earlier, whilst it was sitting on the garage floor, it got sprayed by the cat during the mating season. Apart from the evil corrosion, the thing has stunk terribly ever since! It's really true, I'm not making this up. So, it was barefoot once again. *Rule 8: Don't leave your linear on the floor when the cat's on heat.*

The second night went much the same as the first, so to pass the time between QSOs (there's a joke there somewhere), I periodically had a listen to 40 m . The difference was amazing; crystal clear signals, no QRN, plenty of DX. Going back to 80 was like retreating to the cellar.

Was it fun? Does a sane person enjoy having teeth pulled? On the other hand, anyone who would subject themselves to the above is not sane, so I would have to say, yes. Like all those types who get their kicks from bungy jumping, ice climbing, running away from charging bulls, etc, there is a certain horrible appeal in battling the QRN and poor propagation on the low bands (not to mention station chaos) just to make a handful of QSOs. At the end of it, you know you have worked hard for every point, and the feeling of achievement is palpable. *The final rule: Don't give up, it's worth it in the end!*

PS I'm now working on my antenna for 160 m for next year's contest.

Thanks to VK2BQS, PA3BFM, *QST,* and *Radio Communications.* Until next month, good contesting!

73s, Peter VK3APN

Addendum to Rules for Ross Hull Memorial Contest

Please note the following correction to the date: Wed, 27 December 95 to Sat, 27 January (UTC).

In answer to a reader's query about 6 m scoring, the reference to "2 points per 1000 km or part thereof" applies only to distances *over* 1000 km. QSOs on 6 m below 1000 km retain their higher points value, eg for 900-999 km, 6 m QSOs are worth 10 points.

PACC CW/SSB DX Contest

1200z Sat to 1200z Sun, 10/11 Feb

This is a very popular European contest, with phone and CW held on the same weekend. The object is to work as many Dutch stations as possible on 160 to 10 m, excluding the "WARC" bands. Categories are single and multi-operator; SWL. Only CW contacts are eligible on 160 m. Stations may be worked only once per band, regardless of mode.

Exchange RS(T) plus serial number; Dutch stations will RS(T) plus a 2 letter province code. Possible codes are: DR FR GD GR LB NB NH OV UT FL ZH ZL. Score one point per Dutch QSO. Final score equals the total QSO points times the total Dutch provinces worked from each band (max 72). Mail logs by 31 March to Frank E van Dijk PA3BFM, Middellaan 24, NL-3721 PH Bilthoven, The Netherlands. Certificates will be awarded to the top scoring stations in each category and country, including second and third places where justified.

Spanish RTTY Contest

1600z Sat to 1600z Sun, 10/11 Feb

The object is to contact as many stations worldwide as possible, on RTTY, 80 to 10 m. Categories are single operator (single/multiband); multioperator single transmitter; SWL.

Exchange signal report and CQ zone. Spanish stations will send signal report and province. On 10/20 m score one point per QSO with stations inside your WAC continent, and two points with stations outside your WAC continent. On 40 and 80 m, the QSO points are tripled. QSOs between stations in the same country can be claimed for multiplier credit, but not QSO points. The multiplier is the sum of the DXCC countries and Spanish provinces (max 52) per band. The final score is the total QSO points times the multiplier.

Send log, summary and declaration by 8 April 1996 to EA RTTY Contest, c/o EA1MV Antonio Alcolado, PO Box 240, 09400 Aranda de Duero (Burgos), Spain.

ARRL DX Contest

CW: 0000z Sat to 2400z Sun, 17/18 Feb
SSB: 0000z Sat to 2400z Sun, 2/3 Mar

There is always plenty of activity in this popular contest. The CW section runs on the third full weekend in February each year, and the phone section on the first full weekend in March. The object is to work as many W/VE amateurs as possible on 1.8-30 MHz. Categories are single operator (single band, all band, all band QRP max 5 W O/P, and all band assisted); Multioperator (single Tx, two Txs, and unlimited). In the single and 2 Tx categories, once a transmitter has begun operation on a band it must remain on that band for at least 10 minutes. Listening time counts as operating time.

Exchange RS(T) and a three digit number indicating approx output power. W/VE stations will send RS(T) and state/province. Score three points per W/VE QSO. The multiplier is the sum of US states and District of Columbia (DC) (except KH6/KL7), NB (VE1), NS (VE1), PEI (VE1 or VY2), PQ (VE2), ON (VE3), MB (VE4), SK (VE5), AB (VE6), BC (VE7), NWT (VE8), YUK (VY1), NF (VO1), and LAB (VO2) worked to a maximum of 63 per band. The final score equals the total QSO points times the multiplier.

Entries with more than 500 QSOs must include cross-check (dupe) sheets. Logs on DOS disk are welcome in lieu of a paper log, providing a paper summary sheet showing usual info is included. Multioperator entries must list all operators. Entries must be postmarked by 7 April 1996 or they will be classed as check-logs (no exceptions)! Mark the envelope CW or Phone, and send the log to ARRL Contest Branch, 225 Main Street, Newington, CT 06111, USA. Certificates will be awarded to the top scoring stations in each country and category, and plaques to the top worldwide and continental stations.

RSGB 7 MHz CW Contest

1500z Sat to 0900z Sun, 24/25 Feb

The object of this contest is to contact as many British Isles stations as possible on 40 m CW. Exchange RST plus serial number starting at 001; UK stations will add their county code. Oceania stations score 30 points per QSO, and the final score is the total QSO points times the number of UK countries worked. Include a summary sheet showing all standard details, plus a check-list if more than 80 QSOs are made. Send logs to arrive by 15 April 1996 to RSGB HF Contests Committee, c/o S V Knowles G3UFY, 77 Bensham Manor Road, Thornton Heath, Surrey, CR7 7AF, England. Airmail is recommended, as late logs may be treated as check-logs. Certificates will be awarded to the leading entrants in each overseas section.

RESULTS OF 1995 ANARTS WW RTTY CONTEST

Presented by Jim VK2BQS (ANARTS Contest Manager)

The number of logs was about the same as for 1994. More significantly though, except for last year's Class A winner (who was visited by a storm at a vital time), the points scored by all "world place-getters" were very much increased, a trend which continued well down the listings.

Once again, eighteen VKs were recorded during the contest, of which only five submitted logs. This lack of VK participation is often commented upon by overseas entrants.

Several logs arrived after the due date, due to very slow mail from certain parts of the world. Since they were posted well before the due date and submitted in good faith, to avoid undue penalty to the entrants concerned they are included in the results below. This means there may

be minor differences between this list, and the results sheets sent out recently. No entrant has been disadvantaged, however.

As I have said before, please read the rules. I found errors such as zones being claimed as multipliers; countries being counted once overall instead of once per band; one's own country claimed as a multiplier but not QSO points for one's own country.

Anyway, thanks to all who entered, and see you next year!

1995 ANARTS WW RTTY Contest Results

Section A (Single Operator):

Pos.	Call	Score	QSOs	Pts	Mult	Cont	VK Bonus	
1	UT7I	3,584,870	392	5193	115	6	1700	1st UT; 1st Class A#
2	VK2KM	3,550,230	190	7305	81	6	n/a	1st VK2; 2nd World*
3	UN5PR	2,695,350	248	3775	119	6	1800	1st UN; 3rd World*
4	OH2LU	2,372,420	297	3764	105	6	1100	1st OH*
5	JR5JAQ	1,379,155	159	4113	67	5	1300	1st JA5*
6	AB5KD	1,339,476	381	3234	69	6	600	1st W5*
7	I2HWI	1,160,910	236	2697	86	5	1200	1st I*
8	G5LP	1,100,198	215	1889	97	6	900	1st G*
9	SM5FUG	1,093,560	239	2768	79	5	200	1st SM*
10	IV3FSG	910,640	95	2167	84	5	500	2nd I*
11	PS2A	717,940	126	2991	40	6	100	1st PP*
12	W6/G0AZT	493,084	131	1784	46	6	700	1st W6*
13	SP3EJJ	479,960	113	1546	62	5	700	1st SP*
14	VK5AI	297,924	62	2013	37	4	n/a	1st VK5*
15	SP3BGD	262,732	110	1041	42	6	400	2nd SP*
16	OH0/DL5FF	231,663	208	1643	29	3	—	1st OH0*
17	K2PS	197,695	86	1067	37	5	300	1st W2*
18	ER3ED	186,320	134	846	55	4	200	1st ER*
19	DL9GGA	181,760	88	636	57	5	500	1st DL*
20	VE8NC	150,540	51	939	32	5	300	1st VE8*
21	JH7QXJ	147,880	54	1115	33	4	700	1st JH7*
22	SP3FAR	145,268	48	754	32	6	500	3rd SP*
23	3Z0RY	122,120	67	710	43	4	—	4th SP*
24	N1RCT	116,400	111	970	30	4	—	1st W1*
25	ZL2JON	103,036	33	959	26	4	3300	1st ZL*
26	IK1TWC	98,418	96	1047	47	2	—	3rd I*
27	GW4KHQ	86,592	73	492	44	4	—	1st GW*
28	RS0F	81,484	44	699	29	4	400	1st RS0*
29	W2JGR	78,184	72	723	27	4	100	1st W0*
30	DK7FP/P	71,280	53	495	36	4	—	2nd DL*
31	JA3BSH	57,892	28	602	24	4	100	1st JA3*
32	SP9RTF	57,456	78	342	42	4	—	—
33	W9FFQ	56,980	48	474	24	5	100	1st W9*
34	N2LEB	53,020	31	441	20	6	100	2nd W2*
35	YO5AY	51,300	45	400	32	4	100	1st YO*
36	DJ2YE	51,060	55	345	37	4	—	3rd DL*
37	DL9MBZ	49,840	79	412	40	3	200	—
38	SP2EIW	47,235	78	335	47	3	—	5th SP*
39	LA7AJ	43,440	32	394	22	5	100	1st LA*
40	SP2UUU	39,680	46	310	32	4	—	—
41	JA3DLE/1	37,512	22	583	16	4	200	1st JA1*
42	DF5BX	26,544	35	237	28	4	—	—
43	YL2KF	9,650	39	193	25	2	—	1st YL*
44	SP8FHJ	7,560	32	180	21	2	—	—
45	VK8HA	3,738	7	178	7	3	n/a	1st VK8*

Check-log VK2GQC.

Section B (Multioperator Single Transmitter):

1	VK6GOM	2,313,510	154	5755	67	6	n/a	1st VK6; 1st Cl. B#
2	IK2SGF	926,225	225	2405	77	5	300	1st I; 2nd World*
3	VE3FJB	357,988	152	1419	42	6	400	1st VE3; 3rd World*
4	DL7UVO/P	149,155	77	633	47	5	400	1st DL*

Section C (SWL):

1	ONL383	567,720	191	1436	79	5	500	1st ON; 1st Cl C#
2	ONL4335	328,760	132	888	74	5	200	2nd ON; 2nd World
3	SM03762	232,568	121	1236	47	4	200	1st SM; 3rd World
4	ONL3997	146,400	83	584	50	5	200	3rd ON

= Plaque winner
* = Certificate winner

Entrants' comments: Lost the driven element on my 20 m Yagi in a storm on Sunday night, little success with vertical so gave up!! *(From Contest Manager VK2KM !!!!!)*... Contest very nice with good condx on 15 m *(DL7UVO/P)*... My first RTTY contest *(YO5AY)*... Enjoyed this contest very much *(ONL3997)*... Thank you for running another nice contest *(OH2LU)*... 73 & QRO to all hams/SWL in Australia *(ONL383)*... I enjoy working contest every time *(JA3BSH)*... Propagation no good but much band activity *(ONL4335)*... Had a great time in ANARTS this year *(AB5KD)*... Very nice contest, 73/88 *(IV3FSG)*... A pity more Euros do not listen harder for W6 *(W6/G0AZT)* (My word yes!!! VK2BQS)... It is always my pleasure to take part in the ANARTS contest which I enjoy very much *(JA3DLE/1)*.

Contest Manager's Comments: Despite our best efforts to distribute the rules and points table, many entrants still had problems obtaining correct versions. Some logs were submitted as check-logs, or incorrectly scored or just not scored at all. In every case except one, there was enough information to score the log as if it was a full contest entry, so there are some of you who will be surprised to find their entry shown in full. Others will have much greater scores than expected.

The results show more detail than is usual with contests, but this is to give you a chance to see how your efforts compare with those of other contestants, to help you plan your attack next year. We feel this is a real WW DX contest, and the highest scores go to those who work the most, and the furthest.

Thank you all for participating, and hope to see you 1996.

Results of 1995 Commonwealth Contest

Presented by John Tutton VK3ZC

It would have been a toss-up if conditions over here during the 1995 contest were better or worse than in 1994, but to give up with four hours still to go must surely indicate something.

However, a good sign was that VK log entries (multi and single band) improved from 17 and 5 to 22 and 6. If conditions in March are anything like in the recent CW WW, and they could be, look out for a bumper year in 1996.

The winner for VK was again Barry Simpson VK2BJ who continued his march towards the top, in second place to VE3EJ and with a score increase of 408 over last year. Many thanks to Russ Coleston VK4XA who operated VI4WIA as the local HQ station.

It was good to see a ZS call, ZS6ME, back in the results, the first since 1962. A couple of months ago at the CHOGM held in New Zealand, Cameroon and Mozambique were elected to membership of the Commonwealth, so we may see activity and perhaps expeditions to these outposts in the future.

RSGB Comments from G2HLU

Opinion is about equally divided over whether conditions were better or worse than in 1994 or about the same; they were certainly not good! More than one entrant commented on the similarity to 1985; and G2QT noted optimistically that 1986 was better. At least the number of entries was gratifyingly up on last year; but regrettably, for the third year running, no one entered the Receiving Section.

The winner, not for the first time, is John Sluyrner VE3EJ, who contacted a total of 487 stations from his aerial farm (which includes a three element beam for 40 m at 150 feet), fed with 1 kW. Close on his heels came Barry Simpson VK2BJ who used a modest 100 W to a choice selection of lower sky-wires. Usually among the leaders, Nigel Hoyow 6Y5HN used a TS-120S/SB-201 combination and various antennas at 50-55 ft to come third, from his 2000 ft high QTH, and with the advantage of being able to work strings of G stations (though not on 15 or 10 m) just managed to out-distance Dave Lawley GB4UQ to whom the Col Thomas Rose Bowl returns after a few years' lapse. The winner of the G3PJT medal, introduced last year, is Ivor Stafford VK3XB, whose rise from 77th to 32nd place in the last four years has been done with very restricted indoor antennas, at the bottom of the sunspot cycle.

The total number of participants (over 630) was about the same as in 1994 but there were twice as many on 15 and 10 m. Nearly 60 call areas were active (25 produced entries): C5, G (including GD, GI, GJ, GM, GU, GW), GB (HQ), S7, VE1, 2, 3, 4, 5, 6, 7, 9, VE3 (HQ), VK1, 2, 3, 4, 5, 6, 7, 8, 9N, VK4 (HQ), VO1, VP2E, VQ9, VR2/VS6, VU, VY2, Z2, ZB2, /ZL, ZL1, 2, 3, 4, 9, ZS1, 4, 5, 6, 9, 3B8, 3DA, 4S, 5B, 5X, 5Z, 6Y, 7P, 8P, 9H, 9J, 9L, 9M2, 9V1 and 9Y4. About 14% of G stations who were active sent in logs, and the same percentage of VEs, but VKs excelled with 44% of participants entering. Some entrants/call areas were notably absent, but the re-appearance of ZS stations was very welcome and we must hope that the log from ZS6ME will be the precursor of a wider entry from South Africa next year. The entry of Bill Maxson is noteworthy: he operated as G0/N4AR using the station of the late and much lamented Al Slater G3FXB; he could not be expected to match the performance of that master.

Some comments received with logs: "Conditions must get better" GW3HGJ; "Certainly enjoyed my first BERU contest" ZS6ME; "Good family feeling, familiar calls year after year" ZL4OK; "Where has the Commonwealth gone? — only worked seven countries" VK2AYD; "VEs and VKs did a great job" ZL1MH; "I believe that I may have been the only XL operator to have sent in a log regularly" VK3KS; "All G stations worked (15 m) on backscatter!" 9H1EL; "Fewer prefixes, many missing" G3BPM; "Hard work with wire antennas in sunspot minimum" G4KDL; "Anyone who got 599 from me really was S9 — and there weren't very many" VE3VHB; "Still the best of the HF contests" ZL1HV; "Looking forward to BERU again next year!" VE3HX

1995 Commonwealth Contest Results

Top Ten

Position	Call	80	40	20	15	10	Total
1	VE3EJ	832	1405	2167	677	50	5131
2	VK2BJ	663	1709	1700	768	248	4998
3	6Y5HN	585	1089	1639	480	175	3968
4	G4BUO	618	1151	1577	450	100	3896
5	ZL4OK	530	1259	1027	537	300	3653
6	ZL1MH	450	952	1075	677	285	3439
7	9J2BO	277	849	1184	833	262	3405
8	VK4EMM	380	1285	993	508	223	3389
9	G0IVZ	453	1039	1250	300	50	3092
10	G4ODV	352	885	1411	275	50	2973

Australian Scores

Multi-Band

2	VK2BJ	832	1405	2167	677	50	5131
8	VK4EMM	380	1285	993	508	223	3389
11	VK2AYD	315	807	1251	438	150	2961
18	VK2BQQ	332	1069	737	198		2336
20	VK4ICU	270	530	845	400		2045
23	VK4XW	263	633	887	200	25	2008
26	VK2EL	50	892	824	125	50	1941
31	VK3ZC	320	618	592	123		1653
32	VK3XB	48	557	796	250		1651
33	VK5AGX	200	341	1078			1619
36	VK4OD	245	532	692	25		1494
37	VK4BQL	215	453	670	125	25	1488
38	VK2DID	130	425	728	198		1481
43	VK4LV	100	254	684	147	123	1308
47	VK8HA	105	598	525	25		1253
53	VK4UR			645	173	168	986
56	VK3AGW	25	403	450	25	50	953
69	VK3KS		90	587			677
75	VK3IY	268	233				501
80	VK3AMD			255			255

Single-Band

7 MHz

1	VK2AOK	1913
2	VK2ETM	1010

14 MHz

3	VK4TT	1142
4	VK3MR	1078
6	VK6AJ	848
7	VK2VM	754

The 1996 Commonwealth Contest will take place on 9 and 10 March 1996, and the rules will appear in the February 1996 issue of *Amateur Radio* magazine.

*PO Box 2175, Caulfield Junction, VIC 3175

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Have you advised the WIA Federal Office of your new callsign? Use the form on the reverse side of the *Amateur Radio* address flysheet.

Divisional Notes

Forward Bias — VK1 Notes

Peter Parker VK1PK

It's Ours! RD Trophy Comes to Canberra!

All VK1s were pleased to read in November's *Amateur Radio* that, for the first time for many years, the VK1 Division had won the Remembrance Day Contest. The win follows a concerted publicity campaign and was only made possible by the support of local amateurs. The number of logs submitted by VK1s more than doubled, and the average score per log rose substantially compared to the previous year. The victory breaks the stranglehold that the VK3 Division had over the trophy in recent years. The Division would particularly like to thank the RD Contest Manager, Alek VK6APK, for bringing us the results in record time, and commiserate the VK3s for their loss.

Divisional AGM Next Month

Have your chance to make your mark on amateur radio in the ACT by volunteering to be on the VK1 Divisional Committee. All positions will be declared vacant, and members are invited to nominate for them. In particular, we need a new Treasurer, as Alex VK1AC will be retiring. The AGM is to be held on Monday, 26 February in the Griffin Centre.

Rally Successful

Local amateurs tested their communication and message handling skills during November's Canberra Rally. By all accounts, the event was a success and a credit to those who took part.

Newsbriefs

Approximately 20 people attended the Division's Christmas Barbecue, held at Weston Park, Yarralumla. While it was cold and bleak, the rain held off, and those who attended enjoyed themselves.

The recent improvement in VK1WI's audio quality is due to the efforts of the VK1 Repeater Committee, who provided a refurbished FM826 and microphone.

Canberra Citizens Access Television Association is looking for volunteers to be involved in establishing a community TV station in Canberra. If you are interested in helping, please phone Nita Vartuli on 231 4452.

Nominations are called for in time for next month's AGM — see above.

The Internet edition of VK1WI Amateur Radio News is now available in Canberra local libraries through the Community Information Network. Find it on the aus.radio.amateur.misc newsgroup.

VK1 Committee meetings are now held on the second Thursday of the month. This means that the next committee meeting will be on January 11.

VK2 Notes

Richard Murnane VK2SKY

WIA on the WWW

In the last few months there has been a dramatic increase in the level of activity on the Internet, fuelled largely by a fairly recent innovation called the World Wide Web (WWW). Designed as a research tool several years ago, the Web is a mechanism for finding information from computer sites all over the world and presenting it in a "user friendly" manner. The information is multimedia, ie it can take any form, such as text, graphics, animation, sound, etc, so it goes far beyond what we experience with our packet radio network.

Not wanting to be left out, the NSW Division now has its own World Wide Web page, which contains useful information about the WIA, and about amateur radio in New South Wales, for example:

- WIA Member Services
- VK2WI Broadcast schedules and bulletin archives
- Coming Events list (up to a year ahead)
- Affiliated Clubs and Amateur Examiners list (see below)
- The Internet Australian Amateur Radio Frequently Asked Questions (and answers, of course!)
- "Hot links" to the Web pages of the SMA, and IPS Radio and Space Services, and to over 300 other Amateur Web sites worldwide.

The URL (Universal Resource Locator) for the WIA (NSW Division) Web page is: http://sydney.dialix.oz.au/~wiansw.

If you forget the URL, don't worry; you can find it with a Web search, using the key phrase "Wireless Institute", or simply "Amateur Radio".

Because the Divisional Web page is accessible from virtually anywhere on the planet, I have also included information for overseas amateurs who intend to visit Australia, and links to other Web pages detailing some of the attractions around Sydney and New South Wales.

The Divisional Web page is constantly evolving, so I'm always happy to hear suggestions for making it more useful.

Web Page: Be On It

As mentioned above, the Divisional Web page features a list of affiliated clubs and amateur examiners. We are asking all affiliated clubs to submit up-to-date details for inclusion in the list. Many potential radio amateurs (and therefore club members) are on the Internet, so this is your chance to reach them.

Please note that clubs that do not submit details *will not be included* in the list. Much of the club information held at the Divisional Office is sadly out of date, and I have no wish to propagate inaccurate data on the net. Send your club details by Internet e-mail to wiansw@sydney.dialix.oz.au, or mail or fax them to the Divisional office.

Club details should include the club location, meeting times, postal/phone/packet/e-mail contacts, plus local repeater data, club nets, and examination details if applicable. If your club specialises in a particular area of amateur radio, please note that as well. If your club has its own Web page, just send the URL and you will be linked in straight away.

Are You Confused Yet?

My apologies if all the Internet jargon has left you in a daze. Let me assure you that it all looks better than it sounds! By the time you read this, I should have completed an article for *Amateur Radio* magazine that will explain the World Wide Web for Radio Amateurs. Even if you don't own a computer, the Web may be closer than you think, as the pay TV companies may soon be offering Web access via your television set. Stay tuned...

Thought for the Month

"I could never make out what those damned dots meant" -- Winston Churchill (speaking about decimal points)

VK6 Notes

John R Morgan VK6NT

November General Meeting

About thirty members attended the last GM of the year, at which almost two hours of varied business was discussed and decided.

The decline in the attendance at the monthly meetings has caused the members of Council to question whether these should continue. At the January GM there will be a discussion on the matter, to determine the members' views. The ramifications for the QSL Bureau and the Bookshop will have to be considered. The President requests that members make a special effort to be present, and to participate.

The VK6 Division meets on the third Tuesday of each month, at the Westrail Centre, East Perth, commencing at 8 pm. The bookshop and QSL bureau open at 7 pm. All interested persons (members and non-members, licensed or listener) are encouraged to attend. Free coffee and biscuits are available at "half time".

Re-Broadcast of VK3OTN

The Radio Amateurs Old Timers Club (RAOTC) is a nation-wide club for those who have held an amateur licence, or its equivalent, for more than 25 years.

Their VK3OTN broadcast occurs on the first Monday of each month, except January, and is beamed to VK6 on 14.150 MHz at 0200 UTC. Unfortunately, even though there are about 50 members of the RAOTC resident in VK6, it is rare for more than three to call-back after the broadcast.

Clem VK6CW was recently approached by the RAOTC to help increase the local availability of the broadcasts, especially to those members who are residents of "retirement villages" and similar accommodation (where HF antennas are prohibited), and those without packet or RTTY.

In order to accomplish this, Clem has applied for permission to re-transmit VK3OTN's 20 m signal on WARG's network of VHF/UHF voice repeaters in the south-west of VK6. Initially, he intends to conduct three experimental relays of the February, March, and April broadcasts, before assessing the usefulness of the arrangement.

Members of RAOTC in VK6 are advised to listen to the VK6WIA news broadcasts in late January for up-to-date information.

If You Have Material ...

All material for inclusion in this column must arrive on or before the first day of the month preceding publication. Packet mail may be sent to VK6NT@VK6ZSE.#PER.#WA.AUS.OC, or write to PO Box 169, Kalamunda WA 6076, or telephone (09) 291-8275 any time.

"QRM" — News from the Tasmanian Division

Robin L Harwood VK7RH

A new calendar year has started and your Division is at present winding up the affairs of 1995, preparatory to the Annual General Meeting, which will be held on 23 March. The venue will be the Domain Activity Centre and is timed to commence at 1400 hours Eastern Daylight Time.

All Annual Reports should be forwarded to the Divisional Secretary by 22 February at the address given in the Divisional Directory on page three of this issue of *Amateur Radio*. Nomination forms for Divisional Council will be forwarded to each Branch by the February meeting, and can also be obtained by writing to the Divisional Secretary. Nominations can only be accepted from current financial members of this Division and those proposing and seconding the nomination must also be current financial members. Nominations close on Friday, 22 February 1995 with the Divisional Secretary who is also returning officer. If there are more candidates than vacant positions, an election will be necessary and ballot papers will be forwarded ten days prior to the AGM to all current financial members.

Notices of Motion should also be forwarded by 22 February and the proposer and seconder again must be current members. I believe that several Notices of Motion will be tabled by our Honorary Solicitor to tidy up the Divisional Constitution.

Next month will see the various Branch Annual General Meetings held and officers elected. The dates are of these are: Southern Branch, 7 February at 8 pm at the Domain Activity Centre; Northwestern Branch, 13 February at 7.45 pm at a venue to be advised; and Northern Branch, 14 February at 7.30 pm at St Patrick's College Staff Common Room, Mt Leslie Road, Prospect.

Please note that the Northern Branch will be holding their January meeting one week later than normal on Wednesday, 17 January, again at St Patrick's College, Mount Leslie Road, Prospect at 7.30 pm. The Northwestern Branch may be holding a monthly meeting so please check the weekly VK7WI broadcast early in January. The Domain Activity Centre will be open on Wednesdays from 12 to 5 pm during January.

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How's DX

*Stephen Pall VK2PS**

And a Happy New Year to you all! Hopefully your wishes to have a contact with the DX station you have been awaiting for many years, will come true; you will have a good contact and a few months later the postman will bring you the magic confirmation, the highly prized QSL card.

A result of a survey conducted mid-year in 1995 by The *DX Bulletin* showed that the most wanted DXCC country in the world is Bhutan. 65.5% of DXers need it. Second place goes to the Andaman Islands with 63.4% and, in third place is Heard Island with 60.8%.

Those who had hoped by now they could have crossed off Heard Island from their own personal most wanted list, must wait patiently for another twelve months.

Details of the transportation debacle which overtook the Heard Island DXpedition are now well known. DXpeditions to inaccessible, uninhabited island countries such as Bouvet 3Y, Peter I Island 3Y, South Sandwich Island VP8S, and Heard Island VK0 are very costly affairs running into many hundreds of thousands of dollars. A very big slice of the expenses represent transportation costs. Chartering vessels from 20,000 km distance is not an easy task. In organising a major DXpedition, secrecy and not publishing details in advance is very important to prevent opposition groups from securing the necessary funding from commercial sponsors and DX Foundations. Sponsors support only the group which has a good track record and which is likely to succeed. "In this game of DXpeditions", said one of the Heard Island DXpedition group, "to come second is equal with zero". This secrecy on the part of the organisers can cause havoc sometimes, as happened in this case.

It has to be said quite plainly. The organisers from overseas fully trusted a very unethical, to use a polite word, Australian businessman and they have fallen victim to the "attractive" deal offered by him. That this happened to our friends from across the Pacific is our national shame.

The lesson for the future is simple. When one cannot buy a return airline ticket to the final destination, when one has to charter a boat for transport, and when one is willing to spend a great amount of money for such a journey, one needs a person with very good commercial and business experience, a person who is local, who can deal with the other party face to face, and who is able to sort out the good from the bad.

Heard Island — VK0

Ralph Fedor K0IR, the organiser of the Heard Island DXpedition, released the following message on 15 November 1995:

"Dear Fellow DXers,

I arrived home from Western Australia late last night. As most of you are aware, the Heard Island DXpedition team ran into

difficulty in Australia. As a result, we must postpone the DXpedition.

Upon arriving in Australia, the advance team of ON6TT and PA3DUU found our charter vessel, the Tallarook, unsuitable for a voyage into the Southern Ocean. The owner/operator of the Tallarook, a Mr Kris Mitchell of K & DM Transportation, misrepresented his vessel in the contract and did not outfit the vessel as we had specified. He fled under the cover of darkness with the team's down payment.

Investigations into Mr Mitchell's credibility revealed no problems prior to these incidents. Legal limitation on information that can be released shielded Mr Mitchell from thorough scrutiny during our initial contract with him.

Legal counsel in Australia tells us our chance of recovering our own payment is essentially zero. We have, however, contacted the police, the Attorney General of Australia, The Minister of Tourism and other Australian government officials. Although our loss seems unrecoverable, perhaps our action will shield other visitors from Mr Mitchell. Save for our contact with Mr Mitchell, the Australian people and the Australian amateur community have been gracious hosts and saddened by our misfortune.

Our team at first considered a hurried re-organisation and a trip to Heard Island in January of 1996. Securing a ship on such short notice and rearranging our personal schedules has proven unrealistic. We are, therefore, planning a one year delay in the operation.

The losses resulting from our encounter with Mr Mitchell are substantial. They exceed $100,000. However, no contributions sent to The Heard Island Expedition, PO Box 163, Waite Park, MN 56387 have been spent. Cheques have not been cashed. Contributions will be returned to those who sent them. In addition, funds from the NCDXF and INDEXA remain untouched. From the beginning I made it clear that the risks of this DXpedition would be borne by the team members. Acceptance of those risks was a prerequisite for becoming a member of the Heard Island team. The same was true of the 3Y0PI team. Painful as it is, the Heard Island team members will honour that commitment and be responsible for the loss.

While we regret what has happened, we are fortunate in that we did not let the emotion of the moment control our actions and board a vessel that was unsafe. We are all alive and well and anxious to get on with our commitments, albeit a year later, Undoubtedly there will be changes, but the team's consensus is to carry on.

I have doubts that my schedule will allow me to participate in an expedition a year from now. Therefore, I have asked KK6EK and ON6TT to assume the leadership role in developing future plans. Thanks to all of you who supported us and encouraged us."

In a news item in the *"425 DX News"* of 26 November there are some new prominent points made in connection with the re-start of the expedition. These are:

1. Safety to be the determining factor.
2. The team will be expanded, perhaps to 20, although not all will be radio amateurs.
3. The budget will have to be increased.
4. The principal radio goal will be to get everybody in the log.
5. The management and progress of the project will be much more public and your input and participation will be most welcome.

The group is looking for a semi-professional public relations person to interface with the media and seek support through media contacts. They need an Internet communication person and they will try to find a professional film or video person to do a documentary for international markets (that person will have to find his own support).

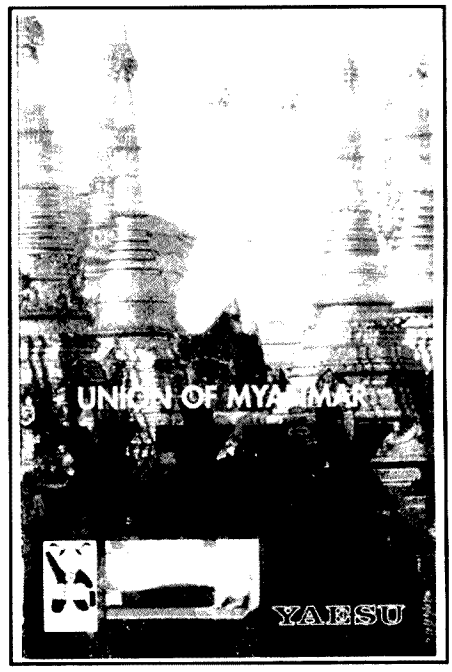
Finally, here are some interesting extracts from an article written by Bruce Butler in the West Australian *"Sunday Times"* of 12 November 1995 on page four, which apparently is based on a discussion which Mr Butler had with the leader of the expedition, Ralph Fedor (because of space limitations, I can quote to you only parts of the article).

The article is headed "Boat Deal sinks Antarctic Quest"

"An international Antarctic expedition which was to start in Fremantle has been scuppered, with organisers $AUS160,000 out-of-pocket. After sending the money from the US to a Melbourne based company expedition leader Ralph Fedor, a Minnesota doctor, expected to find a 25 m vessel, the "Tallarook", waiting in Fremantle. Instead, the vessel, allegedly riddled with wood rot, was still undergoing repairs in Cairns, northern Queensland.

It has since been revealed that the company headed by Kris Mitchell and his wife Dani, was under investigation by Victorian police over another proposed voyage to the Antarctic.

Dr Fedor had negotiated a contract with Mr Mitchell, of K & DM Transport Pty Ltd, which trades as Pioneer Cruises of Glenroy, Victoria and paid four instalments of $40,000 each. The last payment of $33,000 was due when the expedition reached Heard Island, an Australian territory 4000 km south of Fremantle. Dr Fedor fears he has lost all the money and is left with little hope of salvaging the expedition.



The Goldan Land — Myanmar.

Mr Mitchell could not be reached by the Sunday Times and Victorian police have been unable to contact him. The Tallarook was to have been equipped in Cairns and called at Sydney and Melbourne before arriving in Perth by mid-October. Instead, it left Cairns early on one morning, allegedly to escape creditors of K & DM Transport. Several hours later the boat limped into Bowen, a small port between Cairns and Rockhampton, taking water.

"The Tallarook was billed as seaworthy and adequate for the trip", a dejected Dr Fedor said in Perth this week. "It turned out to be a wooden vessel, which we had some concerns about, and some people said there were worm holes through two thirds of the outer hull. We were not allowed on the vessel itself but we learnt the desalinator and the electric generator were not working. The vessel was supposed to be on site (Fremantle) from 15 October but, at that stage, it was still in Cairns. On Wednesday I heard the vessel had come ashore and another creditor had put it under arrest".

Though he never met Mr Mitchell, Dr Fedor said he believed what he was being told. "I spoke to him numerous times over the phone and we have exchanged lots of faxes", Dr Fedor said.

Dr Fedor said when two of the expedition members came to Australia and saw the boat, his concerns were confirmed."

This is the end of extracts from the quoted article in the *Sunday Times.*

Macquarie Island — VK0WH

Macquarie Island lies in the southern Pacific Ocean, nearly 1450 km south-east

of Tasmania, and midway between New Zealand and the Antarctic continent (Lat 54° 30' S, Long 158° 57' E).

The island is a narrow ridge 37 km long and five km wide. Macquarie Island is a nature reserve and forms part of the State of Tasmania. It has a plateau that rises sharply to 305 metres above sea level, rising in places to low rounded spurs and hills, many in the 300-400 metre range. The highest peak is Mt Hamilton reaching 433 metres. The edge of the plateau falls away abruptly to the sea or to narrow beaches.

The climate, flora and fauna are typically sub-antarctic with a mean temperature of 5° C. There is little sunshine, and mist, rain and snow are common. Strong westerly winds are a feature of the climate. There are no trees on the island but luxuriant vegetation covers the plateau slopes and coastal flats.

Macquarie Island was discovered in 1810 by Frederick Hasselburg (a name that is variously rendered Hasselborough, Hasselbourgh and Hasselberg) an Australian sealer who named it after Lachlan Macquarie, the then Governor of New South Wales. For a number of years it was visited by Australian and New Zealand sealers. By the middle of the 1830s the fur seals on the island had been exterminated and the numbers of elephant seal were greatly reduced, though intermittent sealing continued until 1919.

Thousands of penguins and albatrosses breed on the island and, for some years after 1907, penguins were slaughtered in large numbers and were then boiled down for the sake of their oil. This industry, however, was stopped as a result of public outcry.

In November 1930 the BANZAR Expedition ship "Discovery" made magnetic determinations and zoological observations, the last recorded visit to the island until the Australian National Antarctic Research Expedition established a permanent research station there in 1948. The ANARE station on the island has been operated continuously since its establishment and carries out research into various sciences, including meteorology and upper atmosphere physics, geology, geophysics, biology and cosmic ray physics.

Amateur radio was represented on the island by a variety of scientists and technical personnel who had an amateur radio licence. One has to think of Graeme VK0GC who was active from the island in the years of 1983 — 1985, 1987 and 1989. Sjoerd "Sojo" VK0SJ operated from there in 1986, Doug in July 1987 as VK0DS. Robyn, a YL operator, was active (both SSB and CW)in 1989. The last activity from the island was early in 1991 by Mark VK0ML. Incidentally, the ANARE station has been built on the site of Mawson's camp in the shadow of "Wireless Hill" on a narrow land-neck about 100 metres wide called "The Isthmus". In 1911, the famous Australian polar explorer Douglas Mawson built a radio station on the island as a relay station for his Antarctic expedition.

Macquarie Island ranks in sixth place on the most wanted country list according to the survey conducted by *The DX Bulletin*. 48% of the DXers who replied to the survey indicated that they need this country for DXCC.

The difficulty of operating from the island is that it is a nature, fauna and flora reserve under the full control of the Tasmanian Parks and Wildlife Service which does not allow access to the island, except for a maximum of 48 hours on a nominated date by the service.

The maximum number of visitors is 500 per annum, most of whom are fare paying tourists who are allowed to go ashore during the daylight hours only, and must return to the offshore anchored ship for the night. Nothing can be brought onto the island whatsoever and, naturally, no equipment of any description. Of course, no activity of any description can be carried out from the island which includes amateur radio. The ANARE station has special permission to occupy the site because it carries out scientific research work.

In past years there were numerous attempts by a number of amateurs, among them two from the Sydney region who negotiated for almost two years without result to get permission to land on the island. The relevant authorities were not willing to allow any group of people on the island for a period of 10-14 days. The reason given was possible ecological damage and hindering the research program.

So it is with great joy, after checking with the Hobart office of the ANARE, I can report to you that Warren Hull, one of the new ANARE personnel for the year 1996, has an amateur licence and hopefully is already active as VK0WH from Macquarie Island.

Further details about modes, frequencies and QSL route will be published as soon as it is available. Incidentally, Graham VK0GC is also in Antarctica on Davis Base.

Dawn ZL2AGX — the well known YL DXer.

Future DX Activity

- Thomas DL9FCQ will be active from QATAR from 29 December 1995 to 14 January 1996 as A71AN/DL9FCQ. He will QSL only this activity via Tom, Box 1139, 63590 Hasselroth, Germany.
- Martii OH2BH reports that preparations for a North Korea activity as P5BH and P5XX are continuing and there will soon be an official announcement.
- From 12 December 1995 until 1 April 1996, F5UJQ will be active from the Ivory Coast as TU4DA, on SSB on 10 to 40 metres. QSL to F5LPL, 27 SQ Duformentelle, F-94700, Maisons Alfort, France.
- Gary E Neill, who operated from the Central African Republic as TL8NG, will be active from Albania for at least one year as ZA1NG. QSL to WA1ECA.
- Ezio IK4BDZ is active from Lesotho as 7P8EZ on all bands on CW and SSB. QSL to I4JEE.
- CE9AP is active from the Chilean Antarctic base, Capitan Arturo Prat,

located on Greenwich Island in the South Shetlands. QSL via CE2LOL.

- Paul 9L1PG will soon return from his stateside vacation with a new rig and amplifier to Freetown, Sierra Leone.
- Ralf DL2FDK will be active as HS0/DL2FDK from Bangkok until 12 January. QSL to home call.
- YO9CWY/D2 is a new station of the Romanian UN forces in Angola and will be active on all bands for the next few months. Valery D2/YO3YZ closed down at the end of December last.
- Bill Kennamer K5FUV of the DXCC Desk has confirmed once again that all activities of authorised guest operators at the station of 3V8BB (natives and foreigners) are accepted for DXCC.
- Eric WZ6C, previously in Bangladesh, is active from Guyana as 8R1ZG.
- Darek TJ1GD is a young Catholic priest who is now in Cameroon. He is looking for the donation of a matchbox tuner and an amplifier. Write to Darek Gosawa, PO Box 40, Bertoua, Cameroon, Africa if you are able to help. Presently he is active with an FT-840 and a beam on 20 metres. QSL to SP9CLQ, Andrzej Eluja, u1 Aleksandry 9/25, 30-887, Krakow, Poland.
- Chris W1EH will be in Malawi for three years working for the US State Department, and hopes to have a licence soon. Chris has little equipment and works mainly on CW.

Interesting QSOs and QSL Information

- 3W5FM — Nikolay — 14195 — SSB — 1334 — Oct. QSL to The Manager, POB 66, Vladimir, 600011, Russia.
- A61AN — Naser — 14227 — SSB — 1334 — Oct. QSL to Naser Fekri, PO Box 53656, Dubai, United Arab Emirates.
- 9K2MU — Murtada — 14118 — SSB — 0400 — Oct. QSL to WA4JTK, Alan E Strauss, 17401 NW 47th Ave, Carol City, FL 33055, USA.
- VK4ALF/VK9M — Steve — 14195 — SSB — 0410 — Oct. QSL to AA6BB, Gerald D Branson, 93787 Dorsey Lane, Junction City, OR 97448, USA
- J37LF — Thor — 14222 — SSB — 0642 — Oct. QSL to The Manager, POB 117, St Georges, Grenada, West Indies.
- Z31ET — Tod — 14222 — SSB — 0600 — Oct. QSL to The Manager, POB 44, Kocani 92300, Macedonia.
- KH0AM — Tack — 21311 — SSB — 0408 — Oct. QSL to JE1CKA, Tack Kumagai, POB 22, Mitaka Tokyo, 181, Japan.
- JT1Z — 21317 — SSB — 0425 — Oct. QSL to K6VNX, Arient T Turiff, 8819E Callita St, San Gabriel, CA 91775.
- VK9FN — Siegfried — 10.102 — CW — 0551 — Nov. QSL to DK9FN via the Bureau only. No direct cards.
- 9M6NA — Saty — 14017 — CW — 0414 — Nov. QSL to JE1JKL, Saty Nakamura, 1-27-2, Kamiya, Ushiku, Ibaraki 300-12, Japan.
- ZL7CW — Jon — 14011 — CW — 0352 — Nov. QSL to WB8YJF, Jon E Severt, 5586 Babbitt Rd, New Albany, 43054 USA.
- J88BW — Bill — 14226 — SSB — 1306 — Nov. QSL to William DeFreitas, POB 206, Kingston, St Vincent, West Indies.

Remember to leave a three second break between overs whjen using a repeater.

From Here and There and Everywhere

- Lothar T32ZB spent, altogether, 34 days on Christmas Island (Kiribati). He is 59 years old, a retiree living in Berlin as DJ4ZB. He suggests QSLing via the Bureau (DARC) as this makes QSLing more inexpensive. If you must QSL direct, then please include one IRC and one "green stamp" as postage is very expensive from Germany.
- Steve VK4ALF/VK9M, who was recently active from Mellish Reef, is roaming the world and the wild seas on his 40 foot cutter called "Valiant 40". Steve is from San Francisco. He sold his house and belongings two and a half years ago and decided, together with his wife who is a good sailor, to circumnavigate the world at a leisurely pace. Whilst island hopping in the Pacific he has activated many rare islands over the past year. He goes ashore with his 100 watt rig, a ship's battery, a 26 foot Butternut vertical antenna, a tent, a collapsible table, a chair and logbooks, and he is ready to give the world the wanted country. His wife, who is an amateur also, but not a DXer, minds the boat until Steve's return. Steve is very aware of the DXCC IOTA rules regarding his activity.
- If you worked 4D63RG, it was a special event station celebrating the 63rd anniversary of the Philippines Amateur Radio Association. QSL to DU9RG.
- Len VK8DK, is employed by a local Aboriginal Council at Areyonga, west of Alice Springs. He is the essential-services manager for 230 people. He is about to change his QTH to another locality about 200 km north-west from Areyonga.
- The "local area slim" thought to be in the ZL area has reappeared on the bands again. He was heard working CW on the 10 MHz band as ZL9AI, calling CQ UK, and as VK0MI on the CW portion of the 7 MHz band. He operates only on CW and has a good fist. Nobody knows who the person is. My own theory is that he is a lonely, old-style ships radio officer (not many of them left except perhaps on very old ships still tramping around the Tasman), who has some amateur radio knowledge and, whenever his ship is in this area, he is looking for "some excitement". What is your theory?
- Due to the efforts of the German monitoring system Intruder Watch, the Adventist World Radio, which was operating on 7100 kHz causing a lot of interference to amateur traffic, will be moving to the 31 metre band effective 12 Nov 1995.
- Rudi Mueller DJ5CQ became a Silent Key on 23 November. Rudi was a well known DXer who operated mainly in the Pacific area from Lord Howe Island as VK9LM, Cocos Keeling as VK9CR, and from Christmas Island as VK9XY. Rudi Hein DK7NP will answer the QSL requests from his last activity.
- George VK4XW reports improving conditions on 10 metres. He heard the beacon BV2PU PLO5SA from Taipei, Taiwan at 0625 UTC on 28.050 MHz, and worked several Japanese stations on 10 metres.
- Austin VK5WO reports that the Juan Fernandez CE0Z activity made 12,000 QSOs, 42% of them on 40-80 and 160 metres. Their operating QTH was very poor as far as VK and ZL were concerned as there is a 500 feet hill directly in the western path to these countries. Only about seven or eight VKs are in the log of CE0Z. Austin also reported a CW contact with Mani VU2JPS. Mani hopes to operate with a new VU prefix soon and there is no doubt about his legality. Mani's direct address is P Subramanian, Senior Engineer Assistant, All India Radio, Port Blair, 744102, Andaman Island via India.
- One of the photos in this issue is of Dawn ZL2AGX, one of New Zealand's best known DX operators and a regular on the "ANZA", "222" and "YL DX Net" nets. Dawn has been licensed since 1984. She and her husband Dennis ZL2BFI live in a beachside suburb about 50 km north of Wellington in a house which has two separate shacks, so the YL-OM team can operate independently from each other. Dawn is also very active in WARO, the NZ Women Amateur Radio

Operators group of which she is currently the president. Dawn has worked 299 countries of which 230 are confirmed. A delightful couple to meet.

- The Southern Cross DX Net, which used to meet each day at 1100 UTC on 14226.5 kHz has moved to a new frequency of 14255. A persistent, very heavy commercial QRM made the move necessary.
- It has been rumoured that a meeting is scheduled during January to make a final decision about the DXCC status of Scarborough Reef.
- JA6LDD, JH1KRC and JA1BK have operated again from Myanmar from 22 — 27 November as XZ1A. Kan JA1BK, who is the QSL manager for XZ1A and XZ1X, has given the following instructions for QSLing these stations. QSL labels will be printed by computer after the log is entered and four QSO data will be printed on each label. Only one set of labels will be printed. This is to protect the integrity of the QSLing process. Second QSLs will not be issued. Multiband QSOs must be requested in one envelope only. Do not use registered or special delivery mail. QSL to Kan Mizoguchi, 5-3, Sakuragaoka 4 chome, Tama-City, Tokyo 206, Japan.

QSLs Received

8R1AK (4 m — Op); HS0ZBJ (3 w — W8GIO); TL8MS (4 w — DL6NW); 7Z5OO (2 m — W1AF); FM5BH (3 w — W3HNK); 7P8SR (2 m — op).

Thank You

Many thanks to my fellow amateurs whose assistance is always very much appreciated. Special thanks to VK2CJH, VK2KFU, VK2SPS, VK2TJ, VK4AAR, VK4XW, VK5WO, VK6RO, OH0XX and the publications *QRZ DX, The DX Bulletin, The DX News Sheet, The 425 DX News, Golist QSL Managers List, INDEXA,* and *Australian Encyclopaedia.*

PO Box 93, Dural NSW 2158

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Update

WIA News

The manager of the VK4 Division has notified us that his advice of new members was incorrect. Please turn to the *WIA News* item on page 20 of last month's Amateur Radio magazine, and correct the entry for G Metcalfe as VK4ELA to his correct callsign of VK4EZA.

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WIA News

Pressure From Broadcasters on HF Bands

Shortwave broadcasters are making a concerted push for more spectrum in the high frequency bands. This issue emerged at the recent World Radio Conference, WRC-95, held by the International Telecommunications Union (ITU) in Geneva.

While this move could not be dealt with at this Conference, it may affect the Amateur Radio Service in years to come as it will be on the agenda for the 1999 Conference, according to the WIA's delegate to WRC-95, David Wardlaw VK3ADW.

Shortwave broadcasters are seeking access to new HF bands which were allocated in 1979 at WARC-79, and a further lot in 1992 at WRC-92, the latter for single sideband reduced carrier (SSRC) transmissions. This mode of transmission provides more efficient use of spectrum, but requires a more advanced method of reception than simple AM detection, now universally used. Solid-state technology now allows synchronous detection methods to be incorporated in new HF receivers, and modern mass manufacturing methods would make the technology comparatively inexpensive, in time.

The next World Radio Conference in 1997 (WRC-97) may consider some recommendations on the issue, which is likely to be on the agenda of the 1999 Conference. At WRC-99, it is anticipated that bands near 4 MHz up to about 10 MHz particularly will be considered. Fixed and land mobile services have world-wide primary allocations in this part of the spectrum, adjacent to primary broadcasting service allocations. As the demand for fixed and land mobile services is declining over time, this may relieve possible pressure on the HF amateur bands near 4 MHz and 10 MHz.

The situation is being monitored by the WIA's ITU Study Group and Conference Co-ordinator, David Wardlaw VK3ADW, who was a member of the official Australian delegation to WRC-95.

In the meantime, shortwave broadcasters are already taking up more spectrum by moving into some HF amateur bands. From Australia, broadcasters are found in the exclusive 40 metre band allocation. They can be heard on 7010, 7070, 7085, and 7098 kHz, as well as two broadcasters near the 7100 kHz band edge whose sidebands spill into our exclusive band.

WIA Federal Intruder Watch Co-ordinator, Gordon Loveday VK4KAL, said that 40 m continues to be a "happy band" for intruders. They must be stopped, Gordon said, and he urges radio amateurs to protest by sending observer reports. If we don't put up a tough fight for our 40 m band, the shortwave broadcasters will have a stronger argument for more spectrum at a future World Radio Conferences.

Intruder Watch activities pay off. In 1994, reports from *Radio Society of Great Britain* (RSGB) observers were instrumental in having an interfering harmonic of a Russian shortwave broadcaster removed from the exclusive 14 MHz amateur band, along with a French military station on Reunion Island in the Indian Ocean. If you'd like to help Intruder Watch, even on a casual basis, contact Gordon Loveday VK4KAL via his Call Book address.

Help stamp out stolen equipment — keep a record of all your equipment serial numbers in a safe place.

International Amateur Radio Union Monitoring Service (IARUMS) — Intruder Watch

*Gordon Loveday VK4KAL**

The IARU Monitoring System

Most of the information I will give in this column over the next few months is taken from the IARU Monitoring Manual, dated September 1988. The basics never change, but some new developments are advantageous. The first six episodes will be directed at the Aims and Requirements on a day to day working of the Monitoring System, and how national amateur radio societies fit into that system.

What is the IARUMS?

1. It used to be called *Intruder Watch,* and still is for simplicity. It covers the three IARU Regions of the world. The objective is to log, identify and, if possible, have removed ALL non-amateur signals appearing on those frequencies that have been allocated exclusively to the Amateur Service.

Some Monitoring Systems also log non-amateur stations that are operating in breach of the Radio regulations in shared bands.

2. The IARUMS stations may also be asked, from time to time, to conduct "band occupancy monitoring" for special purposes.
3. In August 1985 all three previously independent Region Monitoring Systems were amalgamated.
4. With the increasing demands for spectrum space and the tendency of some administrations to ignore their responsibilities under the ITU Convention, it is evident that the Amateur Service must have a strong, unified and effective monitoring system if it is to retain its frequency allocations. It MUST present factual and authoritative information about intruders for further action.
5. The IARUMS defines a route by which the ordinary radio amateur, in ANY country, has a means of access to the international bodies in cases of "harmful interference". The system is not perfect, but it represents the best we have at this time.

The co-ordinators in each Region are always prepared to try new ideas, whether it be in the reporting or the transfer of information in the most speedy form. Speed is the essence of success in most cases.

Federal Intruder Watch Co-Ordinator, Freepost No 4 Rubyvale QLD 4702 or VK4KAL@VK4UN-1

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What's New

Bob Tait VK3UI introduces new products of interest to radio amateurs*

Kevin Cavanagh VK4SP is pleased to announce some new and exciting additions to his product range to supplement the digital modems and controllers.

If you are considering upgrading to 9600 baud packet, Kevin has available the new Kenwood 9600 certified radio. Yes, that's right, Kevin is an official Kenwood dealer. He is able to supply the whole package including the radio, modem/controller and the software.

Also, he has available the Valor products such as antenna tuners, switches, dummy loads, Curtis keyers, low pass filters, SWR/power meters and linear amplifiers. The RMS products from Italy include power/SWR meters and antenna testers for all bands.

TEKK data radios are now available for 70 cm operation. They are xtal locked and have an output of two watts at 9.6 volts using true FM modulation. Their small size allows them to be integrated with the popular AEA or PacComm controllers.

Heil Sound Microphones are available from Kevin along with other accessory items such as foot switches to provide hands free operation for the DX and contest enthusiast

Contact Kevin Cavanagh on (074) 643 954 or at 222 Brisbane Highway Wanora Queensland 4306.

*C/o PO Box 2175, Caulfield Junction VIC 3161

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Over to You — Members' Opinions

All letters from members will be considered for publication, but should be less than 300 words. The WIA accepts no responsibility for opinions expressed by correspondents.

Objection to Insert

I wish to take issue with the content of the Federal insert in November Amateur Radio. Under the heading of "Cutting the Cost of Licence Fees" it says, *"In March 1995, WIA representatives put the Amateur Radio community's views and objections to the government and won a cut in the proposed fee to $51."*

It should be recognised that it was the actions of the individual amateur radio operators of Australia, in providing a strong lobby to their Federal Parliamentary representatives, which played the major role in having the proposed licence fees lowered. This was well before the Federal representatives of the WIA had any contact with the government concerning this matter.

Personal contact and correspondence in my possession from members of the Federal Parliament makes the situation abundantly clear on this point.

There seems to have been an attempt to rewrite history in the way the insert in *Amateur Radio* is worded. I object strongly to such rewriting.

I acknowledge support provided by some Divisions of the WIA towards publicity with which the campaign was launched. Whilst involved in heavy lobbying activities I was relieved of some stress by the promise of the South Australian Division, backed by offers from other private areas, that my telephone bill would be subsidised. Subsequently, the SA Division was in turn reimbursed by agreement of the Federal Council.

I reiterate my opinion that it was undoubtedly the actions of the individual amateur radio operators which effectively produced the resultant reduction in the proposed fees back in March 1995.

We have seen that solutions to problems with bureaucracy can be found if we have the will to make our voices heard. We may well need a similar approach again in the future.

At a meeting on 6 March 1995 called by the Parliamentary Secretary, Mr Elliott, the WIA was offered the opportunity to provide a submission on the future of licensing of amateur radio stations. To date no submission has been provided to the government. I would ask why?

Ian **Hunt VK5QX**
8 Dexter Drive
Salisbury **East SA 5109**

(Progress on this submission was reported in the December 1995 issue of Amateur Radio, page 22. Ed)

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Repeater Link

*Will McGhie VK6UU**

One Month On

One month to digest the new repeater regulations and my thoughts are little different than before, that is, disappointed. Due to the delay between writing this and you reading it, much could have changed. However, delays aside, continued comment is required about the new repeater regulations. Several of these regulations I find difficult to accept or difficult to understand. Overall I find this legalistic language silly. To give you an example, try reading and understanding the following.

Access control systems

11. (1) If;

(a) an originating station transmits a signal to the amateur repeater station to which the licence relates; and

(b) the amateur repeater station uses a repeater output that:

(I) is not on the same frequency as the amateur repeater station's repeater input; and

(II) is on a frequency on which the originating station is not permitted to transmit a signal;

the licensee in relation to the amateur repeater station must operate the amateur repeater station using an access control system described in subclause (3).

The text is reproduced word for word, and in the same layout as in TLS11. Do you understand what it is saying? I have particular difficulty with subsection (I). I find this type of language very long winded and creates more of a problem than the one it is trying to prevent, that is no room for misunderstanding. It does just the opposite. Let's try and use normal English to break this section down.

If an amateur is using a repeater whose output is not on the repeater's input and is on a frequency that the amateur is not licensed for, then the repeater must have an access control system, such as CTCSS.

Now as you can see, even in plain English, it still does not make sense. I think what it is saying is, amateurs can not be transmitted onto bands they are not licensed for, and repeaters that have such a link, must be fitted with an access control system. The word input, however, confuses me.

Before we lay the blame of the language used in TLS11 squarely on the SMA, it is important to understand that, even though the SMA draw up the regulations, they don't word them. There is a legal requirement that a Government legal department do this. The wording is this department's and not the SMA. Who knows? Perhaps the SMA dislike this legal double talk as much as we do.

Rather than go on and cite several other examples of what I consider a disappointing result, perhaps of equal importance is where are we in all this? Disorganised, is perhaps the kindest description. Close contact with John Martin of *FTAC* has shown how little response there has been from amateurs. The original deadline for comment was extended and two Divisions failed to make the deadline. These being New South Wales and Tasmania. So what happened in these Divisions?

We are also diverse on our opinions on the draft regulations. VK1, VK3, and VK4 see no problems with them, while VK5 and VK6 do see considerable problems. Why such a wide variation of opinion? I have some ideas on why this difference could exist. Please note, it is my opinion and I could be completely wrong. If I'm wrong, please let me know.

Autopatch

One simple example is the "no connection to the public telecommunications network". If you believe connecting a phone to a repeater, so amateurs can initiate a phone call, is a good idea, then this regulation comes as a disappointment. However, if you have no wish to connect a phone to a repeater, and perhaps see it as a bad idea, then this regulation has your approval. But, and it is a big but, it is a restrictive regulation. The fundamental point of all the effort that was put in by several of us over five years ago has been lost. Regulation in an experimental service is fundamentally misplaced. How can you apply regulations that restrict experimentation and expect the experimental service to experiment?

Now I hear you say "but you must have regulation". The Amateur Service has so many regulations that it would not be

amateur radio without them. The point is you have clever non-restrictive regulations. Sensible regulations, like staying within amateur bands, spurious emission levels, non-interference requirements, and control of potential problems, such as swift cessation of interference if it occurs. I'm sure several more could be added but, hopefully, you get my drift. What we do within these regulations should be left up to amateurs.

Returning to the "no connection to the telephone" is a good example to follow through. Just in case you are not aware, the United States has had phone connection to repeaters, called autopatch, for years. New Zealand also allows autopatch. So why not in Australia? What is the real reason for prohibiting autopatch on repeaters? Could it be that the concept is not fully understood by the SMA? I have been told that the SMA do not want non-amateurs to gain control of amateur frequencies. This makes sense. However, a non-amateur can speak on the amateur bands, provided a licensed amateur is in attendance and in control of the equipment. This same level of control can be achieved if autopatch is placed on a repeater. Note, I'm talking about autopatch and not reverse autopatch. Autopatch is where an amateur dials the phone number from a DTMF keypad. Reverse autopatch is where a non-amateur (or amateur) is able to dial the repeater and ask for a particular amateur over the repeater. Even this form of autopatch may not be a problem with a bit of clever thinking, but let's stick to normal autopatch for the moment.

With autopatch an amateur dials a non-amateur. When the non-amateur (note it could be an amateur also) answers, several safeguards are included in the autopatch system. If the non-amateur starts talking about something you do not want broadcast to all, all you have to do is push your PTT. This interrupts the audio from the non-amateur from being transmitted onto the repeater. In effect, it censors the audio. You, as the amateur in control, have several options. As you have hit the PTT you now are able to talk to the non-amateur, just as you do during the normal autopatch conversation. You then inform the non-amateur that the conversation content is not suitable for broadcast. Simple as that. However, let's say the non-amateur persists. You again hit the PTT followed by the disconnect DTMF digit on the keypad and the call is disconnected. Simple as that. It has worked in other countries so why the problem in Australia?

The WIA

I believe the SMA do not understand the in-built safe-guards that are part of autopatch. Why, you ask, don't they understand? The answer is simple. We have not told them! This is where we, as amateurs, often fail. We are poor communicators. In order to inform the SMA of the technical operation of autopatch someone has to have the knowledge of how the system works and, most important, put it on paper. This is where the old saying is repeated "what are the WIA doing?". The WIA are not an endless number of people all waiting to hit the key board to write up yet another submission to be handed onto the SMA. The only people who can do this are you and me. That's right, not the WIA, you and me, because the WIA is you. It took me quite a while to figure out how to bring about policy change in the WIA. You have to do the work. Just saying to your Federal Councillor, "I believe we should be allowed to have autopatch" won't get you autopatch. You have to write an informed submission and see it through. Send it to your Federal Councillor and follow it up. Your Federal Councillor may not understand your submission. Find out if he does and what is required to see it move on.

These types of technical submissions usually end up with FTAC. So not only should you send your submission to your Federal Councillor but also your local TAC in your Division. Most important, continue to follow it up. Don't assume it is going anywhere; it might have been lost or forgotten about. The WIA is not perfect.

So where does this leave autopatch? It means yet another submission to be written for the WIA hopefully to endorse and become the information to gain the freedom for amateur repeater clubs to install autopatch or not install autopatch, as they see fit.

Enough of these long awaited disappointing repeater regulations. All work and no play makes for a frustrating life at times.

Play

On a fun topic, antenna installation at a remote repeater site. Our repeater site at Mt Saddleback, VK6RMS, is located on top of a 2000 ft (sounds better than in metres) hill some 120 km south east from Perth. A working bee was arranged to upgrade the antennas on the site. There is a voice repeater and a digipeater on site. The track to the site is four wheel drive. Several vehicles made the journey with the replacement antennas. The old antennas were removed from the 60 ft tower and the new dual band two metre/70 centimetre antennas assembled and tested at ground level. All worked fine. The antennas were then installed on the tower. All this took some two hours and the result looked good. However, tests showed the top antenna worked fine but the lower antenna had an infinity SWR.

Considerable time was spent trying to find out where the problem was. Tests showed there was an open circuit somewhere. As the antenna had been fully installed and all the coax connector joins sealed, finding the problem proved tedious. Remember, much of this was taking place several metres above ground.

Many misleading possible faults were examined, such as coax adaptors not fitting correctly, but eventually all the sealed joins to the antenna had to be cut apart and examined. It took a while to find the problem. A "N" type male connector had been successfully screwed into a female SO239 (UHF type) socket on the bottom of the aerial. The thin centre pin of the "N" type cannot make a connection to the larger receptacle of the centre socket of the SO239.

This possibility was tried at ground level while trying to isolate the fault. The "N" type male and SO239 (UHF) female tried at ground level would not fit together. Between the inner and outer of the SO239 socket is a ring of insulation that prevents the inner screen of the "N" type male from fitting. However, the antenna SO239 did not have this ring of insulation, and the "N" type screwed neatly in.

How all this came about requires some explanation. The coax that runs up the tower is LDF 450, with a female "N" type at the aerial end. A tail of RG213, a couple of metres in length, is required to connect the antenna to the LDF 450. This tail was made up with a male UHF connector (PL259) at one end and a male "N" type at the other. When tested at ground level the connectors were correctly installed. However, once the test was done the tail was removed to allow for the final coming-together of antenna, tail and mounting frame. It was during this part of the installation that the tail was placed the wrong way round and sealed at the antenna end. The whole structure was then hauled up the tower.

When it came to attaching the tail to the LDF 450 it would not fit because it was the PL259. This caused surprise and confusion but, as the coax tail fitted the antenna "correctly," this was left in the too-hard bin and an adaptor used to mate the PL259 to the "N" type LDF 450 coax. Talk about a comedy of errors!

All this extra activity took over an hour and further added to the saying "trust nothing". The day was a great success with the site now radiating a stronger signal in all directions.

21 Waterloo Crescent, Lesmurdie 6076
VK6UU @ VK6BBR
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Pounding Brass

*Stephen P Smith VK2SPS**

Hello to all the readers of this column and a very happy New Year. I hope your Christmas festivities were enjoyable and that Santa brought that electronic keyer you were hoping for.

Over the past year I received a number of letters from people who were interested in becoming amateur radio operators and were seeking advice on good Morse publications that would assist them in their Morse examinations. As a result of those letters I have decided to start the new year with a book review of an English publication which I believe will assist new students overcome any fears they may have when they sit for their Morse examination.

The Secret of Learning Morse Code by Mark Francis (G0GBY)

This book can be obtained from Practical Wireless, Arrowsmith Court, Station Approach, Broadstone, Dorset BH 18 8PW, ENGLAND (phone 01202 659910) at a price of UK 4 pounds 95 pence.

It is a shame this book is not available in Australia as it contains a wealth of information. It would also make an excellent addition to your Morse library. The book contains some 88 pages, measures 15 cm x 21 cm x 1 cm, and contains eight chapters with an appendix running from A to F. The chapters are as follows:

Chapter 1 — How it Started

This chapter looks at the early history of telegraphy including the founder, Samuel F B Morse, and some of the problems he encountered during the development of the code.

Chapter 2 — Making up Your Mind

This chapter looks at the many problems facing students and the excuses they have made while undertaking Morse studies. It also explains about having a positive state of mind and that one can achieve anything by practice.

Chapter 3 — Learning the Basics

This chapter covers the approach used to learn groups consisting of the following:
(a) E, T, I, M, S, O, H,
(b) A, W, U, J, V, F,
(c) C, G, K, Q, P, Z,
(d) R, Y, L, X, D, N, B,
(e) Numbers 1 to zero.

The method used is to take five pieces of paper about the size of credit cards; on the first piece write down the seven letters as mentioned in group 1 above, but include E = dit, T = dah, I = d'dit, etc.

This is done with all five groups. You then proceed through each group in turn, until you know all the necessary characters.

Chapter 4 — Receiving the Code

This chapter discusses the different methods that can be used in learning how to receive the code, and covers the D70 Datong Morse Tutor (which has been around for quite a few years) to the RSGB Morse Code Practice Transmissions at varying speeds (I was surprised to find there was no mention of using Morse tape cassettes as a means to receive the code).

Chapter 5 — Sending the Code

This chapter covers the commercial practice oscillators such as the COK-2, and making your own from junk-box parts. The only down-side to this chapter is that the author makes no mention on how to adjust your key (how can you use an oscillator if you don't know how to adjust your key?). On the other hand, perhaps the author presumes you know how to do this; in any case, I believe important information is lacking.

Chapter 6 — Improving your Speed

In this chapter speed is discussed, and advises that to obtain faster speeds you should use a code faster than you are comfortably able to handle. He also mentions if you can copy at 40% accuracy you should then increase your receiving speed by about 5-6 wpm, etc.

Chapter 7 — The Test Itself

The author talks about his own experience in sitting for the examination and some of the problems he encountered.

Chapter 8 — Other Information

This chapter looks at electronic Morse code readers; and the pros and cons are discussed about additional reading material which the student might benefit from.

Appendix A Through To F

The appendices cover a range of Morse related topics, from using the Q-Code to abbreviations, and from sample Morse tests to additional sending practices.

I found the book to be well structured, pleasant reading and containing a lot of information that will assist potential students in their Morse Code examinations. However, on the negative side was the lack of information concerning the adjustment of a straight key. I hope the author will include this in future editions.

There are two other excellent books on Morse code which have been on the market for about three years. They are **Learning Morse Code** by Rex Black VK2YA, and **Morse Code, the Essential Language** by Peter Carron Jr W3DKV.

Learning Morse code is an excellent book and is ideal for the beginner. It includes two Morse cassettes and contains a wealth of information. The book is available from WIA Divisions.

Morse Code, The Essential Language is an American publication and is an excellent book for both the beginner and the advanced operator. It covers everything from early history through to modern electronic keyers. I hope to do a review on it later in the year. The book is well worth the money and can be purchased from **Daycom Communications Pty Ltd** for $16.00. Further enquiries can be made with Daycom on (03) 9543 6444.

Next month we will look at straight key construction which I hope all home brewers will find exciting.

**PO Box 361, Mona Vale NSW 2103*

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Spotlight on SWLing

*Robin L Harwood VK7RH**

Well, 1996 has arrived! A New Year has commenced and it is apparent that shortwave will continue despite budgetary cutbacks and the disappearance of some HF facilities.

Recently there have been developments with a clockwork-powered radio in South Africa, which has now come onto the market. It is the brainchild of Trevor Bayliss, who wanted to develop a fairly cheap radio that didn't rely on batteries, particularly for Africa and Asia where the cost of these is rather beyond the reach of the average person.

With the assistance of the British Overseas Development Corporation and the BBC World Service, production commenced recently in South Africa with the aim of some many thousands of units per month. The idea behind the clockwork mechanism is not really new yet would be quite feasible in areas where there are difficulties in obtaining batteries, such as Africa. It must be remembered that Alf Traeger developed the pedal-powered radio for the Flying Doctor Service in the late 20s and early 30s, here in Australia. Also there were similar set-ups employed

by POWs in Europe in the Second World War and by some Aussie troops who were trapped in Timor, to monitor shortwave transmissions.

However, to return to the Bayliss model. I believe that 20 seconds of winding will provide up to 38 minutes of power and that the model does have AM/FM plus one shortwave band, probably the tropical bands from 3 to 12 MHz. Other models for more developed areas, such as Europe and North America, will have from 6 to 18 MHz.

The price within Africa will be cheaper than it will be for Europe and North America. The idea is that these markets will subsidise the price for Africa. The price in a well-known department store in London is 75 pounds sterling, whereas in Africa it will be about $US80. The set has not been designed as a DX machine but for the average listener who wants to keep in touch with what is happening around him. It is not a sophisticated receiver. I believe that the clockwork mechanism makes it weigh more than a conventional battery transistor model. Whether it will succeed in African markets is debatable as the number of conventional models is in the millions.

Tuning around recently, I came across **Radio Slovakia** broadcasting from Bratislava to Australia. The programming was in Slovakian, naturally, and the broadcast was for 30 minutes from 0900 UTC. The frequency chosen is unusual. It is on 17,485 kHz, which is well outside the 16 metre allocation which means that it is free from any adjacent interference. I think that the Slovakian programming may be preceded by a 30 minute English release, but this cannot be confirmed.

All India Radio in New Delhi has been quietly upgrading its transmission facilities over the past 12 months and it is pleasing that it has significantly improved the modulation quality. For many years AIR has been broadcasting on 17,387 kHz and on a 19 metre channel in its General Overseas Service to Australia and the Pacific at 1000 UTC, but poor propagation over the years has often made it inaudible. Recently, a 500 kW sender was fired up on 13,700 kHz at that time and the signal level is excellent as is the audio. AIR is eager to receive reception reports and the address is given frequently plus the added option of forwarding your reports via the Indian High Commission in Canberra. The morning release at 2100 UTC is around 9,940 kHz, yet it must be employing an older sender as the audio quality is not as clear as the 1000 release on 13,700 kHz.

The new facilities are also being targeted to the Gulf States and the Mid-East between 0400 and 0600 on 15,075 and 15,050 kHz. Signal levels vary daily in the Hindi and Arabic releases. The shortwave relay of the domestic service continues on the unusual allocation of 10,330 kHz, which is audible at various times of the day. Hindi programming is the norm; however, several English news bulletins are aired throughout the day.

The **VOA** has been undergoing some financial cutbacks in the US Budget, which saw the demise of English language broadcasts directed to Europe plus reductions to other European language services. The future of the VOA is still uncertain and the popular VOA-Europe feed, which is aired over various European cable systems, is going commercial. The VOA is looking for a commercial partner who would sell advertising to be aired.

In mid-November, the entire US Government was paralysed by a budget crisis and the VOA was affected in some areas. There was stand-by programming available to cover regular non-news based programming, although news and current affairs were spared. After the budget crisis was temporarily averted, the VOA resumed its normal output, although it did warn listeners that, as the crisis was only temporarily resolved, a similar situation could arise in mid-December.

The **Voice of Russia** in Moscow recently revealed the extent of their enforced cutbacks in Joe Adamov's "Moscow Mailbag". Apparently they have only 100 senders now at their disposal compared to the 400 plus they previously had when the USSR existed. 60% of these are in Russia proper whilst the remaining 40% are scattered throughout the CIS nations. Staffing levels have also been reduced significantly.

It was recently pointed out to me that the RAN communications station **VHP/VIX**, which was located at Belconnen in the ACT, ceased operating on CW as of 30 September 1994. VHP/VIX was easily heard on 8478 and 6428.5 kHz and, for many trying to master the intricacies of Morse, it was an invaluable aid and was much easier to copy than the Slow Morse transmissions on 80 metres. The RAN daily drill sessions from VHP and the weather from VIX was always reliable. Sadly, they are now a part of history.

Well, that is all for this month's column; until February, the very best of listening and 73.

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ar

VHF/UHF — An Expanding World

*Eric Jamieson VK5LP**

All times are UTC.

Messages

Peter **VK1PK** further advises that the EME contact between Canberra and Italy planned for 12 December (reported in these columns last month), will now be attempted on 432 MHz instead of 1296 MHz, with Chris VK1DO organising the equipment and operating details. By the time you read this the attempt will be over so I await information on the results.

John **VK3ATQ** reported working Frank VK7ZMF on 3/11 at 2000 with his beam 10° north of east, exchanging 5×1 reports. Frank's beam was pointing in the same direction, so it appears to have been a backscatter contact from ionised air over the Pacific. This was confirmed by loss of signal on the direct path. Frank VK7ZMF runs 100 watts to a 16 m boom own design Yagi, while John uses 100 watts to a NBS 6 element at 20 metres.

The above phenomenon is often noted here in VK5 when we work VK6s; we can hear (and work) VK2, 3 and 4 on backscatter and signals are usually affected by flutter.

On 6-7/11, Frank **VK7ZMF** had a good JA opening and filled two pages of his log book, an interesting extension of the JAs which have been worked in Queensland.

John also said that **Brenton VK7JB** has erected a 60 metre per leg "V" beam aimed at Melbourne, but so far has not made it across Bass Strait with 10 watts (IC-551). However, Brenton is in the process of building a 100 watt linear. It would be interesting to hear how the combination of the linear and "V" beam works. A similar beam was used by Darrin VK0IX for his contacts from Antarctica last January.

John VK4KK reports several strong Es openings, one of the best on 6/11 to VK2, 3, 5 and 7. On a number of occasions, around 11.30 pm local time, John has observed very strong video from New Zealand on 50.750 and 50.760, NZT 2.30 to 3.30 am. Seems rather late for Es, but I am never surprised when strange happenings occur on six metres.

Remember the old adage, six metres never closes, only the operators stop!

John also reported on 16/11 JA2 and JA3, and on 17/11 JA2 and JA5. Signals were not strong and were available around 0500. A week earlier, ZLs had an opening to JA but no details are available.

Steve VK3**OT** issued a bulletin about solar information, being an excerpt from The 50 MHz DX Bulletin, September 1995, in which Arne SM7AED writes: *A total of three sunspot groups potentially belonging to cycle 23 have now been observed at Learmonth Solar Observatory. The major significance of new cycle spots lies in their prediction value for solar minimum. Typically, minimum does not occur until at least 12 months following the appearance of the first spot group of the cycle. Details for the last three cycles are:*

Cycle #	*First spot*	*Minimum*	*Latency*
20	*Sep 1963*	*Oct 1964*	*13 months*
21	*15 Nov 1974*	*Jun 1976*	*19 months*
22	*31 Mar 1985*	*Sep 1986*	*16 months*

On the basis of past behaviour we would thus expect solar minimum to occur between June and December 1996, and the duration of cycle 22 to lie between 9.7 and 10.3 years. The highest reading for October 1995 was on the 12th, with a flux of 92.

From VK3 south, last JAs of Cycle 21 worked 30 March 1984. First JAs of Cycle 22 worked October 1987, a break of 3.5 years. Last JAs worked from VK3 south in late 1994, projected major opening October 1997, but more likely to be October 1996.

VK4s into JA on 14 October and again on 7 November. A JA6 heard the VK3SIX beacon and VK3LK on 14 October after a minor solar disturbance ... de **VK3OT.**

Two Metres

Phil VK5AKK is working many stations on two metres from his new site at Blackwood in the Adelaide Hills, 525 metres ASL. All contacts were made with 100 watts to a 13 element K1FO Yagi, and the following are highlights from his log.

17/10: 1201 VK3AUU 5x6, 1235 VK3TUO Stawell 5x2, 2234 VK3AUU 5x9, 2237 VK2TWR Nimitabel 5x2, 2240 VK3DUT 5x9, 2326 VK3AJN Wangaratta 5x2. 22/10: 2340 VK6AS Esperance 5x4, 2344 VK6KDC 5x2. 23/10: 0010 VK6WG Albany 5x2, 0818 VK6WG 5x9, 1149 VK3TUO 5x3, 1150 VK3BRZ 5x5, 1203 VK3AMZ 5x5, 1213 VK3AUU 5x9, 1316 VK6DM 5x6.

24/10: 0803 VK3DUT 5x9, 0818 VK3TNW 5x2, 0822 VK3TV 5x6, 0833 VK3KWA 5x5, 1008 VK2TWR 5x2, 1012 VK3AJN 5x1, 1102 VK3TUO 5x7, 1104 VK3AXH 5x9, 1111 VK3II 5x4, 1115 VK3BRZ 5x9, 1120 VK3DQW 5x7, 1224 VK3KMN 5x5, 1231 VK3AMX 5x1, 1242 VK3KLO 5x1, 1329 VK6AS 5x7, 2157 VK3DUT 5x7, 2212 VK2TWR 5x2, 2228 VK6WG 5x7, 2230 VK6AS 5x9, 2250 VK3AUU 5x9, 2307 VK6KDC 5x7. 25/10: 2245 VK3ZL 5x2, 2250 VK3DUT 5x1. 13/11: 1150 VK6DM 5x1. 14/11: 1338 VK6BE 5x3, 2140 VK3AUU 5x6, 2155 VK6AS 5x2. 18/11: 1005 VK3AUU 5x9, 1014 VK3RZ 5x4.

I have run the above list to indicate that there is more VK3 activity than is sometimes apparent, although it is obvious from some of the relatively weak reports that it requires a good site for such results.

New 24 GHz Record

On Sunday, 5 November 1995 at 1122, Neil **Sandford VK6BHT/p** at the QTH of VK6KZ in Melville Western Australia (Lat 32° 2' 47" S, Long 115° 48' 15" E) OF77VW, and **Walter Howse VK6KZ/p** at the end of The Beacon (name of street!), Swan View near Perth (Lat 31° 53' 23" S, Long 116° 03' 40" E) OF88AC, worked each other on 24048.025 MHz. Signal reports on SSB were 5x5 to VK6BHT/p and 5x4 to VK6KZ/p. The distance was 29.9 km and creates claims for inaugural distance records for both Western Australia and Australia for the 24 GHz band.

Both were using DB6NT Mark 2 transverters with an estimated power output of about 0.4 mW at 24 GHz and a receiver noise figure of approx 10-12 dB. Neil used a 570 mm dish and Walter a 610 mm dish, both with penny feeds, gain about 40 dB with a 3 dB beam-width of 1.5 degrees, ERP 4 watts. IF of 144 MHz with 10 mW input.

Local oscillator G4DDK 004 on 2390.4 MHz from 99.6 MHz crystal, fifth overtone. The five times multiplier was a G3WDG 009S with 50 mW output on 11952 MHz (X2 = 23904 + 144 = 24048 MHz). Power supply — 12 volt battery at 400 mA maximum.

The contact followed the first over a 4.4 km path and others at 22 and 28 km. Unfortunately darkness, the arrival of rain and VK6KZ being well overdue to a cooked roast dinner, prevented attempts at a longer distance. Neil returned to Geraldton (400 km north of Perth) the next day. Neil operated from Wal's QTH because Wal knew the Perth metropolitan area better than he!

Wal used his Magellan Trailblazer GPS to determine each latitude and longitude. The distance of 29.9 km was verified as correct by John Martin VK3KWA, Chairman of FTAC, and by VK5LP, so the claim goes into the record books. Good work.

Work is proceeding to build Hemt amplifiers for each station to provide increased output power (approx 70 mW) and improved receive noise figure (approx 4 dB).

Thanks to Wal VK6KZ and John VK3KWA for the above information.

[As a matter of interest, I have been informed that in 1993, VK2XSO was involved in a 24 GHz contact over a distance of 396 km. This was probably a contact using wide-band equipment, but no claims were lodged. Can anyone supply more details please?]

Other VK6 news, courtesy **Wal VK6KZ,** is that the Perth beacons were off for the two east-west six metre openings on 5 and 6/11 due to power supply failure. Thanks to Don Graham VK6HK for restoring the beacons to service on Tuesday morning 7/11.

Bill Hockley VK6AS in Esperance has renewed his 144 MHz skeds with Wally Green VK6WG in Albany with great success. If you hear Bill on 7 MHz (!) don't be surprised with a strong signal from his three element full sized beam!

Al Edgar **VK6ZAY,** using his self-designed new 10 GHz transverter, worked VK6KZ for an initial contact over a sea-level 24 km path — Rockingham to Fremantle North Mole. Al won the home-brew contest at the Hamfest with his transverter.

Bruce Douglas VK6BMD has been working 2.4 GHz SSB with Al VK6**ZAY** and Alan **Woods** VK6ZWZ. Arnold Shepperson VK6VV is also active on 2.4 GHz SSB. The impending VHF Group Field Day has encouraged this group to try terrestrial paths rather than their more usual satellite work.

From the US

December 1995 marked the 50th anniversary of *The World Above 50 MHz* in *QST*, the modern-day counterpart of *The World Above 50 Mc*, which made its debut in *QST* in December 1945.

In December 1939, *On the Ultra Highs*

appeared as a new *QST* column under the byline of **Ed Tilton W1HDQ**, and covering the then 56, 112 and 400 Mc bands, which were replaced in 1945/46 by 50, 144, 220, 420, 1215 MHz; 2.3, 3.3, 5.65, 10 and 21 GHz.

War-time developments pushed interest to above 300 Mc, and in May 1943 Ed renamed the column *On the Very Highs*. The columns faced interruption during the later years of World War II and reappeared in October 1945, to finally take its modern name *The World Above 50 Mc* in December 1945. Not one month has been missed since.

Now 88 years of age, Ed Tilton lives in a nursing home in Florida. Unfortunately, he is no longer active or able to correspond with the many friends he made during his years with the ARRL.

Thanks to **Emil Pocock W3EP** for the above information contained in *The World Above 50 MHz* for December 1995. As the scribe for *VHF-UHF, An Expanding World,* on behalf of Australian amateurs, I congratulate *The World Above 50 MHz* and its editors, past and present, on its 50th anniversary, and may the columns continue to serve the amateur fraternity for many years to come.

Last month I mentioned that I was entering the 27th year of this column, which is a long way behind the US column. However, the earliest *Amateur Radio* magazine that I possess is February 1954, and I note therein that VK5XU was editing columns with the title *Fifty Megacycles and Above.*

VHF/UHF Field Day

Barry VK5UBJ lives at Aldinga Beach and is Secretary of The South Coast Amateur Club. He advises the club will again be a starter in the VHF/UHF Field Day on 14-16/1, operating VK5ARC from Loud's Hill near Mount Terrible which is just south-west of Willunga Hill, in grid PF94.

Alan VK5BW will also operate in the Field Day from his usual portable location at Mount Bryan, using 50, 144, 432 and 1296 MHz. Alan said it was likely that **Norm VK2XCI** at Broken Hill would participate.

Alan also advised that Bob **VK3ZL** is now active on 2 metres SSB, running ten watts to a five element beam. He lives at Miranda about 50 km west of Hamilton. He plans to also operate 432 MHz.

From his portable site on 11/11 VK5BW worked VK3ZL four times by aircraft enhancement, with signals available from 10 to 15 minutes at times. Another good catch was VK2EFA in Broken Hill. Good tropo on 12/11 enabled Alan to work 15 stations.

Europe

Ted Collins G4UPS reports that **Fred Fish W5FF,** has now completed working all grid squares in continental USA on 6 m with a QSO in June to N1MLE for square 484! Fred has now worked 843 grid squares on 6 m, with 128 countries confirmed. His XYL **Lee K5FF** received DXCC No 1 for 6 m and Fred No 2.

Anyone still chasing a QSL from **Costas SV1DH,** be advised he has moved and his current address is Dr Costas Fimerelis, 41 Aristofanes St, Halandri 152-32, Greece.

Ted also reports that the first legal QSO from Tunisia on 6 m occurred on 23/10/95, when 3V8BB contacted SM7AED, exchanging 599 reports on 50.110. On 24/10 3V8BB worked PA stations, 25/10 to GJ4ICD, and 26/10 into the UK, first to G3HBR and finally to G4UPS at 1118.

Looking through Ted's log for October, it is interesting to observe that 14 beacons were copied, ranging from CT0WW in Portugal to SV1SIX in Greece, a spread of right across Europe, with other beacons in between. Actual contacts were rather limited, predominantly to EH, F, I, IS0, SM, CT1 and of course 3V8BB.

News from **Geoff GJ4ICD** arrived via **Dave VK2KFU** (with thanks). His info is a collection of highlights from Europe and USA. In much the same way that we experienced TEP to Japan during October, so too from the US to Argentina. 29/9: WA5 to LU; 3/10: WA5, CO to LU; 5-6/10: W5 to LU; 13/10: 7Q7RM to IK8DYD. Quite a few Es openings during October in both the US and Europe — equivalent to April here!

Emil Pocock W3EP, in *QST's* December *The World Above 50 MHz,* reports that: *The unusual outbreak of sporadic E on six metres this past summer may have also affected two metres. DUBUS No 3 for 1995 included 19 pages of 144 MHz sporadic E reports from Western Europe, accompanied by nine maps showing typical paths. Some of the European openings were quite spectacular. On 12 June, for example, EA9AI (Ceuta, North Africa) ran off more than 200 Europeans between 0940 and 1235 — that is around 70 per hour! Similar reports from Japan, published in Mobil Ham for August, September and October indicate that the sporadic E season in Japan was also lively. Japanese 2 metre operators had opportunities to work Korea (DS and HL), Russia (UA0) and Taiwan (BV) in addition to each other. The US and Europe each experienced more than 15 dates with two metre openings between mid-May and Mid-August, or roughly one every three days.*

Emil also wrote that: *The Europeans set two new microwave records over the summer. DB6NT and DF9LN spanned 2.1 km on both 145 and 241 GHz during a series of tests on 26 June. The 241 GHz contact set a new world record. The pair used DB6NT-designed transverters and 25 cm dishes. On 7 July, HB9MIO and DK4GD, both operating from favourable portable sites, made a 114 km contact on 76 GHz. Their rigs ran 2 mW on CW with 30 and 40 cm dishes. Receiver noise figure was less than 13 dB.*

Closure

The main interest this month will be the continuation of the Ross Hull Contest and the VHF/UHF Field Day which combines with the Ross Hull over the weekend of 13-14 January.

These days I cannot go out portable, but I certainly hope to give field stations contacts on 50, 144, 432 and 1296 MHz, especially now that I have a 100 watt *louden-boomer* on 1296!

Closing with two thoughts for the month:

1. There's not much point in spinning a yarn if the audience loses the thread, and
2. Be yourself. Who else is better qualified?

73 from The Voice by the Lake.

*PO Box 169, Meningie SA 5264 Fax: (085) 751 043
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Silent Keys

Due to space demands obituaries should be no longer than 200 words.

The WIA regrets to announce the recent passing of:-

C S (Charles) HIGGINS VK2LO

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Repeaters — additions, deletions, alterations. Have you advised the WIA of changes to the Repeater List?

WIA November Meeting With the SMA

The WIA met with the Spectrum Management Agency (SMA) in Canberra on 30 November last. The full WIA Liaison team attended, comprising Neil Penfold VK6NE, Roger Harrison VK2ZRH and David Wardlaw VK3ADW. Nine officers from various SMA teams attended, but not all were there for the whole of the meeting which ran from 10 am to 4.30 pm.

There were five major areas for discussion, along with a number of minor matters. The WIA set the agenda for the meeting. The major issues were:

- the 80 metre DX window;
- Technical Licence Specifications;
- Interference;
- Licensing; and
- the Examination System.

80 m DX Window

The WIA put a submission to the SMA in late November, before the Canberra meeting, proposing Australian amateurs be permitted to use the band 3760-3900 kHz on a secondary basis, during evening hours between 1700-0700 local time Mondays to Thursdays, and from 1700 LT on Fridays through 0700 LT on Mondays (ie 24-hour weekend operation).

This submission followed a survey of some 300 current primary service licensees assigned channels between 3750 and 3899 kHz. Responses were received from more than 55% of licensees surveyed. Of those who returned the WIA's questionnaire, more than 80% indicated no objection to the WIA's proposal for shared use of the band during night time hours. Objections were received from only 18% of respondents, who were licensed to use only 5% of the channels between 3750-3900 kHz. A number of users have more than one frequency channel assigned in this range.

The WIA's detailed submission included tabulated and graphical summaries of the questionnaire responses. This final submission, drawn up by Roger Harrison VK2ZRH, was derived from an initial survey analysis and recommendations drafted by the WIA Victorian Division.

The SMA has asked the WIA to provide further details in support of the proposal to expand the 80 m DX Window, particularly in regard to amateur allocations in this area of the spectrum in other countries around the world, and the issue of self-regulation among amateurs in Australia should the DX Window be expanded in the future. The WIA-SMA Liaison team will progress this submission as a matter of priority.

Technical Licence Specifications

Discussions under this topic covered the WIA's response to the draft Beacon and Repeater TLSs (TLS 10 and TLS 11), errors in the existing TLSs, comments on emission designations used in TLSs, background to changes in the TLSs made in mid-1995 and the apparent loss of privileges for Unrestricted licensees with the limitation of wideband FM on the 10 metre band to 29 MHz and above where previously it was permitted from 28 MHz.

A lengthy submission commenting on the draft Beacon and Repeater TLSs was prepared and submitted by WIA Federal Technical Advisory Committee (FTAC) Chairman John Martin VK3KWA before the Canberra meeting.

The SMA indicated they will send a written reply to the WIA on this submission, but were unable to indicate when this might be forthcoming as other radiocommunications issues presently have priority with the SMA's time and resources.

The five principal amateur TLSs were gazetted twice in 1995, first on 2 June, and again on 5 July. There were changes made to the Unrestricted, Novice and Intermediate TLSs in the second gazettal. The greatest changes were to the Novice TLS, in section 10, where eight transmission modes were added for telegraphy and data modes on the 3.5 MHz and 21 MHz bands. Two telegraphy/data modes were added for the HF bands in Schedule 2 in the Unrestricted and Intermediate TLSs.

The SMA explained that these were inadvertently omitted from the original drafts and that they were added when an opportunity arose in June to amend the TLSs.

Errors in the existing amateur TLSs were drawn to the attention of the SMA in a WIA submission drafted and sent to the SMA by John Martin VK3KWA. The errors involve transmission modes on 50.0-50.3 MHz, incorrect specification of some telegraphy/data modes and the omission of footnotes warning of frequencies to avoid on the 160 m, 80 m and 30 m bands. The SMA indicated they will see to amending the TLSs in due course, when the opportunity arises. The WIA was told that, despite what happened last June, amending TLSs is not a simple procedure.

On the issue of limiting wideband FM (16K0F and 16K0G modes) for Unrestricted licensees to use above 29 MHz in the new TLSs, where previously it had been permitted across the whole of the 28-29.7 MHz band, the SMA had no immediate explanation but offered to respond to the WIA by letter.

Interference

Issues regarding interference to amateur activities on the 160 m, 2 m and 70 cm bands from other services, and from the possible future installation of Windshear air safety radar systems in Australia, were discussed at the Canberra meeting.

As many amateurs well know, interference to repeater systems on 2 m from pager systems operating above 148 MHz has been a particular problem for many years. A technical report on the subject, compiled by Will McGhie VK6UU, was presented to the SMA at the previous WIA-SMA meeting last May. An update, again from Will McGhie, on a recent pager interference problem, and its solution, was given to the SMA in November. The SMA said, as a general principle, they will investigate all well-documented interference complaints, and that the priority given to any such investigation is made by the choice of the local SMA Area Office.

Recent experience, and cooperation with the SMA, has indicated a number of ways to successfully approach pager problems on 2 m. To improve the situation for repeater system operators, the WIA, in conjunction with the SMA, will develop a flow-chart and "check box" system as part of a self-managed solution to investigating interference sources to 2 m repeaters. Providing a copy of this check list, along with a written complaint, should help the SMA to take the appropriate action in the

future, when it comes to dealing with such interference.

Recent interference problems on the 160 m and 70 cm bands, arising from other services, had already been dealt with before the November meeting in Canberra. However, the SMA will in future advise the WIA of any new licences which may affect activities on amateur bands, particularly on bands where amateurs are a secondary service (eg 420-450 MHz), and work in conjunction with FTAC to avoid possible mutual interference. This procedure will also apply to Windshear radars, which operate immediately adjacent to the 6 m and 70 cm bands.

Licensing

The WIA sought discussion with the SMA regarding progress on reciprocal licensing agreements, improvements to short-term visitor licensing, information on SMA policies regarding spectrum licensing, and the Morse code qualification for amateur licences.

Australia presently has made approaches to seven countries, these being Argentina, Austria, Hong Kong, Italy, Kiribati, Peru, South Korea and Vanuatu. The SMA had good news for the WIA on two of these. Hong Kong and South Korea are agreeable to developing reciprocal licensing arrangements with Australia.

For overseas amateurs coming to Australia on short-term visits, the WIA is seeking to institute simple arrangements similar to that which exists in other countries. For example, the so-called CEPT licence in Europe allows an amateur to "roam" from country to country without having to apply for a country's licence or call sign; the amateur simply uses the appropriate country prefix in front of his or her home-country call sign. The Organisation of American States (OAS) adopted an International Amateur Radio Permit for use in the Americas, last June, which operates in a similar way.

New Zealand permits operation by visiting foreign amateurs, using FM on the 2 m band, who only need add ZL1 (or 2, 3, 4) as a prefix to their home country call sign. Visitors do not pay a licence fee.

Following discussions of the issues at the Canberra meeting with the SMA, the WIA will develop a submission on the matter, and to outline a changed approach to short-term licensing for visiting amateurs. The SMA is proceeding with work on the harmonisation of examination standards with CEPT countries, which will no doubt help with this issue.

The WIA discussed with the SMA the matter of spectrum licensing and how it may affect the Amateur Service in the future. The SMA said that only the 501-505/511-515 MHz band had been recommended for spectrum licensing and consideration of all other bands had been deferred. The WIA will take up the issue with the Radiocommunications Consultative Council (RCC) spectrum licensing working group, through David Wardlaw VK3ADW.

The SMA said amateurs were the largest single group of respondents to the recent public inquiry into spectrum licensing.

Regarding Morse code qualification for amateur licensing, the SMA said that their policy was to align with the ITU regulations as far as possible. Additionally, qualification in Morse code was used as a means of providing a level of extra privileges for amateurs. In the event of any future changes, the SMA said they were unlikely to act unilaterally as any change had many ramifications, particularly relating to reciprocal licensing, which would need to be worked through.

Since the SMA changed to a new computer management system early in 1995, lists of new licensees and statistics on amateur licensing were no longer provided to the WIA. Previously, these were provided under an informal cooperative arrangement. The WIA is working with the SMA to once again obtain this information and will put in a brief submission as a matter of priority.

Examination System

Revision of the Memorandum of Understanding (MOU) between the SMA and the WIA Exam Service has been under way for more than a year, and the WIA sought advice on progress. In addition, the issue of invigilator requirement for remote area examinations, raised at the meeting last May, was discussed, along with the matter of the syllabus and exam question banks not being in harmony with the current TLSs and Regulations.

The SMA explained that the many changes which had occurred in the SMA over recent times had occasioned delays and some loss of continuity in the revision of the MOU, but it is actively under way again. An SMA officer was to visit the WIA Exam Service operation in Melbourne before Christmas, to assess and report on current practices and procedures.

Regarding remote area invigilator requirements, the WIA proposed that, rather than using the Income Tax Act definition of remote areas, a definition based on travelling time would be administratively simpler. The SMA said they were prepared to consider this further and asked the WIA to put up a more detailed submission.

The SMA said they were progressing with consideration of the AOCP syllabus and question bank, which the WIA submitted earlier in 1995. Finalisation of the review of the AOCP syllabus was anticipated by the end of January, and the question bank some time later, although no time frame was proposed at this point.

Until the relevant information booklets on the Amateur Service, RIB70 and RIB71, were revised, amateur licence candidates would continue to be examined on the previous regulations, the SMA said.

Other matters discussed at the November WIA-SMA meeting included use of the AX2000 Olympic Games special event call sign, which the WIA wants to extend the permitted period of operation from one month before and one month after the opening ceremony, to six months or more before and up to three months after; further action on proposed amateur use of LF in the 150-200 kHz region; and a number of issues surrounding the allocation and use of amateur call signs. Armed with more information as a result of the November meeting, the WIA is developing further submissions to put before the SMA in all these matters.

More detailed information on all the matters discussed at the November meeting will be included in later *WIA News* items.

Following the meeting, WIA Federal President Neil Penfold VK6NE said that it had been the most productive of recent times, and augured well for future liaison between the WIA and the SMA.

HF PREDICTIONS

Evan Jarman VK3ANI

The Tables Explained

This month, while the sunspot number remains static, I am trying an alternative format for the HF predictions. Both formats have their advantages. I leave to you the decision of which is better.

For those who prefer the tables, last month's issue tables are effectively identical to the values that would have been used this month. The sunspot number remains unchanged. The graphs show the ALF (absorption limiting frequency — **dotted line**), MUF (maximum useable frequency — **broken line**) and OWF (optimum working frequency — **solid line**). It is a standard form for presentation of HF predictions, appearing in many other places.

The graphs are for the path indicated. Different paths can be used. The **vertical axis is frequency** (MHz). The **horizontal axis is the time of day.** Due to the system being in development the time displayed is really UTC+1. This means that you need to subtract 1 from the horizontal scale to get UTC. This will be corrected if the system proceeds.

The predictions were made using one of the IPSD stand-alone prediction systems. Finally, I could not let the year commence without noting that a new sunspot cycle is evident. More will be said next month on this subject.

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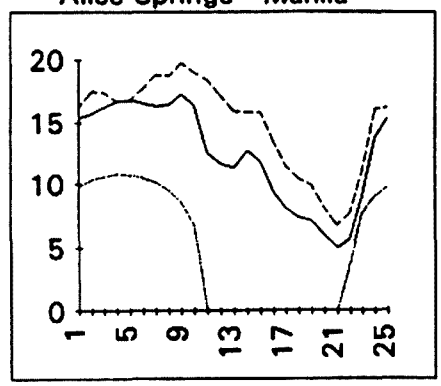
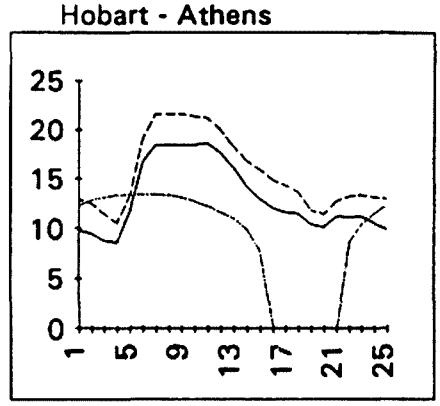
Dotted line — Absorption Limiting Frequency (ALF)
Broken line — Maximum Useable Frequency (MUF)
Solid line — Optimum Working Frequency (OWF)

Vertical axis — Frequency in MHz
Horizontal axis — Time of Day (UTC-1)

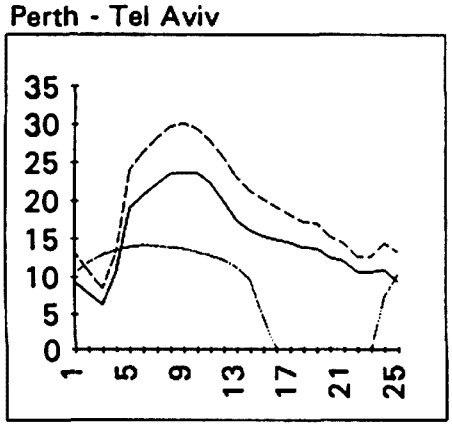
Alice Springs - Manila



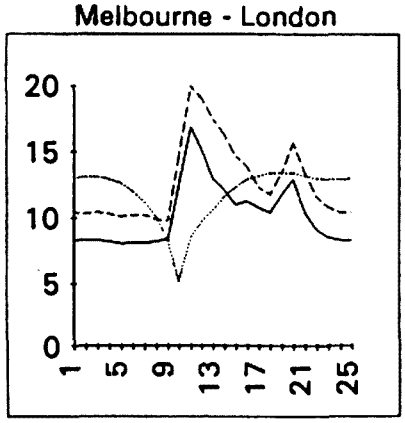
Hobart - Athens



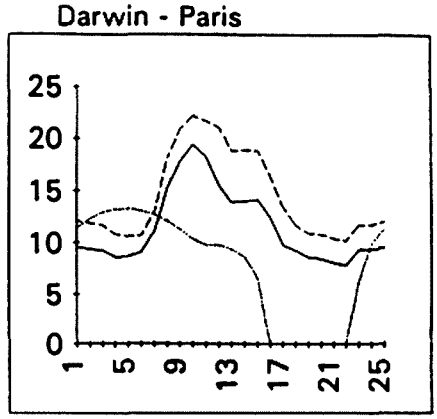
Perth - Tel Aviv



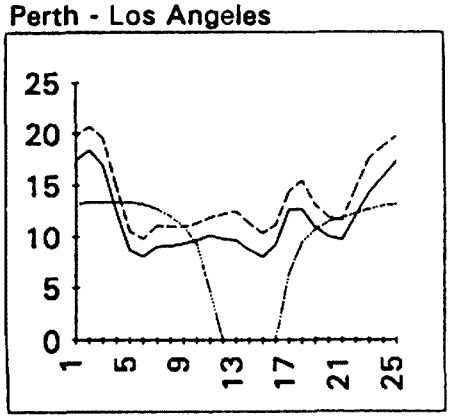
Melbourne - London



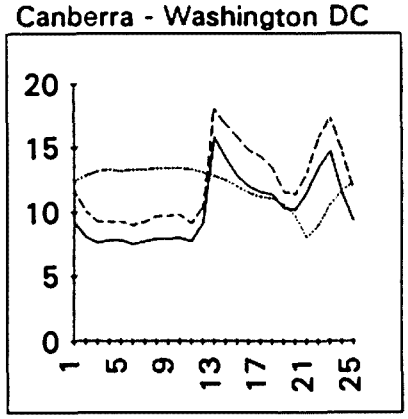
Darwin - Paris



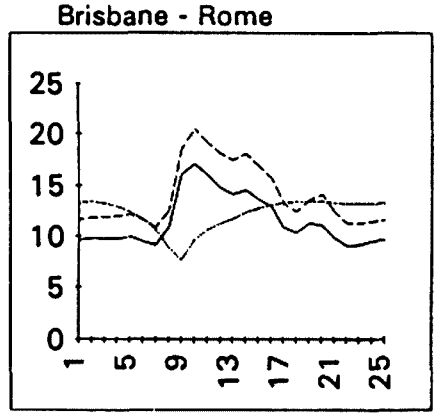
Perth - Los Angeles



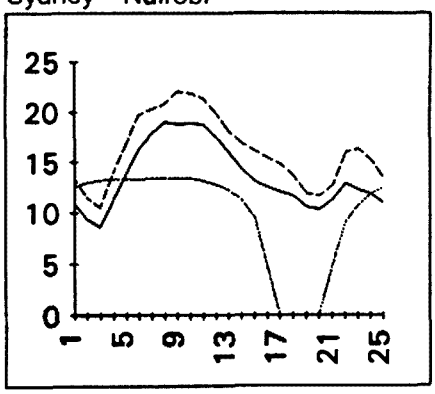
Canberra - Washington DC



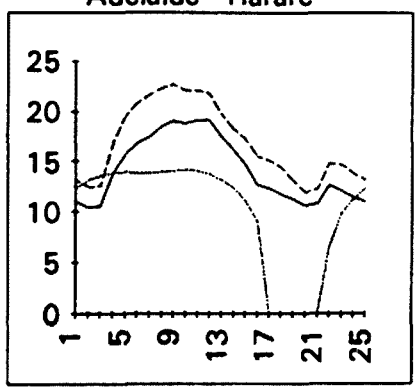
Brisbane - Rome



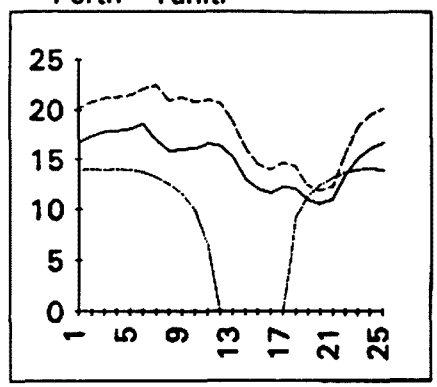
Sydney - Nairobi



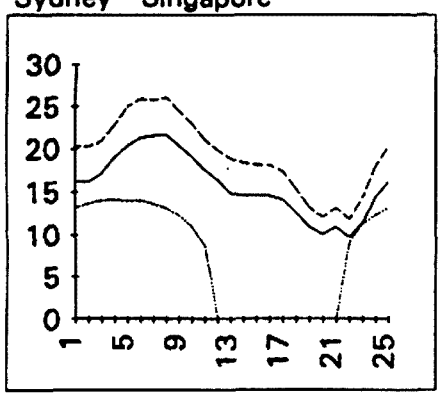
Adelaide - Harare



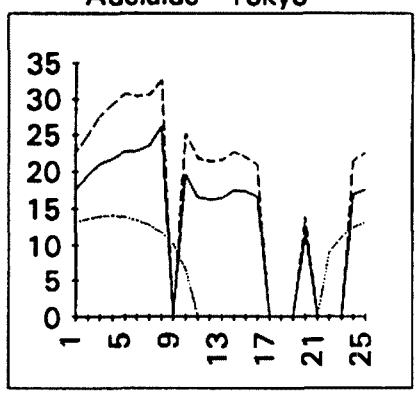
Perth - Tahiti



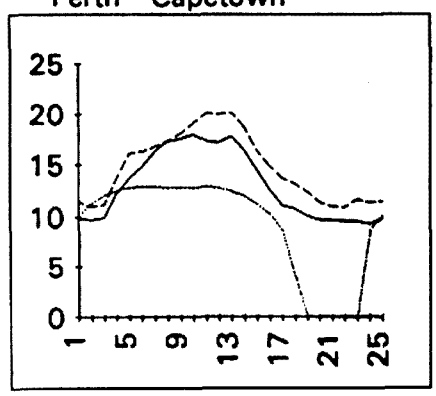
Sydney - Singapore



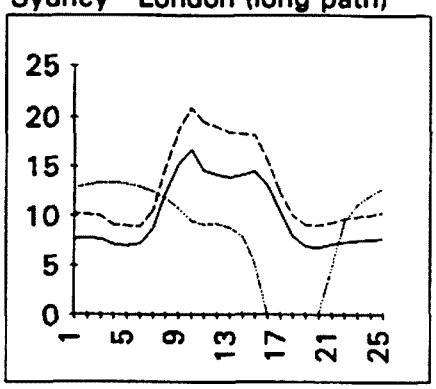
Adelaide - Tokyo



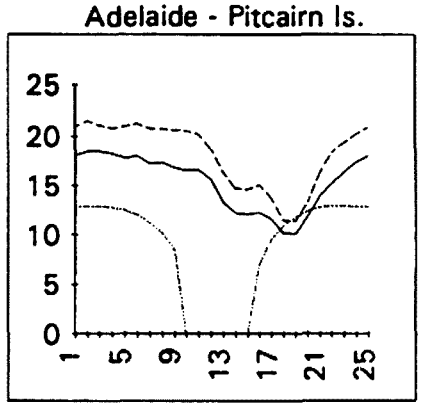
Perth - Capetown



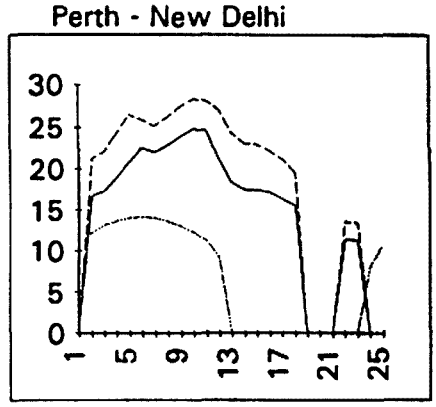
Sydney - London (long path)



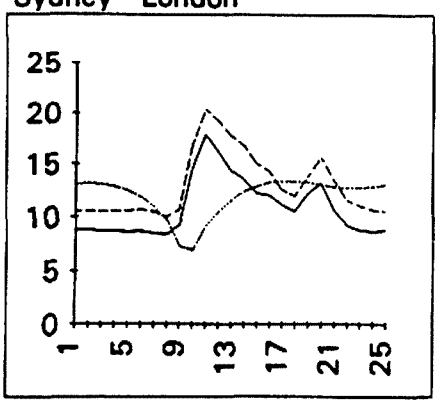
Adelaide - Pitcairn Is.



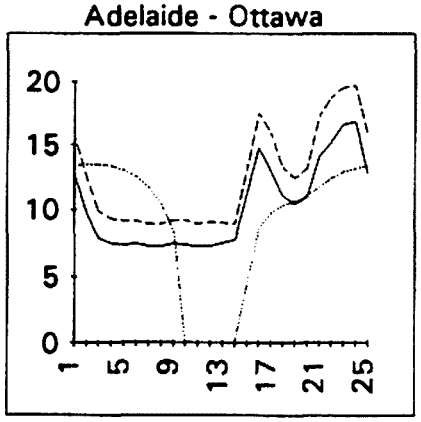
Perth - New Delhi



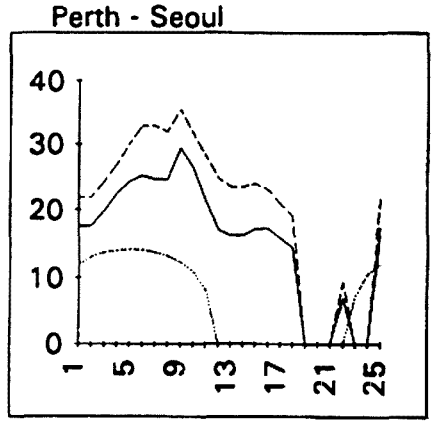
Sydney - London



Adelaide - Ottawa



Perth - Seoul



HAMADS

TRADE ADS

● AMIDON FERROMAGNETIC CORES: For all RF applications. Send business size SASE for data/price to RJ & US Imports, PO Box 431, Kiama NSW 2533 (no enquiries at office please ... 14 Boanyo Ave Kiama). Agencies at: Geoff Wood Electronics, Sydney: Webb Electronics, Albury: Assoc TV Service, Hobart: Truscotts Electronic World, Melbourne and Mildura: Alpha Tango Products, Perth: Haven Electronics, Nowra: and WIA Equipment Supplies, Adelaide.

● WEATHER FAX programs for IBM XT/ATs *** "RADFAX2" $35.00, is a high resolution shortwave weatherfax, Morse and RTTY receiving program. Suitable for CGA, EGA, VGA and Hercules cards (state which). Needs SSB HF radio and RADFAX decoder. *** "SATFAX" $45.00, is a NOAA, Meteor and GMS weather satellite picture receiving program. Needs EGA or VGA & WEATHER FAX PC card, + 137 MHz Receiver. *** "MAXISAT" $75.00 is similar to SATFAX but needs 2 MB of expanded memory (EMS 3.6 or 4.0) and 1024 x 768 SVGA card. All programs are on 5.25" or 3.5" disks (state which) plus documentation, add $3.00 postage. ONLY from M Delahuntly, 42 Villiers St, New Farm QLD 4005. Ph (07) 358 2785.

● HAM LOG v3.1 — Acclaimed internationally as the best IBM logging program. Review samples....AR: "Recommend it to anyone"; The Canadian Amateur: "Beyond this reviewer's ability to do it justice. I cannot find anything to improve on. A breakthrough of computer technology". ARA: "Brilliant". Simple to use with full help, the professional HAM LOG is immensely popular (now in its fifth year), with many useful, superb features. Just $59 (+ $5 P & P), with a 90 page manual. Special five hour Internet offer. Demos, brochures available. Robin Gandevia VK2VN (02) 369 2008 BH fax (02) 369 3069.

Internet address rhg@ozemail.com.au.

● PACKET HARDWARE — PACCOM TNCs, Tiny 2 Mark II ($290) and TNC320 dual port ($375), CASSPAK 1200 low-cost modems, fully built and tested ($85) runs with TPK, BayCom, etc, BAYMOD 9600 baud modem ($200). All prices for hardware include P & P. REGISTERED SOFTWARE — paKet 6.1 TNC terminal program ($30), with manual ($55) includes P & P. BAYCOM 1.6, a TNC emulation program with manual ($35) includes P & P. SHAREWARE — TPK 1.82, Superpacket 6.10, PKTWin 2.1, JNOS 1.10L, TNOS 2.01, WINPACK 4.0, FBB 5.15 & BPQ 4.08, NOSview 304, Compress Utilities 3, F-PROT 2.18a and other shareware titles available for $5 each plus $2 P & P. BAYCOM USCC4 (Universal Synchronous Communications Controller) internal PC plug-in communications card with up to four packet modems. Basic card with no modems installed $250. 1200 baud TCM 3105 modem $105, 3001/1200 baud 7911 modem $150, 9600 baud DF91C modem (G3RUH compatible) $205. Card with these three modems installed $630. Requires BayCom 1.6 or BPQ 4.08 as driver. Send SASE for complete price list or membership details to AAPRA, VK2IN @ VK2DAA or QTHR or (02) 489 4393.

FOR SALE NSW

● SULLIVAN precision oscillator 0-12 kHz used 1930s to calibrate xtals, rack mtd, spare valves. Three home brew generators, dot and cross hatch, TV sweep, R/C bridge. $ zero. Thorn Industrial Vidicon camera, lens f1.9, 25 mm, 3 spare vidicons, $50. Arthur VK2IK QTHR (02) 876 1465.

● RACAL COMMS Rx eqpt, RA17L 0.5 to 30 MHz, ISB adaptor, original bench cases, handbooks, exc cond, $600 ono. Brian VK2GCE QTHR (02) 545 2650.

● YAESU FT707 HF mobile transceiver with CW filter, $650; YAESU FP707 power supply, $350; WERNER Wulf 6 el 6 m beam, $80; ATN 11 el 2 m beam, $50; ATN 14 el 70 cm beam, $60; KLM 6 el 70 cm x 2, $20; KR400 Azimuth Rotator, $300; CHIRNSIDE 2 m Ringo Ranger, $50; DICK Smith 2 m base vertical, $30; MARCONI 10-300 MHz calibrated signal generator (circa 1953), $200. Steve VK2ZSC QTHR (02) 626 7667 after 6.30 pm EDST.

● STANDARD nicad battery pack CNB161 700 mAh for Standard C168 (2 m) and C468 (70 cm) handheld transceivers, good condition, $60; SCANNER PRO 2022 210 channel desktop, mobile, mains + 12 V, in original packing, as new, cost $550, sell $300. Brad VK2KQH day (02) 9906 5855, otherwise (018) 640 377.

FOR SALE VIC

● KENWOOD TM-241A, 50 W, 2 m FM transceiver, as new, little used, $495 ono; ICOM IC-28A 2 m transceiver, 25 W, ec, $375 ono; both rigs complete with manuals, mobile mounts, mics and cables. Bill VK3BR, QTHR, 9584, 9512.

● KENWOOD TS850S s/n 31200069 with in-built ATU, one year old, in vgc, $3300; KENWOOD PS52 s/n 30800304 power supply, one year old, in vgc, $437. Jim VK3NR (03) 9367 6920.

● ICOM 735 with CW filter, $980; KENWOOD TS680S with DSE 100 W 50 MHz linear, $1250. Ray VK3LK (055) 29 2267.

● DECEASED ESTATE Ex VK3PZ. Very well constructed 40 metre mobile whip antenna, $15. Ivor VK3XB QTHR (03) 9795 6229.

● ANDREWS 6' diameter spun aluminium dishes, very shallow dishes, can arrange delivery depending on location, $250; PHILIPS FM92 E band converted to 70 cm, 99 channels converted, $300 each, remote control version, at least 25 watt output; AWA RT85 UHF remote control radios, 64 channels, converted to 70 cm 25 watt output minimum, $250; KENWOOD TM2570 144-148 MHz transceiver, 60 watts output, mounting cradle, handbook, $350; YAESU FT77 HF radio complete with FP700 20 amp power supply, FC700 antenna tuner, all in good condition complete with manuals, tranceiver has new WARC bands, 100 watt output, $800 the lot, will not separate; ICOM desktop battery charger, h/h stolen so no need, $80. Graeme VK3MIL (053) 36 1520 or (03) 752 3500.

FOR SALE QLD

● KENWOOD TS830S HF transceiver s/n 2031326, $800; KENWOOD TS130S HF transceiver s/n 1040723, $600; KENWOOD MC50 desk microphone, $50; REALISTIC HTX100 10 m transceiver s/n 95000428, $250; VICOM noise cancelling microphone, $20. Barri VK4JBJ QTHR (07) 3209 3372.

● ICOM IC-720A txcvr includes general coverage Rx, purchased Daycom 1995, includes manual, $700 or swap Tentec Century 21 CW txcvr and cash difference; SWAN 350 txcvr, vgc with vox and manual, $240. "Doc" VK4CMY (076) 85 2167 AH.

● VALVES for amateurs and restorers, octals, novals, ceramic sockets, 6146, 807, 6V6, rectifiers, regulators, valves for QRP circuits, high watt wirewound resistors, mobile rack MB100 for Kenwood 130S. Send SASE for list. Ted VK4YG QTHR (070) 97 6387.

● SHACK Clearance estate, 97 Jubilee Terrace, Bardon Sundays 9-5. Generator 120 V 1500 W, pump, spot welder, PSUs, transformers 285-1500 V, DC/AC meters, Tx caps, resistors 5 W, caps ceramic poly electro, books, manuals, no valves. Peter VK4APD (07) 3397 3751 AH.

● YAESU FT757GXII HF xcvr s/n IL590069, as new in ctn, PC $1250. Peter VK4EFX (074) 95 8724.

● ICOM 735 transceiver recently serviced by ICOM, $875. Ted VK4DBL (074) 91 2034.

FOR SALE SA

● SHACK CLEARANCE. Antennas, new and used radio equipment, RF adaptors, RFDS antenna base with spring, much more. All must be sold. Send SASE to PO Box 76, Peterborough SA 5422 or ring for list. Paul VK5MAP (086) 51 2398.

● YAESU FL-110 100 W HF linear amp s/n 060256, suits FT-7, TS120V, etc, $200. Jeff VK5BJF QTHR (08) 8842 2085.

● KENWOOD TR2400 2 m FM transceiver, Kenwood ST-1 base/stand/mains charger. Shure 404C HH-Mic to suit above, instruction manuals/sheets for all above, $300 ono. Jim VK5JI QTHR (08) 295 8094.

FOR SALE WA

● UNIDEN HR10 mobile 10 meter tcvr, 25 W, all mode, digital, VFO/RIT, s/n 05000155, unused and in original packing w/handbook, accessories, include up/down mike, $400 plus P & P. "Beau" VK6COP QTHR (09) 457 8179.

WANTED NSW

● MORSE keys, especially Mecograph or the McDonald Pendograph or any unusual Australian keys or Jiggers. Pay top dollar for any of the above. Steve VK2SPS (02) 9999 2933 after 6 pm.

WANTED VIC

● YAGI beam 15 m/ 10 m, rotor and tower also of interest. Must be light weight. Bendigo area. Bob VK3MRG (054) 39 6314.

● STC 191 UHF carphone. Ian VK3AQU QTHR (057) 51 1631 AH or (057) 52 2713 BH.

WANTED QLD

● TENTEC Century 21 CW txcvr, Heathkit Tx, Rx, txcvr or amplifier for collection, US made HF gear from 1960-70 era for collection. "Doc" VK4CMY Granite Belt Amateur Wireless Group (076) 85 2167.

WANTED WA

● Txcvr FT7, plug in cards, cont unit PB1622, RF marker unit PB1633, and for txcvr FT7B, RFPA 50 W PB1879. John VK6RJ QTHR (091) 92 1161.

MISCELLANEOUS

● THE WIA QSL Collection requires QSLs. All types welcome, especially rare DX pictorial cards, special issue. Please contact Hon Curator Ken Matchett VK3TL, 4 Sunrise Hill Road, Montrose Vic 3765, Tel (03) 728 5350.

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VK QSL Bureaux

The official list of VK QSL Bureaux. All are Inwards and Outwards unless otherwise stated.

VK1	GPO Box 600 Canberra ACT 2601
VK2	PO Box 73 Teralba NSW 2284
VK3	40G Victory Boulevard, Ashburton VIC 3147
VK4	GPO Box 638 Brisbane Qld 4001
VK5	PO Box 10092 Gouger Street Adelaide SA 5001
VK6	GPO Box F319 Perth WA 6001
VK7	GPO Box 371D Hobart Tas 7001
VK8	C/o H G Andersson VK8HA Box 619 Humpty Doo NT 0836
VK9/VK0	C/o Neil Penfold VK6NE 2 Moss Court Kingsley WA 6026

Hamads

Please Note: If you are advertising items For Sale and Wanted please use a separate form for each. Include all details; eg Name, Address, Telephone Number (and STO code), on both forms. Please print copy for your Hamad as clearly as possible.
*Eight lines per issue free to all WIA members, ninth line for name and address
Commercial rates apply for non—members. Please enclose a mailing label from this magazine with your Hamad.
*Deceased Estates: The full Hamad will appear in AR, even if the ad is not fully radio equipment.
*Copy typed or in block letters to PO Box 2175, Caulfield Junction, Vic 3161, by the deadline as indicated on page 1 of each issue.
*QTHR means address is correct as set out in the WIA current Call Book.

*WIA policy recommends that Hamads include the serial number of all equipment offered for sale.
*Please enclose a self addressed stamped envelope if an acknowledgement is required that the Hamad has been received.
Ordinary Hamads submitted from members who are deemed to be in 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: $25.00 for four lines, plus $2.25 per line (or part thereof) Minimum charge — $25.00 pre—payable.

State: .....

Not for publication: ❑ Miscellaneous ❑ For Sale ❑ Wanted

Name:..... Call Sign: ..... Address: .....

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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 advertisers are advised that advertisements containing only a PO Box number as the address cannot be accepted without the addition of the business address of the box-holder or seller of the goods.

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MAIL DISTRIBUTION:

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CONTRIBUTIONS TO *AMATEUR RADIO*

Amateur Radio is a forum for WIA members' amateur radio technical experiments, experiences, opinions and news. Manuscripts with drawings and/or photos are always welcome and will be considered for possible publication. Articles on computer disk are especially welcome. The WIA cannot assume responsibility for loss or damage to any material. "How to Write for Amateur Radio" was published in the August 1992 issue of AR. A photocopy is available on receipt of a stamped, self addressed envelope.

BACK ISSUES

Available only until stocks are exhausted. $4.00 to members, which includes postage within Australia.

PHOTOSTAT COPIES

When back issues are no longer available, photocopies of articles are available to members at $2.50 each (plus $2.00 for each additional issue in which the article appears).

The opinions expressed in this publication do not necessarily reflect the official view of the WIA, and the WIA cannot be held responsible for incorrect information published.

ADVERTISERS INDEX

HOW TO JOIN THE WIA

Fill out the following form and send to:

The Membership Secretary
Wireless Institute of Australia
PO Box 2175
Caulfield Junction, Vic 3161

I wish to obtain further information about the WIA.

Mr, Mrs, Miss, Ms:.....

.....

Call Sign (if applicable):.....

Address:.....

.....

.....

State and Postcode:.....

WIA Morse Practice Transmissions

VK2BWI Nightly at 2000 local on 3550 kHz

VK2RCW Continuous on 3699 kHz and 144.950 MHz 5 wpm, 8 wpm, 12 wpm

VK3COD Nightly (weekdays) at 1030 UTC on 28.340 MHz and 147.425 MHz

VK3RCW Continuous on 144.975 MHz 5 wpm, 10 wpm

VK4WIT Monday at 0930 UTC on 3535 kHz

VK4WSS Tuesday at 0930 UTC on 3535 kHz

VK4WCH Wednesday at 1000 UTC on 3535 kHz

VK4AV Thursday at 0930 UTC on 3535 kHz

VK4WIS Sunday at 0930 UTC on 3535 kHz

VK5AWI Nightly at 2030 local on 3550 kHz

VK5RCW Continuous on 144.975 MHz, 5 wpm to 12 wpm

VK6RCW Continuous on 147.375 MHz, 4 wpm to 11 wpm

VK6WIA Nightly at 1930 local on 146.700 MHz and nightly (except Saturday) at 1200 UTC on 3.555 MHz.

WIA Divisional Bookshops

The following items are available from your Division's Bookshop (see the WIA Division Directory on page 3 for the address of your Division)

	Ref	List Price
ANTENNAS		
Ant Compendium Vol 2 Software 5.25" IBM Disk	BR293	$22.00
Antenna Compendium Vol 1 — ARRL Book	BR163	$26.00
Antenna Compendium Vol 2 — ARRL Book	BR292	$32.00
Antenna Compendium Vol 3 — ARRL Book	BR453	$37.00
Antenna Impedance Matching — ARRL	BR257	$52.00
Antenna Note Book W1FB — ARRL	BR179	$26.00
Antenna Pattern Worksheets Pkt of 10	BR902	$3.00
Easy Up Antennas	MFJ38	$39.25
G-QRP Antenna Handbook — RSGB — 1992 1st Edition	BR452	$22.50
HF Antenna Collection — RSGB	BR391	$44.00
HF Antennas for all Locations — Moxon — 2nd Edition	BR188	$45.00
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Volume 64 No 2

Amateur Radio

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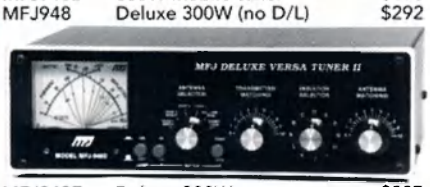

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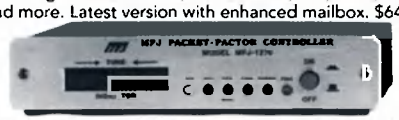

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Taken at the Mount Gambier South East Radio Group Convention, June 1995, this picture represents about 90% of the active 3 cm population in Australia. From left: Chris VK5MC, Alan VK4XPD, David VK5KK, Russell VK3ZQB, Trevor VK5NC, and Roger VK5NY who shares the 3 cm World Distance Record with Wal VK6KZ. All gear, DB6NT narrow-band transverters.

(Photo by Wally VK4DO using VK5NC's camera)

Amateur Radio Service

A radiocommunication service for the purpose of self-training, intercommunication and technical investigation carried out by amateurs, that is, by duly authorised persons interested in radio technique solely with a personal aim and without pecuniary interest.

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Editor's Comment

Apathy?

Page 56 of the December 1995 issue of *Amateur Radio* magazine was wholly occupied by our Readership Survey. The purpose of the survey is to establish how best we can shape **your** magazine to suit **you**, the members of the WIA. We have been rather surprised to find so far (as I write this on 9 January 1996) the response to the survey has only come from about four percent of WIA members.

Thank you to the keen readers who have taken the trouble to respond, but we feel that many more of you would like to help us (and you) by giving us a little more guidance. Probably (what with the holiday season and all!) there just hasn't been time to sit down and concentrate on circling all the points listed. You only need to mark 18 of them but they are chosen from nearly 50.

As I write this, there is still almost a week until the closing date of 14 January arrives. That's not really long enough, is it? So we are going to extend the survey duration by another few weeks, to 28 February.

This is one of those things that only **you** can do. It just won't "be all right on the day if George does it"! Bill and Joe and Ken and Betty can all have a go at it too. Please?

You could win a year's free membership and the magazine will better reflect your ideas about how it should be.

Of course, there is another possible reason for the small response to date. Could it be that you are all so satisfied with *Amateur Radio* as it is, that you don't want to suggest any changes at all? Or are we hopelessly lost in a fog of self-deception?

Dispel the fog and tell us what we need to know. Radio amateurs do have a reputation for being apathetic about many things, but often, once stirred, we leap into belated action. Let's do it!

Bill Rice VK3ABP
Editor
ar

WIA News

Heard Island Update

The aborted 1995 DXpedition to Heard Island (see *WIA News, January*), initially postponed tentatively to November this year, is now targeting a time frame of December 1996 to February 1997.

Recent communication from Peter Casier ON6TT advised the changed time frame. Peter and Bob Schmeider KK6EK have taken over management of the DXpedition from Ralph Fedor K0IR.

A vessel is actively being sought to transport the DXpeditioners and their equipment to and from the island, which lies at 53 degrees S – 75 degrees E, between Perth in Western Australia and Enderby Land in Antarctica. It is near the top of the "most wanted countries" among the world's HF band DXers.

Peter expected the number of amateurs to join the expedition to be settled by the time this is published.

A major goal of the expedition is to implement new techniques for using available high technology to enhance communications from remote sites, to document and monitor local marine life, and to conduct radio propagation experiments.

Apart from working the DX pileups, the expeditioners plan to send data and information from Heard Island via satellite, to be distributed world-wide via the Internet, including daily QSLing. A book, a documentary film and major newspaper and magazine articles are planned as a follow-up to the expedition.

WIA Divisions

The WIA consists of seven autonomous State Divisions. Each member of the WIA is a member of a Division, usually in their residential State or Territory, and each Division looks after amateur radio affairs within its area.

Division	Address	Officers			Weekly News Broadcasts		1996 Fees
VK1	ACT Division GPO Box 600 Canberra ACT 2601	President Secretary Treasurer	Rob Apathy Len Jones Alex Colquitt	VK1KRA VK1NLJ VK1AC	3.570 MHz LSB, 146.900 MHz FM each Wednesday evening commencing at 8.00 pm local time. The broadcast text is available on packet, on Internet aus.radio.amateur.misc newsgroups, and on the VK1 Home Page http://email.nla.gov.au/~cmakin/wiaact.html	(F) (G) (S) (X)	$70.00 $56.00 $42.00
VK2	NSW Division 109 Wigram Street Parramatta NSW (PO Box 1066 Parramatta 2124) Phone (02) 689 2417 Freecall 1800 817 644 Fax (02) 633 1525	President Secretary Treasurer (Office hours e-mail address: wainsw@sydney.dialix.oz.au	Michael Corbin Eric Fossey Eric Van De Weyer Mon-Fri 11.00-14.00 Mon 1900-2100) Sat 1000-1300)	VK2YC VK2EFY VK2KUR	From VK2WI 1.845, 3.595, 7.146*, 10.125, 24.950, 28.320, 29.120, 52.120, 52.525, 144.150, 147.000, 438.525, 1281.750 (*morning only) with relays to some of 14.160, 18.120, 21.170, 584.750 ATV sound. Many country regions relay on 2 m or 70 cm repeaters. Sunday 1000 and 1930. Highlights included in VK2AWX Newcastle news, Monday 1930 on 3.593 plus 10 m, 2m, 70 cm, 23 cm. The broadcast text is available on packet.	(F) (G) (S) (X)	$86.75 $53.40 $38.75
VK3	Victorian Division 40G Victory Boulevard Ashburton Vic 3147 Phone (03) 9885 9261 Fax (03) 9885 9298	President Secretary Treasurer (Office hours	Jim Linton Barry Wilton Rob Hailey Tue & Thur 0830-1530)	VK3PC VK3XV VK3NC	VK3BWI broadcasts on the 1st and 3rd Sunday of the month, starts 10.30 am. Primary frequencies 3.615 LSB, 7.085 LSB, and FM(R)s 146.700 Mt Dandenong, 147.250 Mt Macedon, 147.225 Mt Baw Baw, and 2 m FM(R)s VK3RMA, VK3RSH, VK3ROW. 70 cm FM(R)s VK3ROU and VK3RGL. Major news under call VK3WI on Victorian packet BBS.	(F) (G) (S) (X)	$72.00 $58.00 $44.00
VK4	Queensland Division GPO Box 638 Brisbane QLD 4001 Phone (074) 96 4714	President Secretary Treasurer	Geoff Sanders John Stevens John Presotto	VK4KEL VK4AFS VK4WX	1.825 MHz SSB, 3.605 MHz SSB, 7.118 MHz SSB, 14.342 MHz SSB, 28.400 MHz SSB, 29.220 MHz FM, 52.525 MHz FM, 146.700 MHz FM, 147.000 MHz FM, 438.525 MHz (Brisbane only), regional VHF/UHF repeaters at 0900 hrs Sunday. Repeated on 3.605 MHz SSB & 147.000 MHz FM, regional VHF/UHF repeaters at 1930 hrs EAST Monday. Broadcast news in text form on packet under WIAQ@VKNET.	(F) (G) (S) (X)	$72.00 $58.00 $44.00
VK5	South Australian Division 34 West Thebarton Road Thebarton SA 5031 (GPO Box 1234 Adelaide SA 5001) Phone (08) 352 3428	President Secretary Treasurer	Garry Herden Maurie Hooper Charles McEachern	VK5ZK VK5EA VK5KDK	1827 kHz AM, 3.550 MHz LSB, 7.095 AM, 14.175 USB, 28.470 USB, 53.100 FM, 147.000 FM Adelaide, 146.700 FM Mid North, 146.800 FM Mildura, 146.825 FM Barossa Valley, 146.900 FM South East, 146.925 FM Central North, 147.825 FM Gawler, 438.425 FM Barossa Valley, 438.475 FM Adelaide North, ATV Ch 35 579.250 Adelaide. (NT) 3.555 USB, 7.065 USB, 10.125 USB, 146.700 FM, 0900 hrs Sunday	(F) (G) (S) (X)	$72.00 $58.00 $44.00
VK6	West Australian Division PO Box 10 West Perth WA 6872 Phone (09) 351 8873	President Secretary Treasurer	Cliff Bastin Mark Bastin Bruce Hedland-Thomas	VK6LZ VK6OO	146.700 FM(R) Perth, at 0930 hrs Sunday, relayed on 1.825, 3.560, 7.075, 14.116, 14.175, 21.185, 29.680 FM, 50.150 and 438.525 MHz. Country relays 3.582, 147.350(R) Busselton and 146.900(R) Mt William (Bunbury). Broadcast repeated on 146.700 at 1900 hrs Sunday, relayed on 1.865, 3.563 and 438.525 MHz; country relays on 146.350 and 146.900 MHz.	(F) (G) (S) (X)	$60.75 $48.60 $32.75
VK7	Tasmanian Division 52 Connaught Crescent West Launceston TAS 7250 Phone (003) 31 9608	President Secretary Treasurer	Andrew Dixon Robin Harwood Terry Ives	VK7GL VK7RH VK7ZTI	146.700 MHz FM (VK7RHT) at 0930 hrs Sunday relayed on 147.000 (VK7RAA), 146.725 (VK7RNE), 146.625 (VK7RMD). 3.570, 7.090, 14.130, 52.100, 144.150 (Hobart) Repeated Tues 3.590 at 1930 hrs.	(F) (G) (S) (X)	$72.00 $58.00 $44.00
VK8	(Northern Territory is part of the VK5 Division and relays broadcasts from VK5 as shown received on 14 or 28 MHz).						

Note: All times are local. All frequencies MHz.

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■ Regulations

Understanding Our New Licence Conditions

John Martin VK3KWA, Chairman of the Federal Technical Advisory Committee (FTAC), clarifies the new licence conditions.*

Transmission Modes

1. Introduction

Our new licence conditions are set out in a series of Technical Licence Specifications (TLS) published by the SMA. Since the TLS came into force, there has been a great deal of uncertainty about which modes we are permitted to use.

The mode designations used in the TLS are very precise, but they can also be hard to understand. Each TLS includes an explanation but it can take some thought to translate this into familiar language.

For example, consider the mode 4K00J3E. It means "Using a maximum bandwidth of 4 kHz, amplitude modulation with single sideband and suppressed carrier, the modulating signal being a single channel containing analog information in the form of telephony." It may not be immediately obvious that this refers to plain, everyday SSB.

The following is a description of the mode designators and an explanation of each mode authorised for use by amateur stations. It is not exactly bedtime reading but, hopefully, it will be of help in explaining the regulations in practical terms.

2. Mode Designations

2.1 Bandwidth

The designator begins with (usually) four characters which denote the occupied bandwidth of the signal (referred to in SMA documents as the "necessary bandwidth"). These characters include numbers and the letter "H", "K", or "M", denoting Hertz (Hz), kHz (kilohertz), or MHz (Megahertz). For example, 200H = 200 Hz; 1K12 = 1.12 kHz; and 6M25 = 6.25 MHz.

2.2 Modulation Type

Next follows a letter which denotes the type of modulation. These letters are:

- A Double sideband, full carrier (AM) or suppressed carrier (DSB).
- C Vestigial sideband (an AM signal with one sideband occupying much less bandwidth than the other).
- J Single sideband, suppressed carrier ("normal" SSB transmission).
- H Single sideband, full carrier.
- R Single sideband, reduced or variable carrier.
- B Independent sideband (ie two sidebands containing different modulating information).
- F Frequency modulation.
- G Phase modulation.
- P Pulse modulation.

2.3 Nature of Modulating Signal

The next symbol is a number which refers to the type of signal which is used to modulate the carrier:

- 0 No modulation.
- 1 Single channel, quantised or digital information, no subcarrier. (This includes CW or digital data transmitted by on-off keying or frequency shift keying of the carrier).
- 2 Single channel, quantised or digital information, using a subcarrier. (This includes RTTY or packet transmission using a frequency shifted audio tone from a TNC).
- 3 Single channel, analog information. (Analog information includes all speech and video modes).
- 8 Two or more channels, analog information.

2.4 Type of Modulating Information

The next symbol is a letter which describes the modulating signal:

- N No information.
- A Telegraphy (Morse keying), for aural reception.
- B Telegraphy, for automatic reception (eg by computer).
- C Facsimile (fax).
- D Data, telemetry, telecommand. (This includes amateur digital modes such as RTTY and packet.)
- E Telephony (speech).
- F Television (fast scan or SSTV).
- W Combination of any of the above.

2.5 Supplementary Symbols

The mode designation described above may be followed by an extra symbol:

- K Commercial quality sound with the use of frequency inversion or band splitting.
- M Monochrome.
- N Colour.

A final letter can be added to denote the type of multiplexing used – usually "N" (no multiplexing).

2.6 Summary

The easiest way to understand these designations is to leave out the initial bandwidth characters, and any supplementary characters, and concentrate on the three main characters – A1A, J3E, F2D, etc. These can be put in a table as follows:

First Character Type of Transmitter Information		Second Character Type of Modulation		Third Character Modulating	
A	AM or CW	**1**	Direct keying	**A, B**	Morse
J,H,R	SSB	**2**	Keyed or shifted tone	**C**	Fax
F,G	FM	**3**	Voice, video etc.	**D**	Data
B	ISB	**8**	2 or more channels	**E**	Voice
C	VSB			**F**	ATV, SSTV
P	Pulse				

Note that J, H and R all refer to SSB, but in practice we are only interested in the J modes (SSB with suppressed carrier). G (phase modulation) is treated as FM because the two modes are very similar. Many amateur "FM" radios actually use phase modulation.

To get all the possible combinations, we would need a three-dimensional spreadsheet. In practice, some combinations are not possible. For example, J1 mode would be on-off keying of a suppressed carrier – zero transmitter output no matter what you did!

Other combinations are possible but are not used. For example, vestigial sideband (VSB) is only used for ATV (C3F). C3E would be an AM voice transmission with one sideband occupying less bandwidth than the other – it could be done, but no-one would bother.

Other modes – such as ISB and pulse – are not generally used by amateurs due to lack of suitable equipment.

3. Necessary Bandwidths

Looking now at permitted bandwidths, you will see that there are several standard bandwidth limits. For example, the permitted bandwidth for CW is given as 200 Hz (200HA1A). In theory, a CW carrier occupies no bandwidth at all, but sidebands are produced when it is keyed. The 200 Hz bandwidth is quite adequate for even the fastest keying. If a CW station occupies more than 200 Hz it is usually due to equipment faults such as key clicks.

The bandwidth limit for FSK modes is 1.12 kHz. As with CW, the bandwidth of an FSK signal is determined by the amount of frequency shift and the data rate.

There are several different bandwidth limits for voice modes. The limit for SSB is 4 kHz, which should be no problem because most SSB transmitters use filters with bandwidths of around 2.4 kHz. This, of course, assumes that the transmitter is properly adjusted and is not being driven into distortion – if it is, the transmitted signal can finish up occupying far more than the nominal 2.4 kHz bandwidth.

The bandwidth limit for AM is 6 kHz, ie a maximum audio bandwidth of 3 kHz in each sideband. The audio response of the modulator therefore needs to cut off above 3 kHz. For FM, the limit is 6 kHz on bands below 29 MHz, and 16 kHz above 29 MHz. Note that the FM bandwidth of most HF radios is far more than 6 kHz, therefore they cannot be used legally for FM below 29 MHz.

For other modes, the bandwidth limits are described in the following section.

4. Permitted Modes

Now to a detailed description of each mode. The following list includes all of the modes permitted for amateur use on bands below 30 MHz.

4.1 1A / 1B Modes: CW Transmission

All 1A and 1B modes use a single carrier which is either keyed on and off (A1) or shifted back and forth between two frequencies (F1).

200HA1A On-off keyed CW. Conventional Morse transmission, also known as ICW (Interrupted Continuous Wave). The carrier is keyed on and off by a hand key or keyer. Bandwidth is determined by the keying rate, maximum permitted bandwidth 200 Hz.

200HA1B As above, for automatic reception. Applicable to high-speed machine-sent CW for reception by a computer.

1K12F1 A Frequency Shift Keying (FSK). Keying causes the carrier frequency to shift up or down. Bandwidth is determined by the shift and the keying rate, maximum permitted bandwidth 1.12 kHz. This mode is used by some propagation beacons because the carrier remains on air continuously. All normal amateur CW operation is A1A. Most transceivers do not have facilities for FSK keying.

1K12FIB As above, for automatic reception.

1K12G1B As above, but using phase shift keying.

4.2 2A / 2B Modes: Tone Modulated CW Transmission

With all 2A and 2B modes, the transmitter is modulated by a subcarrier or audio tone which is fed into the microphone input. Keying is applied to this tone rather than to the carrier. If the tone is keyed on and off, the mode is referred to as MCW (Modulated CW). If the keying causes a shift in the tone frequency, it is called AFSK (Audio Frequency Shift Keying).

6K00A2A MCW (Modulated CW) – AM transmitter. An AM transmitter modulated by an audio tone which is keyed on and off by a Morse key or keyer. Bandwidth is twice the highest tone frequency, maximum 6 kHz. Not normally used by amateurs. Time "pips" sent by WWV or broadcast stations are MCW.

6K00A2B As above, for automatic reception.

6K00F2A MCW (Modulated CW) – FM transmitter. An FM transmitter modulated by a keyed audio tone, as for A2A. Bandwidth is roughly the amount of frequency deviation plus twice the highest modulating frequency; maximum permitted below 30 MHz is 6 kHz. Not normally used on HF, but Morse practice beacons on VHF FM channels use F2A with a bandwidth of about 16 kHz.

6K00F2B As above, but for automatic reception.

6K00G2A As above, but using phase shift keying.

6K00G2B As above, but for automatic reception.

4.3 1D / 2D Modes: Digital Data

The 1D and 2D modes are the digital equivalents of 1A and 2A described above, except that the modulating signal is digital data – from a computer, terminal unit or TNC – rather than Morse keying. With the 1D modes, the carrier is keyed directly. With the 2D modes, the keying is applied to a tone generator which in turn modulates the transmitter.

1K12F1D Frequency shift keying. Digital data causes the carrier frequency to shift up or down. Bandwidth is determined by the frequency shift and the keying rate, maximum permitted bandwidth 1.12 kHz. As used for amateur RTTY, packet and other digital modes on HF, the most common shifts being 170 Hz and 850 Hz. Most transmitters cannot generate FSK as such – some have data input sockets but these are usually audio rather than digital inputs. See J2D below.

1K12G1D As above, but using phase shift keying.

1K12J2D Tone Modulated SSB transmitter. An SSB transmitter modulated by a keyed or frequency shifted audio tone from an RTTY terminal unit or a packet TNC. The tone is fed into the microphone socket, although some radios have a separate rear panel socket for AFSK tone input. Bandwidth is determined by the amount of frequency shift and the data rate, maximum bandwidth 1.12 kHz. The normal method used to generate FSK signals on HF without the need to apply direct FSK keying to the carrier oscillator. Because the carrier is suppressed, the output of the transmitter is effectively a single frequency shifted carrier and is indistinguishable from F1D mode.

6K00A2D Tone Modulated AM transmitter. An AM transmitter modulated by an audio tone which is keyed by digital data. Not normally used by amateurs.

6K00F2D Tone Modulated FM transmitter. An FM transmitter modulated by an audio tone from an RTTY terminal unit or packet TNC. Bandwidth is the amount of deviation plus twice the highest tone frequency, maximum 6 kHz below 29 MHz. Not used on HF because F1D or J2D are far more efficient. Most HF transceivers in FM mode produce far more than the 6 kHz maximum bandwidth and will not be legal below 29 MHz. With tone frequencies up to 2 kHz, even a deviation of +/- 2.5 kHz will produce an occupied bandwidth of about 9 kHz. Wider bandwidths are permitted above 30 MHz and F2D is normally used for RTTY and packet operation on VHF FM channels.

6K00G2D As above, but using phase modulation.

1K12F2D Included in this list because it appears in the SMA licence conditions, but it appears to be a misprint for either 1K12F1D or 6K00F2D. Application of digitally keyed audio tones to an FM transmitter would result in a bandwidth far greater than 1.12 kHz.

4.4 3E Modes: Voice Transmission

The 3E modes are the modes used for speech.

8K00A3E Standard AM (double sideband with full carrier) or DSB (double sideband suppressed carrier) voice transmission. Bandwidth is twice the highest modulating frequency, maximum 8 kHz, (maximum modulating frequency 4 kHz).

4K00A3EKN As above, for narrow band voice modulation (NBVM).

4K00J3E SSB suppressed carrier voice transmission. Bandwidth is usually less than 3 kHz, maximum permitted 4 kHz.

2K00J3EKN As above, for narrow band voice modulation (NBVM).

4K00R3E Single sideband with reduced carrier. Not normally used by anyone – except that, unless an SSB transmitter has infinite carrier suppression, most SSB signals are really "reduced carrier" and not "suppressed carrier".

2K00R3EKN As above, for narrow band voice modulation (NBVM).

4K00H3E Single sideband full carrier transmission. Compatible with normal AM receivers and used by some short-wave broadcasters to reduce adjacent channel interference. No intentional use on amateur bands. Some amateur transceivers, when AM mode is selected, produce H3E rather than standard DSB AM (A3E).

2K00H3EKN As above, for narrow band voice modulation (NBVM).

6K00F3E FM voice transmission. Bandwidth is roughly the deviation plus twice the highest modulating frequency. Most multimode HF radios occupy far more than 6 kHz bandwidth in FM mode and cannot, therefore, be used legally for FM below 29 MHz. See comments on F2D above.

6K00G3E As above but using phase modulation.

16K0F3E FM voice, maximum bandwidth 16 kHz. May be used only on bands above 29 MHz.

16K0G3E As above but using phase modulation.

4.5 3C Modes: Facsimile Transmission

The "3C" modes use analog modulating information in the form of picture information rather than speech. The modulating signal is normally an audio tone, or subcarrier, which is modulated by the video information. As with voice modes, the letter "A", "J", "F", etc indicates the type of transmitter the modulation is applied to.

6K00A3C An AM transmitter modulated by picture information. Not generally used by amateur stations.

3K00J3C An SSB transmitter modulated by picture information. Commonly used for amateur fax transmissions on all bands.

3K00R3C As above but with reduced rather than suppressed carrier.

3K00H3C As above but with full carrier.

6K00F3C An FM *transmitter* modulated by picture information. Not used on HF, but commonly used with up to 16 kHz bandwidth (16K0F3C) for amateur fax transmissions on VHF FM channels.

6K00G3C As above but using phase modulation.

4.6 3F Modes: Television

The "3F" modes use analog modulation in the form of television

signals. This group of modes includes narrow band or slow scan television as well as fast scan television. For slow scan television, the modulating signal is normally an audio tone, or subcarrier, which is modulated by the video information.

6K00A3F AM transmitter modulated by video information.

3K00J3F SSB transmitter modulated by video information.

6K00F3F FM transmitter modulated by video information.

6K00G3F PM (phase modulated) transmitter modulated by video information.

4.7 B8 Modes: Independent Sideband

The initial letter "B" indicates two independent sidebands, and the "**8**" numeral means a combination of different modes. These modes consist of two sidebands which contain different modulating information, such as two separate voice channels, or a voice channel plus a digital or video channel. Some use on HF by commercial or military services. No known amateur use due to lack of suitable equipment.

8K00B8E Independent sideband signal consisting of two separate voice channels, maximum bandwidth of each channel is 4 kHz.

8K00B8W Independent sideband signal carrying two different types of modulating signal, eg voice in one sideband and a fax image in the other.

5. Modes Available Above 30 MHz

On bands below 30 MHz, all amateur stations are restricted to the modes listed in their TLS. The same applies to Novice, and Novice Limited, stations above 30 MHz.

For other licence classes, the TLS does not contain a list of permitted modes for bands above 30 MHz. This means that any modes may be used, unless the TLS specifically states otherwise. For Unrestricted, Intermediate and Limited licensees, there are only two mode restrictions above 30 MHz. One is the restrictions applying in the 50 MHz DX window in the eastern states. The other is the requirement that wideband modes (pulse, fast-scan television, spread spectrum, etc) are not permitted below 420 MHz. Stations using wideband modes may not cause interference to other services or inhibit other amateur licensees from using the band.

Examples of modes available on 420 MHz and above include the following:

5.1 3F Modes: Fast Scan Television

12M50A3F AM television with both sidebands transmitted. Bandwidth of each video sideband is usually about 5 MHz, but total occupied bandwidth also includes twice the bandwidth and frequency of any audio subcarriers. The letters "M" or "N" could be added to the designator to specify monochrome or colour.

6M25C3F 6.25 MHz maximum bandwidth, AM television with vestigial sideband. One sideband (about 5 MHz wide) is transmitted intact and the other (vestigial) sideband has its bandwidth reduced, normally to about 1.25 MHz, in order to save spectrum space. Used by TV broadcasters and the normal mode for amateur AM ATV.

18M0F3F 18 MHz maximum bandwidth, FM television. Actual bandwidth is determined by deviation, video bandwidth, and the frequency and bandwidth of any audio subcarriers.

5.2 P Modes: Pulse Modulation

Pulse modulated signals consist of a carrier which is keyed on and off by square wave pulses. Bandwidth depends on the pulse rise time and repetition rate and is usually very large. Used mainly by radars or ionosondes, but has also been used in the past by amateurs on microwave bands. An example would be 1M00P0N (1 MHz maximum bandwidth, unmodulated series of pulses). Other combinations are possible, for example P2A (tone modulated pulse), P3E (voice modulated pulse), or P3F (video modulated pulse).

6. Some Common Questions

Q. *Can I use a mode that is not listed in the TLS?*

A. You must observe any restric-

tions specifically stated in the TLS, but otherwise you can assume that anything is legal unless the TLS states otherwise.

If you hold a Novice or Novice Limited licence, the TLS includes a list of permitted modes for each band, so you can only use modes that are included in the list. Note that the permitted modes are not the same for each band.

For Unrestricted, Intermediate and Limited licensees, the TLS includes mode restrictions on bands below 30 MHz, and in the 50 – 52 MHz band in the eastern states. On higher bands there is no list of permitted modes, so this means that you can use any mode. The only restriction is the one on wideband modes mentioned above.

Q. *Can I use any authorised mode on any frequency within my allocated bands?*

A. According to the regulations, yes. But you need to be careful to avoid interfering with other stations. For example, it is anti-social to use modes like AM or FM in crowded HF bands, when SSB would do a better job and take up much less band space.

It is also a good idea to check the *Australian Amateur Band Plans* to see which band segments are recommended for different modes. On the HF bands, some band segments are reserved for CW or digital modes only, and you will not be popular if you use SSB there. Likewise the reverse.

On the VHF bands, some band segments are reserved for weak signal work, beacons, satellites and so on, and strong local signals (especially FM) in these band segments are bad news.

The SMA regulations do not require you to follow the band plans but it makes sense to avoid causing interference to fellow amateurs – just as you would expect other amateurs to avoid causing interference to you. Copies of the band plans are included in the Call Book and are also available from the WIA. They are also being published in *Radio and Communications.*

Q. *Can I use FM on frequencies below 29 MHz?*

A. Yes and no. You can if your transmitted bandwidth is no more than 6 kHz, but virtually all HF transceivers occupy bandwidths far greater than 6 kHz in FM mode and would need modification to make them legal below 29 MHz. Some radios have preset deviation controls and will have to be opened up to make the adjustment. If you reduce your FM bandwidth to make it legal below 29 MHz, it will be too narrow for normal operation on 29 MHz simplex or repeater channels. The best solution is to use FM only above 29 MHz, where you can be sure that your transmission is legal.

There is no good reason for using a wider bandwidth than necessary on crowded HF bands. Apart from 29 MHz repeaters, FM on the HF bands has mainly curiosity or nuisance value.

Q. *But the specs of my HF radio give an FM deviation of +/- 2.5 kHz – that makes 5 kHz.*

A. Yes, but deviation is not the same as bandwidth. With FM, your bandwidth depends on your modulation index and the bandwidth of the modulating signal, and whether your radio uses frequency or phase modulation. As a rough guide, your bandwidth will be equal to your deviation plus twice the highest modulating frequency. Therefore, a deviation of +/- 5 kHz, and a voice passband of 3 kHz, usually means about 16 kHz bandwidth.

If you are unsure of your transmitted bandwidth on FM, check the receiver bandwidth specification in your radio's instruction manual. You can assume that your transmitted bandwidth will be about the same as the -6 dB bandwidth of your FM receive filter. For most HF radios, this figure is between 12 and 15 kHz – not legal below 29 MHz.

Q. *How close to the band edges can I operate?*

A. According to the regulations, your occupied bandwidth must be "wholly contained" within the band limits. You need to know what your occupied bandwidth is, so you can choose a frequency far enough away from the band edge. This depends on the mode.

For CW, assume that you occupy the maximum permitted bandwidth of 200 Hz. Half of this bandwidth is on either side of your nominal frequency, therefore you should operate at least 100 Hz away from the band edge.

For SSB, assume that your occupied bandwidth extends 3 kHz above your suppressed carrier frequency (for USB), or 3 kHz below it (for LSB). This means that for USB, you must keep at least 3 kHz below the upper band edge, and for LSB you must keep at least 3 kHz above the lower band edge.

Examples: The 15 metre Novice band extends to 21300 kHz, therefore, using USB, you can go no higher than a suppressed carrier frequency of 21297 kHz. The 80 metre DX window extends down to 3795 kHz, therefore, using LSB, you cannot go below a carrier frequency of 3798 kHz.

For AM or FM, half of your bandwidth is on either side of your carrier frequency, so you must keep within the band by at least that much. For example, using 16 kHz bandwidth FM, a Novice station could operate as low as 146.008 kHz, but any lower would place part of his signal outside the 146 – 148 MHz band. In practice you should allow a little more leeway than this, because your peak deviation may be greater than you think.

With any mode, you also need to allow some extra leeway to take care of any frequency setting errors or any inaccuracy in your frequency readout.

Q. *Can I be sure that I am actually transmitting on the exact frequency shown on my readout?*

A. No! There may be some error in your readout due to one or more of your oscillators not being exactly on frequency. Remember also that your readout only shows a single frequency, but your actual occupied bandwidth extends above and/or below that frequency.

In CW mode, it is quite common for the readouts of amateur transceivers to shift by about 800 Hz. This means

that the indicated frequency will only be correct if you tune the other station for an 800 Hz beat note. If in doubt, try zero beating VNG or WWV in SSB mode, then switch to CW and see what happens to your readout and to the pitch of the received signal.

In SSB mode, most modern radios indicate the suppressed carrier frequency. But many older radios have a dial marker which shows the passband centre frequency instead. If you have one of these radios, you have to remember that your occupied bandwidth will extend about 1.5 kHz either side of the indicated frequency.

All this may seem confusing but there is no problem provided you understand the characteristics of the radio you are using. If in doubt, check your radio with a frequency counter or ask for an on-air check with another station.

Q. *Which is the right mode to use for RTTY or packet?*

A. On HF and 50 MHz, all amateur operation is FSK; no-one uses AM or FM. Some radios allow direct FSK (F1D), but with most the only way is to use J2D mode by feeding the TU or TNC into the microphone socket (or data input socket, if there is one). FSK can also be used on 2 metres and higher bands, but most digital operation is on FM channels using F2D mode.

Q. *What is the situation with regard to avoiding the use of certain frequencies?*

A. The old RIB71 listed three frequencies that we must avoid: 1870 +/- 4 kHz; 3794 – 3795 kHz; and 10.1415 MHz +/- 4 kHz. These restrictions have been omitted from the latest TLS but the SMA has advised that this was an oversight which will be corrected. Therefore, these frequencies should still be avoided.

Q. *Are there any other regulations in addition to what is in the TLS?*

A. Yes. All amateur stations must also abide by the General Conditions for amateur stations set out in the Radio Regulations. These regulations include conditions relating to the control of the station; the requirement to identify every ten minutes; and restrictions on retransmissions of other stations.

All of these regulations are much the same as in the previous RIB71. If you contact your local SMA office and ask for a copy of the regulations, make sure you ask for the General Conditions as well as the relevant TLS.

7. Conclusion

I hope this article may clear up any questions that readers may have had about which modes are legal. It may be possible to do a follow-up article on any grey areas that I have not covered properly, or on other aspects of the regulations. It's up to you! If you are interested in ploughing through more articles like this one, please let me know and I will see what I can do.

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WIA NEWS

When a Tower Ain't a Tower

Antenna towers in the suburbs, as every amateur knows, attract controversy more frequently than lightning. Municipal councils everywhere regard them as egregious erections, no matter whether the council's on the tower proposers' or the objectors' side. Egregious has two meanings: extraordinarily bad, even flagrant, on the one hand, and distinguished or eminent, as in standing out from the herd, on the other hand. Do you see the point?

In Sydney, it seems Kuringai Council takes the first view, while Blacktown Council is reported to hold the second view.

Two recent antenna tower applications overcame planning objections in their respective localities with a little lateral thinking, from which amateurs everywhere might take good example.

Kirklees Council, in Britain, refused permission for an amateur in Spenborough to erect an 18 metre (60 ft) high antenna tower in his own backyard. But the amateur remained undaunted. He did his homework (an essential exercise when it comes to tower installations).

Poring over the local planning regulations, he discovered that he could build his tower, so long as it didn't touch the ground. A bit of a problem with an 18 m tower. But amateur ingenuity will out, and so he put a retractable tower on his Land Rover, which he parked in his driveway, and his DX beam antennas went on top.

The neighbours were reportedly furious, but Kirklees Council found they were powerless to move against the amateur. The neighbours reportedly demanded council tax reductions to put up with the "eyesore".

Meanwhile, closer to home, Australian telecommunications carrier, Telstra, has been even more ingenious in avoiding objections to an imposing cellular mobile telephone transmission tower planned for a prominent site in the Melbourne suburb of Burwood. The proposed tower, an open-lattice structure standing 34 metres tall (104 ft), will be erected on the corner of Blackburn Road and the Burwood Highway, which is the site of the local Uniting Church. The tower will have a crucifix on top (apart from the 900 MHz mobile phone antennas). The City of Whitehorse approved the design last November.

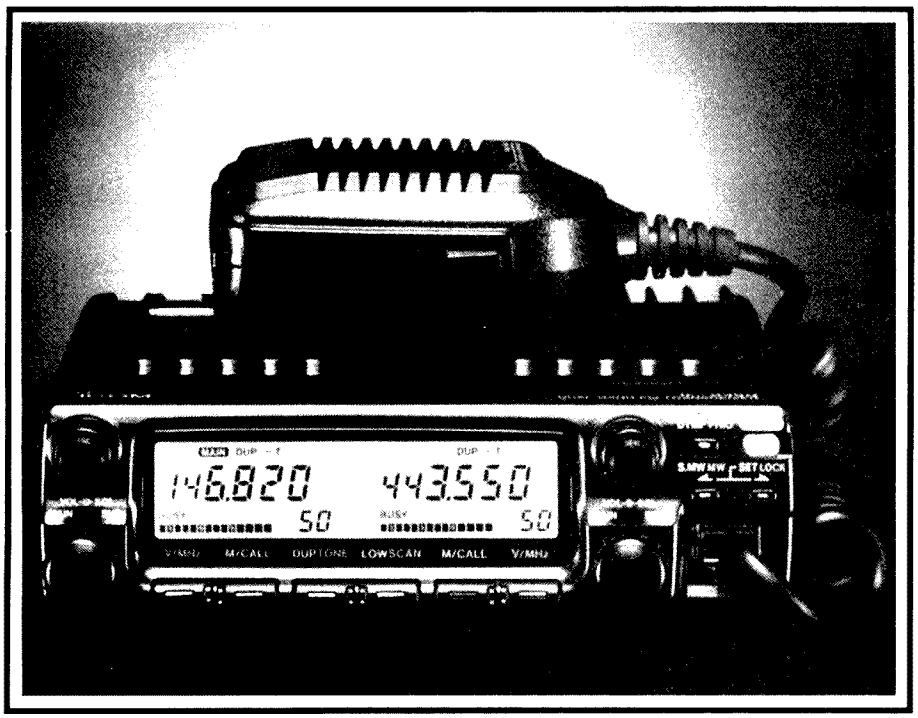
Telstra plans to use the same approach at other sites.

Have you advised the SMA of your new address?

■ Equipment Review

ICOM IC-2350H Dual Band FM Transceiver

*Reviewed by Paul McMahon VK3DIP**



What Is It?

The IC-2350H is a dual band (2 m and 70 cm) FM mobile transceiver, with up to 50 watts of transmit output power on VHF and up to 35 watts of transmit output power on UHF. As received, the review set had wide coverage receive enabled with a 118 MHz - 174 MHz (VHF) and 320 MHz to 479 MHz (UHF) range. UHF also included an extra segment 830 MHz to 950 MHz. The unit is of mid-size (140 x 40 x 204.5 mm) and weight (1.2 kg). The review unit was kindly supplied by ICOM Australia and had the serial number 01906. Retail price is around $1200.

First Impressions

The unit is solidly built and well laid out, with the usual dual symmetrical setup of display and knobs for frequency selection, etc. The microphone connector is, as seems to be becoming standard, one of those pseudo phone connector plastic click-in things. These are very easy to put in, but can be a bit fiddly to take out. I would also have some concern as to how many times you could do this, but I must admit to not having heard too many complaints myself about this sort of connector.

The unit is basic black with a large heat sink at the back and a large easily-read display at the front. Audio quality seems good in subjective on-air tests; and the receiver sensitivity, unlike some of these sets I have tested, seems pretty flat across the ranges covered.

The manual, as per usual these days, could just about have referred to some other radio. No mention is made that the reception below 136 MHz is AM, nor that there is coverage of 830 MHz to 950 MHz. There is definitely an opportunity for some third party to do a better job of a user's guide.

The packaging was the standard styrofoam and cardboard but I was interested to see that the foam seemed to be formed for a slightly different shape set. Perhaps this is another sign of being frugal; or again, perhaps the box, like the manual, was put together before the design of the set was finalised.

Technical Bits

The receive frequency coverage of the review set as measured was 118 MHz - 174 MHz (VHF); and 320 MHz to 479 MHz and 830 MHz to 950 MHz (UHF). The segment 118-136 MHz seems to be basically set up for AM, while all other frequencies are set up for FM. Some mention of this in the manual would have been helpful. At one stage I thought my signal generator was not working properly.

On testing, however, the receiver seems to be very good with only about 8 dB ripple in the sensitivity across the VHF segment. UHF sensitivity also, while not measured directly, seemed to be quite flat, even up in the mobile phone area (the 830-970 MHz range). The transmitter does seem to be as advertised, that is 144-148 MHz and 430-440 MHz.

As usual, no circuit diagram was provided so, again, any real technical details are restricted to what small amount is in the manual and things which I could manage to measure from the outside.

As far as the bits from the manual are concerned we find that it has a dual conversion superhet with a 17.2 MHz and 30.85 MHz first IF on VHF and UHF respectively, with both bands using a 455 kHz second IF. Sensitivity for 12 dB SINAD is claimed as less than 0.16 μV.

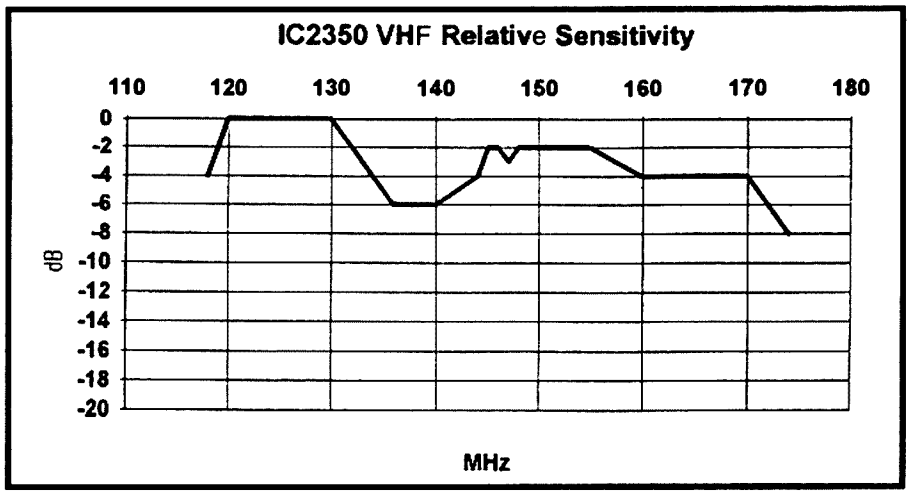


Figure 1

Selectivity is on a par with other like boxes, as is spurious and image rejection.

Audio output is claimed at better than 2.4 watts, and subjectively sounded clear and clean. For the transmitter, the rated power outputs were 50, 10, and 5 watts on VHF and 35, 10, and 5 watts on UHF. Peak current drain at maximum rated power out is given as 11.5 amps at 13.8 volts.

The set has 110 memories shared across the bands (100 normal, two call, and four scan edges), and has selectable tuning step sizes of 5, 10, 12.5, 20, 25, 30, and 50 kHz.

Tests

The results noted below are for the VHF side of the receiver, more because of the available test equipment rather than anything else. I feel, however, that they are probably representative of the UHF band as well, based on "on-air" performance. The apparent fact that the set automatically selects AM for the segment 118-136 MHz was a bit of a surprise, as there was not even a hint of this in the manual. This is, however, a useful thing as this area contains the AM aircraft band.

The VHF receiver performance is shown in Fig 1.

The S meter was fairly linear in its operation, as shown in Fig 2. One strange thing, however, was that while the S meter had 14 little LCD squares, they only seem to come on in pairs. In effect, then, there are only seven segments leading to somewhat less resolution than might have been thought.

Operation

The fan on the back of the heat sink made little noise, and could be set up to be on permanently, or only on transmit, etc if the noise was a problem. In a mobile environment, where the set is intended to be used, it would be pretty hard to notice the fan noise unless you had a very quiet car. The heat sink became warm after some time of continuous use, and the fan is definitely needed.

If this, and similar sets, are mounted in a vehicle, then you really should be careful where you mount them so that they have a good airflow, but remember that heat sinks can be bi-directional. I do, unfortunately, remember the time I mounted one radio in a car in an area with too good an airflow. In winter, during one long drive with the car heater on flat out, I discovered too late that the hot air from the car heater was blowing directly onto the set heat sink. The effect of this was that more heat was being transferred from the surroundings to the finals, than from the finals to the surrounds. The result? Exit stage left one expensive PA module.

As has been said already, the on-air performance was quite good, and the scanning and tuning functions were as you would expect - simple to use and could basically be worked out without recourse to the manual.

Conclusion

This is a fine mobile rig with a good wide-band, though not continuous coverage, receiver. I would be quite happy to have it in my car.

*47 Park Avenue, Wattle Glen VIC 3096

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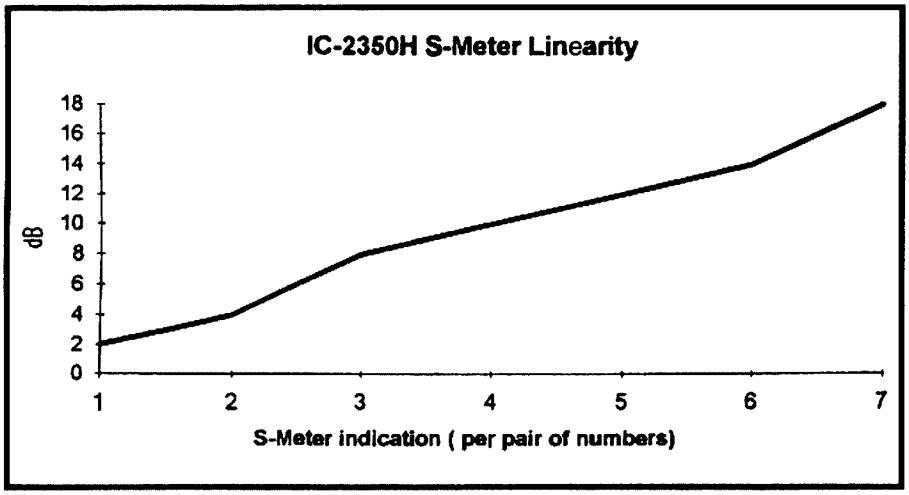

Figure 2

■ History

Television 110 Years Ago!

Who would have thought that TV, in a primitive but feasible form, was first suggested in Australia in 1885? This was only one of many highlights in the life of one of the first Australians to achieve fame in applied science. He was also one of our first radio amateurs. His name was Henry Sutton. This brief summary of Sutton's life is derived from several sources and assembled by the Editor, Bill Rice VK3ABP.

Most of the material in this story comes (with permission) from a regular column by Phillip Adams in *The Bulletin* (the long-established and well-known Sydney news magazine). In the issue dated 9 October 1984, Adams' column is headed "The Aussie Who Really Invented TV". But Adams, in turn, "relies heavily" on a speech to the Melbourne Club in July 1981 by Clive Coogan of the CSIRO. Coogan discovered Sutton accidentally while "browsing in a library in 1980". A copy of the Bulletin article was passed on to *Amateur Radio* by one of Sutton's descendants, Jeff Sutton VK3SJ.

The Sutton family began in Australia with the arrival of Richard Sutton on the Ballarat goldfields in 1853. To quote Phillip Adams, "Seeking amusement in his tent at night, he set about constructing a concertina, a device which had just been invented in England by Charles Wheatstone, the father of the telegraph".

This was the beginning of Sutton's Musical Emporium which traded, in Melbourne and elsewhere, for over one hundred years (but sadly is no longer in the Melbourne telephone directory).

Henry Sutton was born in Ballarat on 3 September 1856. At the age of 12 he appears to have learned all that school could teach him and sought knowledge elsewhere. "By 14 he had read every book on science and engineering in the library of the Mechanic's Institute". Based on this newly-acquired information he built an ornithopter (a wing flapping flying machine), which was successful enough for him to be invited at the age of 21 to address the Aeronautical Society of Great Britain. In the meantime, at 14, he had invented an electric dynamo/motor anticipating the Frenchman, Gramme, whose name is now remembered rather than Sutton's because Sutton could not be bothered with patents!

"Sadly, Edison had invented the same device just 16 days earlier."

To quote further from Adams, "Before he was 25, the young Sutton had invented a new type of lead storage battery, a torpedo, a colour printing process, telegraph facsimile and a method of using gas and water pipes for telegraphic signalling. And working in the isolation of Ballarat, far from the company of other scientists or technicians, completely ignorant of Thomas Edison's work, Sutton invented a carbon filament lamp. Sadly, Edison had invented the same device just 16 days earlier."

A brief account of Alexander Graham Bell's telephone in the *Scientific American* was sufficient to enable Sutton to devise 20 different types of telephone, and to install probably "Australia's first telephone line" between the music emporium and warehouse. "Shortly thereafter Bell visited Ballarat, where he was duly astonished by Sutton's achievements."

By the time Sutton was 30 he had been a lecturer at the Ballarat School of Mines for some years and, to quote from Withers' "History of Ballarat", published in 1887, "won fame as a student and inventor .... acknowledged by Prof Andrews and Mr Ellery as one of the best lecturers." (He taught electricity and magnetism.) Ellery was the Victorian Astronomer Royal.

Further quoting from "History of Ballarat", "Mr Sutton has designed, but not yet constructed, an apparatus by which he hopes to be able to see here in Ballarat, by the aid of electricity, the race for the Melbourne Cup."

A diagram is reproduced here from "The Telegraphic Journal and Electrical Review" of 7 November 1890 showing the basis of his television. The portrait is presumably of Sutton himself. The diagram refers specifically to the use of a Nipkow disc (patented in 1884) for scanning, so Sutton obviously was aware of Nipkow's work, but he predated by three decades the development of mechanically scanned systems by John Logie Baird.

As we now know, Baird's system was rendered obsolete by fully electronic systems, and Sutton's version would have been no more successful. But Baird in the 1920s may well have been influenced by Sutton's publication in 1890. If Baird can be described as the "father of television" then Sutton would have to be one of the grandfathers.

In fact, of course, if any one person could be called "the father of television" in the form in which it finally evolved, it would have been the Russian emigre genius, working first for Westinghouse, then for RCA, Vladimir Kosma Zworykin. But in Sutton's time, Zworykin was decades into the future.

Had Sutton's achievements been no more than those already outlined,

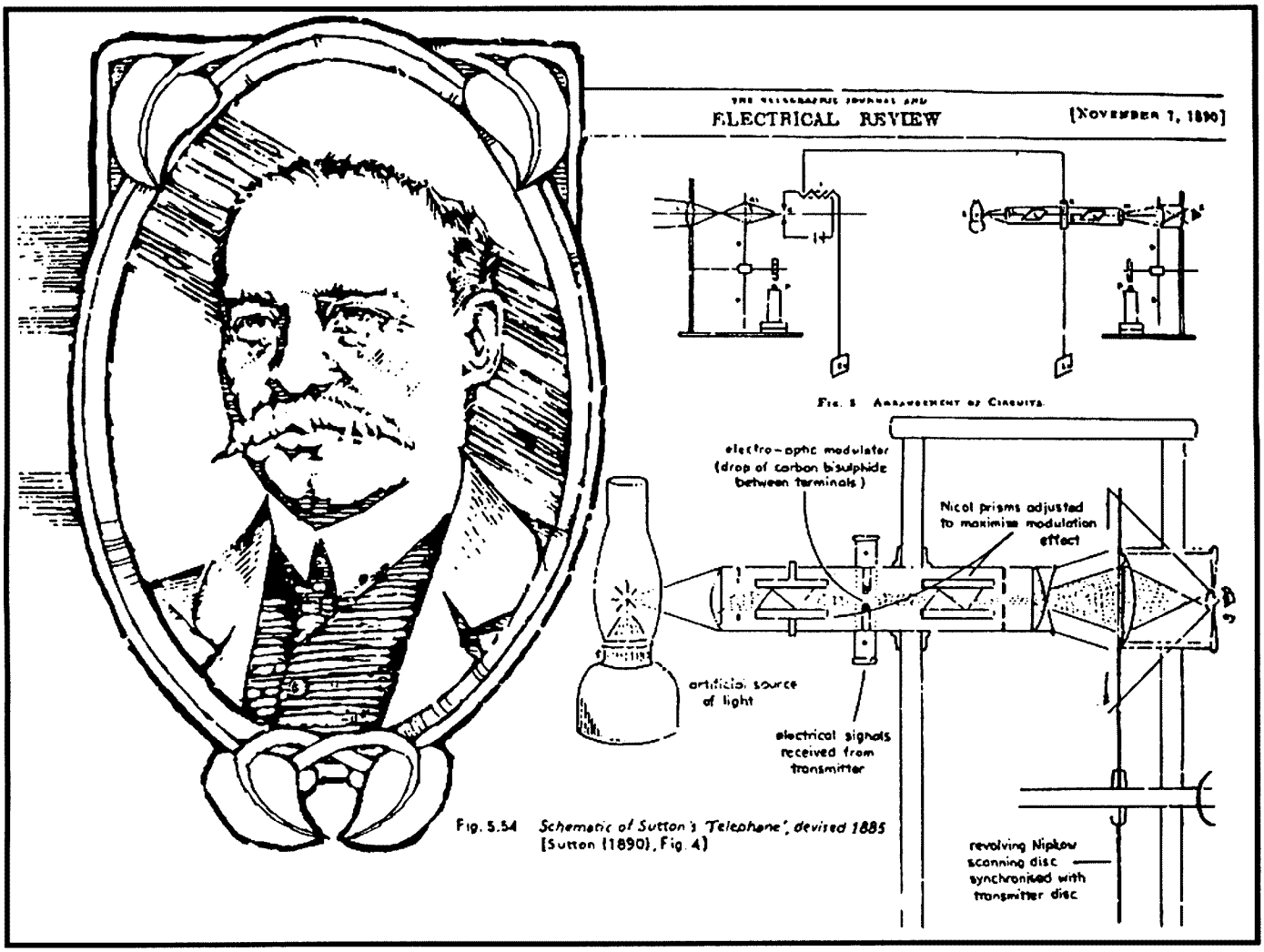

Fig. 5.54 *Schematic of Sutton's 'Telephone', devised 1885* [Sutton (1890), Fig. 4]

they would have been impressive enough. But Adams' column also claims that Sutton built "the first motor car in Australia and then made another .... He made the first triumphal trip by car from Melbourne to Ballarat, escorted by members of the Melbourne Cycle Club. And .... later .... moved a motion at a meeting of automobile amateurs .... which gave rise to the Royal Automobile Club of Victoria."

Sutton is also claimed to have built a portable radio transceiver in 1900 and to have become "one of Australia's first radio hams .... granted a licence by the Commonwealth .... to erect a wireless station at his Malvern home." Apparently he had by then moved from Ballarat to Melbourne (early in the 1900s). He died at the early age of 58 in 1914 (in Ballarat), but is buried in Melbourne at the Brighton Cemetery.

Throughout his life, Sutton seems to have had a genius for applying novel solutions to current problems, mostly based on the knowledge of the day but also adding to it. His 1900 radio was probably similar to the spark and coherer equipment with which Marconi immortalised himself at about the same time.

Everybody has heard of Marconi, but how well known is the name of Henry Sutton?

I must confess, until approached by Jeff Sutton, that I had never heard of Henry Sutton. Yet he is as important to Australian technological history as, for example, Lawrence Hargrave (Sutton's ornithopter preceded Hargrave's box kites by nearly 20 years!)

Perhaps this article may help make better known the achievements of Henry Sutton, one of Australia's unsung geniuses!

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WIA News

New WIA Members

The WIA bids a warm welcome to the following new members who were entered into the WIA Membership Register during the month of December 95.

L30854	MR A RAUS
L30922	MR R HILL
L30923	MR K MCCARTHY
L30924	MR B RICH
VK3ADI	MR D G TURNER
VK3EA	MR R OWEN
VK3HBI	MR R GARDNER
VK3JUV	MR E R SHAW
VK3KTM	MR R G WILKINSON
VK3MRG	MR C R GEORGESON
VK3TOC	MR T ALLEN
VK3XAS	MR A SCOTT

■ Historical

Our Mrs Mac

Christine Taylor VK5CTY, President ALARA, the organisation which carries the flag for all the YLs who followed Mrs Mac into the field of amateur radio.*

Were you or your children or grandchildren among the 6000 people who saw the stage production "Electro Diva"? If so, you know all about Mrs Mac, as many others do through personal experience.

"Electro Diva" was written by Anita Punton for the Arena Theatre Company, and is based on the life of Mrs Florence (Violet) McKenzie VK2GA/2FV who prepared thousands of young men and women to enter the armed services during World War II with skills in radio telegraphy.

Mrs Mac was a remarkable woman who could be said to have been born before her time. She was a fully licensed electrician who clambered over and between the rafters installing house wiring. She was the first woman to hold a Diploma in Electrical Engineering as well as being the first woman in Australia to take out an experimental wireless licence, in 1921, and to pass the amateur examination in 1925. With her background she found the theory easy and developed a lifelong love of Morse Code.

With her husband she ran a radio shop in the Old Royal Arcade in Sydney before WW II. There she not only sold electrical components but was always happy to explain the technicalities and help with circuits or advice on soldering.

However, it was the advent of WW II that led her to foresee the importance communications were going to play in wartime. She set up a "school" in Clarence Street, Sydney to teach Morse code to both men and women.

Mrs Mac in 1924.

Long before any one else, she could see how women could play their part in winning the War. She saw that men could be freed for other duties if women telegraphists were used in their place.

When Billy Hughes and the leaders of the Armed Services were slow to understand, she bombarded them with letters and visits. She was responsible for the formation of the WRANS who served, and serve, our nation so well. She was awarded an OBE for her service to Australia and is commemorated by a stained glass window in the Royal Australian Navy's Garden Island Chapel.

The play "Electro Diva" was performed in the 1995 year of "Australia Remembers" (unfortunately only in VK3) but, as it was taken to many schools after its theatre season, we can be sure that many children were inspired by the lady known to so many servicemen all over Australia as "our Mrs Mac".

*16 Fairmont Avenue, Black Forest SA 5035

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A promotion photo for the play "Electro Diva". *Photo by Ponch Hawkes*

Your Call Sign or Name Can Fly on Phase 3D

AMSAT-UK is sponsoring a program that allows individuals or organisations who make a donation to have their name or callsign engraved onto an aluminium plate and placed on the Phase 3D amateur satellite before it flies – which is not far off!

According to a release from the Radio Society of Great Britain (RSGB), the offer is open to any individual sending at least $US250, or businesses, universities or government agencies sending $US8000.

All methods of payment, including currency, Mastercard, Access and VISA are accepted and will be acknowledged with a receipt. Donations should be sent to R J C Broadbent MBE G3AAJ, Director, Phase 3-D B of D, AMSAT-UK, 94 Herongate Rd, Wanstead Park, London E12 5EQ, ENGLAND.

Ron can be contacted via Internet e-mail at r.broadbent @ee.surrey.ac.uk (Compuserve ID: 100024,614), fax on 44 0181 989 3430, or (last resort) phone on 44 0181 989 6741.

In addition to having funds to complete construction of the Phase 3D satellite, money is also required for use during the life of Phase 3D for command stations around the world, to control the spacecraft for the benefit of all radio amateurs.

As with the present AO-13, command stations normally get funding assistance to a greater or lesser extent by the AMSAT group of the respective country. This is a hidden charge on those groups, which the majority of the world's amateurs rarely think about, let alone subscribing to the AMSAT organisation.

So, act today and your call sign or organisation's name could fly on AMSAT Phase 3D. AMSAT-UK has already paid more than 110,000 pounds towards the Phase 3D satellite, and the RSGB presented AMSAT-UK with a cheque for 25,000 pounds towards the project at the RSGB's Annual Meeting last December. The cheque was accepted by Ron Broadbent MBE G3AAJ.

If AMSAT-UK can raise a similar amount from other sources, the RSGB Council has agreed to make a further contribution of 25,000 pounds. Ron G3AAJ, in thanking the RSGB for its support, said he hoped that AMSAT-UK could double or treble the amount the RSGB had given.

A Decade of Change

The most dramatic changes to amateur radio in Australia came about during the past 12 months, the culmination of a decade of increasing development and pressure for change in licensing, privileges and conditions.

Two new licence grades and improved privileges for existing licence grades came into effect last year with the announcement of the new Technical Licence Specifications (TLSs) for radio amateurs.

The Radiocommunications Act 1983 was reviewed and became the Radiocommunications Act 1992, subsequent to which the Department of Transport and Communications disappeared and the Spectrum Management Agency (SMA) was created in 1993. One of the first major projects of the new Agency was to review Apparatus Licensing. As a result, amateur radio became a single licence type, with seven subtypes. Beacons and repeaters are now formally recognised as a separate licence subtype, with their own licence conditions.

During the past decade, Australian amateurs were allocated five more bands and two existing bands were widened, while last year's changes saw an increase in the international 50 MHz "DX Window" by 100 kHz to 50.0-50.3, increased power for Novices from 30 W to 100 W and 100 kHz more band access on 21 MHz, plus access to 10 m for Limiteds.

While there has been something for everyone in the new licences, privileges and operating conditions introduced last year, license fees jumped from $36 to $51 for individuals, and charges for new beacon and repeater applications were introduced. However, the cost of renewals for some beacon and repeater installations has dropped.

An overview of the licences, privileges and conditions for 1985 can be compared with those as at 1995 in the Table 1. As can be readily seen, 1995 privileges and conditions are significantly improved over those prevailing in 1985! But it didn't all happen at once.

New bands and new limits for existing bands are highlighted in bold type. New band segment allocations or limits are also highlighted in the same way. Note the five new bands in the extra high frequency (EHF) spectrum. These were allocated following a decision of the 1979 World Administrative Radio Conference (WARC-79), but weren't released until after 1985. The 10 cm (3300 MHz) band has been expanded by 100 MHz. Access to the worldwide 50 MHz allocation was returned in 1991, with regional limitations in Ch 0 broadcast areas, to 50.0-50.2 MHz, which was expanded last year.

An entirely new licence, the Novice Limited, arrived with the revised licence privileges and conditions last year. This provides a new "entry level" licence – a so-called "no-code" Novice licence. It simply requires passing the Novice theory and regulations qualifications and provides access to segments of the popular 2 m band, along with 70

LICENCES, PRIVILEGES & CONDITIONS
A DECADE OF CHANGE: 1985-1995

1985 Licence Grades	1985 Bands	1995 Bands	1995 Licence Grades
Full	1800-1875 kHz	1800-1875 kHz	Full
Full	3500-3700	3500-3700	Full & Intermediate
Novice	3525-3625	3525-3625	Novice
Full	3794-3800	3794-3800	Full
"	7000-7300	7000-7300	"
"	10.1-10.15 MHz	10.1-10.15 MHz	"
"	14.0-14.35	14.0-14.35	"
"	18.068-16.168	18.068-18.168	"
"	21.00-21.45	21.00-21.45	Full & Intermediate
Novice	21.125-21.200	21.125-21.300	Novice
Full	24.89-24.99	24.89-24.99	Full
"	28.0-29.7	28.0-29.7	Full & Intermediate
Novice	28.1-28.6	26.1-28.6	Novice
		29.0-29.7	Limited
Full & Limited	52-54	*50-54	Full, Limited & Intermediate
" "	144-148	144-148	Full, Limited & Intermediate
		144.692-145.208	Novice & Novice Limited - digital
		146-148	Novice & Novice Ltd - voice & digital
" "	420-450	420-450	Full, Limited & Intermediate
		433-435 & 438-440	Novice & Novice Ltd - voice & digital
" "	576-585	(576-585)	* permitted use only
" "	1240-1300	1240-1300	Full, Limited & Intermediate
" "	2300-2450	2300-2450	" " " "
" "	3300-3500	3300-3600	" " " "
" "	5650-5850	5650-5850	" " " "
" "	10.0-10.5 GHz	10.0-10.5 GHz	" " " "
" "	24.0-24.25	24.0-24.25	" " " "
		47.0-47.2	" " " "
		75-81	" " " "
		119.98-120.02	" " " "
		142-149	" " " "
		241-250	" " " "

Powers peak	Powers mean	Licence Grades
400	120	Full
100	30	Combined
400	120	Limited
100	30	Novice

Emission Modes >1000	>300	>30 MHz	HF	All	
+1	+13	+9		28	Full
+1	+8	28	6		Combined
+1	+8	28			Limited
			6		Novice

Licence Grades	Powers peak	Powers mean
Full	400	120
Intermediate	400	120
Limited	400	120
Novice	100	30
Novice Limited	~	30

Emission Modes	HF	Special	>30 MHz	>420
Full	40	29 MHz/+2	Any	Any + WB
Intermediate	40	29 MHz/+2	Any	Any + WB
Limited		29 MHz/2	Any	Any + WB
Novice	7	3.5 & 28/+8	2m, 8/10	70cm,10
Novice Limited			2m, 8/10	70cm,10

*50 MHz: limits on frequency, modes and power in some regions

Any: any mode devisable, except wideband
WB: wideband e.g. fast-scan TV, pulse, spread spectrum

Table 1. Licences, Privileges and Conditions – A decade of change: 1985-1995

cm, and allows the use of both voice and what are regarded as the all-important digital modes. This is seen as being particularly attractive to today's young computer technology enthusiasts, as well as those seeking to enter amateur radio but having more of a communications interest.

The old Combined licence, which was for holders of Novice and Limited qualifications, has gone. The new Intermediate licence has replaced it, but with considerably enhanced privileges. Where the old Combined licence simple added Novice privileges to the Limited, and a distinctive call sign suffix (K-calls), the Intermediate licence provides access to the entire 80, 15 and 10 metre bands, with Full-licence powers and privileges. This makes sense, as previously, Combined licensees had the knowledge of Full licensees, without the Morse code qualification, and were unrestricted in modes and powers above 30 MHz, but restricted to the Novice modes and powers on HF.

All licensees now have access to a wide variety of data transmission modes, where a decade ago, only those with Full and Limited qualifications could use data modes, and they were restricted to a defined few modes. While automated reception and transmission of radioteletype (RTTY) was well advanced in 1985, especially with the adaptation of the then-burgeoning personal computers (the "glass teletype"), packet radio was still in relative infancy.

In 1985, operation on the HF bands was restricted to 28 emission modes, which have ballooned to 40 modes today (42 on 10 m). Above 30 MHz, now, amateurs may use any emission mode that may be devised, with the exception of "wideband" modes on 6 and 2 m. In 1985, the modes for all bands were strictly defined. Today, above 420 MHz, any emission mode and modulation method that can be devised may be used (and that includes those "not yet invented"), but wideband signals must remain within the band in use. In other words, "you can do what you like, but keep it in your own backyard." That's a far cry from 1985, and strikes a positive blow for amateur experimentation!

While there has been continuous demand for development and deregulation in amateur radio since privileges were returned 50 years ago following World War 2, the gains made were largely incremental – that is, generally small and one step at a time. Demand for change was given considerable impetus and focus with publication of what became known as the "Linton/Harrison Paper", authored by Jim Linton VK3PC and Roger Harrison (then) VK2ZTB and published exactly 10 years ago. Titled *Amateur Radio, Future Direction,* it appeared simultaneously in *Amateur Radio and Amateur Radio Action.* The authors subsequently won a Higginbotham Award from the WIA Federal Publications Committee.

The paper gained some public coverage in the press ("Paper seeks to revamp amateur radio licences," *The Australian,* 11 February 1986) and sparked a debate within the amateur radio community which continued for many years after publication. The paper highlighted developments in electronics and communications which were then beginning to have some impact on amateur radio and were predicated to grow and increasingly influence the hobby.

Highlighting the perceptions of the hobby held by those outside amateur radio, the Linton/Harrison paper advocated a restructuring of the licence system to provide more "entry points" and the removal of restrictions so as to encourage more experimentation. It is remarkable to see just how many of the concepts recommended in the paper have been implemented.

Two "code-free" licences were proposed. First, a "new Novice" licence was suggested ("Telephony Beginners"), providing voice operation on 70 cm after passing a theory exam more elementary than the Novice, and a regulations paper. This concept has languished. The paper proposed the Novice be "enhanced" by the addition of access to 2 m and 70 cm, and the use of data emission modes. Novices gained access to 2 m in 1986, then 70 cm and the use of data modes last year.

The Combined licence concept was retained and the concept of an "Intermediate (Digital)" licence was introduced, which was to be a grade between the Telephony Beginners and the Enhanced Novice, but without the Novice HF privileges – aimed at attracting computer enthusiasts new to communications. The new Intermediate Licence last year replaced the old Combined, with enhanced privileges as noted earlier. However, the new Novice Limited echoes the concepts of the paper's Intermediate (Digital) licence.

The Linton/Harrison paper's fourth major recommendation was the removal of the "defined mode" restrictions for Full and Limited licensees, "to permit experimental freedom with **new** transmission modes," which has now come to pass. The paper urged increasing the power limit (no change, here) and to permit unattended operation of Full and Limited licensees' stations – which is now a reality.

Just what influence the paper had on subsequent events can only be conjectured, but the DOTC began a review of the amateur radio privileges and conditions from 1989, less than four years following the paper's publication and with the debate still fresh in the mind of many. The DOTC sought to move towards a more deregulated regime, not only for the Amateur Radio Service. This was largely driven by the Federal Parliament's powerful House of Representative's Standing Committee on Transport and Communications Infrastructure (HORSCOTCI), changing the face of communications in Australia as a result.

Many of the changes to amateur radio have flowed from that mid-decade review, a process in which the WIA was closely and continuously involved. Apart from improvements to the licensing structure and privileges, the amateur examination system is now run by the WIA, since 1992, with examinations being overseen by amateurs accredited by the WIA. Every amateur, whether licensed earlier or since, and thus the amateur radio community as a whole, has benefited from this decade of change.

ALARA

Sally Grattidge VK4SHE, ALARA Publicity Officer*

ALARA Award

ALARA has an attractive award, based on contact with other members, which is quite easy to earn. If you have always considered awards to be a major undertaking requiring many hours chasing illusive callsigns, and therefore not the kind of activity you can slip in between getting the washing off the line and making tea, this one may be a good one to try.

The award is available to YLs, OMs and SWLs contacting ALARA members on or after 30 June 1975. VK/ZL applicants require 10 contacts, including five Australian call areas, and DX applicants require five contacts, including four Australian call areas. All contacts must be made from the same call area, and repeater contacts and official ALARA net contacts do not qualify. Special endorsements are available for Mixed, CW, Phone, All 28 MHz, etc, and endorsement stickers are available for each 10 (five DX) additional members contacted.

Applicants must submit a log extract which has been certified correct and signed by two other amateurs, under headings of DATE – TIME UTC – BAND – MODE – CALLSIGN – NAME (of ALARA member contacted) – REPORT SENT/RECEIVED. Full name, address, signature and callsign of applicant are also required. The fee (to accompany the application) is $AUS3.00 or four IRCs. Additional stickers, to be applied for at a later date, cost $AUS1.00.

Applications for this ALARA Award should be sent to the ALARA Awards Custodian, Jessie Buchanan VK3VAN, 4 Milford Crescent, Karingal, Victoria 3199.

NZ WARO Awards

GENERAL: Contacts may be in any mode or band, with the applicant's contacts all from the same QTH (except on the VHF section), but contacts via repeaters, WARO nets or contests are ineligible. QSLs are not required. Send a list certified by one other licensed amateur to the award custodian with sufficient postage for return of the award.
MAIN AWARD: ZL and VK stations work 12 WARO members resident in New Zealand. DX stations work 6. Contacts date from 1 June 1969. Endorsement seals are available to ZL and VK stations for each additional 12 stations; and to DX stations for each additional six stations. Contacts with WARO DX members qualifying for endorsements must contain at least three ZL contacts.
VHF SECTION: 10 VHF contacts with WARO members dating from 1 June 1979. WARO members and/or applicants may be home station, mobile or portable. Endorsements for each additional five.
SWL SECTION: ZL and VK stations list 20 contacts heard with WARO members. DX list 10. Date from 1 January 1979. List full log details with callsigns of both stations concerned. Endorsements for each additional 10 stations; and to DX applicants for each additional five stations.

Applications should be sent to the WARO Awards Custodian, Jeanne Gilchrist, 37 Roy Crescent, Concord, Dunedin, New Zealand.

News from the Members

Meg VK5AOV was awarded an Honourable Mention for a watercolour in a local art show. Meg has only been painting for four years and turned to watercolour only two years ago so this is quite an achievement.

At the Adelaide Hills Buy and Sell day Meg VK5AOV, Tina, Jean VK5TSX, Maria VK5BMT, Yvonne VK5AHK and Christine VK5CTY ran a craft stall as well as the usual tea and coffee, worked hard and met a lot of friends.

The District Radio Ladies held a successful Christmas party at the QTH of

QSP News

1995 Amateur Radio Awards

At the January 1996 Publications Committee meeting, the winners were chosen for the Technical and Higginbotham Awards.

For the best technical article(s) of 1995, the author chosen was Ralph Holland VK1BRH for his two antenna articles "Short Vertical Antennas and Ground Systems" and "Spiral Top Loading of a Short Vertical", both published in the October issue.

For the Higginbotham Award (service to amateur radio generally, not necessarily the magazine), the winner was Stephen Pall VK2PS for his consistently thorough work in the How's DX column.

Congratulations to Ralph and Stephen who will each receive a cheque for $100.

Ann VK4MUM, Jeanette, Sally VK4SHE and Evelyn VK4EQ, entertaining the troops at the North Queensland Amateur Radio Convention last year.

(Photo by VK4IGM)

The ALARA stand at the North Queensland Convention with (l to r) Cheryl ZL2VCC, Hazel Sleep and Sally VK4SHE. *(Photo by VK4IGM)*

Robyn VK4RL, complete with Santa Claus and something about dancers with flashing lights (ever tried to get news items from 80 m on a hot summer night?). I look forward to some photographs later.

News from Ruth IT9ESZ

YLRCI – Elettra Marconi

Last spring we had our annual contest with good participation, mainly from Europe due to poor propagation. To increase interest for our only contest, this time the winners of the first two places of each category were awarded a cup instead of the usual medal.

At the HAM-RADIO in Friedrichshafen we were again present with a stand for our club and the two YLs were busy giving information about awards, etc.

1995 was the 25th anniversary of our oldest award, the **Gioconda** or **Mona Lisa Award**, and we were on the air with the special prefix IR for 10 days in October, with a beautiful award and a special QSL. More than 6000 QSOs, mainly on 20 m and 40 m, were made from 30 club members and so far over 75 applications for the special award have been forwarded.

Mid October our club was invited to be present in San Marino where the local Radio Amateurs held their first Radio Exhibition. Our club delegation was warmly welcomed and we had a nice stand at the exhibition. The two days spent in this little country (60 sq km) on the Adriatic Coast were pleasant and gave us a good chance to talk about the possibility to be QRV from their rare YL-DX location (maybe next spring?).

**C/o PO Woodstock, QLD 4816*

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AMSAT Australia

*Bill Magnusson VK3JT**

National co-ordinator
Graham Ratcliff VK5AGR
Packet: VK5AGR@VK5WI
AMSAT Australia net:
Control station VK5AGR
Bulletin normally commences at 1000 UTC, or 0900 UTC on Sunday evening depending on daylight saving and propagation. Check-ins commence 15 minutes prior to the bulletin.

Frequencies (again depending on propagation conditions):

Primary 7.064 MHz (usually during summer).

Secondary 3.685 MHz (usually during winter).

Frequencies +/- QRM.

AMSAT Australia newsletter and software service
The newsletter is published monthly by Graham VK5AGR. Subscription is $30 for Australia, $35 for New Zealand and $40 for other countries by AIR MAIL. It is payable to AMSAT Australia addressed as follows:

AMSAT Australia
GPO Box 2141
Adelaide SA 5001

Something Moved in the Night Sky

My mate Bernie used to say, "Trouble with fishing trips is that there's always some idiot who wants to fish". Bernie was a drinker, you see. A fishing trip was just an excuse to get away from home and do some steady drinking.

Now, I have a confession to make. My main motivation for organising so many satellite mountain top expeditions over the years was not drinking but things like bushwalking, yarning around the campfire, photography and astronomy. Sure, there were people who came along just for the radio, some even came along expressly for the satellites and I have to admit that the odd bottle of port came out on New Year's Eve but my time was more or less equally shared around the above activities.

The banana lounge and binoculars were the main attraction following the evening meal when the camp fire had died down. A mile high in the alps on a clear night, the sky is alive. We have watched in awe as MIR streaked overhead while we were talking to the guys on board. "We can see you clearly and you're right above us now". It is surprising just how many satellites and bits of space junk are visible from a good clear, dark-sky site. Around Christmas time in our part of the world the sun is not all that far below the southern horizon even in the wee small hours and there can be hundreds of objects in orbit which can be seen even without the aid of binoculars.

A satellite tracking program I came across recently is ideally suited to predicting visible satellite passes. It is called SatSpy and it was written by David Cappellucci, an American who contributes to the astronomy and amateur radio satellite forums on CompuServe. His new program has been well received. It does not pretend to replace programs like InstantTrack for OSCAR users but, if you are interested in looking for movement in the night sky, it is the "bee's knees".

Most of the current batch of tracking programs fall a poor second to the tried and tested IT, SatFoot, QuickTrak, etc when used by OSCAR satellite stations. Many new programs tend to be oriented towards "bells and whistles". They are far too complex to configure and clumsy to operate. If, however, those lights in the sky fascinate you, take a look at SatSpy. As an example I gave it a set of keps containing data for some 3000 orbiting objects. After chewing for 30 seconds or so on my 486 (it needs a fast computer), it came up with a sky map showing the star field with brighter stars and constellations and the tracks of about 50 satellites which were in the sky at that time.

The object magnitudes are shown and you can manipulate the kep data base to exclude all but (say) magnitude 3 and brighter objects. It keeps track of percentage illumination and you can point and click along the tracks to see time and illumination. You have control over preferences like maximum elevation, inclination, etc to further zero-in on the objects you want to observe.

In addition to the above it has many other features. You can look at "three dimensional" views of all orbits with complete control over viewing position. In this mode the 3d earth has continent and country boundaries and the orbit trace shows eclipse data. It has a ground track mode which looks something like IT. You can zoom in on either mode to see the exact ground trace position.

It has all the usual Windows goodies like floating menu bars. You can select the usual three twilight definitions, Civil, Nautical and Astronomical and it will give you the visible traces for these three 20 minute periods or any other 20 minute period, either in text form, graphical form or as ground or sky traces. It also has useful astronomical data like sunset/sunrise, moonset/moonrise times and phases of the moon. All good stuff for sky observers.

SatSpy is just what the doctor ordered for astro-photographers who want to AVOID satellite traces in their time exposure photographs. I assume you have at least a passing interest in satellites because you're reading this column. If you've ever wondered about those moving lights in the sky, there is a shareware copy of SatSpy in the AMSAT-VK software library.

Uplink Power Requirements for the Digisats

Here in south eastern Australia, UO-22 will respond to an uplink signal when the satellite is a degree or so below the horizon on most occasions. This prompted me to see just how far I could reduce power and still reliably access the digital birds.

I had to reduce power to five watts before there was any noticeable deterioration in performance on UO-22. It regularly updates the computer hardware clock via WiSP when it is still below the horizon and instantly responds to uplink commands after the first few packets have been received.

KO-25 has not been fully operational since I started these tests but KO-23 seems to be a little less sensitive. It is also much higher and therefore further away at AOS and LOS, so maybe its on-board sensitivity is about the same. Unless you live on a mountaintop or down a hole, KO-23 is about 4350 km away at signal capture compared to about 3100 km for UO-22. My 100 watt <grunt> IC-271-H now idles along at 10 watts output which I find is a good compromise. The only time the going gets a little rough is when the PB queue is very long.

Sometimes, in the case of KO-23 with its higher orbit and larger footprint, it is subjected to a lot of non-amateur QRM from Asia when it comes up in our northern sky. It would be fruitless to increase power under either of these circumstances so it remains at 10 watts now for all occasions. I'm using 9913 co-ax to a fairly standard 7x7 element crossed Yagi for uplink and a 19x19 element crossed Yagi for downlink in a below average location.

New station manager at SSTL

Doug Loughmiller G0SYX/KO5I is leaving the University of Surrey and returning home to Texas with his family after four years in the UK. Doug has done an outstanding job as UoSAT Command Station Manager at Surrey and his place will be taken by Chris Jackson

ZL2TPO/G7UPN. Chris is the author of the revolutionary WiSP ground station control program. He is to be congratulated on his appointment to this important post. In between his duties at Surrey Chris will be continuing development of the Windows 95 version of WiSP.

IARU AMSAT Frequency Co-ordinator Appointed

AMSAT-NA News Service reports that our own Graham Ratcliff VK5AGR has been appointed IARU AMSAT Frequency Co-ordinator. Graham was selected from a number of nominations made by international AMSAT groups. His long association with the amateur satellite program and his excellent performance as ground command station for AO-13 were cited as reasons for his selection. Congratulations Graham.

Helix Antenna Design Development from John Kraus W8JK

There has been an interesting development in the design of helix antennas. John Kraus has described a version of his famous helix antenna which does not require the traditional ground plane reflector. It was detailed in "Antennas and Propagation" magazine, (IEEE) Vol 37 No 2 April 1995, (ISSN-1045-9243).

Instead of the mesh or solid plane reflector it uses two continuous rings of similar diameter to the helix element. The first sets the feedpoint impedance and the second acts as a reflector. The design would have particular application for mast mounted antennas where the solid or mesh reflector adds considerable wind loading to the structure.

I have not as yet built and tested one, but a friend who has reports that it works exactly as Kraus suggests and gives similar performance to the same size helix with the more usual plane reflector. It will be interesting to check on secondary and rear lobe performance. It could mean a resurgence of interest in this type of antenna for satellite work. The ungainly plane reflector has been a stumbling block for helix builders and has been a major disincentive to place them on an az/el rotator system. A dish feed using such a radiator would shade the dish much less than one with the standard reflector. This could make an appreciable difference when using smaller (say 30 cm) dishes for "S" mode.

DOVE Crashes Again

It has been reported that DO-17 has suffered another on-board software or hardware crash. The controllers are appealing for copies of the telemetry from the few days leading up to the failure to help them in their quest to set things right.

Replacement for FO-20 Under Construction

Fujio Yamashita JS1UKR, of JARL Technical Laboratory, reports that the JAS-2 spacecraft is nearing completion. It is a similar bird to FO-20 which it will replace when launched sometime in 1996. It will provide analog, mode JA and packet, mode JD communications. The uplink for analog mode will be 145.900 – 146.000 MHz and the downlink, 435.800 – 435.900 MHz. The output will be inverted and have a power of one watt. The digital mode will provide for four uplink frequencies: 145.850, 145.870, 145.890 and 145.910 MHz. The downlink will be on 435.910 MHz.

It will operate at either 1200 baud or 9600 baud speeds, switchable from ground control. It will have a new attitude control system. It will orbit in "wheel" mode with the axis of spin normal to the orbit plane. This is unusual as most amateur radio satellites are spun with the axis of spin pointing straight down. This should allow good up and down access when the satellite is reasonably high in the sky.

*359 Williamstown Rd, Yarraville VIC 3013
Packet: VK3JT@VK3BBS.#MEL.VIC.AUS.OC
CompuServe: 100352,3065

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Awards

*John Kelleher VK3DP - Federal Awards Manager**

Propagation has been slightly on the improve lately, although spasmodic. Surprisingly, some rare stations have been heard and worked on both short and long path. Mid-afternoon seems to be the best long path, while the short path to Asia and the Middle East is fair to good from 1000 UTC. The Southern Cross DX Net on 14255 kHz has been very active with anything up to twenty DX stations on frequency, operating from 1100 UTC and featuring some of Australia's top net controllers.

The "W - SP0" Award

The worked SP0 Award is issued by the Bydgoszcz Section of PZK for confirmed contacts with different Polish Amateur Stations using the special prefix SP0. No time, bands or modes limits. The award is attainable by all licensed amateur operators and Short Wave Listeners, if you possess the three QSLs from SP0 stations for European applicants, or two QSLs from SP0 stations if you're a DX applicant. The award fee is nine IRCs or $US6.00. Send this together with your verified list to PZK Ot Bydgoszcz Award Manager, PO Box 37, 85 - 950 Bydgoszcz, Poland.

Hong Kong Amateur Radio Transmitting Society Award Series

In response to a number of requests, please consider the Award Series from the Hong Kong Amateur Radio Transmitting Society. General requirements - GCR requested; cards not wanted. Apply to Awards Manager, HARTS, GPO Box 541, Hong Kong.

The Catch 22 Award

Contact stations located on the 22nd parallel North, as per the list below, after 1 January 1980. A VS6/VR2 contact is required. Awarded in three Classes: Class 3 = 15 countries, Class 2 = 20 countries, Class 1 = all 25 countries. The fee is $US7.00 or equivalent. Upgrade stickers $1.00 each.

The Countries List

1.	VS6 Hong Kong	14.	SU Egypt
2.	XX9 Macao	15.	5A Libya
3.	BY China	16.	TT8 Chad
4.	BV Taiwan	17.	5U7 Niger
5.	XV Vietnam	18.	7X Algeria
6.	XW Laos	19.	TZ Mali
7.	XZ Myanmar	20.	5T5 Mauritania
8.	S2 Bangladesh	21.	CN Morocco
9.	VU2 India	22.	C6 Bahamas
10.	A4 Oman	23.	CO Cuba
11.	A6 UAE	24.	XE Mexico
12.	HZ Saudi Arabia	25.	KH6 Hawaii
13.	ST Sudan		

The Firecracker Award

Requires six contacts with different Hong Kong stations, after 1 January 1964. Stations in zones 18, 19, and 24 to 30 require 10 contacts with VS6/VR2 stations. The fee is $US2.00, $AUS2.00 or 10 IRCs.

The Nine Dragons Award

Make one contact with a country in each of Zones 18, 19, and 24 to 30 inclusive. The contact for zone 24 must be from Hong Kong. Stations within the nine listed zones require two contacts in each zone, with two contacts with VS6/VR2 stations.Contacts after 1 January 1979. The award fee is $US3.00, $AUS3.00 or 10 IRCs.

WIA DXCC Standings

Phone

Honour Roll

Callsign	Countries
VK5UO	99 /101
VK6RU	326/380
VK5MS	326/379
VK4KS	326/372
VK4LC	326/372
VK5WO	326/358
VK6HD	326/350
VK6LK	326/350
VK4RF	326/344
VK3QI	326/339
VK3AKK	326/337
VK2FGI	326/331
VK3DYL	326/331
VK5QW	326/331
VK5XN	325/345
VK4UA	325/338
VK4OH	325/331
VK3CSR	324/332
VK1ZL	324/329
VK5EE	322/327
VK6NE	320/335
VK3YJ	318/323
VK3OT	315/327

General Listing

VK7BC	314/323
VK3AMK	313/329
VK6AJW	312/317
VK4AAR	309/312
VK6VS	309/312
VK2DEJ	307/312
VK6PY	307/312
VK5WV	306/325
VK3RF	304/311
VK3WJ	303/308
VK6RO	301/306
VK3JI	298/312
VK2WU	292/296
VK4DP	289/300
VK2AKP	289/294
VK4BG	287/302
VK2DTH	287/289
VK2APK	285/313
VK3CYL	283/290
VK3DU	282/290
VK5OU	281/286
VK3VU	272/275
VK4OD	272/275
VK3GI	264/267
VK3VQ	259/276
ZS6IR	259/262
VK2SG	253/274
VK2AVZ	251/257
VK4QO	251/255
VK3DP	246/249
VK2PU	244/247
VK6YF	238/241
VK2CKW	234/237
PS7AB	233/237
VK3DS	226/336
VK2ETM	226/227
VK4SJ	220/
VK5IE	219/221
VK5BO	218/222
VK3UY	217/217
VK6APW	216/217
VK3DD	214/217
VK4CY	211/212
VK4XJ	204/216
VK3DVT	201/203
ON6DP	200/202
VK4ICU	200/202
VK4KRP	199/201
VK2VFT	198/201
VK4DDJ	198/198
VK3CIM	196/199
VK4AU	191/191
VK6BQN	186/190
KA1TFU	176/179
VK4LV	174/176
WA1MKS	171/
VK7TS	170/171
VK2BQS	162/165
VK4BAY	158/160
VK2NO	157/
VK4IT	153/154
7J1AAL	149/150
VK4ARB	149/150
VK4DMP	147/148
VK4IL	143/
VK3DNC	141/142
VK3DQ	141/
VK2SPS	139/141
VK6LC	139/140
VK2EQ	139/
VK4CHB	137/138
VK4VJ	135/137
VK6LG	135/135
TI2YLL	129/
LU5EWO	125/
SM6PRX	122/126
VK3TI	122/125
VK7WD	115/116
VK3BRZ	114/116
VK4NJQ	111/115
VK4VIS	111/113
VK6NV	111/113
VK5ATN	110/112
VK5GZ	108/110
VK5AGM	105/107
VK4LW	105/
N4JED	104/105
VK3EHP	103/105
JN6MIC	103/104
VK4BJE	102/104
JH3OHO	101/103
VK2CMV	100/102
VK6APH	100/101
VK4KGE	099/101

CW

Honour Roll

Callsign	Listings
VK3QI	326/337
VK6HD	324/344

General Listing

VK3XB	309/343
VK4RF	306/332
VK5WO	300/315
VK3KS	295/322
VK6RU	275/319
VK2APK	274/304
VK3JI	267/291
VK3AKK	267/272
VK3DQ	245/
VK7BC	230/239
VK3DP	230/233
VK4LV	223/230
VK4DA	221/223
VK2CWS	210/212
VK4DP	203/214
VK6PY	191/194
VK4OD	185/188
VK3CIM	184/185
VK4ICU	174/
VK6HW	166/169
VK5GZ	166/168
VK6MK	165/167
VK4CY	162/
VK5BO	159/184
VK3DNC	154/157
VK4XJ	150/163
VK5UO	144/145
VK4UA	143/155
EA6AAK	138/
VK7DQ	137/138
VK2SG	136/148
VK4KS	126/134
VK7TS	125/
VK2TB	123/125
VK4AAR	121/123
VK3AGW	119/120
VK4CMY	117/119
VK2AKP	115/117
VK5BWW	110/111
VK5QJ	107/109
VK2FYM	106/108
VK8KV	102/103
VK2CXC	101/103

Open

Honour Roll

Callsign	Countries
VK6RU	326/380
VK4KS	326/372
VK5WO	326/362
VK4RF	326/361
VK6HD	326/351
VK3QI	326/340
VK3AKK	326/337
VK5QW	326/330
VK4UA	325/340
VK3JA	324/371
VK7BC	319/327
VK3OT	318/330

General Listing

VK3AMK	313/329
VK3XB	311/340
VK3JI	311/339
VK6PY	309/316
VK4AAR	309/312
VK6RO	307/312
WA3HUP	306/330
VK4DP	304/317
VK3DP	296/299
VK4BG	294/312
VK2APK	292/328
VK2SG	289/314
VK2AKP	289/294
VK4OD	285/288
VK3CYL	283/290
VK3VQ	274/291
VK3UY	272/274
VK5BO	264/301
VK3DQ	262/
TF5BW	260/264
VK4CY	259/262
VK4LV	242/249
VK2ETM	239/240
VK3CIM	236/239
VK4XJ	233/249
VK4ICU	233/235
VK5UO	230/233
VK6APW	223/224
VK4DA	222/224
WA5VGI	216/218
VK2CWS	214/216
VK2VFT	202/205
VK7TS	201/202
VK3DNC	185/187
VK5GZ	178/180
VK2BQS	176/179
PR7CPK	174/175
VK6MK	170/172
VK6NV	165/166
VK2NO	158/
VK2CXC	150/152
VK4CHB	145/147
VK6LC	142/144
VK2SPS	140/142
VK4NJQ	133/139
VK4EZ	129/138
YB8GH	127/129
VK7HV	114/117
VK5BWW	111/112
VE7BS	106/107
VK3COR	102/104
VK3VB	102/104
SM7WF	101/
VK7DS	099/102

RTTY

Callsign	Countries
VK3EBP	198/200
VK2SG	157/160
VK2BQS	115/117

PO Box 2175 Caulfield Junction 3161

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Contests

*Peter Nesbit VK3APN - Federal Contest Coordinator**

Contest Calendar Feb - Apr 96

Feb 10/11	PACC CW/SSB DX Contest	(Jan 96)
Feb 10/11	Spanish RTTY Contest	(Jan 96)
Feb 17/18	ARRL DX CW Contest	(Jan 96)
Feb 23/25	CQ 160 Metre SSB Contest	(Dec 95)
Feb 24/25	NZART National Field Day	
Feb 24/25	RSGB 7 MHz CW Contest	(Jan 96)
Feb 24/25	UBA Belgium CW DX Contest	(Dec 95)
Mar 2/3	ARRL DX SSB Contest	(Jan 96)
Mar 9/10	BERU CW Contest	
Mar 16/17	WIA John Moyle Field Day	
Mar 16/17	BARTG RTTY Contest	
Mar 23/24	CQ WPX SSB Contest	
Apr 6/7	SP DX Contest	
Apr 6/7	Israel DX Contest	
Apr 12/14	Japan International High Band CW	
Apr 27/28	Helvetia DX Contest (Switzerland)	

Have you noticed the amount of impatience creeping into our on-air activities these days? So many of us are in such a hurry to make QSOs, and then get them over and done with, that we seem to be missing the point of why we became amateurs in the first place. Perhaps I'm getting out of touch, but I'd always thought the aim of our hobby was to enjoy ourselves.

This is nowhere more evident than in contesting. We have long become used to the "gun" contesters who, with their big signals and good copying skills, achieve rates many of us only dream about. However, what about those who would like to be guns, or worse yet think they are, but really aren't?

I'm speaking of those massive signals, often (but not only) emanating from Eastern Europe, ripping along at 35 wpm calling "CQ TEST", and pausing for replies for a second at most. You are lucky to get half way through your callsign, before our hero is calling CQ again. Since he apparently doesn't hear you, you reduce speed. Waste of time. So you increase to his crazy speed, and sometimes he seems to hear you because he sends QRZ VK? a few times, but of course he has no hope of copying you because such speeds are much too fast for the level of QRM. So you sit bemused for a while, listening to half a dozen others going through the same motions as you just did, before also giving up. All the while, Mr Lid is blatting out CQs as if his life depended on it, completely oblivious to the stations calling him, and losing valuable multipliers into the bargain. If only he slowed down a little, and listened properly from time to time, both he (and us) would make more QSOs!

Another aspect of excessive speed is how the speed-kings fill their contest logs with miscopied callsigns and exchanges. Such QSOs are struck out, of course, and all the entrant has achieved is to waste his (or her) time making them, and possibly lose multipliers as well. When the competition is close, places can (and do) change on the strength of logging accuracy. Having just checked the logs for the 1995 VK/ZL Contest, I should know! A little extra effort to get it right, at the outset, can make all the difference.

Whilst on the subject, I have noticed this speed-mongering extending to ordinary QSOs as well. A couple of mornings ago I heard a moderately strong station working through a dog-pile of Europeans. His overs comprised "callsign 599 K" and, in correct dog-pile fashion, he was managing to avoid sending his own callsign for long periods on end, so I jumped in hoping to get his callsign later. Imagine my embarrassment when he turned out to be a VK2! Even worse, the same experience was repeated a few minutes later with a VK3! Now I could understand if the stations were rare, or even moderately unusual. But VK??? I mean, really!

Not all is gloom, however. A couple of months ago I had the pleasure of working a 3D2 who seemed pleased to chat about the weather, his rig, who he was, how long his DXpedition would be on the island, etc. We had quite an enjoyable QSO, and he wasn't itching to sign off and resume the 599 K nonsense. It reminded me of the DX ragchews which were so common in past years and, for once, the nice log entry really meant something.

By all means we should do our best to score well which, after all, is what contesting is about. However, as I've often said, we shouldn't lose sight of our broader goals, which is not only to enjoy ourselves, but also *to put something back for the benefit of others.* A log full of letters and numbers, gained without care in getting it right or concern for others, is a hard, and ultimately meaningless slog; but a log full of real QSOs, where you have put in your best efforts and helped others at the same time, is much more rewarding. As they say, it's not the destination that counts, but the journey you take to reach it. Happy travelling!

Thanks to VK1PJ, VK2BQQ, VK3ZC, PA3BFM, ZL1AAS, *CQ, Radio Communications, QST,* and *Break-In.*

Jock White National Field Day (NZART)

0300-1200z Sat 24 Feb &
1800-0300z Sun 25 Feb

This contest is open to portable ZL stations, and overseas stations. Both 80 and 40 m can be used, phone and CW. Crossmode contacts are not permitted. Sections include CW; phone; mixed mode; 80 m only; "natural" power; QRP max 5 W O/P. Exchange RS(T) plus serial number. ZLs will add their branch number.

This contest is divided into 18 one-hour

periods, changing over on the hour. Stations can be contacted once per hourly period, per mode, per band. Note that two consecutive QSOs with the same station are not permitted under the following circumstances, unless five minutes have elapsed: (a) when changing modes but staying on the same band; (b) at the end of one period and the start of the next.

Score 10 points per QSO, and multiply by the total number of branches worked on phone and CW. Multipliers are counted separately on 80 and 40 m, and on phone and CW, ie the same multiplier can be counted up to four times. Separate logsheets are preferred for each period, except where periods contain only a few QSOs, in which case more than one can be on the same page, if they are ruled off.

The summary sheet should show all usual details, plus a summary of the QSOs and multipliers per band and mode. Send logs to S White ZL2AHC, 19 Rossport Street, Johnsonville, Wellington, New Zealand to arrive by 25 March 1996.

Commonwealth Contest (BERU)

CW only: 1200z Sat to 1200z Sun, 9-10 March

This popular contest takes place each year on the second full weekend in March, and is intended to promote contacts between stations in the British Commonwealth and Mandated Territories. Categories are single operator, single and multiband, and receiving. The use of spotting nets, packet clusters, etc is precluded. Contacts may be made with any station using a British Commonwealth prefix, except those within the entrant's own call area. Use 80-10 m, keeping within the bottom 30 kHz of each band, except when contacting Novice stations above 21030 and 28030 kHz.

Exchange RST and serial number commencing with 001. Score five points per QSO, with a bonus of 20 points for each of the first three QSOs with each Commonwealth call area on each band (note that for the purpose of this contest, the entire UK area counts as one call area).

Several "headquarters" stations will be active during the contest, and will send "HQ" after their serial number to identify themselves. Each HQ station counts as an additional call area, and therefore attracts the 20 point bonus. Entrants may contact their own HQ station for points and bonuses.

Show duplicate contacts in the log with zero points. Entrants making more than 80 QSOs should include a sorted alphabetical list of the callsigns appearing in the log, together with either the serial number sent or the time of contact beside the callsign. Separate logs and lists of bonuses claimed are required for each band. Single-band entrants should claim points for contacts on the selected band, but should also submit details of QSOs made on other bands for adjudication purposes.

Include a cover sheet showing standard details, and send the log postmarked by 8 April to RSGB HF Contests Committee, c/o S Knowles G3UFY, 77 Bensham Manor Road, Thornton Heath, Surrey, CR7 7AF, England. Airmail is advised, as late logs may be treated as check logs. The Senior and Junior Rose Bowls will be awarded to the overall leader and runner-up respectively, and Certificates of Merit to the leading stations in each category and call area on each band.

The following call areas are recognised for the purpose of scoring in the 1995 Commonwealth Contest: A2, A3, AP, C2, C5, C6, C8/9, CY9, CY0, G/GB/GD/GI/GJ/GM/GU/GW (all one area), H4, J3, J6, J7, J8, P2, S2, S7, T2, T30, T31, T32, T33, TJ, V2, V3, V4, V5, V8, VE1, VE2, VE3, VE4, VE5, VE6, VE7, VE8, VK1, VK2, VK3, VK4, VK5, VK6, VK7, VK8, VK9C, VK9L, VK9M, VK9N, VK9W, VK9X, VK0 (Heard Isl), VK0 (Macquarie Isl), VK0 (Antarctica), VO1, VO2, VP2E, VP2M, VP2V, VP5, VP8 (Falkland Isl), VP8 (S Georgia), VP8 (S Sandwich Isl), VP8 (S Shetland Isl), VP8 (S Orkney Isl), VP8 (Antarctica), VP9, VQ9, VR6, VS6/VR2 (Hong Kong), VU, VU4 (Andaman & Nicobar Isl), VU7, VY1, YJ, Z2, ZB2, ZC4, ZD7, ZD8, ZD9, ZF, ZK1 (N Cook Isl), ZK1 (S Cook Isl), ZK2, ZK3, ZL0 or /ZL (NZ reciprocal calls), ZL1, ZL2, ZL3, ZL4, ZL5, ZL7, ZL8, ZL9, ZS1, ZS2, ZS3, ZS4, ZS5, ZS6, ZS8, 3B6/7, 3B8, 3B9, 3DA, 4S, 5B4, 5H, 5N, 5W, 5X, 5Z, 6Y, 7P, 7Q, 8P, 8Q, 8R, 9G, 9H, 9J, 9L, 9M2, 9M6/8, 9M0, 9V, 9Y, GB5CC (RSGB HQ station), various other HQ stations.

CQ WPX Contest

SSB: 0000z Sat to 2400z Sun, 23-24 March

CW: 0000z Sat to 2400z Sun, 25-26 May

This contest is sponsored by CQ Magazine, and the objective is to contact as many stations worldwide as possible on 1.8-30 MHz (except 10, 18 & 24 MHz). Categories include single operator (either single or all band), subdivided according to power (unrestricted, low power max 100 W O/P, and QRPp max 5 W O/P), and multioperator (either single or multitransmitter, all band only). Single operator stations are where one person performs all operating, logging, and spotting functions. The use of DX spotting nets places the station in the multioperator single transmitter category. Multi-multi stations must have all transmitters located within a 500 m diameter circle or within the property limits of the licensee's address, whichever is greater. All antennas must be physically connected by wires to the station transmitters and receivers.

Exchange RS(T) plus a three digit number starting at 001. Continue to four digits if past 1000. Multitransmitter stations must use separate numbers for each band. Score three points (14-30 MHz) or six points (1.8-7 MHz) for contacts with stations on different WAC continents, and one point (14-30 MHz) or 2 points (1.8-7 MHz) for contacts with stations within the same WAC boundary. Contacts with stations in the same country are permitted for multiplier credit but have zero point value.

The multiplier is the total number of prefixes worked on all bands (each prefix is counted only once regardless of the number of different bands on which it is worked). A "prefix" is the unique letter/numeral combination forming either the first part of the callsign, or else the normal country identifier for stations using their home callsigns in another DXCC country. For example, N8, W8, AG8, Y22, Y23, HG7, HG73 are all separate prefixes. The prefix for both N8ABC/KH9 and KH9/N8ABC is KH9. KH6XXX operating from Ohio could sign /W8, /N8, /K8, or any other prefix authorised for that district. Portable designators without numbers will be assigned zero after the letter prefix, eg N8ABC/PA becomes N8ABC/PA0. Any calls without numbers will be assigned a zero after the first two letters, eg RAEM becomes RA0EM. Suffixes indicating maritime mobile, mobile, portable, alternate location, and licence class do not count as prefixes (eg /MM, /M, /P, /A, /E, /J). The final score is QSO points x multiplier.

QSP News

Australian ICARE Co-ordinator

Brenda Edmonds VK3KT, the WIA Federal Education Co-ordinator, has been invited by the Chairman of STELAR and ICARE to become the country co-ordinator of ICARE for Australia. She has, of course, accepted with enthusiasm. The promotion of amateur radio in schools and in education has been an interest of Brenda's for many years.

For information about ICARE and STELAR see this month's *Education Notes.*

Logs must show times in GMT, with breaks clearly marked. Show prefix multipliers only the first time they are worked. Logs must be checked for duplicates, correct points, and prefix multipliers. Logs must be accompanied by a sorted alphanumeric list of prefix multipliers, and a summary sheet showing call, name, address, category, power, scoring information, and a signed declaration that all contest rules and radio regulations were observed. Logs may also be submitted on 3-1/2 or 5-1/4 DOS disk in ASCII format (.BIN, .RES, .DBF, .WKS also acceptable), providing a sorted multiplier file and a paper summary sheet are included. Send logs postmarked by 8 May (SSB) or 8 July (CW) to WPX Contest, 76 N Broadway, Hicksville, NY 11801, USA. Indicate SSB or CW on envelope.

A comprehensive range of trophies and plaques is offered, and certificates will be awarded to the highest scoring station in each category, country and VK call area. To be eligible for awards, single operator stations must show at least 12 hours operation, and multioperator at least 24 hours operation. Single band entries showing points claimed for more than one band will be judged as multiband unless otherwise specified. Where returns justify, second and third place awards will also be made.

Results of 1995 Japan International DX Contest

(call/band/score/QSOs/mult; * = certificate winner)

Low Band Section:

VK2AYD	40	5670	135	42

High Band Section:

VK4ICU *	10	2500	100	25
VK2AYD *	15	8512	224	38
VK4XA	15	8442	201	42
VK2APK *	20	11505	295	39
VK2BQQ *	A	10557	153	69
VK4TT	A	4370	95	46
VK5GN	A	3827	89	43
VK4CRR *	QRP	6370	182	35

Results of 1994 CQ-M DX Contest

(call/section/score/QSOs/mult):

VK4TT	20 CW	6480	90	24

Results of 1995 PACC DX Contest

(call/score/QSOs/mult):

VK4TT	240	24	10

Results of 1995 ARRL RTTY Roundup

(call/score/QSOs/mult/hrs):

VK6GOM	7515	167	45	21

1996 John Moyle Contest Rules

Presented by Phil VK1PJ

Well, once again those who enjoy a weekend in the bush should be planning for this year's John Moyle Field Day. The rules are the same as last year.

I hope to be on air the weekend before the contest, family and work commitments permitting, to help anyone with rule interpretations, etc. My planned schedule is 14.275 MHz at 1200 EST and 3.570 MHz 2030 EST (approx) on Sunday, 10 March. For those without HF callsigns, perhaps you can join one of the nets as a second operator. If anyone wishes to contact me privately, my home phone number is 06 292 3260, and my address is shown in the Log Submission section below.

Overview

1. The aim is to encourage and provide familiarisation with portable operation, and provide training for emergency situations. The rules are therefore designed to encourage field operation.

2. The contest takes place on the third weekend in March each year, and this year (1996) runs from 0100 UTC Saturday to 0059 UTC Sunday, 16-17 March.

3. The contest is open to all VK, ZL and P2 stations. Other stations are welcome to participate, but can only claim points for contacts with VK, ZL and P2 stations.

4. Entries shall consist of one choice from each of the following (eg six hour, portable, single operator, phone, VHF/UHF):

a. 24 or 6 hour;
b. Portable, Home, or Receive;
c. Single or Multiple operator;
d. Phone, CW, or Open mode;
e. HF, VHF/UHF, or All Band.

Scoring

5. Home stations for all sections shall score:

a. two points per QSO with each portable station;
b. one point per QSO with other home stations.

6. Portable HF stations shall score two point per QSO.

7. Portable stations shall score the following on 6 m:

a. 0-49 km, two points per QSO;
b. 50-99 km, 10 points per QSO;
c. 100-149 km 20 points per QSO;
d. 150-199 km 30 points per QSO;
e. 200-499 km 50 points per QSO;
f. 500 km and greater, two points per QSO.

8. Portable stations shall score the following on 144 MHz and higher:

a. 0 to 49 km, two points per QSO;
b. 50 to 99 km, 10 points per QSO;
c. 100 to 149 km, 20 points per QSO;
d. 150 km and greater, 30 points per QSO.

9. For each VHF/UHF QSO where more than two points is claimed, either the latitude and longitude of the station contacted, or other satisfactory proof of distance, must be supplied.

Log Submission

10. Logs must be accompanied by a summary sheet showing callsign, name, mailing address, section entered, number of contacts, claimed score, location of the station during the contest, and equipment used. For multioperator stations, the callsigns and signatures of all operators should be included. If any VHF/UHF QSOs have been made which qualify for more than two points, the latitude and longitude of the station during the contest must be included.

11. The summary sheet must include the following declaration signed by the operator or, in the case of a multiple operator station, one of the licensed station operators: "I hereby declare that this station was operated in accordance with the rules and spirit of the contest".

12. Logs must be postmarked no later than 26 April 1996, and forwarded to John Moyle Contest Manager, 33 Willoughby Cres, Gilmore, ACT 2905, Australia. An ASCII text copy on a MS-DOS floppy disc would be most helpful, with the following alternative formats also acceptable: Wordstar, Word, WordPerfect, dBase3 & 4, Lotus 123.

Certificates and Trophy

13. At the discretion of the Contest Manager, certificates will be awarded to the winners of each portable section. Note that entrants in a 24 hour section are ineligible for awards in a six hour section.

14. The Australian station with the highest CW score will be awarded the President's Cup, a perpetual trophy held at the WIA Federal Office, and will receive an individually inscribed wall plaque as permanent recognition.

Disqualification

15. General WIA contest disqualification criteria, as published in Amateur Radio from time to time, applies to entries in this contest. Logs which are illegible or excessively untidy are also liable to be disqualified.

Definitions

16. A portable station comprises field equipment operating from a power source independent of any permanent facilities, eg batteries, portable generator, solar power, wind power.

17. All equipment comprising the portable station must be located within an 800 m diameter circle.

18. A single operator station is where one person performs all operating, logging, and spotting functions.

19. A single operator may only use a callsign of which he/she is the official holder. A single operator may not use a callsign belonging to any group, club or organisation for which he/she is a sponsor except as part of a multioperator entry.

20. A multioperator station is where more than one person operates, checks for duplicates, keeps the log, performs spotting, etc.

21. A multioperator station may use only one callsign during the contest.

22. Multiple operator stations may only use one transmitter on a given band at any one time, regardless of the mode in use.

23. Multiple operator stations must use a separate log for each band.

24. A station operated by a club, group, or organisation will be considered to be multioperator by default.

25. None of the portable field equipment may be erected on the site earlier than 24 hours before the beginning of the contest.

26. Single operator stations may receive moderate assistance prior to and during the contest, except for operating, logging and spotting. The practice of clubs or groups providing massive logistic support to a single operator is, however, totally against the spirit of the contest. Offenders will be disqualified, and at the discretion of the manager, may be banned from further participation in the contest for a period of up to three years.

27. Phone includes SSB, AM and FM.

28. CW includes CW, RTTY, and packet.

29. It is not expected that any other modes will be used in the contest, but if they are, they shall be classed as CW.

30. All amateur bands may be used except 10, 18 and 24 MHz. VHF/UHF means all amateur bands above 30 MHz.

31. Cross-band, cross-mode and contacts made via repeaters are not permitted for contest credit. However, repeaters may be used to arrange a contact on another frequency where a repeater is not used for the contact.

32. Portable stations may make repeat contacts and claim the appropriate points providing that at least three hours have elapsed since the previous valid contact with that station on the same band and mode.

33. Home stations may not claim points for repeat contacts.

34. Stations must exchange ciphers comprising RS(T) plus a three digit number commencing at 001 and incrementing by one for each contact.

35. Portable stations shall add the letter "P" to their own cipher, eg 59001P.

36. Multiple operator stations are to commence each band with 001.

37. Receiving stations must record the ciphers sent by both stations being logged. QSO points will be on the same basis as for Home Stations, unless the receiving station is portable.

38. The practice of commencing operation and later selecting the most profitable operational period within the allocated contest times is not in the spirit of the contest, and shall result in disqualification. The period of operation commences with the first contact on any band or mode, and finishes either six or 24 hours later.

*PO Box 2175, Caulfield Junction, VIC 3175

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Divisional Notes

Forward Bias - VK1 Notes

Peter Parker VK1PK

Marconi Celebrations an Outstanding Success

Marconi Week, held to celebrate the centenary of radio, officially ended on 12 December, with the completion of EME contacts between VI100GM in Canberra and stations on four continents. The 432 MHz moonbounce station, situated at the University of Canberra, made thirteen two-way contacts with Japan, USA, Australia, Germany, the Czech Republic and Sweden. All but one occurred on CW.

The station's operators included Chris VK1DO, Geoff VK1CO and Andrew VK1DA. Under a special high power permit, output power was approximately one kilowatt. The gain of the 10 metre dish used for the experiment is approximately 45 dB.

On HF and VHF, we also did well with almost 1000 contacts being made by operators of the VI100GM Special Event callsign. Those who used the special callsign include Graeme VK1KGT, Phil VK1PJ, Jim VK1FF, Len VK1NLJ, Alex VK1AC, and Richard VK1RJ.

Just a reminder that, to claim your Marconi Award, all you need to have done is to have had one contact with the VI100GM callsign. The cost of the certificate is five dollars, and to apply, either a log extract or QSL card should be sent to the Divisional Address, GPO Box 600, Canberra, 2601.

Divisional AGM This Month

The VK1 Division's AGM is to be held on Monday, 26 February in the Griffin Centre, Civic, starting at 8 pm. All positions will be declared open, and a new committee elected. If you would like to be more involved in amateur radio affairs in the ACT, you should think seriously about nominating for a position. News has just been received that our current President, Secretary and Treasurer will not be renominating, so there will be a complete turn-over of the Division's key positions.

Check Your Packet Watchdog Timer Today

A recent incident in Canberra, where an unattended packet station was accidentally jammed on transmit for several days, has highlighted the need for care to be taken by packet users who keep their systems running continuously.

The problem was caused by a fault in the TNC, causing the equipment to lock on transmit for several days before the owner was tracked down. It transpired that the watchdog timer, whose function is to prevent the TNC from being in transmit mode for more than a few seconds, in the owner's TNC had been inadvertently disabled. So, to prevent embarrassment, it might be a good idea to ensure that your TNC's watchdog timer is switched on.

VK2 Notes

Richard Murnane VK2SKY

Web Page

Some weeks ago, Council circulated all affiliated clubs, asking them to update their contact details. If your club returned the questionnaire, then those details should by now appear in the Clubs section of the VK2 Divisional "World Wide Web" page.

Feedback about the page has been very positive, with electronic "QSL cards" coming from all over Australia, and from overseas, as far away as Norway. The Web page is updated regularly, with more interesting links being added each week. If you would like to check out the VK2 Web page, you'll find it at http://sydney.dialix.oz.au/~wiansw/

Coming Events

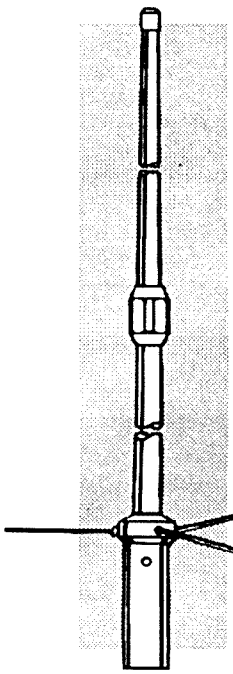
This month's Divisional Council meeting takes place at Tamworth on Saturday, 10 February. This will be another good opportunity for country members to talk with Council and share ideas for making the WIA better for all members.

For many of us, the big event of the year is the Central Coast Amateur Radio Club Field Day at Wyong at the end of the month. No details were available at the time of writing, but should be in circulation by now on packet and, of course, on the Divisional the weekly broadcast. Divisional Councillors and other volunteers will be in attendance on the WIA stand, so do please drop in and say hello!

A Great Range Of Accessories!

High Performance 2m/70cm Base Station Antennas

Our range of top-name Brainer base station antennas offer outstanding quality and exceptional value. They are stacked colinear types providing high gain, wide bandwidth and a low radiation angle for extended range. The fibreglass reinforced polyester (FRP) outer tubing randome and gasket seals provide excellent all-weather operation, and they are supplied with compact ground-plane radials for a clean radiation pattern. Stainless-steel mounting hardware ensures a long trouble-free life. They also feature comprehensive instruction sheets to make installation and set-up easier. Both come with a 1 year warranty.



BRAINER

2m/70cm GST-1

Frequency: 144-148MHz, 430-450MHz
Gain: 6dB on 2m, 8dB on 70cm
Max. Power: 200W
Length 2.5m
Type: 2 x 5/8 wave (2m)
4 x 5/8 wave (70cm)
Connector: SO-239 socket

$199

Cat. D-4830

2m/70cm GST-3

Frequency: 144-148MHz, 430-440MHz
Gain: 7.9dB on 2m, 11.7dB on 70cm
Max. Power: 200W
Length: 4.4m
Type: 3 x 5/8 wave (2m)
7 x 5/8 wave (70cm)
Connector: SO-239 socket

$299

SAVE $40

Revex W56ON HF/VHF/UHF SWR/PWR Meter

Quality Revex wide-band SWR meter, offering 2 in-built sensors for 1.8MHz to 525MHz coverage! Provides measurement of 3 power levels (3W, 20W, 200W), and SWR. Uses an N-type socket for the VHF/UHF sensor to ensure minimal loss. Measures 120 x 80 x 85mm.

Cat D-1375

$329

Rugged HF 5-Band Trap Vertical Antenna

The rugged 5BTV incorporates Hustler's exclusive trap design (25mm solid fibreglass formers, high tolerance trap covers and low loss windings) for accurate trap resonance with 1kW (PEP) power handling. Wide-band coverage is provided on the 10, 15, 20 and 40m bands (SWR typically 1.15:1 at resonance, <2:1 SWR at band edges) with 80kHz bandwidth typical on 80m at less than 2:1 SWR. An optional 30m resonator kit can also be installed without affecting other bands. High strength aluminium and a 4mm (wall thickness) extra heavy-duty base section guarantee optimum mechanical stability. At just 7.65m, the 5BTV can be ground mounted (with or without radials, although radials are recommended), or it can be mounted in an elevated position with a radial system. Unlike other antenna designs, the 5BTV can be fed with any length of 50ohm coax cable.

Cat D-4920

HUSTLER **$349**

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Thought For The Month

"If we all did the things we are capable of doing, we would literally astound ourselves." Thomas A Edison.

VK6 Notes

Bruce Hedland-Thomas VK600

Notice of Annual General Meeting

It is hereby notified that the Annual General Meeting of the West Australian Division of the Wireless Institute of Australia will be held on 30 April 1996 following the General Meeting which commences at 8 pm. The meeting will be held at the Westrail Centre, East Perth.

Agenda

1. Consideration of the council's annual report
2. Consideration of the financial report
3. Consideration of other reports
4. Election of office bearers, viz president and vice-president of the Division and seven other councillors
5. Election of two auditors
6. Appointment of a patron
7. General business which has been duly notified.

Notice of Motion for the AGM must be received by the secretary not less than 42 days prior to the meeting and must be signed by at least three members.

Nominations of a candidate for election to council must be received by the secretary in writing not less than 42 days prior to the meeting, with an intimation that such candidates are willing to act. A candidate may submit a statement not exceeding 200 words outlining his or her case for election, and experience. Each nomination shall be signed by two members proposing the candidate. Candidates must possess a current amateur licence.

Proxies

Any financial member entitled to vote may appoint a proxy, who must also be a financial member entitled to vote, to speak and vote on his/her behalf. Each such proxy must be in the hands of the secretary prior to the meeting and be in the following form: I....., a member of the Institute, hereby appoint..... also a member of the Institute, to act for me as my proxy, and in my name to do all things which I myself being present could do at the meeting of the Institute held on .....
Signed:
Witness:
Date:

"QRM" News from the Tasmanian Division

Robin L Harwood VK7RH

Just a reminder that the Divisional Annual General Meeting will be held on Saturday, 21 March 1996 at 1400 hours Tasmanian Standard Time at the Domain Activity Centre in Hobart.

All Annual Reports should be forwarded to the Divisional Secretary by 22 February at the address given in the Divisional Directory on page three of this issue of Amateur Radio. Nomination forms for Divisional Council will have been forwarded to each Branch by now. They can also be obtained by writing to the Divisional Secretary. Nominations can only be accepted from current financial members of this Division and those proposing and seconding the nomination must also be current financial members.

Nominations close on Friday, 1 March 1996 with the Divisional Secretary who is also returning officer. If there are more candidates than vacant positions, an election will be necessary and ballot papers will be forwarded 10 days prior to the AGM to all current financial members.

Notices of Motion should also be forwarded by 22 February to the Divisional address and the proposer and seconder again must be current members. Please note that there will be several Notices of Motion put forward by our Honorary Solicitor to tidy up the Divisional Articles of Association.

It is with regret that we announce that Edgar Nicholls VK7RY passed away late in December. Edgar was active on two metres and on 80 metres and he will be missed in VK7.

On 9 December last year, Council met in Launceston and quite a deal of time was given to revising the Articles of Association. Mr Phil Corby VK7ZAX, Honorary Solicitor, was in attendance and briefed Council as to the history and requirements of the current Articles. Some of these will need to be revised and updated into the 21st Century, which is only five short years away. As mentioned earlier, these will be brought as Notices of Motion on 23 March. Council benefited from Mr Corby's assistance and advice, as we went through each article in detail.

The SMA advised this Division that it is no longer permissible to use the AX7ITU prefix annually on 17 May. The use of this prefix is confined to Special Commemorative Events such as the Bicentennial and the Olympic Games. They suggested we could apply for a license to operate VK7ITU. This has been referred to the Divisional Awards Manager, VK7BE.

Several repeaters in the state are now interlinked. By inserting a 141.3 Hz tone it is now possible to key several repeaters. For example, an operator in Hobart can talk via VK7RAF which is now on 146.65 MHz and, by inserting the tone, can access VK7RAB in the North on 438.55 MHz. VK7RNE in the Fingal Valley has now been added to this chain. This repeater is on 146.725 MHz. So it is possible to interlink through any of these sites, with the addition of the appropriate tone.

Please note that the name of the Northwest Telephone BBS, operated by Tony Bedelph VK7AX, is now the ATV and Northwest BBS. The number is unchanged and will still carry WICEN news from other sources.

All Branch meetings this month will be Annual General Meetings. The Southern Branch AGM will be held on Wednesday, 7 February at the Domain Activity Centre at 2000 hours EADT; the Northwestern Branch will be meeting, presumably at the Penguin High School at 1945 hours EADT, on Tuesday, 13 February; and the Northern Branch will be meeting at St Patrick's College, Mount Leslie Road, Prospect (in the Staff Common Room) on Wednesday, 14 February at 1930 hours EADT. ar

WIA News

Solar Cycle Minimum Near

It is likely that the solar cycle minimum will be reached this year, probably between June and December, according to IPS Radio and Space Services.

Sunspot groups identified as most probably belonging to the new cycle (No 23) were observed to appear between May and September last year. Typically, the minimum does not occur until at least 12 months following the appearance of the first spot group of the cycle, said IPS radio and Space Services.

The first spot of Cycle 20 appeared in September 1963 and the Minimum occurred in October 1964. Cycle 21's first spot appeared on 15 November 1974, and the minimum followed June 1976, while with Cycle 22, the first spot appeared on 31 March 1985 and minimum occurred in September 1986.

"On the basis of past behaviour, we would thus expect solar minimum to occur between June and December 1996, and the duration of Cycle 22 to lie between 9.7 and 10.3 years," said IPS radio and Space Services.

Education Notes

Brenda M Edmonds VK3KT Federal Education Coordinator*

In my last column in December 1995 *Amateur Radio* magazine, I wrote of the formation of ICARE, the International Council for Amateur Radio in Education.

A short time after writing the column I received a response from the Chairman, Richard Horton G3XWH, who is also Schools Liaison Officer for the RSGB. This, as well as promising me a copy of the Conference Proceedings, included fuller information on ICARE and, among other items, copies of a couple of issues of AMRED (Amateur Radio in Education) the magazine of the STELAR group (Science and Technology through Educational Links with Amateur Radio). The STELAR group organised and hosted the conference at which ICARE was established, with sponsorship from Trio-Kenwood and the RSGB.

I think I have mentioned these magazines previously. For a small publication (about 20 pages of A5, ie half an AR page size) they pack in a surprising amount. Comments from the Editor or Chairman, technical information, building projects, historic items and current news are there, all in an easy-to-read text and with clear diagrams where appropriate. It is obvious that these magazines are produced by a group of enthusiasts, and that amateur radio is active in schools in Britain. There are over 120 schools listed as affiliates, with nearly half of them having callsigns.

The STELAR group also offers assistance to teachers, who do not hold an amateur licence, to help them gain a licence or to assist with amateur radio activities in their schools. One six day live-in crash course was held last Easter, and another is planned for next Easter. Again, commercial sponsorship and RSGB assistance have been vital for this work. The group is very appreciative of the support received from the national Society. It was noted at the ICARE conference that many delegates seemed to be receiving little support for their efforts from the parent Society.

Shortly after the letter from ICARE, I received a letter from Bill Little VK3TAJ, to tell me of the activities at Mt Beauty Secondary College, which has had an amateur radio group for several years. There have been up to four licensed staff members at times. An active group of students over several years has worked HF, VHF/UHF, packet and satellite, and has brought amateur radio into a number of areas of the curriculum as well as gaining individual licences. Keep up the good work, Bill!

As I have said before, there must be many amateurs out there who have been involved with amateur radio in schools. Please share your ideas and initiatives, or your problems. I will be happy to co-ordinate any information received, in the hope of encouraging others to venture into the field. I have some information on the SSTV project which I can pass on.

Australian schools are territory which has not yet been very widely exploited as a source of recruits. We need all the new amateurs we can get.

**PO Box 445, Blackburn VIC 3130*

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FTAC Notes

*John Martin VK3KWA, Chairman, Federal Technical Advisory Committee**

80 and 40 Metres – Digital Modes

I have received one reply so far to the note in the October issue of *Amateur Radio* regarding the digital mode segments in these bands. The suggestion is that we should stick to the band plan digital segment of 3620 – 3640 kHz, especially as the same segment is used in other countries such as New Zealand.

A further suggestion is that all RTTY groups should support the band plan and help to avoid clashes by operating within this segment. I would strongly agree with this. It seems strange to ask SSB operators to keep 3620 – 3640 kHz clear for digital modes when, at the same time, we have RTTY activity in the low end of the SSB segment. With regard to 40 metres, the suggestion is that we cannot ignore the significant amount of activity using RTTY, AMTOR, etc in the 7040 – 7050 kHz segment. Therefore, there are strong grounds for expanding our digital segment to 7030 – 7050 kHz.

I would appreciate any further comments so that the proposal can be finalised.

Beacon and Repeater Licence Conditions

The WIA has responded to the SMA's draft licence conditions for beacons and repeaters, and it is hoped that the new licence conditions will be finalised and gazetted in the near future.

Band Plans

I would suggest a close look at the band plans section in the new Call Book. It has been rewritten and incorporates the changes made and described in this column in recent months. Copies of the band plans are also available from WIA offices.

The Australian Amateur Band Plans are also being published in instalments in *Radio and Communications.*

**PO Box 2175, Caulfield Junction, VIC 3161*

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Why the Members Are At The Top

The "map" of the relationships between the WIA Divisions and Federal, published on page 5 of the October 1995 issue of *Amateur Radio* and page 21 of the 1995 *Call Book,* shows Divisional members at the top. There is a clear reason for this.

The WIA Divisions, and through them the WIA Federal company, are *member* driven organisations. That is, they exist and operate because of the mutual interests of the people who belong to the Divisions.

Conventional organisation charts typically apply to companies or government authorities, and show lines of command, from top to bottom, and responsibility, from bottom to top. "The boss", the managing director or chief executive officer, is shown at the top of the organisation chart because it is that person who has ultimate control of a company's or authority's direction and operation and ultimate responsibility for its performance.

Likewise, with the WIA Divisions and WIA Federal, it is the members who, in the end, decide what serves their mutual interest. Hence, the members are at the top of the map. The WIA Divisions and WIA Federal exist and continue to function because of the members.

Further News from the World Radio Conference

Decisions made at the World Radio Conference, WRC-95, held in Geneva last October-November, will see the introduction in a few years of new personal communications services (PCS) employing mobile satellite systems (MSS).

Large numbers, referred to as "constellations", of "big LEO" (Low Earth Orbit) and "little LEO" satellites are planned to offer mobile voice and data telecommunications services on a global basis, with services able to connect people anywhere on the planet, regardless of their location and of the local telecommunications standards, according to the International Telecommunications Union (ITU).

A system devised by multinational communications giant, Motorola, called "Iridium", plans to use 66 satellites in continuous orbit at a low altitude, so that one or more satellite is always within view of a user on the ground. Several other companies have planned and are working on similar systems.

The LEO satellite systems were introduced at the 1992 World Administrative Radio Conference, held in Spain. The Little LEOs were allocated spectrum below 1 GHz (one block covering from 148 MHz, above the 2 m amateur band), while the Big LEOs were allocated spectrum above 2 GHz, which could be used from 1 January 2005.

The ITU said there is intense commercial interest in the new PCS satellite systems. Some 250 satellite systems have already been filed with the ITU, and operators are anxious to get the go-ahead to offer their services to consumers.

The spectrum allocations required by these services were "vigorously debated", the ITU said. Countries from the Middle East, Latin America and Africa were concerned about sharing existing terrestrial services with mobile satellite service allocations. The Conference agreed to arrangements for protecting existing terrestrial services so that they can be phased out slowly and replaced with newer technology.

The Conference allocated additional spectrum below 1 GHz for Little LEO mobile satellite systems, which will be used to provide "mobile data" type services, while the date for entry into operation of the Big LEO systems using the 2 GHz band was brought forward to 1 January 2000. The ITU said there was considerable lobbying on the latter issue, as operators are eager and ready to develop the new market quickly.

The complex mobile satellite systems issues were handled by a Conference committee chaired by Garth Jenkinson from the Australian delegation.

One satellite issue which saw strong interest at the Conference was an application by the Teledesic Corporation which sought a spectrum allocation in order to fix its plans to operate a fixed satellite service of 840 non-geostationary satellites.

Teledesic plans to operate a low-cost global broadband data communications system, which has been dubbed a "fibre in the sky" service. Teledesic was formed by software giant, Microsoft, and US mobile phone company, McCaw Cellular (which is part-owned by the telecommunications multinational, AT&T). The issues raised by the Teledesic system were dealt with separately from the main Big LEO issues, said the ITU, the Conference allocating the system 400 MHz of spectrum in the 19 GHz and 29 GHz bands.

An ITU conference in 1989 saw the need for simplification of the Radio Regulations, which constitute an international treaty on the use of radiocommunications. A Volunteer Group of Experts has studied the issues since then, their work resulting in a report which formed the basis of discussions at WRC-95.

Changes to the Regulations agreed at the Conference recognised technological developments and global political changes, and the need to improve the Regulation's efficiency. The matter will be reviewed again at WRC-97.

A draft agenda for the next Conference includes the planning of Broadcast Satellite Systems, and the scope of international broadcast rights, both of which are controversial issues, said the ITU.

WRC-95 was attended by 1223 delegates from 140 of the ITU's 184 member countries, as well as 78 representatives and observers from international and regional organisations. The WIA's delegate on the Australian team at WRC-95 was David Wardlaw VK3ADW.

Cable and Pay TV Standards to be Investigated

Standards Australia is in the process of establishing a project to develop standards for cable television distribution systems, to provide cable TV network design and installation engineers with limits for unwanted radio frequency (RF) emissions (and methods of measurement), and to afford protection to other RF equipment in the local environment.

One of Standards Australia's committees is to undertake the project, Committee TE/3 which covers Electromagnetic Interference matters. TE/3's project manager, Terry Ehret, expects the project to get under way this year, following completion of the formal approval process and clearance from the Board of Standards Australia. Mr

Ehret could not advise a target date for the adoption of a standard. The project will principally be concerned with emissions from cable distribution systems.

Cables for distribution of pay TV and other services are currently being laid around Australia by Telstra and Optus. Telstra's network was on-target to pass more than one million homes by the end of 1995. Telstra's cables are largely laid underground, but Optus has gone for above-ground cabling, using curbside electricity poles. Both networks are designed to reach four million homes when completed, scheduled for late 1999. Foxtel began supplying cable pay TV services last October.

The Australian Broadcasting Authority is concerned that cable TV services using channels in the broadcasting service bands may have the potential to interfere with free-to-air TV, and cable services using channels between 230 MHz and 520 MHz may potentially interfere with mobile or fixed radiocommunications services and navigation equipment which operate in that frequency range. They also expressed concern with the possibility of re-radiation of cable transmissions via indirect connections to external TV reception antennas connected to a customer's TV system.

Standards Australia's Committee RC/5 is considering standards for connection between pay TV service providers' "in-premises delivery systems" and their set-top units (STUs – pay TV receiver and decoder) and their connection to customers' TV receivers. Committee RC/5 is also considering channel plan standards for cable systems and output channels for pay TV STUs and VCRs.

The cable system sends signals to customers in the 85-550 MHz band. Analogue PAL TV signals require a 7 MHz bandwidth, as for broadcast TV, so a large number of channels can be accommodated. It is planned to replace analogue TV delivery with a digital system within a few years. The cable equipment being installed will handle both systems as the digital system will employ FM mode RF signals.

Microwave distribution pay TV has been operating for just over 12 months, with Galaxy being the principal operator.

MICROWAVE PAY TV SET TOP UNITS' OPERATING FREQUENCIES

Channel	STU Output Video Carrier (MHz)	STU Output Band (MHz)
Prom	140.25	139-146
Premier Sports	147.25	146-153
Showtime	154.25	153-160
Encore	352.25	351-358
ANBC	359.25	358-365
BBC World	373.25	372-379
TV1	380.25	379-386
World Movies	394.25	393-400
Music	401.25	400-407
Documentary	408.25	407-414
Arena	415.25	414-421
New World Narrow	422.25	421-428
Nickelodeon	429.25	428-435
Telitalia Narrow	436.25	435-442
Single channel output	57.25	56-63*

* B/cast TV ch. 1

Table 2 Microwave Pay TV Set Top Units' Operating Frequencies.

The RC/5 committee is understood to be looking into standards for here, too, covering the STUs, channel plans and installations. Telecommunications regulator, AUSTEL, is also considering standards for STUs and their installation.

The accompanying table shows the output channel plan of an actual Galaxy customer installation, with a *Jerrold* STU (by General Instruments). A single channel output, using TV Ch 1, can be taken to the TV set, and the STU operated using its remote control. Alternatively, another RF output sends each pay TV channel to an individual output channel, which can be selected using the TV or a VCR's channel selector. The STU to TV/VCR link is via coax from a screw-type F-connector.

Note from the table that the two lowest frequency channels span the 2 m band, and the four higher frequency channels cover the bottom of the 70 cm band.

For amateurs, there may be potential for electromagnetic interference (EMI) from, and RF interference (RFI) to, cable and microwave pay TV STUs. This will be dependent on standards of STU manufacture and installation. While concerns have been aired over cable EMI and RFI, the equipment and installation has to be watertight as well as "RF tight", as the carriers (Telstra and Optus) have to meet regulations with regard to reliability and delivery of services, or face government sanctions.

There is more potential for EMI and RFI problems from the street-to-premises link, and the STU installations. However, suppliers are providing equipment (cable transmission equipment as well as customer equipment) designed and manufactured to meet European and North American market requirements, where fairly stringent electromagnetic compatibility standards have been mandatory for some time, and have in recent years been strengthened.

It is anticipated that Australian standards will likely be modelled after recent European standards.

The WIA is represented on Standards Australia's electro-magnetic interference Committee, TE/3, by David Wardlaw VK3ADW.

How's DX

*Stephen Pall VK2PS**

At the beginning of the year one looks ahead and tries to foresee what the future might bring.

We certainly will see improved propagation on the bands and, with a bit of luck, we will reach the bottom of the present solar cycle by the middle or the end of this year. At present, propagation is lingering with its usual ups and downs near the bottom. Unsettled and active conditions are monthly regulars as the result of a recurring coronal hole activity. Try to make the most of the present low-band activity on 80 and 160 metres, conditions will change in the future.

New DXCC countries? Tung Sha Dao (Pratas) has been accepted, Hung Yan Dao (Scarborough) is on the threshold of being accepted, the independent Palestine (formerly ZC6) will became a new DXCC country once the political settlement process is completed, and there is a slim chance that we will see a reorganisation of the callsigns in the future Bosnia-Herzegovina. I think the DXCC Awards Committee will take a serious look at themselves and I can see some internal changes and new decisions to strengthen the prestige of the DXCC Award which has suffered a few light dents lately.

A few deletions from the present DXCC countries list is also a possibility, among them the fate of Mt Athos being a separate country. If there is no activity from the only resident amateur, and there is no "access" to outside amateurs, what is the purpose of having a separate country on the books?

In the meantime, let's enjoy the hobby, which some of us treat as a full time profession. Let's try, even if it is difficult, to live in peace with each other on the bands.

Pratas Island – BV9P and Scarborough Reef – BS7H

The controversy of the acceptance or non-acceptance of these two activities as separate DXCC countries has reached its final stage. The ARRL DX Advisory Committee, in a press release dated 22 December 1995, announced that the DXAC has voted 12 to 4, and the Awards Committee has voted unanimously, to add Pratas Island BV9P, for contacts made 1 January 1994 and after, to the DXCC Countries list. This decision is based on DXCC Rules Section II 2(a) (separation by water). Pratas Island, located in the South China Sea, is administered by Taiwan.

QSL cards will be received by the DXCC Desk commencing 1 April 1996. Cards received before that date will be returned without action. Because of QSLing irregularities, it will be necessary for anyone who has a picture card from the January or March 1994 operation to obtain a replacement from QSL manager KU9C (the picture cards are not acceptable for DXCC credit).

The QSL Manager, Steven M Wheatley KU9C, POB 5953, Parsippany, NJ 07054, said, on 25 December, *"The QSL card artwork is about to go to the printer. It has provision in the artwork to "work" with any of the three BV9P operations, and approximately 20,000 cards are due to be printed. I have the March 1994 and May/June 1995 operational logs. I should have the first operation logs soon".*

The ARRL Membership Services Committee (MSC) reported in a press release dated 19 December 1995 that the committee has reviewed the documentation from the DXAC and Awards Committee, and has voted five to two in favour of recommending the addition of Scarborough Reef to the DXCC countries list. This recommendation will be considered at the ARRL Board of Directors meeting on the 19/20 January. In my personal opinion, and taking the Pratas decision into account, Scarborough Reef will get the green light. Watch this space.

Macquarie Island – VK0WH

Not since the DXpeditions to Bouvet and Peter I Island, was there such a bedlam on the bands as on 10 December, when Warren, VK0WH showed up on the 20 metre band.

The "big guns" from Japan were there in full force, as were the northern Europeans. Warren must have felt lost and wondered what all the fuss was about? He admitted on the air that his last DX experience was back in 1980, some fifteen years ago when he was on the other side of the dog-pile.

As reported earlier, Warren left his home state Queensland at short notice to join the 1996 ANARE team on Macquarie Island. This left him with little time to organise his future amateur activities on the island. He has given his home call as VK4WH, indicated that cards should be sent there, and he will reply to them after he finishes his tour of duty.

He has no personal radio equipment with him, and he is using the ANARE old-styled equipment where he is restricted to the use of only three frequencies, which have to be pre-programmed at the transmitter site, a one kilometre walk from his shack. The equipment uses synthesised tuning instead of VFOs, therefore making split operation difficult.

Originally, Warren did not intend to be very active on the bands, as he is very busy with work commitments. He is responsible for the upkeep of the telecommunication equipment on the island. A round trip to the southern end of the island takes a full week. The world wide DX fraternity must understand that he is not on a DXpedition, he is not a red-blooded "mad" DXer, he has limited time for the hobby as demands of work with irregular working hours comes first, and he cannot oblige with requests on different bands and modes.

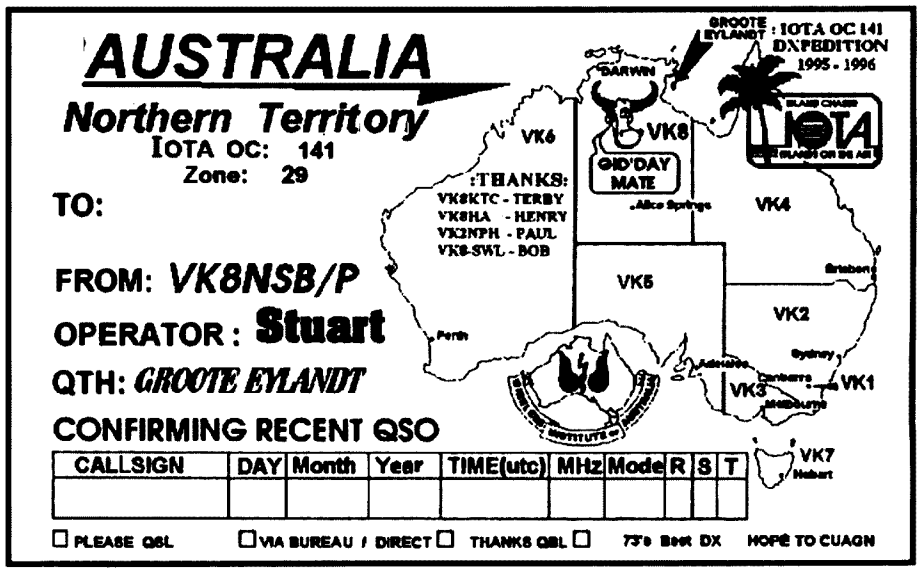
His antennas are those of the ANARE station, consisting mainly of V-beams directed to the north. Warren is an old style DXer. He wants proper reports, names and QTH which slows down the QSO rate. His contacts are QSO contacts, not the contest type "59" report. His CW is of moderate

Is this the QSL you have been waiting for?

speed which will improve as time goes by. He has already worked a number of stations in VK, ZL, JA, USA and Europe. Unless you have a directional beam, your chances to work him from VK/ZL and to break the "Northern Air Invasion" which very often uses excessive power, are negligible.

Warren operated originally on 14130 and 3570 kHz SSB and 7010 kHz CW. These frequencies have been changed around after he nominated Jim Smith VK9NS as his QSL Manager. Warren now operates on 7010 and 14040 CW, and on 14260 kHz on SSB, for one or two hours starting around 0930/1000 UTC. He sends his logs by fax at the end of the month to Jim, who has already made arrangements for the printing of QSL cards.

It is expected that Jim will start QSLing by the end of January. Jim requires a SAE and return postage. Please note that Australian stamps are not valid on Norfolk Island, they have their own. For return postage, send either Norfolk Island stamps or one IRC or one "green stamp". Jim prefers a separate envelope for the Macquarie Island activity. Send your card to Jim B Smith VK9NS, PO Box 90, Norfolk Island, NSW 2899, Australia.



It seems Stuart did not give up amateur radio (see *How's DX*, August 1995).

Callsigns of the Past

In the past there has been a great number of amateur radio operators on Macquarie Island. This was the time when shortwave radio was the link between the island and mainland Australia. Since the improved satellite technology has advanced to the present stage, short wave radio has lost its significance. It is no longer essential to have a full time radio operator at hand, who very often also had an amateur operator's licence and callsign.

It was an entirely different world in the 60s, 70s and 80s. Ken Matchett VK3TL, the curator of the WIA National QSL collection, was kind enough, at my request, to prepare a list of callsigns which were active from Macquarie Island in the past. The list is a long one and probably boring to some of our readers. However, it is published here in full for historical reasons, as I believe this is the first and most extensive list of amateur operators on Macquarie Island going back to the birth of ANARE (Australian National Antarctic Research Expeditions) in the year 1948. The callsigns are in the order of year of activity, callsign, and operator's name and home call if known). One must remember that, until the late 1950s, the Australian Antarctic had the VK1 prefix allocation.

1948, VK1AA (Ted McCarthy); 1949, VK1ADS (Ron W Sterrett VK3ADS); 1949/1950, VK1JT (John Totten); 1949/50, VK1RD (Brian Robertson VK5RD); 1950, VK1RF (Indecipherable RGF?); 1950/51, VK1RB (Trevor Boyd); 1951, VK1SW (Jim Wyatt); 1951/52, VK1BS (W J Storer); 1951/52, VK1WO (Hugh Oldham); 1952, VK1EM (Eric L Macklin); 1952, VK1RR (Roy Amel VK1RR); 1952/53, VK1RG (Rob S Gurr VK5RG); 1953, VK1RL (Russel Fraser); 1953, VK1BA (Brian? Fiebig); 1953, VK1AF (Scott); 1953/54, VK1AC (Alan "Chas" Hawker VK3IB); 1954, VK1DJ (David H Johns VK7DJ); 1954, VK1GA (Gordon Abbs); 1955, VK1XM (Bernie E Shaw); 1955/56, VK1IJ (Doug Twigg); 1956, VK1DA (Alex Brown); 1957, VK0CJ ("Alan"); 1958, VK0KT (George Heindricks); 1958, VK0TC (Tom Cordwell); 1959, VK0CC (Clive J Cooke VK4CC SK); 1960, VK0IT (Alf Kissick?); 1960, VK0WH (Harold L Wright ex-VK2AWH SK); 1961, VK0FX (Fred M Stean); 1964/65, VK0TO (Trevor Olrog VK2TO); 1966, VK0MI (Col Lebbon); 1966/67, VK0CR (Rodney Champness VK3UG); 1967/68, VK0IA (David James); 1968/9, VK0KJ (Greg Johnston VK7KJ); 1969, VK0KW (Karl Warchot OZ9KP); 1969/70, AX0KW (Karl Warchot OZ9KP); 1970, AX0LD (Harold Brown); 1971, VK0TM (Fred Iliff); 1971/72, VK0RC ("Chris"); 1972/73, VK0WW (Ronald W Worden); 1974, VK0DM (Dave Meldrum); 1977 & 1980, VK0KH (Ken Hanson); 1977, VK0AC (Art Collidge); 1978/79, VK0JC (Joergen Christensen OZ8AE); 1978, VK1PA/P (Peter Arriens); 1979, VK0PK (Peter W King); 1980, VK0DB ("David"); 1980, VK0KH (Ken Hanson); 1981/82, VK0AN (Alan Nutleg VK2BNA); 1982, VK0AP (Peter McLennan); 1983, 1984, 1985, 1987, 1989, VK0GC (Graeme J Currie); 1984, VK0CK (David J Rasch VK5CK); 1985, VK0YL (Denise Allen); 1986, VK0SJ (Sjoerd "Sojo" Jongens); 1986, VK0NE (Graeme McDiarmid VK3NE); 1986, VK0ML (Mark Loveridge); 1987, VK0DS (Doug Speedy); 1987, VK0ML (Mark Loveridge); 1988/89, VK0AE (Robyn Downey [YL]); 1988, AX0NE (Graeme McDiarmid VK3NE); 1989, VK9YQS/0 (Doug Speedy); 1991, VK0ML (Mark Loveridge).

Crozet Island – FT5W & Kerguelen Island – FT5X

Samuel F5IJT and Jean Jacques F5SZK arrived at Possession Island (46° S 51° E), Crozet Archipelago) on 14 December and will sign FT5WE and FT5WF. They hope to have two stations active for 12 months. Activity will be on CW and SSB but they intend to operate also on RTTY, SSTV and packet radio. Suggested frequencies are CW: 3505, 7005, 10105, 10115, 14005, 18075, 21005, 24890 and 28005 kHz; and on SSB: 3792, 7045, 14145, 14245, 18145, 21245, 24934 and 28445 kHz.

A beacon will transmit on six metres with the callsign FT5WE. QSL to FT5WE via F5GTW, Touyeras Claude, 23 Rue des Chardonnais, Cite de la Diete, 86130, Jaunay Clan, France. QSL to FT5WF via F5IZK, Loiseau Andre, Ecole de Garrabet, 09400 Garrabet, France.

On Kerguelen Island, Jean Jacques FB1LYF (ex J28CW) was reported signing FT5XK; QSL to F5NZO. Look for him on 14136 kHz around 1600 UTC.

Higher ARRL DXCC Fees

Times are changing. The "free" or "moderate cost lunch" is no more. The ARRL have published a new schedule of fees to take effect from 1 January 1966. The reason is to break-even the cost associated with granting and processing of the awards.

First ever DXCC award will now cost $US10 (including pin); and additional

awards $US5 (including pin). The first DXCC application by a foreign non-ARRL member will now cost $US10 for the first 120 credits (previously no limit). Additional for a foreign non-ARRL member is $US20 for first 100 QSO credits (new), and additional QSOs will cost 10 cents per QSO (new).

In the past the DXCC desk has been overwhelmed from time to time with the number of new applications or endorsements requests. Dare we say that, in view of the above changes, the rate of DXCC applications by foreign amateurs will dramatically decrease in the future.

Future DX Activity

* Peter PB0ALB will be active from Sarawak, East Malaysia from 20 February to 2 April with a special suffix in the 9M8 block. QSL to home call.
- Roman 4K2OT is active from the Ukrainian Antarctic Base Vernadsky. This is located near the British Antarctic Base Faraday on Argentine Islands (AN-006). With his own call EM1EA, and with the EM1U base call. QSL to 9H3UP Roy Rogers, PO Box 113, CMR, Valetta, Malta.
- The DS1BMJ station is active from the multinational Antarctic Base at Patriot Hills located on Ellsworth Island.
- Two Argentinian stations are active from the Antarctic. LU1ZB is located at the Argentinian Antarctic Navy Base Melchior on Anvers Island (AN-012). LU6Z is active from the Argentinian Antarctic Navy Base Orcadas on Laurie Island, in the South Orkney Island group (AN-008). QSL via LU6EF.
- The LZ0A station is active from the Bulgarian Antarctic Base Hemus, located on Livingstone Island in the South Shetland Group (AN-010). QSL via LZ1KDP.
- The ZX0ECF station is active from Brazilian Antarctic Base Commandante Ferraz located on King George Island in the South Shetland Islands (AN-010).
- Bernhard DL2GAC is on the "Pacific Road" again. In January he was active as VU2BMS from southern India. In February he will be in the Solomon Islands. If he can find suitable transport he wants to be active from Stewart Island, operating mainly on 40 and 80 metres. He intends to take part in the "CQ" SSB contest at the end of February as H44MS on 160 metres. In March-April he will be in Vanuatu.
- Oleg UT9XL is active from Kabul, Afghanistan as YA9XL. His QSL manager is Yan F5TCN whose correct address (not the one listed in the 1996 callbook) is Yannick Chilliau, 14 Route D'Harnes, F-62880, Annan sous Lens, France.
- Theo PA3CBH (ex-YN1TV) is in Mozambique and operates under the C91BT call.
- VP8CRE is active from Faraday Base on Argentine Island (AN-006).
- VP8CQR is active from British Antarctic Base on Deception Island in South Shetland Group (AN-010). QSL to Cristoff, PO Box 35, 80/325 Gdansk 37, Poland.
- Art NN7A and Mike NG7S will be active as V31JZ and V31RL from Turneffe Island (NA-123) from 9 to 14 February. QSL to home calls.
- EC4AAC, the US base station on Palmer Island, Antarctica is active during Thursdays around 0300 UTC. QSL to KE9AS.

Interesting QSOs and QSL Information

(E) = East coast, (W) = West coast, (N) = North, (M) = the rest of Australia.

- 9Y4GR – Greg – 21133 – CW – 1034 – Nov (N). QSL to Gregory Redon, 8 Henry Pierre St, Saint James, Port of Spain, Trinidad (one IRC for return postage).
- FR5DD – Jean – 21135 – CW – 1026 – Nov (N). QSL to Jean Pierrat, 8 Ave des Badamiers, Les Filaos, F-97434, Saint Giles les Bains Reunion, France (one "green stamp" for return postage).
- Z24JS – George – 21295 – CW – 1048 – Nov (N). QSL to W3HNK, Joe Arcure Jr, PO Box 73, Edgemont, PA 19028, USA (one "green stamp" for return postage).
- LZ2RS – Rumi – 28135 – CW – 1014 – Nov (N). QSL via the QSL Bureau.
- C21TT – Tony – 21280 – SSB – 1159 – Nov (N). QSL to PO Box 372, Republic of Nauru.
- 3A2MD – Laura – 14224 – SSB – 1303 – Nov (E). QSL to PO Box 2, Monte Carlo, 98001, Monaco.
- ZP5MAL – Juan – 14185 – SSB – 0944 – Nov (E). QSL to Juan F Duarte Burro, PO Box 34, Asuncion, Paraguay.
- A71DX – Saad – 14250 – SSB – 1255 – Nov (E). QSL to PO Box 6372, Doha, Qatar.
- A45ZN/25 Tony – 14255 – SSB – 1232 – Dec (E). QSL to Box 981, Muscat 113, Oman.
- A92FZ – Bob – 14255 – SSB – 1242 – Dec (E). QSL to PO Box 15763, Adliya, Bahrain.
- E21CJN – Tham – 14226 – SSB – 1311 – Nov (E). QSL via PO Box 25, Klongtoey, Bangkok, Thailand 10110.
- S01RSF – Mulai – 14255 – SSB – 1205 – Dec (E). QSL to EA4RSF via the "EA" QSL Bureau.

From Here and There and Everywhere

- If you worked Bill KH4/NH6D on Midway, send your card to his home call. Bill says, in two to three years time, Midway will be open for commercial enterprise activities. At present, access is restricted to military personnel.
- Frank YJ0AA reports that ZY0PT, allegedly on St Peter & Paul Rocks, is a pirate. Frank also reports that the Vanuatu (YJ) QSL Bureau is active again and he is the QSL Manager. Bureau cards should be sent to Frank Palmer, PO Box 6, Vila, Vanuatu, South Pacific.
- According to VK6VS, DK1RV, the QSL Manager for ZK1DI, advises that, due to the high postal charges in Germany and the low value of the "green stamp",,he needs three green stamps or two IRCs for an airmail reply, or one IRC for surface mail.
- Zal VU2DK suggests using strong well-closed envelopes, so that contents will not be seen from the outside, when QSLing direct with Indian stations. Also, do not write any callsign anywhere or make any reference to amateur radio. The local postal situation in India is very bad.
- ZR1DCE/ZS8 is a new beacon located on Marion Island and is active on 50.200 MHz.
- Most of the 3A prefixes like 3A2CC, 3A50A, 3A50DX, 3A0DX, 3A0X, which appeared on the bands during October were all pirates, as are all 3A0 prefixes.
- The XZ1A activity during the month of October produced approximately 15,000 QSOs of which about 4000 were with the US. The other station, XY1HT, made approximately 11,000 contacts.
- The Republic of Austria will celebrate its millennium, the 1000th year of its foundation, by authorising a special callsign prefix for Austrian amateurs in 1996. Austrian amateurs, if they so wish, can use the OEM prefix for the entire year. The Austrian Radio Amateur Society (OVSV) will sponsor two special awards. See details in the "Awards" column of *Amateur Radio,* November 1995 issue.
- If you are concerned about sending "green stamps" with your direct QSL request to Russia, it is suggested that you write UEHHOCTEW HET on the envelope which, in Russian, means "no value". *(Well, sort of! Perhaps best check with a good Russian grammar. Ed)*
- On 15/16 December the Port Adelaide Radio Club VK5APC activated the special call V15SUB to celebrate the launching of the second "Collins" Class submarine, HMAS Farncombe. To receive a special QSL card, send your card to PARC, PO Box 352, Port Adelaide, SA 5011.
- Marion Island ZS8 will probably be re-activated in March 1996 by an amateur

scientist, commencing work at the research station.

- Pirates galore. Jim W6YA is not the QSL manager for AP6YA, who is a pirate. A new pirate is active on 80 metres and other bands using the callsigns OA4EEI, DL4EEI, PY2EEI and G3PPE.
- 9K2UA Mohammad is a new amateur in Kuwait and is not yet listed in the callbook. QSL via the Bureau.
- The operator of XU2UN was SP1MVE, and that of XU3UN was SP5ABL.
- Stuart had a very successful activity on Groote Eylandt (OC-141). QSL via VK8HA.
- Phil VK0FPS was heard in December from the Australian Antarctic Base at Casey.
- Franz 3W6GM is operating on a fixed frequency of 14198 kHz SSB from Saigon. QSL to DF5GF.
- If you are still waiting on your 1992 Aves Island DXpedition card (YX0AI), try re-QSLing to WS4E Scott M Cronin, 1909 N 41st Ave, Hollywood Hills, FL 33021, USA. Scott only collects the cards; they are then hand carried to Venezuela where they are verified and mailed. Those who have enclosed a US SASE are then hand carried to the USA and posted there. IRCs are welcomed.

Similarly, if you are still waiting on cards from the YV0RCV Aves Island 1994 DX Activity, please re-QSL to Reinaldo Leandro, M207, PO Box 020010, Miami, FL-33102, USA, who seems to be able to obtain the QSL card for you. Best of luck.

- It has been reported, but officially not confirmed yet, that Romeo UB5JRR has become "persona non grata" at the ARRL DXCC desk, which means that any further activity by him will not count for DXCC. This alleged decision can be linked to his past P5RS7 and XY0RR activities. All currently credited operations will remain valid but Romeo will not be allowed to participate in the future in the DXCC program.
- Syd VK2SG, the co-founder of the Australian National Amateur Radio Teleprinter Society (ANARTS)in the 1970s, became a Silent Key due to a heart attack on 29 December 1995 at the age of 76. Syd and Bill VK2EG started the weekly RTTY DX Notes which were renamed the VK2SG RTTY DX Notes in 1993, when Syd had to relinquish his contributing efforts to others. Syd was the first to receive the RTTY DXCC in Australia. Vale Syd, a great DXer who left his mark on the RTTY DX scene.
- If you wondered, there is no further news of the postponed Heard Island DXpedition.

QSLs Received

TT8BP (4 w IK5JAN); 9L1PG (3 w NW8F); ZC6B (4 w K9JJR); 9N/G3XWW (4 w op); 3W6GM (5 w DF5GF); C53HG (2 w W3HCW).

Thankyou

Many thanks to my friends and supporters who supply me with news and information. Special thanks to VK2XH, VK2KFU, VK2TFJ, VK3TL, VK4AAR, VK5WO, VK6VS, VK8NSB, VK9NS, OH0XX as well as the publications *QRZ DX, The DX Bulletin, The DX News Sheet, INDEXA, 425 DX News,* and *Golist QSL Managers List.*

*PO Box 93, Dural NSW 2158

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Spotlight on SWLing

*Robin L Harwood VK7RH**

Well, a New Year has arrived and already there have been some cut-backs and deletions to the shortwave scene, even as I am compiling this on New Year's Day.

The British Government budget, which was brought down in Parliament at Westminster, announced some large cuts to the annual allocation doled out to the BBC World Service. Programming will be affected and already one popular language service has been discontinued. The French Service, which commenced in 1938 and played a vital role during the Second World War to the Underground Resistance, ceased as at midnight on 31 December 1995. Other services and programming are likely to be affected in the days ahead.

It was also recently announced that Canada was axing its shortwave service as of 31 March. Apparently the Government and the Canadian Broadcasting Corporation, who operates the Service, could not agree who was responsible for its budget. There was a predictable outcry from many SWLs and Canadians abroad and conciliatory noises were made. However, no definite reprieve for Radio Canada International has been granted yet.

The future direction of the VOA and Radio Free Europe is also unclear in view of the continuing saga between the President and the US Congress over the Federal Budget. The RFE/Liberty operation is now based in Prague, although the senders are based in Germany, Portugal and Spain and now also from VOA sites in the USA. As I have frequently mentioned, programming from both the VOA and RFE/RL is being carried over domestic AM and FM networks in the target countries. RFE/RL's future does look questionable with the emergence of strong viable independent broadcasting structures in the former Warsaw Pact nations.

For instance, Polish was recently axed altogether after paying a significant role in Poland's emergence from Soviet dominance. As well, Russian language programming over RL has also been reduced and replaced with VOA Russian programming. It is a far cry from 10 years ago, when RFE/RL signals were everywhere because you could easily hear the multiplicity of white noise jammers blocking the frequencies.

However, there is some good news that English language programming will be re-introduced over Radio Denmark. A monthly 15 minute broadcast will be aired on the first Saturday of the month at 10 minutes into their daily 30 minute program. The broadcasts will be on 3 February, 2 March and 6 April and the best time for this region is at 0940 UTC. Radio Denmark broadcasts over the senders of Radio Norway and their programs are tacked on to the end of the regular Radio Norway output. Frequencies are 15175 and 15230 kHz.

Incidentally, Oslo also broadcasts in English for 10 minutes every Sunday, on 7185 kHz between 0700 and 0800 UTC. Listeners in WA could try 15605 between 1300 and 1400 UTC.

Recently my brother-in-law became engaged to a Vietnamese-Australian and naturally a query came for frequencies in that language. This was easy as the Voice of Vietnam is easily heard on an unusual channel of 10059 kHz in our evening hours. It is also heard on 9732 kHz variable but is shared with their foreign service output. English programming is on 9840 kHz at 1000 UTC but the modulation is down, yet it does help that one of the announcers is Australian.

Well that is all for this month. Please note that I no longer have a fidonet address. All the best in monitoring.

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Have you advised the WIA Federal Office of your new callsign? Use the form on the reverse of the *Amateur Radio* address flysheet.

International Amateur Radio Union Monitoring Service (IARUMS) – Intruder Watch

*Gordon Loveday VK4KAL**

The IARU Monitoring System – Part 2

Part 1 of this continuing series was presented in last month's column.

1. Policy Statement

a. No person shall, without the prior approval of the IARU (International Amateur Radio Union) Administrative Council in writing, communicate in the name of the IARU, with the ITU (International Telecommunications Union), IFRB (International Frequency Registration Board) or any administration or radio operating agency.

b. The Administrative Council (AC) shall be the sole deciding authority with regard to any requests from regional organisations, national societies, or individuals, for a case or cases of a breach of the Convention or infringement of the Regulations to be referred to the IFRB.

2. Objects of the Monitoring System

a. To collect data on the use of the amateur bands.

b. To compile a record of instances of "harmful interference" for further action.

c. To take steps to eliminate "harmful interference".

d. To encourage monitoring activity by national societies.

e. To have Monitoring stations, that meet the technical standards recommended by the CCIR, available on a regional basis.

3. Participation in the IARUMS

Any national society that is a member of the IARU may participate in the work of the IARUMS and may send monitoring reports to the appropriate Regional Co-ordinator.

Any individual in those countries where there is NO IARU member society, may send monitoring reports to the Regional Monitoring Service Co-ordinator.

4. The ITU Radio Regulations

Every national society and each Regional co-ordinator shall have access to a copy of the ITU Radio Regulations. They should be read in conjunction with the ITU Convention. These publications are available from ITU Geneva or National Administrations. Not every country in the world is a signatory to the Final Protocol of the ITU Convention or to other ITU Documents (in Australia, the SMA (Spectrum Management Agency) has a list of these countries.

5. Harmful Interference

It is obvious from even a casual reading of the radio regulations that complaints about non-amateur stations in amateur bands MUST be supported by evidence of "harmful interference".

NOTE: Any station may operate in an amateur band under the provisions of paragraph 342 of the Radio Regulations, PROVIDING it does NOT cause "harmful interference" to amateur stations. It must be NOTED that the definition of *harmful interference* in the Convention is different to the definition given in the Radio Regulations (I can supply a copy if needed).

6. Breaches of the Convention and or Radio Regulations

It is important to realise that the Radio Regulations derive from the Convention. It must also be noted that, until a signatory Government has ratified the Convention it is not necessarily bound by the provisions of the convention and the regulations.

7. IARUMS International Co-ordinators

Section 2 is about Regional Organisations.

Section 3 is about Regional Co-ordinators – I will cover these if requested.

Section 4 covers National Societies.

IARUMS Results

I have received some good news from the Region 3 Co-ordinator, Rohan ZL1CVK. I quote, *"Region 1 monitoring system have reported the successful removal of intruders from several ham bands. These include two from 40 m, four from 20 m, one from 30 m, and 10 from the 17 m band."*

I have received an official report that the Adventist World Radio Station operating on 7.100 MHz has been removed as from 13 November 1995. The frequency has been clear since.

Also, as a rider to this, discussions are now taking place with the object of putting into operation a system for monitoring international amateur satellite transmissions. The system will possibly be run by the satellite fraternity.

Federal Intruder Watch Co-Ordinator, Freepost No 4 Rubyvale QLD 4702 or VK4KAL @ VK4UN-1

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Technical Correspondence

All technical correspondence from members will be considered for publication, but should be less than 300 words.

Feeding Verticals

It was suggested in my two articles about verticals (December 1995 and January 1996 issues of Amateur Radio) that a suitable RF choke could be made by winding a few turns of the coaxial feeder cable through a toroid. A current balun was also suggested as doing the job.

Further tests have been done using a Current Probe on a ground plane built just for this purpose and current has been detected on the coax shield with both of these devices installed.

The radials were each a quarter wavelength long and I used four of them for this test. A length of 0.25 and 0.28 of a wavelength was used for the radiating element with the radials in a horizontal position. The feedpoint was 0.2 of a wavelength off the ground.

Not only was RF detected on the feeder cable but RF current was flowing down the aluminium mast supporting the ground plane, which was insulated at the top and run into the ground at the bottom.

All of the above would have put the ground plane at a disadvantage when comparison tests were done between it (the ground plane was the same when the articles were written) and the ground-mounted vertical.

Conclusion

The ground plane would be a better choice and a lot less work would be required than for a ground-mounted version if one was starting from scratch.

It should also be pointed out that performance will suffer in the ground-mounted case and TVI may be worse.

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Novice Notes

*Peter Parker VK1PK**

The WIA Education Service – 34 Years of Helping Amateurs

This month's column is a special look at a service, run by a small group of volunteers, that has assisted thousands to obtain their amateur licence. It will give a brief history of the WIA Education Service and its precursor (the Youth Radio Scheme) and outline how their activities can benefit you.

The Youth Radio Scheme

The Youth Radio Scheme (YRS) came about after a NSW proposal for its formation was accepted as WIA policy at the 1962 Federal Convention. Founded by Rex Black VK2YA, it aimed to encourage young people to become radio amateurs by providing practical instruction in radio and electronics at clubs attached to schools and youth groups; some of these had been operating in the 1930s, but the YRS triggered a renewed interest. By 1967, 48 clubs and groups were operating in NSW alone, and the Scheme had spread to all states.

The YRS was based on a series of syllabuses, examinations, and constructional projects. Those who satisfied the requirements were awarded certificates, several grades of which were available. The standards of the YRS were high. The level demanded of those who achieved the Advanced YRS certificate was more rigorous than the standard of current AOCP theory examinations. The first two levels of certification are still in use by schools today in some states.

Vocational placement was a major feature of the YRS, and many former YRS students pursued careers in electronics. It received support from the Institution of Radio and Electronic Engineers (IREE), and was highly regarded by employers. In many cases, when two otherwise equal applicants applied for a position, it was the YRS certificate holder who gained the job.

Possibly the greatest legacy of the YRS was its support for the introduction of the Novice amateur radio licence. The Federal WIA established the Novice Licence Investigation Committee which recommended that a Novice licence be established in Australia. After much debate, this subsequently became WIA policy, and was agreed to by the Minister for Posts and Telecommunications in 1976.

Some of the original question bank for the Novice licence came directly from YRS publications, published several years previously. It is noteworthy to add that the style of sending used in the Novice Morse receiving exams is based on that long advocated by the YRS – individual letters and numbers are sent faster and the gaps between them are increased so that they can only be learnt properly as single entities, rather than combinations of separate dits and dahs.

The WIA Education Service

During the time of the CB boom of the 1970s, the YRS was reconstituted to become the WIA Education Service. By publishing and distributing amateur study books and Morse tapes, the Service has assisted thousands of people to gain their amateur licences.

The philosophy of the Service is to spread radio and electronics knowledge through the provision of study material at the lowest possible cost. A small group of volunteer radio amateurs and teachers produce and distribute books and Morse tapes. During the late 1970s, Dave Wilson, Rex Black, Ken Hargreaves, Derek Lark, Ian Hook, Athol Tilley, Geoff Pages, Tom Scott, Kurt Welzel, Br Cyril Quinlan and others were involved in this work. The material is regularly updated to keep pace with changes to the amateur licence syllabus.

The Service has been responsible for the education of a whole generation of radio amateurs. The material produced was popular, not only amongst aspiring amateurs. It also found ready acceptance amongst High Schools, Scouts, the Armed Services, Technical Colleges, PMG/Telecom as well as private training colleges. Electronics became an accredited examinable subject in NSW

WIA Education Service – Products Available

The following is a list of the material distributed by the WIA Education Service. Some items are also available from Dick Smith Electronics. All prices include postage. The prices shown are reduced for bulk orders. Although based in NSW, the Service caters for people in all states.

*** Novice Study Kit: $28.00**

Includes books entitled Into Electronics, Novice Electronics, 1000 Questions, Learning Morse Code Kit (with three tapes) and the Novice Supplement Handbook.

*** Novice Limited Study Kit: $17.00**

Includes all items in the Novice Study Kit, except the Morse Tapes.

*** Into Electronics: $5.50**

An introductory theory text suitable for club and school classes covering the fundamentals of electricity and how it is used.

*** Novice Electronics: $5.50**

An easy to follow text that extends from "Into Electronics" to a complete Novice theory course, covering all syllabus topics.

*** 1000 Questions and Answers: $5.50**

A collection of typical exam questions covering all areas of Novice theory and regulations. Rewritten 1994 to reflect recent syllabus changes.

*** Novice Supplement: $4.00**

Syllabus, Regulations, study guide and general information about all licence levels.

*** 100 Projects: $5.00**

Simple, cheap, well-explained electronic projects for High Schools and hobbyists, using common components, with an emphasis on learning from each project.

*** 500 Questions and Answers: $5.00**

A collection of typical exam questions that bridge the gap between Novice and Full Call Standard.

*** Learning Morse Code Pack: $11.50**

Three 60 minute Morse cassettes with 120 programmed steps keyed to a comprehensive text and spoken prompts. Letters, numbers and sentences at 5 wpm for Novice standard Morse.

*** Morse Code Cassettes: $4.00 each**

60 minute Morse tapes at any speed from 4 to 30 wpm, three versions of each available. Specify speed when ordering. 5 – 8 and 10 – 12 wpm tapes for an easier learning style are also available.

All orders should be sent to **WIA Education Service, PO Box 262, Rydalmere, NSW, 2116.**

Those with enquiries should phone the Service on (02) 622 2040. Alternatively, those with e-mail access could send a message to hook@ee.su.oz.au.

high schools due to the influence of the WIA Education Service. The Service ran some 20 holiday camps for students with an interest in electronics. These were very popular, with 40-50 children normally attending.

The Service's assistance to people, regardless of disability or geographic location, makes it unique. It has had a long association with Blind schools, which have been given permission to translate books into Braille. A scheme to allow people in remote localities to sit Novice examinations was established. This allowed hundreds of people to gain their amateur licences for no cost other than postage.

Many school electronics courses continue to be based on the YRS curriculum. At the end of the course, students sit an external examination, set and marked by the Education Service. Certificates are issued to the successful students. Thousands have sat these exams, and they proved very popular with teachers. Schools or youth clubs interested in this program should contact Ian Hook on (02) 639 2109.

Today the Service is run by two volunteers, Ian Hook and Kurt Welzel. It produces a full range of Novice and AOCP textbooks and Morse tapes (a list of material stocked is shown below). While orders are well down on their peak in the late 1970s/early 1980s, the Education Service fills a definite need, without which amateur radio in Australia would be much the poorer.

Acknowledgment

Thanks to Ian Hook and Kurt Welzel of the WIA Education Service for assisting with the writing of this article, and to Rex Black VK2YA for providing (through personal correspondence) information on the Service's early years.

(The WIA Education Service, as described by Peter VK1PK, has operated, and presumably still operates, under the auspices of the VK2 Division of the WIA, not the Federal body. The Federal WIA appoints an Education Co-ordinator (currently Brenda Edmonds VK3KT). Most Divisions also have Education Officers. Ed)

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Over to You – Members' Opinions

All letters from members will be considered for publication, but should be less than 300 words. The WIA accepts no responsibility for opinions expressed by correspondents.

Objection to November Insert – WIA Replies

An insert to all issues of the November 1995 Amateur Radio magazine carried a membership promotion on one side and a WIA statement titled "Activities and Achievements" on the other.

In the January 1996 issue of *Amateur Radio*, page 44, Ian Hunt VK5QX took issue with a statement made under the heading "Cutting the Cost of Licence Fees". The whole of that statement read: *"When the SMA in 1994 proposed raising Amateur Licence fees to $71 from $36, the WIA publicised the issue widely, through amateur channels and the public media, bringing pressure to bear on the government. In March 1995, WIA representatives put the amateur radio community's views and objections to the government and won a cut in the proposed fee to $51."*

In his letter, Mr Hunt chose to quote only the second sentence of that paragraph, then argued that it was lobbying by individual amateurs *"... which played the major role in having proposed licence fees lowered. This was well before the Federal representatives of the WIA had any contact with the government concerning the matter."*

The WIA readily acknowledges the role individual amateurs played in conveying their opposition to the proposed fees to members of parliament. However, Mr Hunt has not informed himself of the facts, his own contact with the Federal Parliament notwithstanding. The chronology of WIA action over the licence fees issue shows Mr Hunt's assertion to be in error. In addition to a report in *WIA News*, page 41, February 1995 *Amateur Radio*, that chronology is as follows:

14/12/94: WIA News release on proposed new fees finalised, despatched to Federal Office for insert in January 1995 issue of *Amateur Radio*, sent to Divisions, and released to the packet radio network.

15/12/94: WIA News Release appeared on the packet network, to ALL@VKNET.

16/12/94: First comment on proposed fees appeared on packet radio.

18/12/94: News of proposed fees carried on some Divisional broadcasts. NSW Division suggest amateurs write letters of protest to members of parliament.

29/12/94: WIA, having monitored reactions to news of proposed fees, saw clear evidence of overwhelming opposition. Draft Media Release on fees issue prepared and finalised.

30/12/94: WIA released Media Release protesting new fees: *"New Tax Hits Community Group"*.

31/12/94: WIA wrote, sending Media Release, to the Minister for Communications & the Arts, Michael Lee, Senator Richard Alston, and lower house opposition spokesman, David Kemp. A courtesy copy was also sent to the Spectrum Manager, Christine Goode.

3/1/95: "Ham radio users attack fee" appeared in *The Age* (morning newspaper), page 3. Television channels 9 and 10 gave nationwide coverage to the amateur fees issue. Ian Hunt contacted the WIA proposing a "form letter" for amateurs to send to members of Parliament to be inserted in *Amateur Radio*.

4/1/95: Immediate reaction from the SMA, Canberra; WIA replied, reiterating amateurs' reaction to the proposed fees.

In the weeks following 4 January, the amateur radio fees issue was publicised by many other metropolitan and regional print and electronic media, stemming from reaction to the WIA's initial Media Release which had outlined objections to the proposed fees increase and detailed the many ways in which amateur radio is of value to the community. The WIA wrote to the Spectrum Manager on 11 January 1995, seeking a meeting over the fees issue. Through January, February and March, the WIA sent material to parliamentarians over the fees issue, supporting the barrage of communications from individual amateurs, with a view to clarifying the issues – which some parliamentarians requested of the Institute. The WIA made contact with Michael Lee's office in February 1995, with a view to negotiating on the issue, ultimately resulting in the meeting with Paul Elliott on 6 March.

There has been no "... *attempt to rewrite history*". In one page, the WIA had to summarise some 20 major points of Institute activities and achievements. Of necessity, therefore, the paragraph on "Cutting the Cost of Licence Fees" had to be a considerably "attenuated" summary of the Institute's involvement, which nevertheless acknowledged the fact that the amateur radio community had expressed its objections, and that the WIA representatives advocated the amateur community's position to the government

which capitulated and reduced the proposed fee to $51, announced on 8 March 1995, by the Parliamentary Secretary to the Minister for Communications, Paul Elliott.

It has been clearly demonstrated that the WIA contacted the government very early in the saga over the fees protest, in the first instance well before the barrage of opposition from amateurs around the country, more than a month before Mr Hunt's "form letter" to parliamentarians was circulated, and that the WIA continued contacting the government throughout the period of amateur protest.

Mr Hunt's opinion *"... that it was undoubtedly the action of the individual amateur radio operators which effectively produced the resultant reduction in proposed fees ..."* is true to an extent, but tells only part of the story. The Institute's statement in the "Activities and Achievements" promotion accurately summarises the situation, *" ... the WIA publicised the issue widely, through amateur channels and the public media, bringing pressure to bear on the government,"* which, clearly, it did. Individual amateurs make up the amateur radio community, and so the last sentence of the statement acknowledges their role in achieving the reduction in fees: *"In March 1995, WIA representatives put the amateur radio community's views and objections to the government and won a cut in the proposed fee to $51."*

The amateur radio community, of which the WIA is an integral part, certainly exercised some political "clout" last year. Mr Hunt correctly observes "that solutions to problems with bureaucracy can be found if we have the will to make our voices heard."

In inviting the WIA to provide the government a submission on how the amateur radio service might be better licensed in the future, the Institute was given wide scope. A ten-point framework for this was agreed by the Federal Council, circulated and publicised in mid-1995, with a call for Divisions, clubs and individual amateurs to provide input. A progress report was released in November 1995 and published in *WIA News* in December *Amateur Radio*, page 22. Given the opportunity to provide input, to date Mr Hunt has not done so.

Neil Penfold VK6NE
WIA Federal President

Fees Reduced?

I am a member of the WIA and support the concept of a body representing many amateurs. I receive the monthly magazine.

I noted with interest the November 1995 issue of *Amateur Radio* where the WIA was praising the achievement of reduced licence fees. The reduction was reported as being from $71 down to $51. Well done.

However, it would seem that someone forgot to tell the SMA; or maybe they don't subscribe to *Amateur Radio* magazine. My renewal notice, received in November, requested payment for $86.63, which appears to be more than $51.

What is happening to our licence fees? The year before, under the old system, I paid about $37. At this rate I hate to guess what next year's fees are likely to be.

I hope the WIA hasn't dropped the ball on the issue of fees. I am sure there are a number of older amateurs who would find a fee rise like this a great impasse.

Glenn Alford VK3CAM
6 Chippendale Terrace
East Burwood VIC 3151

(It would seem the SMA has made a mistake, Glenn. Have you complained to them? All the renewals I have knowledge of, barring yours, were for $51. Ed)

Morse Survey

I am rather puzzled by the statement in the VK3 Notes on page 26 of December 1995 *Amateur Radio*, regarding the results of the Morse Survey.

Retain Morse for Unlimited – YES 357 NO 172 = 67% FOR

Retain Morse for Novice – YES 331 NO 198 = 60% FOR

In each case the voting for retention of Morse qualifications was 2/3rds or more of the votes. The report goes on to state this will be the WIA policy at this point of time. Quite right, as the majority of members who bothered to vote made clear.

However, I am rather puzzled by the following lines, stating a significant number of members believe that a knowledge of Morse SHOULD NOT be a mandatory requirement for an amateur licence.

Surely a vote of 2/3rds of the total voting is significant of the members' requirements, not 1/3rd?

Of course, I am in total agreement that should, at a future date, the vote swing against Morse, then that would naturally be the WIA policy.

Lindsay I LaPouple VK3FR
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Need for Morse

The WIA is surveying its membership to see which of its members are in favour of retaining a Morse code test as part of the examination to obtain a radio amateur's licence with HF privileges.

As everything these days works on the basis of "user pays, user says", the only people who should have been surveyed are those who hold existing radio amateur licences with HF privileges. We are the users who will be affected if at any time there is a change in Australian/IARU policy in this matter – and the *only ones* who should have a say in this.

A survey carried out by the UK Radiocommunications Agency in 1993 showed that the majority of Class A licensees (those with HF privileges) wished to retain a Morse test as an entry requirement for HF operation, whilst the majority of Class B licensees (those with VHF-only access) saw no need for a Morse test to allow them onto HF.

Let's get one thing clear – as the UK example shows – it is primarily those "non-users" who are too lazy to put their minds to a Morse test who want to get rid of it, allowing them an easy ride to HF operation.

My father G0TYJ passed the Morse test at 69 years of age, at the first attempt. There are many amateurs worldwide who are severely physically handicapped, but still manage a pass at 12 wpm.

To get on to the question of the relevance of Morse code to radio, one oft repeated line is that professional radio communications hardly uses it today. With the majority of intercontinental professional radio communications being carried using satellites and VHF, there is little need for the operators concerned to use CW. On the other hand, for those radio amateurs interested in experimenting with radio propagation at low signal levels on the lower HF bands, CW is the *only* serious mode to use.

We share all of these LF bands with professional users many of which use CW as an identifying beacon-type signal. The idea of non-CW reading amateurs operating on the LF bands and causing QRM to professional users fills me with horror – especially when we are close to getting an extension on the 80 m SSB DX window thanks to the support of the latter.

The International Amateur Radio Union (IARU) Region 3 conference in 1994 resolved that a Morse code test should be retained as a pre-requisite for those desiring HF operation. There is no reason to change this, apart from laziness on the part of some radio amateurs and greed (at the prospect of more licence fees) from the licensing bodies of a few countries.

Morse is very relevant to HF amateur operators with interests in DXing and propagation, or those who just like using CW. By the way, I use SSB almost as much as I use CW, when signal levels are good enough.

For me, the idea of doing away with the CW requirement for amateur licences allowing HF operation is totally unacceptable *and* extremely dangerous.

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Pounding Brass

*Stephen P Smith VK2SPS**

When I first took over this column, my first couple of articles included a detailed study of early telegraph codes to include the codes of 1838, 1844, 1851 (International) and a brief mention of the Bain Code (1846).

Since then I've tried to obtain as much historical data on the Bain Code as possible so I can fill the many gaps in my telegraph records.

I achieved success in this field through corresponding with Mr W K (Bill) Dunbar, President of the "Morse Telegraph Club" Grand Chapter I L, and as a result of him passing my request for information to club members.

Some time later I received an historical account on the Bain Code from Dr B Stuart Davis (author of the following article).

The Remarkable Chemical Telegraph of Alexander Bain

Alexander Bain was a native of Edinburgh, Scotland. In the 1840s he was already well known as an inventor and experimenter in the new field of electricity. Turning his talents to the budding art of telegraphy, he first patented a letter printing telegraph in 1839. Soon thereafter he devised what continues to be one of the most widely used methods of high speed transmission, the punched paper tape.

His attention had been attracted to the work in chemical recording telegraphs previously announced by several experimenters. The simplicity, speed and small current needed to produce a permanent record on chemically-treated cloth or paper intrigued early investigators. Prof Coxe of Philadelphia in 1816 proposed a telegraph system based upon the discovery that the passage of an electric current through suitably treated paper caused electrolytic decomposition to take place. Harrison Dyar appears to have employed such effects in his 1827 telegraph strung around the Long Island race track. Between 1838-1843 Davy, Cruickshanks and others in Great Britain proposed telegraphs based upon this phenomena.

It was Bain, however, who recognised its high speed characteristics. No matter how rapidly the sending key was tapped, the chemical action took place so quickly that it was impossible to detect the slightest delay. He invented a device to open and close the circuit under the control of a paper tape perforated in accordance with the signal to be transmitted.

By 1848 he had developed a machine to punch the tape such that he was able to demonstrate his apparatus in New York City at speeds as high as 1,000 words per minute! While the fantastic speeds attained by the perforated tape startled and amazed telegraphers, there is no evidence that it was ever used in actual message handling. A hand key, similar to the ones used by the Morse Lines, was employed.

The receiving mechanism was relatively simple. Paper tape treated with a metallic salt solution was drawn beneath a metal stylus or brush by means of a clockwork-like gear train. Passage of an electric current through the moist paper caused electrolytic decomposition of the salts and the metal stylus, leaving a visible discolouration.

There were two types of recorders. Instruments utilising paper tape, as described above, were in general use at small and intermediate offices. At terminal stations, a paper disc replaced the tape of earlier designs. The clockwork gear train was modified to rotate a brass turntable carrying the paper disc. A spiral groove in the turntable caused the arm bearing the metal stylus to traverse the paper in ever-widening circles.

Bain's telegraph was faster than any previously known method. It was simple, noiseless, and infringed but a fraction on the Morse patent. Bain applied for, and received, a United States patent in 1849. Henry O'Reilly of New York, builder of thousands of miles of telegraph lines, was chaffing under the territorial restrictions imposed by the terms of his Morse license. Witnessing a demonstration of Bain's apparatus in New York City, he set about the formation of a new telegraph company to exploit the Bain machinery.

The North American Telegraph Company was incorporated 10 April, 1849 by a special act of the Pennsylvania state legislature. The first section of line to connect Washington with New York opened for business in Baltimore in the same month. Construction proceeded rapidly, and by mid-June the Philadelphia office was ready.

The line was built, using No 9 galvanised iron wire. In operation, the Bain system proved to be highly reliable. Under adverse weather and line conditions that crippled the Morse company, Bain's apparatus delivered the accurate copy. Enthusiasm for the chemical telegraph grew rapidly and within two years, more than 2,000 miles of wire had been placed in service. They quickly proved to be a serious competitor of the Morse lines.

Just how serious the competition from the chemical telegraph lines had become can be seen in the dividend record of the Magnetic (Morse) Company. In 1849, before the New York and Washington line of the North American Telegraph company opened for business, 9% was paid. For the years 1851 and 1852, when Bain lines were expanding throughout the Northeast, westward to St Louis and south to New Orleans, the dividend dwindled to 2%. In 1853, one year after the consolidation, the rate had returned to 9%, and continued to enjoy annual increases for some years.

Except for the soft whirr of the gear train, operation of the Bain apparatus was silent. Attracting the attention of a particular station, with several offices on the same line, proved to be a problem. One solution was assignment of time periods when stations were expected to start the recorder and signal "ready for business". This scheme caused serious delays.

Another method – which, it was hoped, might circumvent the Morse patent – was a device called an "alarm", constructed along the general pattern of a Morse relay, complete with electromagnet and armature. Bain's device mounted a pair of glass disks in place of the usual relay contacts. An audible signal was produced when the tongue of the armature tapped first one and then the other disc as it moved back and forth. The courts had no difficulty in declaring it an obvious infringement of the Morse patent.

Morse covered chemical recording methods in his 1840 patent. Magnetic Company licensees instituted suits and obtained injunctions against the Bain apparatus. The Federal District Court, sitting in Philadelphia, held a prolonged hearing on the technical questions raised. In November of 1851 it found that the 1849 patent granted to Bain infringed upon the 1840 patent of Morse.

Meanwhile, the Morse patentees had begun negotiations with Bain for consolidation of the rival companies. Having lost his patent protection and faced with mounting litigation, he agreed to the merger for $83,000 worth of Magnetic stock.

Substitution of the Morse apparatus and the Morse code for the Bain machinery and Bain's code was ordered on all former chemical telegraph lines. The conversion was completed in less than six months, with the notable exception of the Vermont & Boston Telegraph Company, where the Bain code and recorder remained in service as late as 1886.

The Vermont & Boston Telegraph Company's 229 mile line of No 8 iron wire was completed from Boston via White River Junction to Burlington in 1850. It worked well from a battery of 36 cells. In 1851 it was extended to Rouse's Point, Ogdensburg, NY and Montreal, Quebec. Between 1852 and 1858, additional lines were built from Newport to White River Junction, Vt, southward to Springfield, Mass. The total length of the company's lines was 600 miles.

It is probably impossible to determine the day and year when the last recorder was retired and the era of the Bain chemical telegraph ended. However, in the case of Bain's code, we can detect its presence in office calls such as "AA" Manchester, NH, and "PU" Bradford, Vt (Morse equivalents for the letter "M" and letters "BD" in Bain code). These calls were still used into the late 1920s on Western Union Lines that had been a part of the old Vermont & Boston.

Here are a few calls from the chemical telegraph days, first in Bain, followed by the Morse equivalents, BOSTON, B, F; MANCHESTER NH, M, AA; WHITE RIVER JCT VT, J, V; NORTH THETFORD VT, NT, UTB; BRADFORD, BD, FU;

NEWBURY, NB, UTF; WEST BURKE, WB, MIF; and LONDONVILLE, NP, UTK.

Bain's code was put to unique use by US Army surgeon Dr Albert Myer. Myer used the code to communicate with deaf mutes, and published a paper in 1851 describing his successful experiments. In 1861 he founded the Signal Department – forerunner of the Signal Corps of today.

He continued the use of the Bain code in army communications for some time. The outbreak of the Civil War forced a common language upon telegraphers of the US Military Corps and the US Signal Corps. The Morse Code was now in universal use by commercial and railroad operators, and the Army had no choice but to change.

Bain's high-speed automatic transmitting and receiving method profoundly affected developments in telegraphy, both landline and cable, for many decades.

One of the first to be galvanised into action was Prof Morse. He proposed to send messages by the conventional Morse key to be received on a Morse-Vail embossing register. A probe, sensitive to the indentations in the register tape,

WIA News

Low Frequency Band Nearer for UK Amateurs

Amateurs in Britain will likely be able to use an allocation in the low frequency part of the spectrum in the near future, according to a release from the Radio Society of Great Britain (RSGB).

The RSGB said that the British Radiocommunications Agency (RA) has agreed on a frequency around 73 kHz. The move is a result of negotiations between the RSGB and the Radiocommunications Agency (which has a similar role to our Spectrum Management Agency). The RSGB's Licensing Advisory Committee reported in December that the release of the LF allocation was getting nearer, and now depended on discussions on the actual terms of licensing, which were continuing.

The RSGB originally explored the possibility of an allocation around 87 kHz.

controlled a pair of contacts, thus transmitting the recorded message to the telegraph line.

This scheme was destined to be re-invented by scores of telegraph people, including Thomas A Edison and Walter P Phillips.

Finally, the chemical telegraph demonstrated that it could work over longer distances with less battery, and at higher speeds than the Morse system. Why, then, was it not adopted?

The sensitivity which enabled the chemical telegraphs to record with extremely small currents was, at once, its virtue and its undoing. Where a single line was strung on a pole, earth currents were the only problem. But as soon as additional wires were installed, induced currents between the different lines caused unwanted signals on the tapes, blurring the recording and resulting in serious errors. The moist chemical-treated paper was, to say the least, messy and a probable health hazard.

I would like to thank Dr E Stuart Davis for sending me this historical account of the "Bain Code" and for allowing me to reproduce it in this column.

I would also like to thank Mr Bill Dunbar (president) and the members of the "Morse Telegraph Club" for their assistance.

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QSLs from the WIA Collection

Ken Matchett VK3TL Honorary Curator WIA QSL Collection*

Amateur Radio in the German Reich – The Long Struggle for Legalisation

by Wolf Harranth OE1WHC

(Translated from the German by Ken Matchett VK3TL)

As in other parts of the world, particularly the USA, amateur radio had a hesitant beginning in Germany. A legal barrier had been set up, namely "The Law pertaining to Telegraphy", *(Gesetz ueber das Telegraphenwesen)* which, from 6 April 1892, had reserved all wireless communications for use by postal and military authorities.

The first two radio amateurs who began to transmit in 1920 did so illegally using self-assigned call-signs. They were Werner Slawyk, WYKE and Richard Dargatz, RITZ. Others followed, including one with the mysterious call UHU, who operated from Heidelberg. At that time considerable investigative skill was required to determine the address of the sender and to enable the exchange of QSL cards.

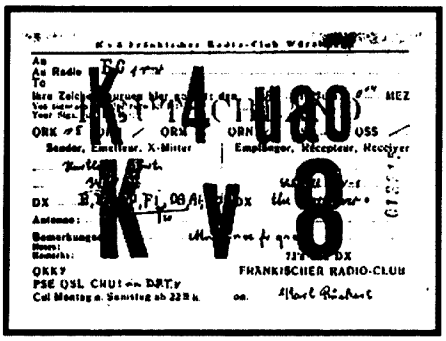
In 1924 the German Post Office *(Reichspost)* sanctioned the reception, free of charge, of wireless news broadcasts, thus issuing the first listeners' licences for the new medium of radio. However, the ban on the issue of transmission licences continued. After this, most of the local radio clubs combined to form a transmitters' collective *(Funkkartell)* in order to force a relaxation of these strict regulations.

Out of this amalgamation of clubs was formed in 1925 the German Technical Radio Organisation *(Deutsche Funktechniche Verband – DFTV)*. From the very beginning the DFTV had up to 50,000 members, amongst whom, however, there were barely three dozen transmitting amateurs. These used "K" for Germany as the first letter of their call-signs, followed by one further letter and a numeral. Thus Rudolf Horkheimer, Dip Eng, a founding pioneer, went on the air as station KY8.

For wireless listeners, the German Receiving Service *(Deutscher Empfangs-Dienst, DED)* issued the first DE call-sign numbers. This organisation amalgamated with the German Transmitting Service *(Deutscher Send-Dienst, DSD)* within the DFTV and from May 1927 became the German Amateur Transmitting and Receiving Service *(Deutscher Amateur Sende und Empfangsdienst, DASD)*, a representative body to the hitherto independent organisation of unlicensed German amateurs.

The Post Office had, up to this time, issued only a few official call-signs – from KB to KZ – and now ceased issuing them altogether. Unlicensed operators *(Schwarzfunker)* gave themselves their own call-signs which consisted of the letter K followed by one numeral and two letters. (Licensed stations had an EK plus one numeral and two letters in their call-signs.) Later the call-sign suffix of the illegal operators was extended to three letters since they wished to distinguish their own calls from the few legal ones using only two letters.

Examinations were held in strict secrecy, illegal licences *(Schwarz Lizenzen)* issued and QSL cards exchanged via bureaux. When the issue of legal licences *(Weisse Lizenzen)* to scientific institutions, radio manufacturers and privileged individuals by the German Post Office began in 1928 (all with the D4 call-sign), both illegal and semi-illegal *(Halb schwarzen)* operators adopted the D4 call-sign. The German Post Office took very strong measures against unlicensed operators. The much quoted



legalisation appeared for the first time in Post Office Official Publication No 19 dated 20 February 1931, but in what form! The decree stated: "The activity of transmitter operators will again be permitted if they are engaged in experimental work conducted in radio clubs and do not employ an open antenna lead".

In 1933 there followed the forceful seizure by Hitler of the DASD, (Quote: "Which up to now has evidently been run by Marxists and operated on Marxist lines"). At the same time, the DASD was placed under the German Ministry for Propaganda *(Reichspropagandaministerium)* in order to (Quote: "Achieve cooperation with the SA, SS, NSBO, Stahlhelm and the Aerial Sports Organisation *(Luftsportverband)* and to pursue the aims of the country's defence"). Some official licences were unhesitatingly issued without the need for examination to faithful Party members (Quote: "In order to show the world the progress achieved in the fields of optics and sound by the new Germany").

On 1 September 1939 the immediate surrender of all amateur radio equipment, without compensation, was decreed by the Post Office authorities. At the same time all 529 licences were rescinded. Only three stations were to remain with the commission to (Quote: "continue to represent the radio operators of Germany to the rest of the world"). Later, the High Command of the German Army issued in all 35 authorisations for wartime radio transmissions, *(Kriegsfunksendegenehmigungen)*.

In the historical section of the (Austrian) QSL Collection there are, at the present time, approximately 200 German station

QSLs from the 1920s and 1930s. We seek the assistance of all Old Timers in our task.

Translator's Note

QSL cards are exchanged on a regular basis between the Austrian QSL Collection and our own WIA National QSL Collection.

Thanks

The WIA would like to thank the following for their kind donation of QSL cards to the Collection: Ron VK4BG, Malcom VK3CLM, Bob AA9DX, Adelaide Hills ARS, Jim VK4KJM, Hans SWLVK4/HE9RFF, Mike VK6HD, and Don VK3ADI.

Also the friends and relations of the following Silent Keys: Chas Harrison VK7CH, Ian Lamont VK3KAB, Ken VK7KA, James Carr VK3JV, Austine Henry VK3YL, and Ken Grimes VK6AKG (courtesy of Jeff VK6AJ).

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Repeater Link

*Will McGhie VK6UU**

For Sale

Our portable WICEN repeater in VK6 has a problem with pagers. Considerable efforts have been invested in trying to sort the problem out with no success. The receive frequency of the repeater is 147.775 MHz and, being a portable repeater, is offered no interference protection by the SMA.

Efforts to reduce pager interference included a front end crystal filter. That's right, front end crystal filters can be bought for the VHF band. They are not cheap but offer very narrow bandwidth of about 15 kHz around the receiver's input frequency, and are connected between the aerial and the receiver. Attenuation outside the 15 kHz bandwidth is better than 20 dB, with up to 30 dB attenuation on some frequencies.

To use 147.775 MHz as an example, a frequency of 147.785 MHz and above is attenuated by 20 dB or more. The input output impedance is 50 ohms. This type of filter can reduce or eliminate interference caused by overload in the receiver by signals very close to the receiver's frequency.

However, even with the inclusion of this crystal filter in the WICEN repeater's receiver, pager interference remained. The source of the pager interference may not have been a receiver problem but too much time had already been spent on trying to sort the problem out, so a frequency shift was made. One of the few remaining repeater frequencies below 147 MHz was chosen.

The result, one surplus crystal filter. These filters only operate on the frequency they have been made for, so if you would like to obtain the crystal filter, contact me and I can let you have the details.

29 MHz

The 29 MHz gateway port on our VK6RLM two metre voice repeater is still not licensed. The licence was applied for some five months ago. A request from the SMA for $24, plus $91 for one hour's investigation, resulted in our repeater club sending off $24 only. Would the SMA miss the $91 or not?

After five months they did, and returned our $24 cheque. The next effort is to request the SMA to detail exactly what is done for the $91. This could be a long wait but this is what we have become used to. We waited almost five years for TLS11 – was it worth the wait?

While on the subject of 29 MHz gateways, I have heard that Wollongong has a 29 MHz gateway operational on 29.620 MHz. This information came from Grant VK5ZWI who is concerned where all this is leading, and I must admit it does pose a few questions. It all relates to silly regulations. Gateway stations from 29 MHz onto an existing repeater are not allowed except when placed in the 29 MHz repeater segment. This is a silly place to put them but, frustrated with no where else to put them, there are only two choices – locate the gateway in the repeater segment or not have the gateway at all.

The way to change this is to spend considerable time preparing a submission to the WIA to either support a gateway sub band or not on 29 MHz and, if they do, negotiate with the SMA to allow gateways. This begs the question, what has it to do with the SMA? Why do we amateurs have to do this every time someone comes up with a bright idea. The point of amateur radio is experimental. As soon as you place detailed regulations on experimentation, experimentation is limited or lost altogether.

Costs

The changes to the way in which repeaters are licensed, in particular the cost of the licence, is a worry. In VK6 our digital network is undergoing considerable change and, as a consequence, frequencies for digipeaters and remote BBSs are changing. This appears to mean investigation costs every time a frequency

is changed. If $91 an hour is charged for every frequency change the total cost will be considerable. I find this all a bit too much.

The SMA have every right to want to know where every particular remote amateur digipeater or repeater is, but I don't believe the $91 an hour is right. We can set up a portable repeater or digipeater without the SMA doing a site compatibility check and leave the system running for up to a week, so why does the time in which it operates change the situation and attract this cost? If the SMA allow us to operate such systems on a portable and, I presume, unattended basis, why should it be so different to extend this period and not incur a cost?

The simple solution would be to inform the SMA of the new installation with all the details as to location, frequency and contact persons. The SMA do not run a site compatibility check and hence incur the $91 per hour. After one week (or longer) the amateurs then contact the SMA to ask if any reports of interference to other services have occurred. If not, the system is licensed and allowed to operate as a permanent installation. Less work for the SMA and less costs for the amateurs.

Flying East

As VK6's alternate councillor I flew east at the end of October 95. The weather in Perth was warm and sticky with large amounts of haze all around indicating an inversion. Once the plane took off and climbed over the inversion layer the height to which the inversion layer went was obvious. The top of the cloud, ie haze level, was as straight as the eye could see, for as far as the eye could see. The path was open on VHF between VK6 and VK5 across the bight, so it was with interest I watched the cloud as the plane headed east. All the way to Adelaide the same cloud formation persisted, with the top of the cloud base absolutely straight all the way. The plane was flying at about 35,000 feet and the cloud was only a few thousand feet below. If the top of the cloud indicated the top of the inversion then this inversion extended up to about 30,000 feet. Not much to see out of the window for most of the passengers, but I found it interesting.

WIA Convention

The flight east was to take me to my first WIA Federal Convention as VK6's alternate councillor. I was looking forward to seeing the sharp end of the WIA. For years I had wondered what went on and how decisions were made. Many an idea or submission from myself had appeared to disappear into these Federal get togethers and I wanted to find out, along with representing VK6, how it all took place.

Rather than go into detail, generalisations are simplest. For a start the convention was well run, from the accommodation in a Melbourne hotel, which also housed the conference room, to the food. There was nothing lacking in the running or convenience of the conference situation.

From 9 AM Saturday morning it was straight into WIA business. The pace was to move along as there was a great deal to plough through. I found at times it was too much, with some items possibly needing more time, but there was limited time.

Day two was the same. However, the convention finished slightly ahead of the forecast time by about an hour. The timing was well arranged.

After it had finished I had formed some opinions on an area of the WIA I previously knew little about. The Federal councillors make up the most important part of the WIA in terms of policy and direction. They are required to decide the issues. However, many decisions require research and effort by someone. It often gets down to one councillor, or any other WIA member who can be seconded, doing much of the spade work on their own and then reporting back to council. It might sound easy but it is not. The end result can be very drawn out and one individual is required to devote a lot of time.

Another point I noticed at the conference was a degree of them and us. The them and us being the Federal WIA and the individual Divisions. At times the Divisions seemed to be in conflict with the Federal WIA simply because they have different names. I could be wrong and it may be that this is the best way for it all to operate.

Communications

The biggest problem we face as an organisation is poor communications. Communications between the individual Divisional councillors, and communications between the Divisional Technical Advisory committees TACs, to give an example.

The repeater TLS11 is a current situation that springs to mind. The TLS is forwarded to each Division, at least that is what should happen. I don't know if each Division received one, if it was received early enough to comment on, and if it reached the correct amateurs who should be commenting on it, who may not necessarily be the TAC person. How can I find out if each Division received its copy on time and that it went to the correct amateurs for comment?

One answer is that I could ring each Division and track the information down. There is a degree of luck involved in this as it depends where in the chain the correct person is who can supply the information. It may not be the Divisional President, or the secretary, or the TAC. It could be a long road to finally contact the right person and I have to do this for each Division. A very slow and costly process.

Furthermore, what interchange of information occurred between the Divisional TAC's over TLS11? The answer, to my knowledge, is none. What if a particular Division decided that TLS11 did not need any changes, but this was based on limited knowledge of some parts of TLS11 that could hinder repeater development now or in the future. A particular Division missed some thing and as a result supported a part or all of TLS11. Contact between the TACs could have supplied information or a point of view that was missed.

The point of this is that, as an organisation with different parts, making up the organisation communication between these parts is vital. We do not have that communication! Prove me wrong if you can. I hear you saying phone, Fax, or snail mail. Not good enough because these means have existed for years and we are not communicating. Some amateurs have access to STD phones at no cost due to work. Most do not.

The Answer

The answer is simple and, I believe, the only answer – electronic mail. Until the WIA at the administrative level becomes connected by an effective electronic mail server we will continue to stumble along. Strong words I know, but the present system is not working. Just think, if all the Divisional Presidents, TAC's, FTAC, Divisional Councillors and any other relevant part of the WIA were connected via e-mail, how much easier and effective we all could be.

There is a move to introduce just such an e-mail system. A well thought out and costed system has been proposed by Richard VK1RJ. A computer known as a server would reside at the Federal office and be connected via a modem to a phone line. Access could then be made by those amateurs who have access, to pick up and leave mail on all order of things relating to the running of the WIA and amateur radio in general. There is detail to be worked through but the sooner such a system goes into operation the sooner the WIA can function at a higher, more efficient level. Perhaps the wait for TLS11 of almost five years could have been shortened and comment on the TLS could have been more wide spread and conclusive.

Next Month

Next month I hope to have an alternate method of converting the E band 828 exciter to 6 metres. This conversion was put together by Don VK6HK for a beacon and uses a very different approach.

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VK6UU @ VK6BBR

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VHF/UHF – An Expanding World

*Eric Jamieson VK5LP**

All times are UTC.

VK5VF VHF/UHF/SHF Beacons

David VK5KK, from the WIA (SA) Beacon Committee, reports the interesting information that over the past few years the upgrading of the VK5VF Mt Lofty transmitting site (700 m ASL) has been slowly progressing to the point where we now have all planned beacons in full operation, with the exception of 3.4 GHz.

After a series of trials the following beacons were commissioned in final configurations on 16/12/95. I have also summarised the current status of the existing beacons. **Note: All beacons are horizontally polarised.** F1 keying is -500 Hz on key down, 10 wpm. The 10 GHz beacon is narrow-band.

Call	Freq(MHz)	Eirp	Mode	Heading	Comment
VK5VF	52.450	10 W	A1	Omni	ID every 30 seconds
VK5VF	144.450	15 W	A1	Omni	ID every 30 seconds
VK5VF	432.450	10 W	A1	Omni	See Note 1
VK5VF	1296.450	30 W	F1	135/305°	VK3-VK6 Note 2
VK5VF	2403.450	50 W	F1	200/360°	VK6 - Adelaide
VK5VF	10368.450	10 W	F1	Omni	See Note 3

Note 1. The 432 MHz beacon is remotely commandable in power level. The beacon listens on its frequency for 1.5 seconds before ID: transmit on F3 single DTMF for power as follows: 63 mW = 1, 250 mW = 2, 1 watt = 3 and (Default) 4 = 4 watts. Auto reset to full power after 30 minutes.

Note 2. Both the 1296 and 2403 MHz beacons have better than ±300 Hz stability over normal day temperature variations. Both use active temperature compensation rather than oven technology. Antennas are stacked waveguide (1296) and slotted waveguide (2403) giving -3db beamwidths as shown. The figures are for the directions of the main lobes which presently favour the VK3 and VK6 paths.

Note 3. The 10 GHz beacon runs approx 800 mW to omnidirectional slot antenna. Stability + or - 1 kHz approx over day temp cycle. Keyed at same time as the 1296 and 2403 MHz beacons. We have the option available to make this beacon directional, with remote commanding on 1200 MHz when commissioned.

Adelaide Users

All beacons are audible with the most basic (working!) equipment. The SHF beacons are audible with minimum antenna if you have a view of Mount Lofty, although coverage of the 1296 beacon is deliberately poorer due to beam heading (into northern areas). Eric VK5LP reports the 1296 MHz beacon is S9 at Meningie, 120 km.

The 2403 MHz beacon can be heard with any Mode S converter - just tune to an IF of 147.450 MHz. Good beacon for propagation warnings of 10 GHz. The 10368 MHz beacon can be heard on open waveguide with a narrow band receiver within line of site; worst path is due north, due to the summit peak blocking line of sight. A test carried out over the New Year weekend confirmed all beacons are audible in most areas over a 150 km radius of Mount Lofty.

VK6 Users

The Eirp of both the 1296 and 2403 Beacons should be sufficient for reception (1296 has been previously heard 1991/2) during ducting. Eirp of 10368 MHz may restrict it to local ducting up to 400 km, but who knows! We have room for a 600 mm dish to point at 262° (Albany); any interest in this option should be directed to VK5KK. Lower frequency beacons as per ducting or Es as usual.

VK5 South East/VK3 Users

Users in this area will have poorer coverage from the 2403 MHz beacon, with an estimated equivalent of 1 W Eirp in that direction available. 1296 MHz has a good lobe to the South East. 10 GHz should be of great interest under ducting out to 300-400 km.

General

VK5VF is one of the oldest VK Amateur Beacon sites, established in 1961. The latest UHF and SHF beacons are a result of private donations and funding in the interest of promoting the use of these frequencies. The following have made all this possible. VK5EME (Exciter PCB design), VK5ACE (432 MHz), VK5ZO (2403 and 10368 antennas), VK5NY (10 GHz PA) and VK5KK (Design/Assembly & Tuning). Any reports and/or, etc direct to VK5KK@VK5LZ or e-mail Tecknolt@ozemail.com.au, or phone 08 3074579 24 hours.

3456.450 MHz is the next stage, does anyone else have equipment? .. de VK5KK.

Trevor VK5NC reports that the Mount Gambier beacon VK5RMG is now operational on 144.550 MHz running 25 watts to a crossed-dipole antenna. Ident is **VK5RMG Mount Gambier QF02.**

The West Australian VHF Group Newsletter advises that the beacon **VK6RPH** is on air continuously from the Channel 9 TV tower at Walliston on the top of the Darling Scarp, just east of Perth. Beacon frequencies are 50.066, 144.460, 432.460 and 1296.460 MHz. Locator is OF88AA. The four antenna systems are horizontally mounted at 23 m. Transmit powers are nominally 10 watts each and identify with **VK6RPH** Perth every ten seconds.

VK - ZL DX

A most welcome letter arrived from **Cliff Betson ZL1MQ**, editor of the VHF-UHF Column of *Break In* magazine for NZART, with details of the VK-ZL contacts on 50, 144, 432 and 1296 during the period 11/11 to 10/12/95. Auckland city had the most openings with ZL3NE/1 scoring best on 50 and 144 MHz. Cliff said he was second on 50 MHz!

Contacts were on 50.0 to 50.5 MHz, and on both sides of 144.1 MHz, being direct contacts using SSB or CW. ZL1 contacts to ZL2 on 50 and 144 were via ground-wave or backscatter, while ZL1 to ZL3-4 were Es or backscatter.

Cliff said, *"The large Sporadic E cloud in the northern area of the Tasman sea was the reason for most openings occurring to VK4 from ZL1, with the spill-over to VK2, plus at times a trough of low pressure between VK4 and ZL1. Next year we may see the Es cloud further south giving ZL2-3 large openings with ZL1 on the edge".*

Due to the overall large number of contacts, I have omitted the ZL to ZL contacts which numbered 19 on 50 MHz, one on 144, and four on 432. There were 93 contacts between the VKs and ZLs, plus three VK9 to ZL. The band was open on 17 days during the month.

50 MHz: ZL3NE/1 worked VKs 2ABW/2, 2AIF, 2BIT, 2DN, 2DVZ, 2FZ/4, 2HC, 2YDC, 3AMX, 3LK, 3YDE, 4AFL, 4APG, 4ARN, 4CF, 4GPS, 4JHM, 4KK, 4KMA, 4OE, 4PU, 4ZAZ, 5BC.

50 MHz: ZL1MQ worked 2AIF, 2FLI, 2PB, 2YDC, 3AMX, 3DQJ, 3DUQ, 3DUT, 3KCM, 3OT, 3YDE, 3ZNF, 3ZNF, 4ABW/2, 4AFL, 4GPS, 4GWC, 4KK, 4TQ, 4WAG, 5BC.

50 MHz: VK4AFL was also worked by ZL2KT, ZL1TMF, ZL2WNB, ZL2AGI; VK4DO, VK4DN, VK2ARB, 5BC worked ZL2AGI; VK4DWJ worked ZL2AQR/3; VK4GPS, VK4ARN worked ZL1TMF,

VK2AIF worked ZL2WNB, VK2FZ/4 worked ZL1AVZ and ZL4AAA. A number of stations were worked via the VK six metre repeaters.

At 0537 on 10/12 **ZL4TBN** worked Jim Smith **VK9NS** on Norfolk Island, and again on 11/12 at 0636. Jim was also worked by **ZL3**NE on 11/12 at 0638. Unconfirmed reports say Jim also worked VK2, 3 and 4 on 50 MHz.

On 144 MHz there were 51 contacts to ZLs, plus the first recorded contacts to VK9NS on 30/11 by **ZL4AAA** and **ZL1IU.** A good effort. 144 MHz was open on six days with the best day 30/11 when 21 contacts were made. Open 21/11, 29/11, 30/11, 3/12, 6/12 and 10/12, usually in the mornings from 1900 to 0240, then again from 0620 to 1200. The length of the openings tends to suggest the contacts were mainly tropo, with perhaps some Es assistance at times.

144 MHz: Worked were VKs 2DVZ, 2FZ/4, 2RSY/b, 4AEN, 4AFS, 4APG, 4ARN, 4ATG, 4DH, 4GMC, 4GPS, 4JSR, 4KSO, 4KZR, 4LC, 4LP, 4LV, 4OE, 4PF, 4PU, 4QV and 4RH.

ZLs were 1AVZ, 1HR, 1IU, 1TWR, 2AGI, 3NE/1, 4AAA. ZL3NE made 29 contacts, ZL1TWR made 15. In addition, several VK2s and VK3s contacted ZL3s using repeaters. Using 432 MHz, VK2FZ/4 worked ZL4AAA and ZL1AVZ on 29/11.

One contact was made on 1296 MHz between **VK2FZ/4** and **ZL1AVZ** on 29/11 for what is probably a new 23 cm distance record for ZL. VK2FZ/4 is 83 km north of Brisbane and ZL1AVZ is West Auckland, on the coast. The exact distance is yet to be determined but is in the region of 2250 km over the sea for most of the distance.

Obviously it was a very exciting period for the east coast Australians and also kept the New Zealanders on their toes. It will be interesting to receive their next report

Packet Radio

Steve VK5ASF, Chairman of the SA Packet Users Group, advises much behind the scenes work is required to keep packet activities operational.

There has been a large number of bulletins which the Sysops felt violated our network's Acceptable Use Policy (and SMA regs!). Monitoring for these bulletins is a real "chore" for all the Sysops.

There is a great deal of interest in high speed packet. Various people are examining options for both high speed user ports and a high speed backbone to link the major BBSs. There are some quite large costs associated with each. However, individuals are encouraged to carry out their own research and experimentation if they are interested in this area, as a high speed BBS/backbone infrastructure will take quite a long time to put in place.

Band Reports

From Brisbane, Peter **VK4APG** sends a report, *that on 6/12 he enjoyed a 2 m Es opening to ZL. No doubt the other openings via tropo late November will be well reported but I didn't hear too many other stations on the sixth. Got home from work about 0500 to hear VK2ABX in Orange on six, so put key down on 2 m beaming VK3. VK2APG and VK2BIT appeared on six with big signals then when VK2ZVF in Newcastle appeared I turned the beam 90° to the 6 m path, called CO on 2 m and Bob ZL3NE came back just like a local 40 dB over 9.*

0637 ZL3NE 5x9 sent, 5x9 received; 0639 ZL1TWR 5x9 5x9; 0640 ZL1HR 5x5 5x9, 2.5 watts! 0643 ZL1IU 5x9 5x5; 0645 ZL1PE 5x5 5x2; 0648 ZL2AGI 5x2 5x4; 0657 ZL3TIC 5x1-2 Christchurch - using vertical, no two-way; 0657 ZL2UCG 5x3 5x6; 0738 ZL1SL 5x7 5x3-5.

I'd heard the tip to turn 90 degrees to the short skip 6 m stuff ..it works!! Seasons Greetings. Good DX.

From **Ron VK4BRG**, *six metres was open nearly all day Sunday, 26/11, with Es to VK3 and VK5. At 0241 the band opened to the Perth area... worked VKs 6JJ, 6WD, 6ZPP, 6KZ, 6TRG, and finally 6RO at 0314 UTC.*

From **Steve VK3OT**, *Today, 14/12, propagation on six metres was very different, no doubt due to the influence of the solar event on the E layer. Backscatter signals and very strong ZL/Tasman Sea signals were the order of the day The first 2 m ZL to VK9 Norfolk Island contacts were made, and VK9NS worked into VK at 2000z and again at 0700z on 50.110. ZL1, 2, 3 and 4 signals were up to S9+ during the afternoon. ZL TV video and respective sound carriers up to and including 67.750 were heard and watched on TV. At one stage 45.240/250/260, 55.240/250 and 62.240/250/260 were all 59.*

Solar Noise burst from 0240 for three minutes up to S7 followed by highly enhanced backscatter conditions. The previous day and for the following 36 hours, the sun noise has been way above normal conditions. Today it is back to normal. 48 MHz TV was heard on backscatter from the N/East during the opening to Norfolk Island.

I heard a couple of stations discussing the wisdom of preparing for Cycle 23 this early. Moral to the story and from experience gained in the past 10 years - the band is where we thought it was in 1985/86, but we didn't gear up until the large opening of March 1989.

The point is, if a mediocre station running 75 watts to a five el Yagi was heard in Europe in December 1988 and the 53 MHz TV sound was audible from Spain, the Europath was available (in hindsight) from October 1988, but we didn't work anything until mid 1989 - 6 to 12 months later. You can never be too prepared.

The best DX was at the beginning (1989) and end (1992) of the major enhanced period of Cycle 22. With a projected peak of mid 1999, you need to be set up by next year to exploit March 1997. The first of the large JA openings will occur in either of the next two equinoxes. There have been F2 JA paths on October 13/14, Nov 7/8 and Nov 15/16 to VK south and ZL.

Do not make the fatal mistake of thinking that, if stations in Northern Australia have no DX, down south is not possible. I worked into Europe in October, November, December, January and February 1989, 1991, and 1992. Up North the European propagation was earlier and later but not much during December and January.

The only problem is wading over the tops of countless individuals who insist on using the 50.110 international call channel as a local E layer chat channel. You will have to coordinate the DX yourselves and move it around.

AH8A from American Samoa (WB6FBN) told Steve VK3OT that he is interested in re-activating six metres. The island was last worked from VK in April 1981 on 52 MHz. **Mike VK3BDL** first reported the beacon on 50.104 on 20/4/1981 at 2215 and a few VK3s (BDL, XQ, OT, et al) made two way contact. Cards were hard to get, and probably still are rare.

VK3OT said that on 21/12 the MUF was very high, and E layer/Field Aligned Signals reached 92.77 MHz to Townsville. The 87.270 video is unique to Townsville and was S9+. The 64.250 Channel 2 s was in, also the VK4ABP beacon. Channel 0 Toowoomba, at a lower frequency and thus shorter skip, was viewed in full colour.

From 0400z to 0900z: 45.240 59, 45.2500 59, 45.260 59, sound 59, 50.120 ZL3NE 55, 51.029 ZL2MHB 55, 50.110 VK1MJ, VK6WD, VK6YJW worked. 50.130 VK6**ZAK** worked. 55.240 TV 59, 55.250 59, 52.345 VK4**ABP**/b, 50.057 VK4RGG/b, 50.065 VK6RPH/b, 50.077 VK4BRG/b. 87.270 video Townsville 59+, 92.770 sound Townsville, 50.110 ZL1MQ calling VK6 DX and worked VK6WD.

46.260 Tamworth video 59+, 52.005 Tamworth sound 59 stereo pair. 28.230 ZL beacon, 28.261 Perth beacon, 48.2396 TV 55, VK6YU working VK7GUN, VK6BE working ZL, VK5, VK3, VK6RO, VK6JJ, VK6RPH/b 559, VK4PU.

From **Bob VK6BE** in Albany, *My six metre log for 21/12 - it would be interesting to compare the log of VK6HK with mine over the same period on 21/12/95 from 400 km south of Perth.*

0745 beacons VK7RAE, VK3SIX and VK2RHV (Newcastle). Worked: 0750

ZL3TLG, 0750 ZL3ADT, 0803 VK5ZBK, 0805 ZL3AAV, 0817 VK3LK, 0827 ZL2AGI (CW please note!), 0845 ZL2TPY, 0850 VK7GUN, 0855 VK5BC, 0902 ZL3TIC, 0907 VK5AIM, 0925 VK3AMX, 0935 VK3ATQ, 1005 VK2FA, 1050 VK3DUT, 1100 VK3KAQ (ex-VK6ZCN), 1150 VK5AKK.

Band then folded. Did Don go out that night or did the band fold earlier in Perth than it did here?? Also heard VK6JJ and another Perth station (VK6YU??) on back scatter.

By the way I read a query about capability on RTTY etc on VHF. I can work RTTY, FEC, AMTOR, PACTOR etc on all bands up to and including 144 MHz if anyone is interested in trying to make a contact on one of those modes. I could also get on to 432 with any of those modes without much bother if there was interest, but I'd want to know there was a chance of working someone before I'd go to the trouble of wiring the necessary plugs! Activity on 432 is pretty rare in these parts. I got on to ATV on 70 cm once but after a few months of watching myself I gave that away! Narcissus? No, not me! Cheers, Bob VK6BE.

From **Don VK6HK**, *50 MHz propagation from Perth on 21/12/95: 0234 VK2FZ/4, 0250 VK4KK, 0251 VK2KF, 0803 ZL3TIC, 0810 ZL2AGI, 0813 ZL2AAA, 0821 VK3LK, 0828 VK7GUN, 0835 ZL2TPY, 0844 VK7RAE/B. This list is by no means exhaustive but indicates widespread Es on 50 MHz, as sampled during the day*

From **VK4TUB,** *Since there has been so much DX round the northern tropics lately, we have decided here in Townsville to start a local six metre DX newsletter on a monthly basis, to keep all the Queensland operators in the picture as to what to listen for... thanks for your support and we'll start the ball rolling shortly... Tub VK4TUB.*

Geoff Brown GJ4ICD e-mail via Dave **VK2KFU** says a group of nine operators are on Marion Island until May 1996, with a beacon on 50.200 signing ZR1BCE/ZS8, running continuously, using 170 watts to a five element Yagi beaming to South Africa. Marion Island is SSE and about 2000 km from South Africa, and in the southern Indian Ocean.

Trevor VK5NC in Mount Gambier was busy at the rig during December. On 12, 13 and 14/12 he worked ZLs 2, 3 and 4 on 50 MHz. 15/12: Good two metre opening to VK3, signals to 5x9, included were VK3s DEM, XRS, 3AUU, KDO, DQW, XPD, and VK3XRS on 432 (600 km) 5x5; 16/12: 432 to VK3RZ, VK3ZQB, VK3II, and VK3RZ on 50 MHz; 17/12: VK3KXJ and VK3HY on 144; 21/12: VK3DEM, VK3TBM on 144 and 432; 23/12: VK3ZQB 1296 FM 5x9, VK3RZ 144 and 432; 24/12: VK3XRS, VK3XBD 144 and 432; 25/12: VK5NY 1296 5x7 at 0000 and again at 0234, VK3DEM and VK3XRS 144 and 432; 26/12: 1296 to VK3ZQB, VK5NY and VK3KWA.

27/12: Various contacts to VK3 and VK5 on 1296, 432 and 144, most signals 5x9. 28/12: VK3s on 144 and 432, VK7XR on 144, VK3ZQB 1296, at 1240 VK3XRS 1296 at 600+ km, 2330 VK5RO, VK5ZRK and VK3s; 29/12: VK3ZQB and VK3XRS on 1296, many VK3s on 144 and 432; 30/12: VK3XRS and VK3ALZ on 1296, VK3AUU running 2 watts and 5x9+ on 144.

30/12: 10 GHz contact between VK5NC at Blue Lake Crater and VK3XPD on Mount Dandenong at 2150, 5x4-5x9, distance 400 km. Heavy rain from 0000 prevented further contacts.

Closure

There has been a lot of information to sift through this month, much of it received via packet, which is fortunate in one way as few people write with information these days. I was fortunate to receive the pile of information about the trans-Tasman openings from Cliff ZL1MQ. I knew many contacts had been made but lacked the details.

Closing with one thought for the month:

1. Age is mind over matter. If you don't mind, then it doesn't matter. And something different -

Bud VK4QY said he saw the following on the back of a T-shirt - "The older I get, the better I was." There are many areas of life to which this could apply.

73 from The Voice by the Lake.

PO Box 169, Meningie SA 5264
Fax: (085) 751 043
Packet: VK5LP@VK5WI.#ADL.#SA.AUS.OC
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Silent Keys

Due to space demands obituaries should be no longer than 200 words.

The WIA regrets to announce the recent passing of:-

S E (Syd)	MOLEN	VK2SG
W E E	FIELD	VK2PWU
W M (Bill)	CAVANAGH	VK2WC
N J	HIRD	VK6KKR
F E (Edgar)	NICHOLLS	VK7RY

Syd Molen VK2SG

Syd Molen passed away on 30 December 1995 aged 76.

Syd was always interested in radio and electronics. He was an avid SWL in his teenage years. Even in his school days I have been told that he had bits and pieces of crystal sets hidden in his desk.

In 1939 he joined the RAAF and served throughout the hostilities on Hudson and DC3 aircraft in the operational Pacific theatre of war. As well, he was an instructor in the field of electronics. It was during his war service that he met and married Jean.

After his discharge from the Air Force in 1945, he became involved with the Royal Flying Doctor Service as one of their leading mobile technicians in the far outback of Queensland and the Northern Territory. It was during this time that Syd became a licensed amateur with the callsign VK4SE.

After leaving the RFDS he obtained his Broadcast Certificate and was employed with various broadcast stations, ending up with 2UW in Sydney. He then took out his current call of VK2SG. From here he broadened his horizons by assisting with the planning and eventual opening of Channel 10 studios. He served in both their studio and transmitting facilities and eventually retired from Channel 10 around 1980.

All through these years he was an active amateur, gaining different awards in different fields of communication, and still continuing experimenting with different aspects of his hobby. In 1970, Syd was responsible for the safe completion of the first 8600 mile voyage of the raft "La Balsa" across the Pacific from South America to Australia. The raft's radio equipment malfunctioned approaching Australia and it was Syd's technical knowledge and dedication that enabled them to make their successful landfall.

It was during the last 15 years that he became particularly interested in digital methods of communication and he was in the forefront of many developments in these modes. Much of the original equipment that was used was ex-surplus disposals and, with his knowledge and expertise, he developed new ideas.

He was one of the foundation members of the Australian Amateur Radio Teleprinter Society and was a regular participant in many contests. He furthered and encouraged younger members of the amateur fraternity to become active amateurs in the digital modes. He was known throughout the world for his radioteletype DX notes. Although he gave the origination of these notes to overseas amateurs, they are still sent worldwide weekly and known as the "VK2SG DX Notes". They even now appear on the new super highway, the Internet.

Syd has many amateur friends around the world who remember him fondly and

miss seeing that VK2SG callsign on their screens. Syd's pioneering in amateur radio has given many thousands of people around the world a lot of pleasure.

Bill Storer VK2EG

Bill Cavanagh VK2WC

Bill Cavanagh VK2WC of Wauchope passed away suddenly on Sunday, 19 November 1995.

Gaining of his first amateur call sign A3WC in 1925 marked the beginning of Bill's long experience and participation in the developments and practices of communication technology.

In addition to being a prominent figure in the amateur radio fraternity, Bill was also a champion swimmer. He gained State championship titles in the Victorian Swimming Association during his swimming career over the years 1922-1932. He was also a prominent surf board rider in the days of the "long boards".

Historical records of the Goulburn Amateur Radio Society show that in 1926 he was the broadcast engineer at the commercial radio station 2GN and was also an active member of the small amateur radio group at that time.

Bill served as a Signals Officer in the RAAF during WW2 and later settled in Wauchope. Here he operated a Radio and Electrical Business until his retirement in 1972.

He was an Honorary Life member of the Oxley Region Radio Club at Port Macquarie.

His home constructed Quad was something of a land mark spreading his foot print far and wide. He became widely known throughout the world and kept many regular schedules with old friends.

A guard of honour was formed by ex members of the Armed Services and the Amateur Fraternity who attended the service to honour this well known and respected member of the community. Bill was laid to rest in Wauchope Cemetery on Thursday, 23 November 1995.

Pete Alexander VK2PA for Oxley Region Amateur Radio Club.

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Ionospheric Update

*Evan Jarman VK3ANI**

Solar Cycle 23

On 15 May last year, helio-seismology equipment at Learmonth observatory recorded areas of reverse magnetic polarity. They were at higher latitudes, indicating the beginnings of a new solar cycle.

Each solar cycle can be considered separately to others. It is **not** a continuous oscillation in activity. A new cycle can be observed while activity is governed by the "old cycle"; the current situation. It usually takes 12 to 20 months before the rise in activity of a new cycle exceeds the decline in activity of the old cycle. This is when a turn around in radio related activity will be seen. Ionospheric Prediction Service T index data last put this turn-around at mid 1996.

The T Index

Currently the HF predictions are using the IPS T index. The T index should be considered as an "equivalent sunspot number", one that best matches the activity as observed by ionosondes. The maximum useable frequency (MUF) is measured by an ionosonde, effectively an ionospheric echo sounder.

Ionospheric conditions are affected by more than solar activity, for instance geomagnetic activity. EUV radiation, which actually produces the ionosphere, does not vary exactly with the sunspot number.

The T index bears an undefined resemblance to the sunspot number but better matches observed ionospheric activity. The graph demonstrates how recorded sunspot numbers match the T index and shows how the T index is predicted to change.

ALF, MUF and OWF

The HF predictions currently show the diurnal variation of three key frequencies. They are:-

ALF Absorption limiting frequency. Frequencies below this limit are expected to be absorbed in the atmosphere. The absorption is due to ionisation and shows a very distinct rise and fall matching sunrise and sunset on the path. This limit dominates the others: if the plotted ALF rises above the other plotted frequencies, then radio communication on this circuit is unlikely.

MUF Maximum useable frequency. Corresponds to the highest reflected frequency expected. It is essentially the foF2 recorded by ionosondes. It is not the highest frequency for communications as most signals approach the ionosphere at an angle. The probability of communications at this frequency is expected to be 50%

OWF Optimum working frequency. Also called the frequency of optimum travail (FoT). This is the frequency most likely to result in successful communication. For best communication, pick a time at which the OWF matches the required, or available, band. The probability of communications at this frequency is 90%

Please remember, they are predictions based on expected activity and conditions do vary.

*C/o PO Box 2175, Caulfield Junction VIC 3161

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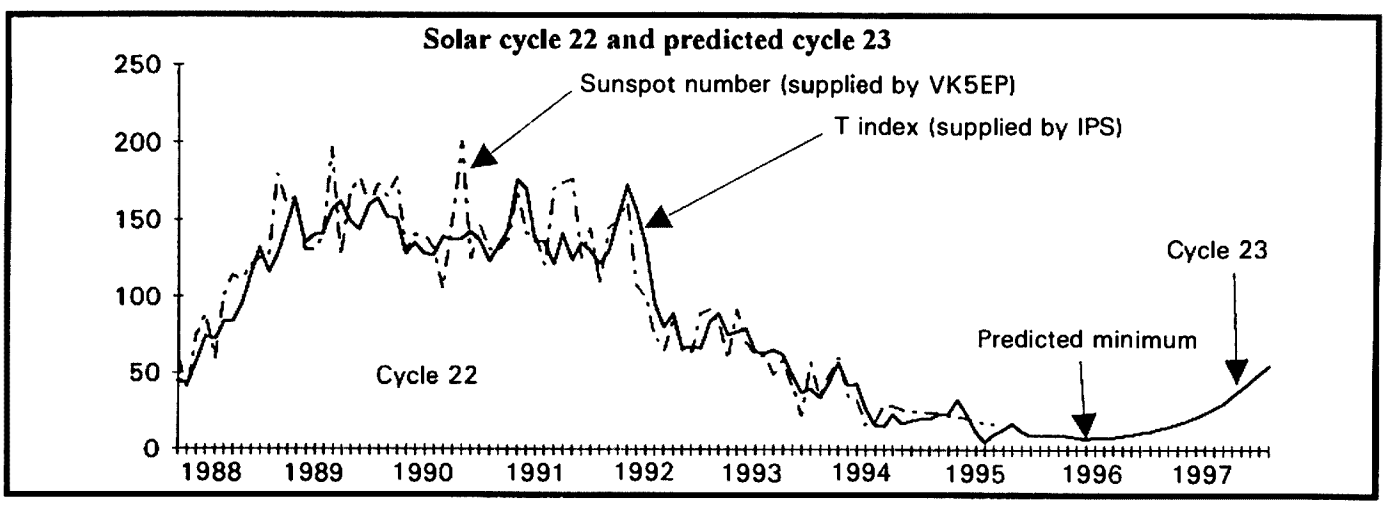

HF PREDICTIONS

Evan Jarman VK3ANI

The Tables Explained

These charts were prepared using one of the IPS stand-alone prediction systems. They show the diurnal variation in ionospheric conditions. The legend below indicates how each of the frequencies is plotted.

Those frequencies are:-

ALF Absorption limiting frequency
MUF Maximum useable frequency
OWF Optimum working frequency

The T index used is shown in the legend.

Also included is the path bearing for the Australian station of each circuit. The short path is displayed unless indicated.

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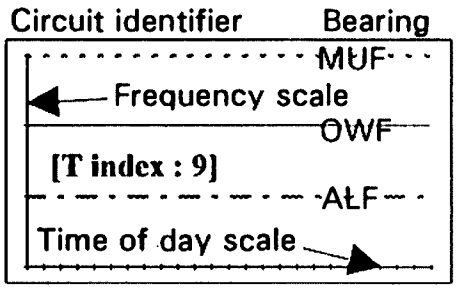
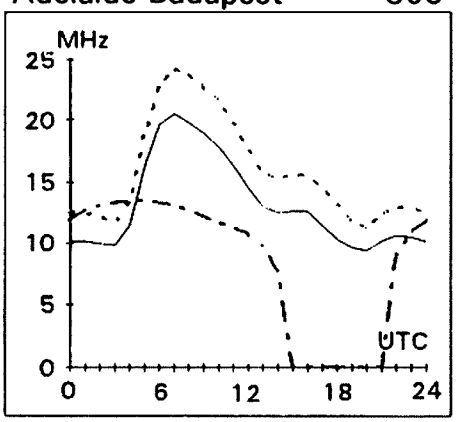
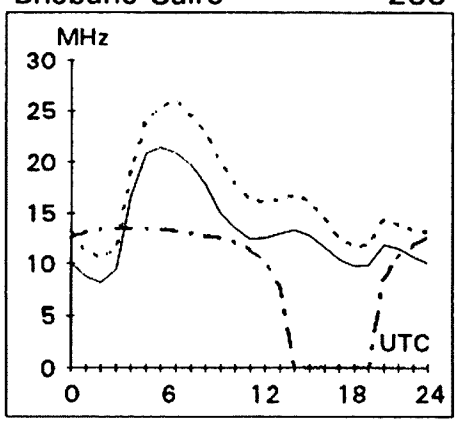


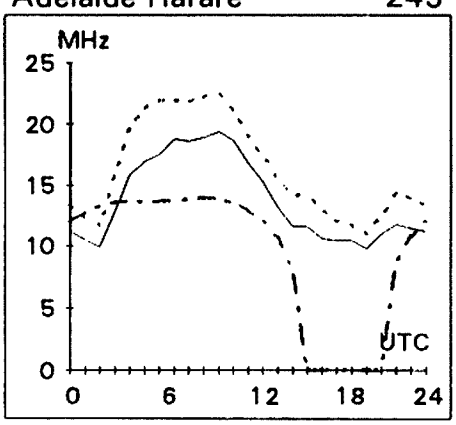
Adelaide-Budapest 305



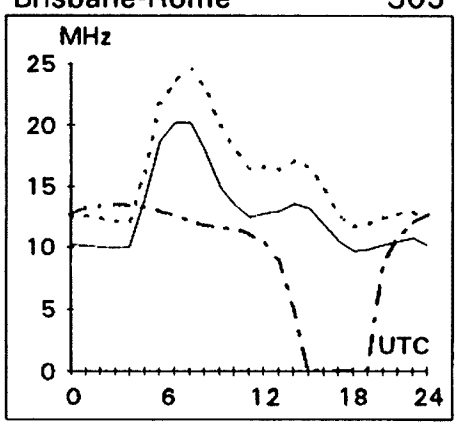
Brisbane-Cairo 288



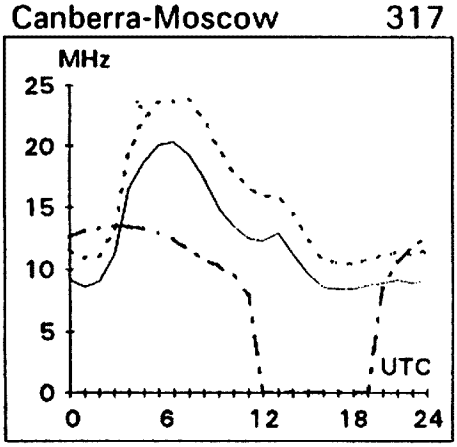
Adelaide-Harare 245



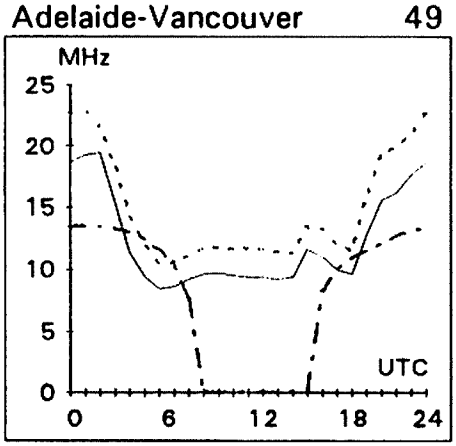
Brisbane-Rome 305



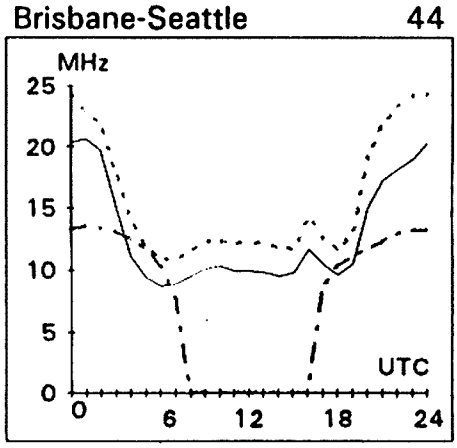
Canberra-Moscow 317



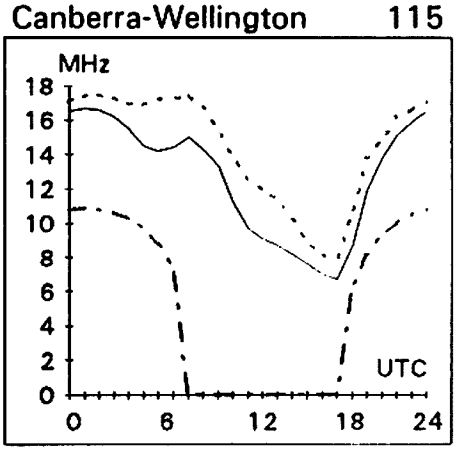
Adelaide-Vancouver 49



Brisbane-Seattle 44



Canberra-Wellington 115



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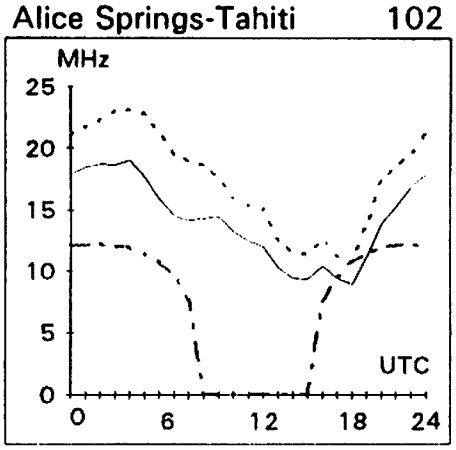
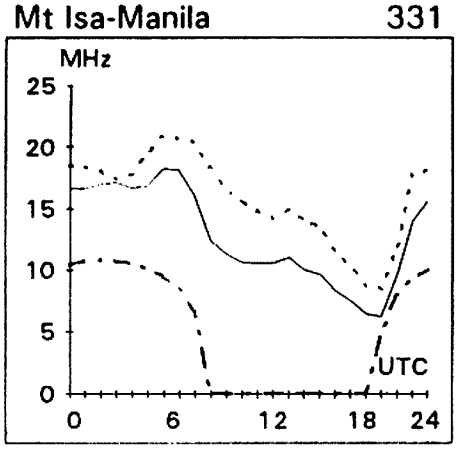
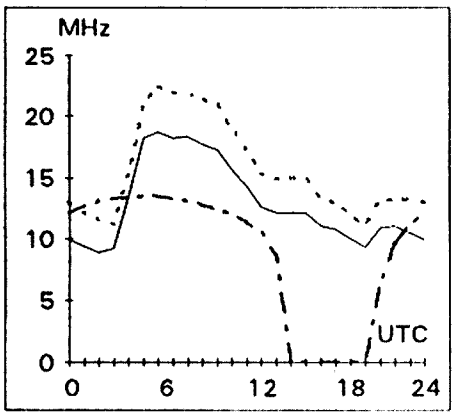


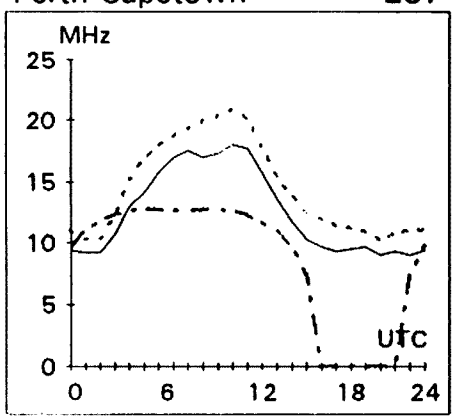
Mt Isa-Manila 331



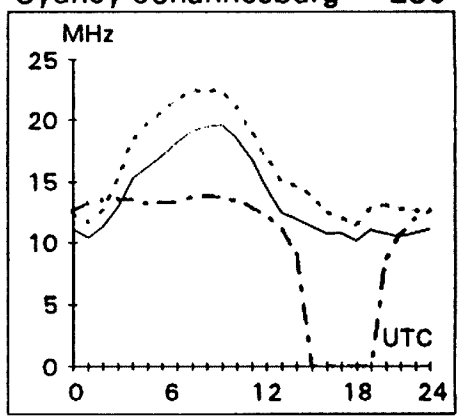
Melbourne-Athens 289



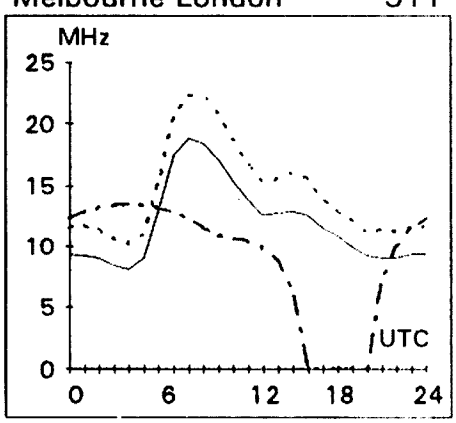
Perth-Capetown 237



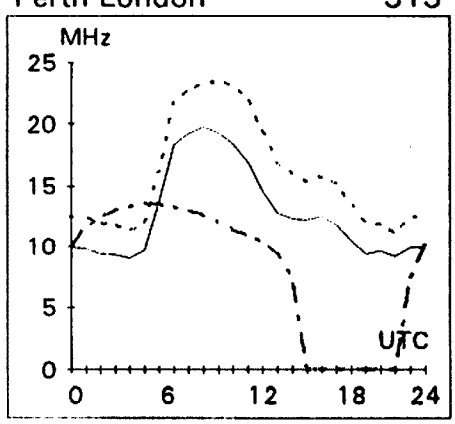
Sydney-Johannesburg 230



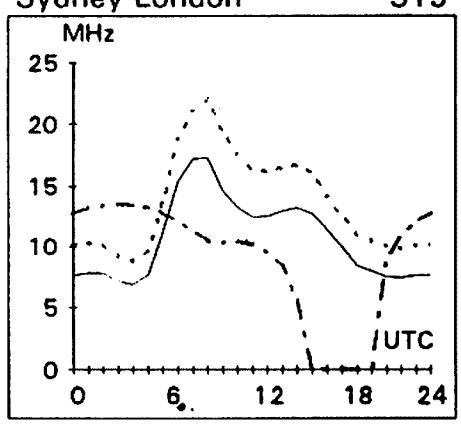
Melbourne-London 311



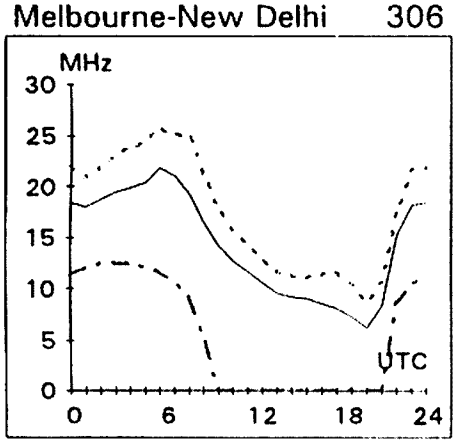
Perth-London 313



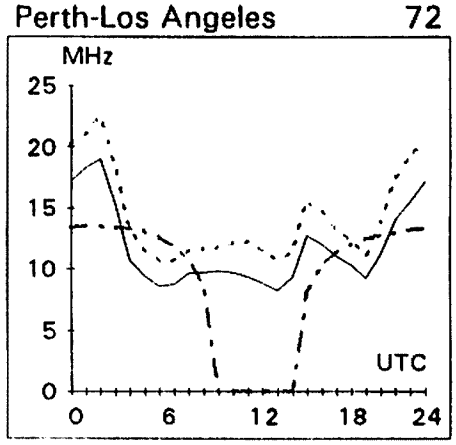
Sydney-London 319



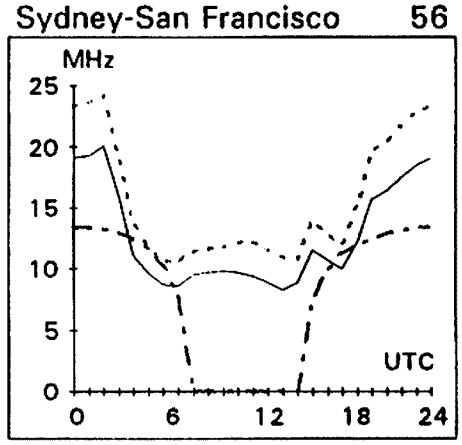
Melbourne-New Delhi 306



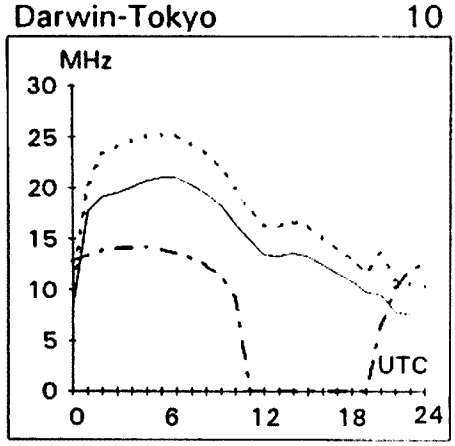
Perth-Los Angeles 72



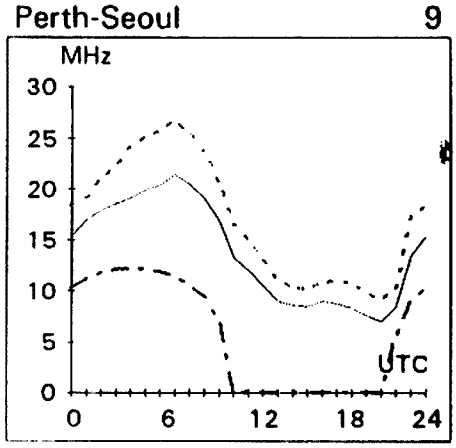
Sydney-San Francisco 56



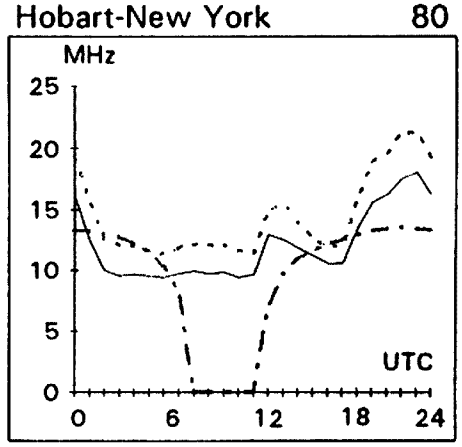
Darwin-Tokyo 10



Perth-Seoul 9



Hobart-New York 80



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• HY GAIN TH3 plus balun plus HAM M rotator plus CDR antenna indicator (faulty) plus coax, $350 the lot. Ken VK3TL QTHR (03) 9728 5350

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WANTED NSW

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CIRCUIT Diagram for AN/PRC-64 radio. Particularly need details of battery used. John VK2DVW (02) 580 6567, PO Box 57, Bexley North NSW 2207, e-mail j.faulkner@unsw.edu.au.

• CURTIS chip 8043 or 8044. K Harvey VK2BKH (02) 9948 8082.

• SPEAKER transformer, small AWA or Rola. 10 k CT, VC impedance not critical; also copy circuit or book "Advance" mod-osc type 6Z. Stan Dogger, Tunnel Rd, Stokers Siding NSW 2482, (066) 77 9292.

• TS-790A TRIBAND all-mode or TS-711A, must be A1 with h/books, boxes. We will be at Wyong Field Day Feb 1996. Could arrange cash payment. A Walsh VK2BTW, PO Box 573, Bowral NSW 2576, (048) 612 092 fax (048) 611 536 anytime.

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• DISK DRIVE TYPE 1541 for Commodore 64. Must be in gc and working. Also, handbook for same. Christine VK4CB QTHR (07) 3202 7137

WANTED WA

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Update

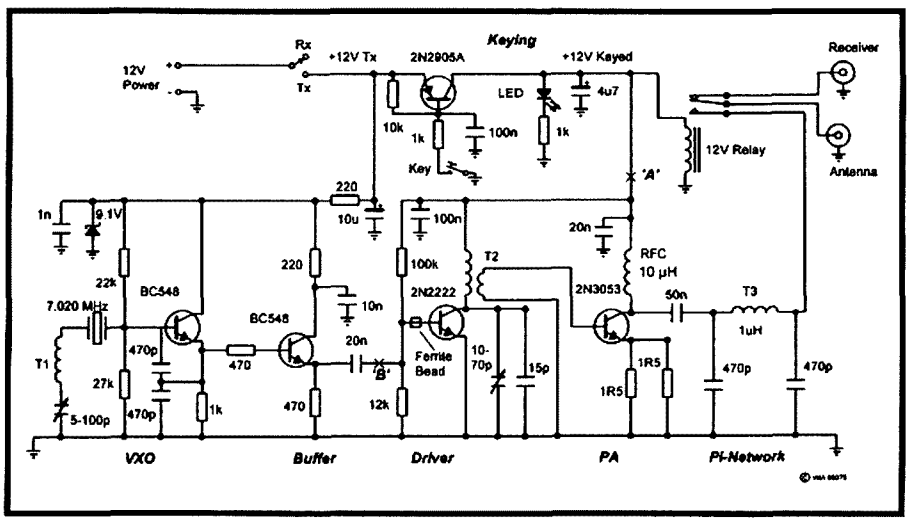
The Garran 40 m CW QRP Transmitter

This article appeared on pages 10 - 12 of the January 1996 issue of *Amateur Radio* magazine. Please note the following:

1. The RFC in the PA collector has a value of 10 μH.
2. Both the LED and the 9.1 V zener diode were incorrectly shown with reversed polarity in the circuit diagram on page 11.
3. T1 and T2 are wound on 9 mm toroids, 4C6 material, Philips 4322-020-97160.

It might be a good idea to correct your copy of last month's issue of *Amateur Radio* now.

ar



The corrected schematic diagram of the Garran 40 m CW QRP Transmitter.

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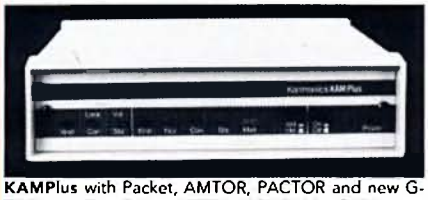

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MR-B5016G	2mtr 50-160W with preamp	$660
MR-B1030G	2mtr 10-300W with preamp	$1425
MR-B2530G	2mtr 25-300W with preamp	$1425
MR-B5030G	2mtr 50-300W with preamp	$1390
MR-B1060G	2mtr 10-600W with preamp*	$2270
MR-B2560G	2mtr 25-600W with preamp*	$2270
MR-B5060G	2mtr 50-600W with preamp*	$2270
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MR-D26N	70cm 2-60W no preamp	$585
MR-D100ATVN	70cm 1-52W for ATV	$860
MR-D1010N	70cm 10-100W no preamp	$860
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CONTENTS

Cover

A special Radio Amateur Old Timers Luncheon was held on 29 August 1995 to celebrate the 92nd birthday of George Moss VK6GM, the WIA's Western Australia Division's longest serving member (see article on page 9). Left to right, Cliff Bastin VK6LZ, Division President, George Moss VK6GM, Neil Penfold VK6NE, WIA Federal President. *(Photo by Les Taylor)*

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Founded 1910

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Editor's Comment

Early Survey Findings

Last month I did a little "pot-stirring" to bring in some of you who had not yet sent in your survey sheets on the popularity or otherwise of the many columns and items we publish in Amateur Radio. We also extended the closing date to 28 February, and a good few additional responses have been coming in. The survey was also mentioned at the Federal Council meeting held over the 3-4 February weekend and one comment heard was that there should be a survey like this every year.

So what are we learning from a preliminary assessment of your responses? The first and very definite finding is that you want more construction articles. 72% want more, only 2% want less. Technical theory articles are nearly as popular, 38% wanting more and less than 3% wanting less. General interest articles came third (33% more, 3% less).

Further down the list, no-one wanted less Hamads, although only 7% wanted more. Only about 1% wanted to read more "Editor's Comment" and 4% wanted less. Only 2% wanted more "QSLs from the WIA Collection" and 34% wanted less. 5% wanted more "Contests" but 31% wanted less. The same figures applied to "Awards".

Overall, I think we can deduce that our present mixture of material is not too greatly out of line with readers' expectations. Obviously we need to find more space for more technical articles, which raises two problems.

Firstly we need more articles to be written, but that means, secondly, we have to reduce space occupied by the less-popular material. This can be achieved in three ways. We can use smaller type for the longer columns, their authors can write a little less, or the editorial "blue pencil" can be used more ruthlessly.

Of these, I think Plan B is the best. Remember the old proverb that anyone can say in a thousand words what a literary genius can say in a hundred! I'm not suggesting a 90% reduction in word-count, but maybe 10%? Maybe 20%? Maybe!

One final observation. The approximate average age of the survey respondents so far is 59 years. Where are all the younger amateurs? Mostly on the Internet, I suspect. But let's not start on that; my space is full already.

Bill Rice **VK3ABP**
Editor
ar

CONTRIBUTIONS TO *AMATEUR RADIO*

Amateur Radio is a forum for WIA members' amateur radio technical experiments, experiences, opinions and news. Manuscripts with drawings and/or photos are always welcome and will be considered for possible publication. Articles on computer disk are especially welcome. The WIA cannot assume responsibility for loss or damage to any material. *"How to Write for Amateur Radio"* was published in the August 1992 issue of *Amateur Radio*. A photocopy is available on receipt of a stamped, self addressed envelope.

■ WIA News

Institute seeks use of AX prefix on Australia Day

Early in January, the Federal WIA approached the Spectrum Management Agency (SMA) asking that Australian amateurs be allowed to use the alternative call sign prefix 'AX' on Australia Day, 26 January 1996, as part of the national celebrations.

Sadly, the SMA refused and when approached to review their decision in mid-January, the WIA application was again rejected. The SMA said that it did not consider Australia Day met the guidelines for use of the AX prefix by Australian amateurs. As these guidelines were drafted quite a few years ago, the WIA is drawing up a submission to have them reviewed.

Our national day is the focal point for many activities across the country. Municipal councils and members of parliament take the opportunity to recognise the contributions made by individuals in their municipalities and electorates. The Department of Immigration and Ethnic Affairs conducts citizenship ceremonies through municipal councils, when our newest citizens pledge allegiance to Australia.

Other Australia Day celebrations this year ranged from formal dinners through to flag-raisings, arts competitions, family entertainment, fairs and fireworks displays.

The Australia Day Council and the Local Government Association, in a joint initiative known as "Australia Consults", is conducting a forum over the next three Australia Days. Hosted by local government councils around the country, these forums will discuss national identity issues as we head towards the centenary of federation in 2001.

The WIA believes Australia's amateurs should be able to celebrate our national day in the one way unique to amateurs – the use of the AX prefix – and at the same time publicise Australia Day around the world while operating on the high frequency bands, or the OSCAR satellites, for example.

The WIA was disappointed that a favourable decision could not be reached in time for Australia Day 1996 and will pursue a review of the now ageing guidelines for use of the AX prefix through the foreshadowed submission.

10 gigahertz gets a Guernsey

The 10 GHz band has seen a surge in activity in recent years, with a world record being set by Roger Bowman VK5NY and Wally House VK6KZ in December 1994, then a 10 GHz moon-bounce record being established last year by Lyle Pattison VK2ALU. Then, in a flurry of New Year activity, the previous VK3-VK5 terrestrial distance record was broken – twice within half an hour – in January, this year.

At 1125 EDST on 13/1/96, Alan Devlin VK3XPD, on Melbourne's Mt Dandenong, accomplished a 5x4 two-way contact with Trevor Niven VK5NC, at Robe in South Australia, over a path of 500.8 km – a new record. Later, at 1153 EDST, Alan made contact with Roger Bowman VK5NY, at Mt Magnificent in South Australia, exchanging 5x2 signals under deteriorating conditions, extending the just-established record to 657.1 km.

The distances have been confirmed by FeTAC chairman, John Martin VK3KWA, who adjudicates VHF/UHF records. Both contacts have additional significance in that they were entirely over land, unlike the previous record-setting contacts.

The previous VK3-VK5 record was set in December 1994 by Russell Lemke VK3ZQB, operating from the beach front at Port Fairy in Victoria, and Roger Bowman VK5NY at his Mt Magnificent location, for a distance of 466.4 km.

Equipment used by the operators during January's record-breaking contacts is based on the German-designed DB6NT transverter which feeds into a 144 MHz intermediate frequency. Power output levels on 10 GHz were below one watt and 600 mm diameter dishes were used.

The 10 GHz gang in VK3 and VK6 are lining up for a crack at setting a new world distance record for the band. Wally House VK6WG is to set up a beacon at his West Australian location as a first step.

Help stamp out stolen equipment – keep a record of all your equipment serial numbers in a safe place

Wilkinson Award

The holders of the 10 GHz terrestrial world distance record, Roger Bowman VK5NY and Wally House VK6KZ, have been awarded the prestigious Ron Wilkinson award by the WIA.

The WIA Federal Council voted at its February meeting to give Roger and Wally the Ron Wilkinson Award for their achievement in setting the 10 GHz (3 cm band) world record in 1994 and for their contribution to VHF/UHF techniques over many years.

The award is named in memory of the late Ron Wilkinson VK3AKC, who set a number of VHF/UHF records himself over the post-war decades until the mid-1970s, including work on 1296 MHz moon-bounce.

The award is for special achievement in any facet of amateur radio.

Congratulations to Roger Bowman VK5NY and Wally House VK6KZ.

FM on the HF bands

While the current licence privileges permit the use of FM transmission modes on all the HF bands, operators are cautioned that different bandwidth restrictions apply to the bands below 29 MHz, to what is permitted above that.

While voice FM operation on the VHF and UHF bands has been popular for 25 years, the mode employed has generally been so-called "wideband" FM (wideband to some, but narrow-band to VHF/UHF enthusiasts), with a nominal transmission bandwidth of 16 kHz, and identified in the licence specifications as 16K0F3E (for straight frequency modulation) and 16K0G3E (for phase modulation).

The present Technical Licence Specifications restrict the use of 16K0F or 16K0G modulation modes on bands below 30 MHz to the 29.0-29.7 MHz segment of the 10 metre band.

On the other HF bands, 6K00F or 6K00G modes ("narrow-band" FM) are permitted, but here lies a stumbling block – don't try to use your "store-bought" transceiver, it's unlikely to produce legal FM transmissions. This is no reflection on the transceiver manufacturers, who produce their rigs for world markets. The accompanying table tells the story.

Specifications for some 24 popular transceivers from the three main manufacturers have been compiled here (courtesy of Federal Technical Advisory Committee chairman, John Martin VK3KWA). Without making adjustments, at the very least, or at worst having to modify a rig, the occupied bandwidth of these rigs would be at least twice as great as the 6 kHz permitted below 29 MHz.

To get an idea of the transmitter's occupied bandwidth of a commercial rig featuring FM mode operation, look at the receiver filter bandwidth for FM reception. From the table you can see that, for many cases, this is 15 kHz at the -6 dB point; the narrowest are 8 kHz – still wider than the 6 kHz permitted in Australia.

But what about where the deviation is given as +/- 2.5 kHz? If you think this results in a transmission bandwidth of 5 kHz, go back to your amateur textbooks (pass in your licence, re-sit the exam....). The bandwidth of an FM transmission depends not only on the deviation, but the highest, modulating frequency and a factor called the modulation index.

The majority of commercial rigs, as the table shows, are specified for +/- 5 kHz deviation, some for +/- 2.5 kHz. Either way, as they are, they can't legally be used below 29 MHz.

A transceiver may be adjusted to produce 6 kHz occupied bandwidth on FM. In FM mode, the mic gain control acts to set the audio level presented to the transmitter limiter circuit, but does not control the peak deviation; the deviation adjustment is always an internal preset pot. But, you'd need the necessary test equipment (at least a deviation meter) to achieve the proper result.

However, assuming a 6 kHz transmitted bandwidth could be achieved, the result on reception is compromised because of the wide receiver filter bandwidth which yields poor audio. Transmit and receive bandwidths need to be matched.

A rig specified for +/- 2.5 kHz deviation and an 8 kHz receive filter could have the deviation adjusted slightly to get the transmission bandwidth down to 6 kHz, and probably get acceptable results – provided the rig on the other end had an 8 kHz receive filter. However, working anyone with a 15 kHz filter would bring reports of "inadequate deviation".

Experimenting with FM on the HF bands below 29 MHz is for the home-brew enthusiast or the amateur prepared to adjust or modify (and measure) his store-bought rig. You can't just flick to "FM" and conduct a contact.

John Martin reports hearing a station using FM on 3693 kHz, whose transmission bandwidth appeared to be on the order of 16 kHz wide (3684- 3702 kHz) – a double breach of the permitted conditions.

Transceiver Model	Max. deviation (kHz)	Receiver bandwidth (kHz) @-6 dB	@-60 dB
TS430	± 5	15	32
TS140, TS450, TS690, TS50	± 5	12	25
TS850, TS950	± 5	12	24
IC765, IC781	± 5	15	30
IC725, IC735	not specified	15	30
IC728, IC729, IC736, IC738	not specified	12	30
IC751	± 5	not specified	not specified
IC706 (normal FM)	not specified	>12	30
(narrow FM)	not specified	8	not specified
FT650 (normal FM)	± 5	15	30
(narrow FM)	± 2.5	8	30
FT747	± 2.5	8	19
FT757, FT767	± 5	15	30
FT890	± 2.5	not specified	not specified
FT990, FT1000	± 2.5	not specified	not specified

TS – Kenwood IC – Icom FT – Yaesu

FM mode specifications of popular HF transceivers

WIA Federal to embark on marketing campaign

At a meeting held in Melbourne over the weekend of 3-4 February, the Federal Council of the WIA heard a number of reports covering membership growth and retention, and advertising and marketing plans.

At its October meeting last year, the Federal Council adopted recommendations to form three Council working groups: Strategic Planning, Marketing and Advertising, and Membership Growth and Retention. To some extent, the operations of each working group impinge on the others, but the Council felt that this would help develop a cohesive, and better coordinated, approach.

Reports discussed by the Council at the February meeting, covered a variety of proposals for marketing amateur radio activity, membership of the WIA Divisions, and the variety of services and activities conducted by both WIA Federal and the Divisions.

Proposals being considered include: boosting the 'visibility' of amateur radio in the community in various ways, membership cards, membership 'bonus' schemes and competitions, a special youth membership grade, changes to membership grades, promoting the WIA among computer enthusiasts and other technologically aware groups, etc.

The working groups are continuing to refine the proposals and to integrate already existing activities to better promote amateur radio and the Institute. As proposals are investigated and mature, the Council intends to introduce them at the earliest opportunity that each can be initiated. Keep a watch on *WIA News*.

■ Equipment Review

Alinco DX-70 HF/6 Metre All Mode Transceiver

*Reviewed by Ron Fisher VK3OM**

The Alinco DX-70 transceiver.

That's right, Alinco is now in the business of producing HF transceivers. Well known for their VHF and UHF hand-held and mobile equipment, this is their first piece of HF gear. As we will see, they are jumping in at the deep end and taking on the "big three" head on.

The DX-70 is designed to compete with the Kenwood TS-50S and the ICOM IC-706. Yaesu are yet to throw a competitor into the ring in this field but, no doubt, will do so very soon.

The DX-70 is essentially the same size as the TS-50S and the IC-706 and is right in the middle as far as weight is concerned. The TS-50S is the heavyweight at 2.9 kg, the DX-70 is 2.7 kg and the IC-706 the lightest at 2.5 kg. All these transceivers feature 100 watts output on the HF bands up to 30 MHz and full general coverage receivers. However, the DX-70 adds six metre coverage with 10 watts output and the IC-706 provides six metres with 100 watts output and two metres with 10 watts output. Prices run in reverse order. The TS-50S will cost you $1599, the Alinco DX-70 $1799, and the IC-706 $2478.

One feature, though, that sets the Alinco and ICOM apart from the Kenwood TS-50S is that they both feature removable front panels. I will look later at the mechanical set up of the Alinco's front panel compared to the ICOM.

Alinco DX-70 Features and Facilities

The DX-70 is ideal for both mobile and fixed station use. The remote front panel would make a mobile installation much easier. However, one cable is required to connect the front panel of the transceiver to the main chassis, and a second cable is needed to extend the microphone as the only microphone connector is located on the main transceiver chassis.

Unfortunately, the DX-70 uses four in-line multi-pin connectors, two on the panel and two on the main chassis. I must admit I have never been too sure just how to disconnect these. Do you pull on all the wires at the same time hoping they won't rip themselves out of the plug? Or what? Well, that's a problem facing you with the DX-70. Alinco need to put this right. Perhaps they should take a good look at the ICOM IC-706. ICOM got it right the first time.

Now, let's look at what the DX-70 has to offer. Briefly, it has almost everything that current SSB transceivers have and, in some cases, more. Let's see what you get. Twin VFOs, 100 memories, a full general coverage receiver tuning from 150 kHz to 30 MHz and from 50 to 54 MHz, an effective IF shift, a non-adjustable noise blanker, both receiver and transmitter offset tuning, four selectivity selections (9 kHz for AM and FM, 2.4 kHz for SSB and wide CW, 1 kHz for CW and narrow SSB, and 500 Hz for narrow CW), a receiver pre-amplifier plus -10 and -20dB attenuation, three transmitter power levels (an internal switch selects 100 or 50 watts on HF while a front panel button selects 100 (or 50) watts and 10 watts – power output on 6 metres is 10 watts on high and 1 watt on low power), a speech processor for added punch on voice modes, and full break-in for CW operators.

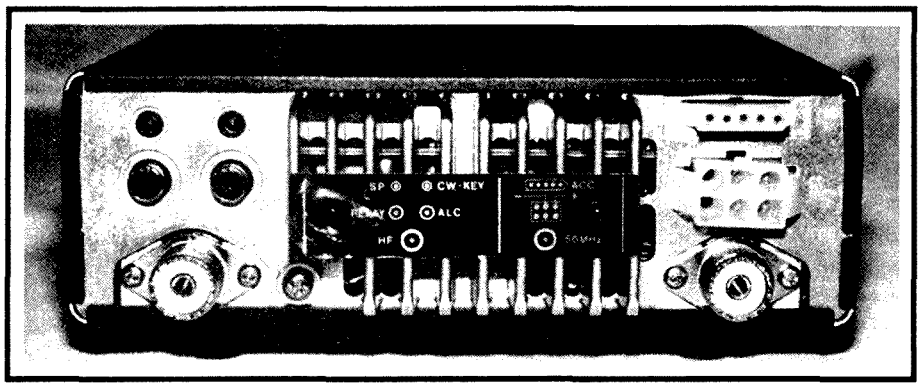
In addition, the AGC can be switched for fast or slow recovery (but cannot be switched off), both "Band" and memory scanning is available, and the transmitter final amplifier is cooled with a small but very effective fan which is thermostatically controlled so it only comes on when required.

Many of the transceiver's functions are controlled via the "Function" button. This is done in two ways. Firstly a single push of the "Function" button gives access to the second function on several controls. These include noise blanker on/off, AGC fast/slow, memory to VFO, memory write and priority channel select. Then, by giving the "function" button a quick push followed by holding it down for one second, the following "set-up" functions become available: CW offset setting, LCD brightness, automatic power off function, automatic USB/LSB selection (correct sideband for band in use), speech compressor on/off, CW break-in delay time and several others.

The DX-70 has two antenna sockets, one for HF and one for six metres – a very handy facility.

DX-70 On The Air

To put the DX-70 on the air you need only a 13.8 volt DC power supply, either AC operated or a standard car battery for mobile or portable operation, and an antenna. The supplied microphone is fitted with a standard eight pin connector and this actually plugs into the main transceiver



The rear panel of the DX-70, clearly showing the separate antenna SO-239 socket for 6 metres.

chassis with the microphone lead going through a slot in the front panel. This certainly makes for a neat looking installation and, with the use of the normal eight pin connector, allows you to use an alternative microphone with very little effort.

The main tuning control is very smooth, but perhaps a trifle small. The tuning rate is 5 kHz per knob revolution, which feels just right. Rotating the knob faster than about one revolution per second speeds up the tuning rate to about 20 kHz per revolution. Band changing is selected via the "MF SEL" button. The first push of this brings up the memory channel number. Push two brings two icons above the leading two MHz figures and you can then use the "MULTI-FUNCTION" knob to select each amateur band in turn. A third push of the "MF SEL" button allows you to select each MHz in sequence for general coverage receive use, while a fourth push brings in selection for 100 kHz steps. A fifth push then puts things back to normal.

This operation is one of those things that takes time to explain but, in fact, not long to do. However, in this area I think the TS-50S wins out for simplicity. If you are contemplating a lot of band changing, you can, of course, leave it in the amateur band selection mode. When changing bands you will always come back to the last used frequency on that particular band which is a very handy feature.

The received audio quality on the internal speaker was very good on SSB but a bit thin on AM. A good quality external speaker made a very noticeable improvement here and was certainly worthwhile on SSB also. The preamp and attenuators are selected in sequence by pushing the "RF" button.

I found that the noise blanker often introduced a fair amount of distortion. There may be an internal preset level control but no mention is made of this in the instruction book. I did not actually use the transceiver mobile but I feel that, while the blanker would reduce ignition noise to a low level, the distortion on strong signals could be a problem.

There is a separate readout for the RIT which has a +/- 1.4 kHz range. While on the subject of the display, the main frequency readout is to 100 Hz. The "S" meter is a bar graph which doubles as a relative power output indicator when in transmit mode. No other metering is provided. There are many other status indicators included in the display, including sideband in use, RIT/XIT, VFO A/B, noise blanker on, AGC slow/fast, pre-amp attenuator status, etc. Illumination of the LCD is adjustable via the "function" set-up procedure.

The selectable selectivity was great for eliminating QRM. The 1 kHz band width is actually somewhat wider than specified which made it ideal for narrow SSB reception, particularly with the IF shift slightly off-set.

DX-70 On Transmit

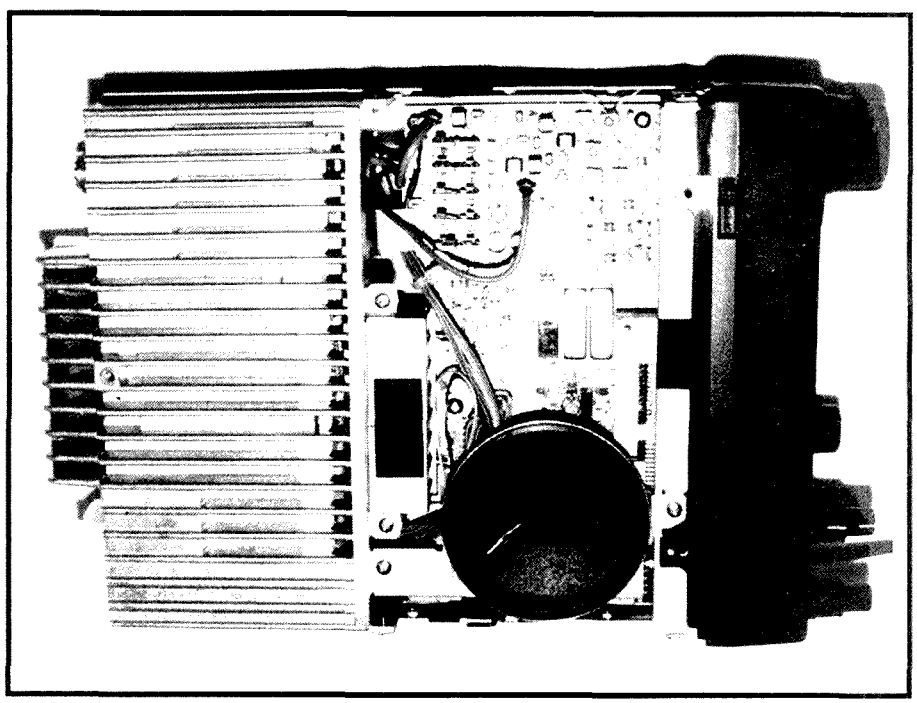
What better place to try the transmit capability of the DX-70 than on the 14.116 MHz Traveller's Net. Peter and Roy can really pick the good ones from the not-so-good. They gave the DX-70 a very clean bill of health. The only slight problem was that the speech processor produced some audible distortion, so don't use it on local contacts. The rig delivered a full 100 watts output but I noted that it was fairly critical of the correct load impedance. Output power was reduced with an SWR above 1.5 to 1. CW operators are very well catered for. You can choose full or semi break-in, and also zero-in the transmit signal on the signal you are listening to. CW keying was found to be very clean.

Alinco EMS-42 Microphone

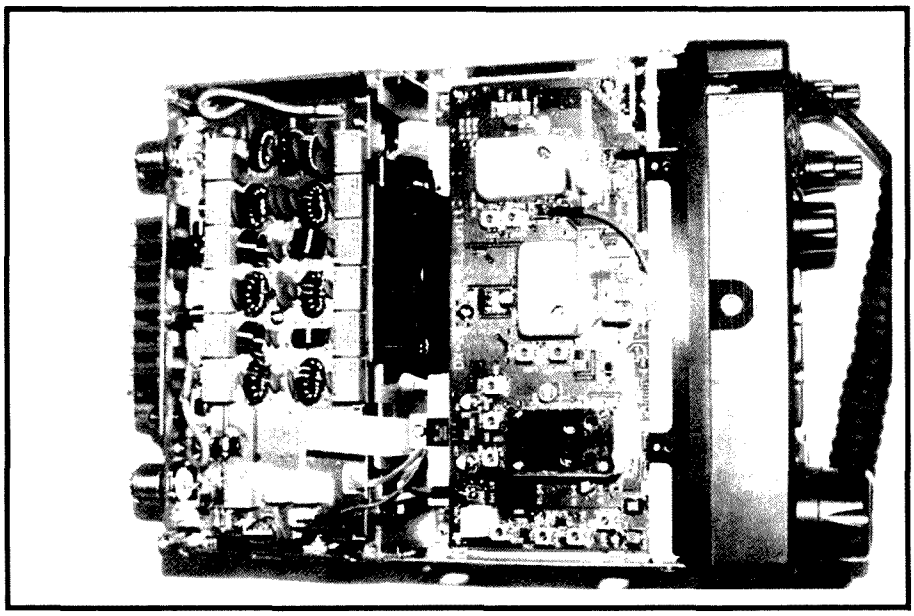
This is the microphone supplied with the DX-70 as standard equipment. It has a low impedance dynamic insert which produces very clean audio quality. There are three micro-switches inside, two for the up/down buttons on top of the casing and one on the side actuated by the PTT button. The shape of the case fits the hand very well and the up/down buttons on top are easy to operate. The verdict is that it is a very nice little microphone which is easy to use.

DX-70 On Test

Firstly, I checked the power output and current drain on each band. Maximum output in CW mode with 13.8 volts DC supplied to the transceiver was:



Top view of the DX-70 with the cover removed.



Bottom view of the DX-70 with the covers removed. Note the centrally mounted cooling fan.

Band	Power Out	Current Drain
160	112 watts	18 amps
80	118 watts	18 amps
40	110 watts	16.5 amps
30	105 watts	15 amps
20	100 watts	14 amps
17	100 watts	14 amps
15	105 watts	14.5 amps
13	95 watts	14 amps
10	95 watts	14 amps
6	9.5 watts	2.6 amps.

In the low power position, the power output averaged 16 watts over all the HF bands and was 2.5 watts on six metres. Current drain on the HF bands averaged about 7 amps and on six metres it was 1.8 amps. PEP output on SSB was the same as the CW readings, as was FM on 10 and 6 metres. The AM output (for the 160 operators) was about 25 watts.

I then carried out tests to estimate the transmitter inter-modulation distortion. Again, the figures obtained were estimated on a comparative basis with a transceiver with known figures of distortion and were measured with normal SSB modulation. The DX-70 produced a figure of -20 dB which is 2 dB worse than the IC-706. There was very little difference with the processor switched in or out; however, the processor did produce quite audible distortion and was generally not liked by listeners.

Next, the transmit audio response was measured in the SSB mode (see Fig 1). The method used was the same as detailed for the IC-706 review in the November 1995 issue of *Amateur Radio*. Basically, the response shows a smooth bass roll-off with the -6 dB point at about 450 Hz. At the top end the -6 dB point was at 2.9 kHz. The mid-band ripple did not exceed +/- 1.5 dB. Most listeners found the audio response very pleasing with the exception of the distortion produced by the compressor.

There was a difference in the response between upper and lower sideband with slightly more bass on lower sideband. In retrospect, I feel that the upper sideband response would have sounded slightly better if it had been shifted nearer to the filter to match the lower sideband response. Both carrier and sideband suppression were excellent, each being in excess of -60 dB down.

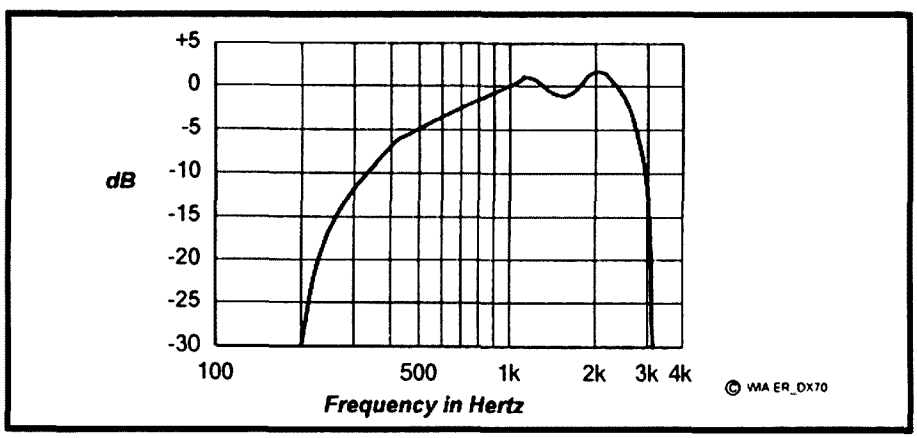


Fig 1 – A plot of the transmitted audio response of the DX-70, using USB on 14.2 MHz with no compression and no ALC.

Receiver Tests

The first test was to check the S meter calibration. In common with the TS-50S and the IC-706, the S meter is a series of bars on the LCD and is calibrated at S1 to S9 and then +20, 40 and 60 dB. There are actually 16 bars between S1 and S9. I measured the calibration at 14.2 MHz and then checked the input required to produce S9 on each amateur band. The results are as follows:

S Unit	Preamp On	Preamp Off
S1	2.3 μV	6.8 μV
S2	2.6 μV	8.0 μV
S3	3.6 μV	11 μV
S4	4.6 μV	14 μV
S5	5.8 μV	18 μV
S6	7.8 μV	25 μV
S7	10.3 μV	37 μV
S8	10.9 μV	49 μV
S9	20.0 μV	60 μV
+20	120 μV	300 μV
+40	500 μV	1800 μV
+60	2000 μV	5000 μV

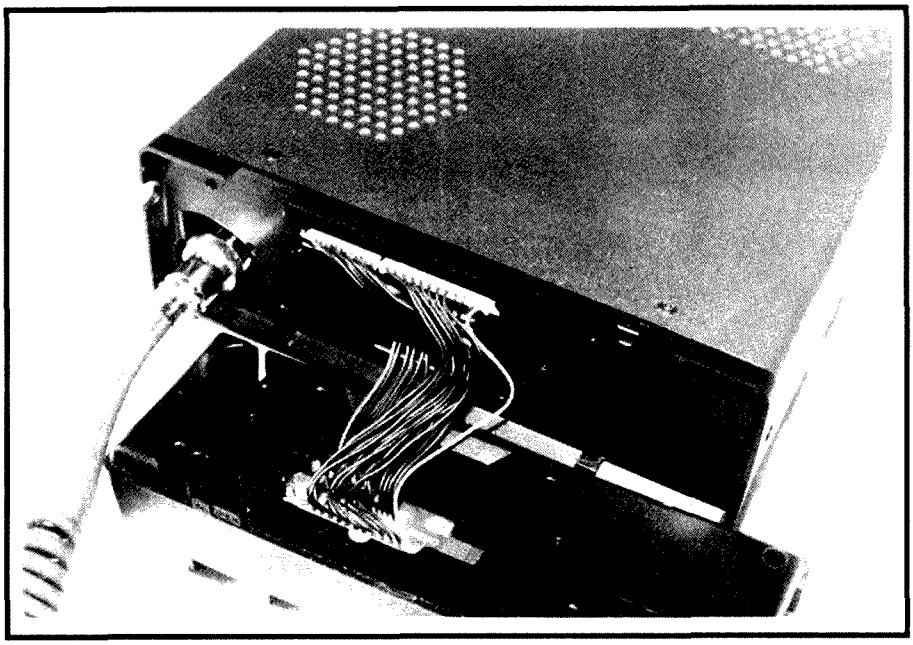
The signal required to produce S9 on each amateur band with the pre-amp in operation was measured as follows:

Band	Input for S9
160	21 μV
80	20 μV
40	20 μV
30	20 μV
20	20 μV
17	24 μV
15	24 μV
13	24 μV
10	25 μV
6	17.5 μV.

The switchable attenuator provides -10 and -20 dB of attenuation, and these were checked as being spot on. The received frequency response on SSB was the same as the transmit response shown earlier.

I next measured the response for AM receive with the following results:

Frequency	Response
100 Hz	-14 dB
200 Hz	- 6 dB
400 Hz	- 2 dB
600 Hz	- 0.5 dB
1.0 kHz	- 0 dB
1.5 kHz	- 1 dB
2.0 kHz	- 2 dB
2.5 kHz	- 3 dB
3.0 kHz	- 5 dB
3.5 kHz	-10 dB
4.0 kHz	-13 dB.



A close-up view of the front panel unclipped from the DX-70 showing the connecting cabling and how the microphone plugs directly into the main chassis.

Interestingly, this response is within a dB or so of the ICOM IC-706. Perhaps they both use the same filter. With a good quality external speaker the AM quality is quite acceptable.

Next on the list of tests was audio power output and distortion levels. Maximum audio output into an 8 ohm load was measured at 2.9 watts at 20% distortion. The 10% distortion level was produced at 2.4 watts which easily exceeds the specified 2 watts. Product detector distortion for SSB and CW was an excellent 0.45%. Distortion on AM at high modulation levels was fairly high at 10% for 80% 1 kHz modulation.

Selectivity

The DX-70 has three and a half positions of selectivity. Let me explain. Position one is 9 kHz for AM and FM reception, position two is 2.4 kHz for SSB and narrow AM, position three is 1 kHz for narrow SSB and wide CW, and the "half" is provided by the 500 Hz wide audio filter which augments the 1 kHz filter.

In practice these all work very well, but they are all somewhat wider than the specification might have you believe. The 1 kHz filter is nearer to 1.6 kHz at -6 dB and the 2.4 kHz filter is about 2.7 kHz at -6 dB. On the surface this isn't too bad, but the selectivity at -60 dB is wider than you would expect from a top grade crystal filter.

Sensitivity

I measured the sensitivity at 14.2 MHz and at 51 MHz. 14.2 MHz SSB gave a figure of 0.2 μV for a 10 dB SINAD. This is slightly better than the specified 0.25 μV for 10 dB S/N. At 51 MHz the measured sensitivity is quite a bit better than the specification at 0.12 μV for 10 dB S/N. I noted that the sensitivity was noticeably down with the preamp switched out.

Overall the DX-70 performed very well. It is not a substitute for a top grade transceiver but I feel that for general home-station use and mobile operation it would prove a very useful rig.

DX-70 Instruction Manual

The instruction manual runs to a surprising 100 pages. A full circuit diagram is included as a loose supplement. The book is divided into seven chapters plus an appendix and these cover the following subjects:

Chapter 1. Getting Started. This covers the initial setting up of the transceiver such as connecting the DC supply, key, microphone, external speaker, etc.

Chapter 2. Communication. This tells how to set up the transceiver for transmission and reception in the various modes, including packet operation.

Chapter 3 and Chapter 4. These describe the memory and scanning facilities of the transceiver.

Chapter 5. Chapter 5 is interestingly called "Interference Reducers". It covers the operation of the IF Shift, use of the narrow filters for SSB and CW, RIT and XIT (transmitter offset), noise blanker and attenuator.

Chapter 6. This chapter shows how the initial "set up" system is programmed. The options were explained earlier.

Chapter 7. Covers several adjustments such as microphone gain, CW sidetone, volume, etc.

The instruction manual is a generally well written and presented book. I give it eight out of ten.

Alinco DX-70 Conclusions

For their first attempt at an HF transceiver, I give Alinco top marks. They have produced a transceiver that would please most operators. It is in the lower price bracket and its general performance is similar to other rigs under $2000. However, there are a few rough edges. The remote front panel is far too fiddly to use frequently. Alinco need to clean this up. The mechanics of the tuning control need improving with perhaps a slightly larger knob and a better system to adjust the tension. Also, I feel that a basic mobile mounting bracket should be included as a standard feature. However, I am sure that the DX-70 will prove to be very popular.

One thing that I cannot comment on is the service backup that the Australian distributors can provide. If I can obtain any information on this aspect I will pass it on to readers. On the same subject, I do not know if workshop manuals are available in Australia. You might need to take some of these factors into account when considering your purchase.

The review DX-70 was kindly provided by Strictly Ham Pty Ltd of 14 Church Street, Bayswater, Victoria.

24 Sugarloaf Road, Beaconsfield Upper, VIC 3808

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■ People

RAOTC Special VK6GM 92nd Birthday Celebration

Clem Patchett VK6CW supplied the following material, most of which was broadcast on the Radio Amateur Old Timers RTTY news transmission.*

What an outstanding success the August 1995 meeting of RAOTC was, the special VK6GM birthday celebration. There was a very pleasing roll-up for this notable occasion, with about 29 Old Timers, YLs, XYLs and friends honouring George VK6GM for his 92nd birthday which he celebrated on 2 September 1995.

The formal part of the get-together commenced with WIA Federal President Neil Penfold VK6NE congratulating George on his achievements both in amateur radio and in reaching the age of 92. Neil's remarks were followed by a **This is Your Life** style summary of George's radio and teaching career, which was presented very ably by Cliff VK6LZ. Both Neil and Cliff then made a presentation on behalf of the WIA in recognition of George's long association both with the WIA and amateur radio and his contributions to each.

George Moss VK6GM and his Award. *(Photo by Les Taylor)*

Mr Les Taylor, professional photographer and son of Frank VK6JK, kindly made himself available and took a number of photographs of the proceedings.

Following the formal part, Neil and several others had to make their farewells and return to their normal working conditions whilst the remainder took some lunch and liquid refreshments. All agreed that it was a "top" turnout and certainly supported all the time and effort that Clem VK6CW had put into its organising.

The following is the address delivered by Cliff VK6LZ.

GEORGE ARTHUR MOSS – These Are Your Lives

Wireless Institute of Australia

You joined the Western Australian Division in 1925 and you are its longest standing member. You served the WA Division as Secretary during 1935/36, and as President in 1946 and 1947. In 1938 you were named as the inaugural winner of the

Carl Cohen trophy for amateur radio research in WA.

During the same year you attended the World Radio Convention in Sydney as the WIA delegate at the invitation of the NSW Government.

Your contribution to amateur radio was recognised in 1965 when you were made a life member of the WIA.

Amateur Radio

You first became interested in communications and things electrical at the end of WWI. In 1923 you built your first wireless, a crystal set in order to receive the time signal and weather report from the Wireless Hill Coastal Radio Station VIP. For this you were required to obtain a TEN SHILLING experimenter's licence.

During this period you decided to become a Radio Amateur. In order to practice Morse with a friend who lived several houses away, you constructed a device which enabled you to transmit signals utilising the 250 volt power mains. This relied on a couple of home made foil and paper capacitors to isolate the mains from the headphones. However, you both managed to survive.

In 1926 you passed the amateur licence examination, and were issued with the call sign A6GM. In the early 30s your station broadcast music three nights a week, and became extremely popular due to your ready access to the latest record releases through your employer.

Employment

You first obtained paid employment in 1921 with a firm specialising in piano maintenance. Your mastery of tuning was materially assisted by your recently acquired knowledge of beating frequencies.

In the late 20s you took charge of the Radio Servicing Division of one of Perth's largest musical establishments, shortly before it opened a commercial radio station. In order to participate in its operation, you obtained a Broadcast Station Operator's licence.

Education

You commenced your academic career in 1938, when you took over the lecture program in radio theory at the Perth Technical College, and the following year you inaugurated radio apprentice training in WA.

With the onset of WWII, you were seconded half-time to teach Army Radar Trainees, and you obtained your First Class Commercial Operator's Certificate in 1942 in case your services should be required.

With the end of the war you obtained your Diploma in Communications and became a full time lecturer, an occupation you were to pursue until your retirement in 1969. However, your involvement with teaching continued part-time for another 17 years.

On the occasion of your 92nd birthday, Neil and I have pleasure in making this presentation on behalf of the Institute, in recognition of your services to amateur radio, the Wireless Institute, the WA Radio Industry and Education.

**34 Lester Drive, Thornlie WA 6108*

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■ Antennas

All Band Vertical

Keith Rehe VK4KL tells how he adapted a CB antenna for amateur use.*

The Stationmaster CB antenna can be simply converted for use as a "Compromise All Band Antenna" with a simple modification.

Drill out the two pop rivets that earth the bottom of the coil and isolate it from ground using an insulating block. Do not alter the length of the radiator. The antenna is shown in Fig 1.

Using RG58 coaxial cable, wind a 10 turn in-line RFC six inches in diameter and tape it to the support mast as close to the SO239 socket as possible. This isolates the coax and stops it acting as a radial. Another RFC of the same type can be used before the ATU, but was not required by VK3EL, VK4QP and VK4KL.

The mounting can be to suit your convenience. VK3EL used a clothes line but these do not always earth. VK4QP used the back stair rail. This was not earthed either. Mine is mounted on a 12 inch metal pin which is a poor earth.

By experiment I found that the height above ground can help to resonate the antenna. The SWR on mine is flat on 30 metres and at the top of 10 metres. Further experiments gave best results with the antenna raised as high as possible and the mast earthed. An ATU was used to achieve a match for the transceiver. Lengthening the antenna to 26 feet did not help and it was left at its original length of 19 feet.

It has been very useful for some bands and is compact for small yards. The antenna will break down to lengths short enough to carry in a car boot for portable use. I have one with an ATU built into the bottom of the antenna for caravan or portable use.

These cast-aside CB antennas can be found in flea markets for $25 to $40.

Technical Editor's Note

The operation of many vertical antennas is dependent on reflection in the ground. Antenna efficiency can only be guaranteed if adequate provision has been made in the form of an earth mat, counterpoise or ground plane. Less than optimum results may result if attention is not given to the provision of an appropriate earth mat, counterpoise or ground plane.

The use of an ATU at the end of a length of relatively lossy coaxial cable may lead to excessive losses. A better technique is to match the antenna to the coaxial cable at the antenna feedpoint. This minimises the losses in the system.

**7 Guardsman Avenue, Alexandra Hills QLD 4161*

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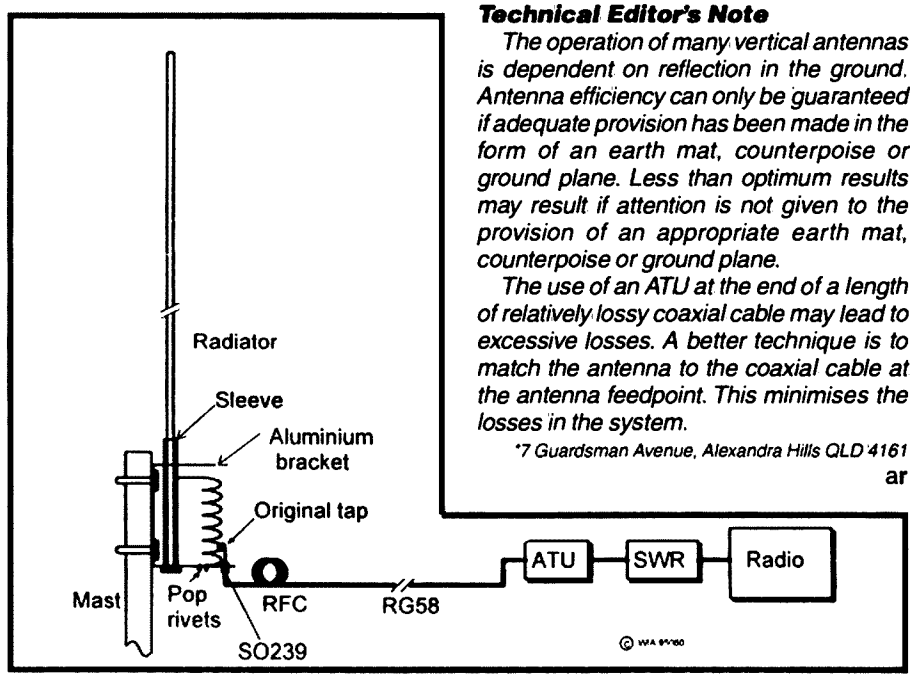


Figure 1 – All Band Vertical

1995 WIA Victorian Fox-Hunting Championships

Jack Bramham VK3WWW tells about the local championships for that interesting aspect of amateur radio known as "fox-hunting".*

Bruce VK3TJN on the hunt. *Photo by Geoff VK3VR*

On Saturday, 29 April, six Melbourne fox-hunting teams gathered at the Yarra Glen Scout Hall in Yarra Glen, to contest the Victorian Fox-hunting championship for 1995/96.

With excellent weather forecast for the day, all teams were in high spirits. Foxes for the day were the 1994/95 champions, Jack VK3WWW, Chris VK3CKH, Bryan VK3YNG and Jack's brother Alex. Also helping were Arron VK3AJQ, Andrew VK3SWR and Simon VK3TUG.

Hunt one was a straight 2 metre fox hunt. This event was won by Bruce VK3TJN from the YQN team, hotly pursued by Geoff VK3VR and Greg VK3VT. Hunt two was on the 160 metre band. There was so much RF being produced for this hunt that one of the foxes received an RF burn from the dipole antenna. The amount of RF annoyed the hounds, with one complaining that they had run out of attenuation at least one kilometre from the fox. Eventually the fox was discovered by the VK3TVB team with the minor placings going to VK3VT and VK3YQN.

Hunt three was contested on 70 cm. Winning his first event at any state title was Phil VK3GMZ, followed by VK3VT and VK3DIP. Hunt four on 80 metres caused problems for most teams. Only two teams, VK3VT and VK3TVB, managed to find this fox.

Hunt five was to be a two leg hunt. The first leg was in the 2 metre band and the second leg on the 10 metre band. By the time this hunt started, Bryan VK3YNG had decided to fix the problem of some teams complaining the hunts were too short, by adding a second 2 metre sniffing leg. This was fine except that the hounds had to run about 1.5 km up hill and down dale to locate it. Because they were in unfamiliar territory, the best pick-up point was where they were dropped off. This meant running back the same way they had come. Bryan's tactics had paid off, for this really split up the teams; so much so, that one team found the 10 metre leg before any of the 2 metre transmitters. This wasn't a bad effort considering that the 10 metre fox wasn't transmitting!

An exhausted Geoff VK3VR from the VK3TVB team gave his team an enormous lead over the opposition by finding the 10 metre fox at least half an hour before the VK3VT and VK3DIP teams. All the teams then headed back to the Scout Hall for a BBQ tea and a well earned break.

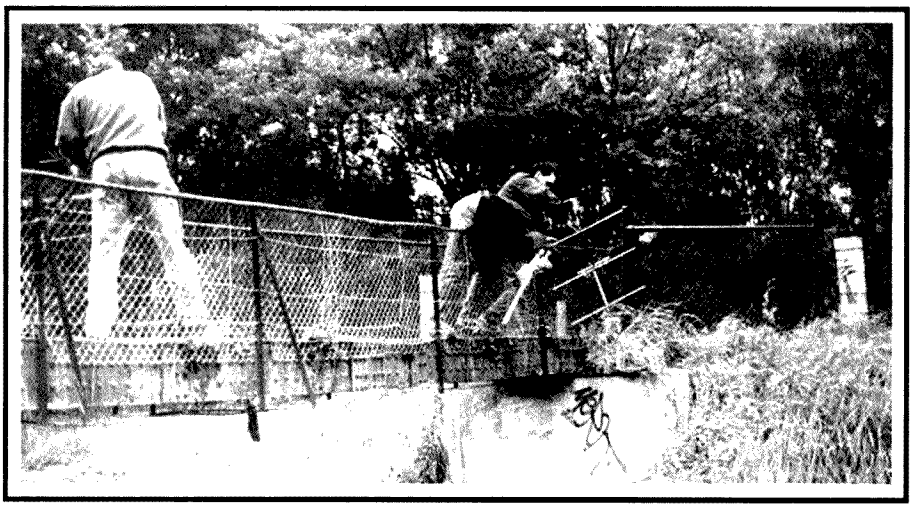
Once tea was over, all the hounds gathered in the hall in preparation for the start of a four leg sniffer hunt. For this hunt all the mini foxes were located in the grounds of the Scout Hall. They were all transmitting on the same frequency but were timed so that they would transmit in sequence. Well, at least that was the idea. But, listening on my hand-held, it seemed that all four were transmitting at once!

Each mini fox was emitting a CW ident as well as quite lengthy messages. They were the brain child of Bryan VK3YNG and were the test versions of much larger remote-controlled versions to be used in RDF style fox hunts.

All the transmitters going at once didn't seem to bother Tony VK3JTT who quickly ran back into the hall with a correct list of letters taken from each mini fox.

By now two teams were emerging as potential champions, and both needed a

Jack VK3WWW hiding the "fox". *Photo by Geoff VK3VR*



Trying to find the "fox" with "sniffers". L-R Greg VK3VT, Bruce VK3TJN and Bryan VK3YNG. *Photo by Geoff VK3VR*

good result in the final event to take out the championship.

Hunt six was a four leg, three band fox hunt. The first leg consisted of a straight 2 metre fox hunt followed by a 10 metre fox hunt. Next came one of the most difficult bands to hunt on, 6 metres. This band has caused much frustration for a lot of hounds in the past and today was no exception. The last leg was a 2 metre beacon located on the edge of an enormous blackberry bush which, for the first team in the area, posed quite a problem. I can still see Greg VK3VT attempting to walk across the top in the direction of the signal. After some considerable time, Ewen VK3NC located the transmitter to take out the event from VK3TVB and VK3DIP.

After a supper served by the foxes, teams gathered in the hall to hear the final results and receive a host of prizes kindly donated by Dick Smith Electronics.

Congratulations to Greg VK3VT, and his team of Ewen VK3NC, Phillip VK3JNI Doug VK3JDO and Lindsay (second harmonic VK3NC), who won the Victorian Fox-hunting champions 1995/1996 with a score of only five points lost. A close second was the VK3TVB team with seven points lost.

46 Nurlendi Road, Vermont VIC 3133

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Sign up a new WIA member today – we need the numbers to protect our frequencies and privileges

■ Technical

Technical Abstracts

*Gil Sones VK3AUI**

Connector Troubles

Three articles in the German amateur radio society magazine *CQ DL* have highlighted some dubious coaxial connectors. Michael Krochmal VK3KRO/ VK3ZIP kindly supplied translations of the German text.

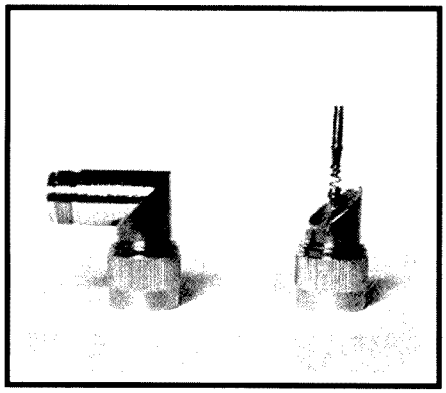

Photo 1 – N Type Connector

1. In *CQ DL* for November 1993, Heinrich Reckemeyer DJ9YW reports on an "N-Type Right-Angle Adaptor With Integral Attenuator Coil". Heinrich notes that the two internal central conductor pins which are arranged at 90 degrees to each other were connected by means of a helical metal spring. To make matters worse the spring made only poor electrical contact to each pin. The spring formed a wonderful attenuator with attenuation varying intermittently between 3 dB and 10 dB (see Photo 1).
2. In *CQ DL* for April 1994, Willmut Zschunke DL9ZO reports on a "UHF Right-Angle Adaptor With Integral Intermittent Contact" which caused his HF PA to become incandescent and also resulted in considerable intermodulation distortion in receive mode. Photo 2 shows the cause. Both of the internal components were able to be easily removed from the housing as they were only press-fitted into place. They should have been fitted with a screw thread. The connection between the two parts is merely a point-contact at the point where the spring which is attached to the male pin meets the cylindrical outside surface of the female socket half. The contact resistance varied randomly between zero and open circuit and was probably accompanied by rectification effects which demodulated the incoming signal so that the receiver would not have to work so hard!
3. In *CQ DL* for June 95, DK1WC draws attention to 50 ohm and 75 ohm versions of BNC connectors. Apparently the 75 ohm versions have become common of late as a result of usage in video applications. Even though the differences between the two types are subtle, they are easily distinguishable. The 75 ohm types have a smaller diameter central pin. The 75 ohm types can be successfully used at HF and only incur attenuation of the order of 0.1 dB in the 2 metre and 70 cm bands. However, one should steer away from the highly chromed types. The silver or nickel plated versions are much more reliable.

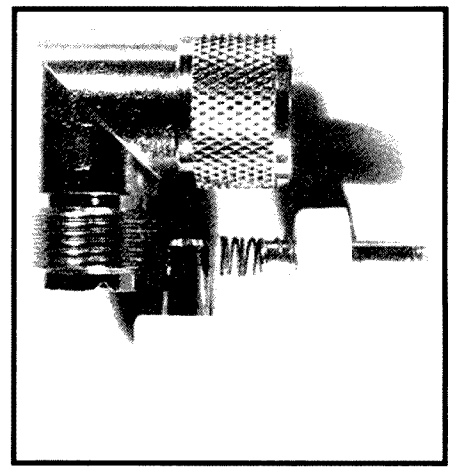

Photo 2 UHF Connector

You should always be wary of connectors which have not come from a recognised manufacturer. There are also 75 ohm versions of N type connectors and you should not mix 75 and 50 ohm connectors in an installation.

Simple ACS Reception

There have been a number of decoder circuits featured in the local electronics magazines which enable reception of the Ancillary Communications Service (ACS) signals which ride piggyback on many local commercial FM radio stations. Damien Vale VK3CDI tells of a simple means to receive the ACS signals which he found in the August 1995 issue of *Popular Communications.*

The article outlined a simple way to receive Ancillary Communications Service transmissions employed by many FM broadcast stations. These transmissions are carried with the main FM signal and include services such as the BBC and other special purpose broadcasts. The main requirement is a communications receiver capable of receiving the VLF range 67 to 92 kHz. I use a Kenwood TS-450 which tunes down to 30 kHz, although the specifications indicate a lower limit of 100 kHz.

Assemble the interface cable as shown in Fig 1 and connect between the FM receiver and antenna socket of the communications receiver. Tune to an FM broadcast station with the volume set to a comfortable listening level and then tune the communications receiver between 67 – 92 kHz to receive the ACS transmission, if any. Not all stations provide the service, but there are some interesting things to be heard.

The stations I have encountered transmit ACS on either 67 kHz or 92 kHz so an alternative tuning method is to set the communications receiver to either 67 or 92 kHz and then tune the FM receiver

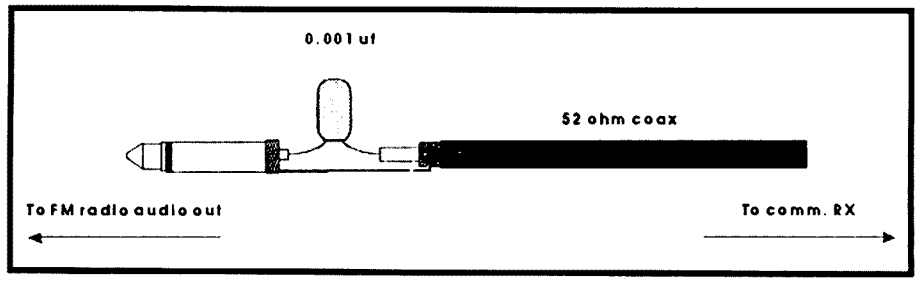

Figure 1 – ACS Interface Cable.

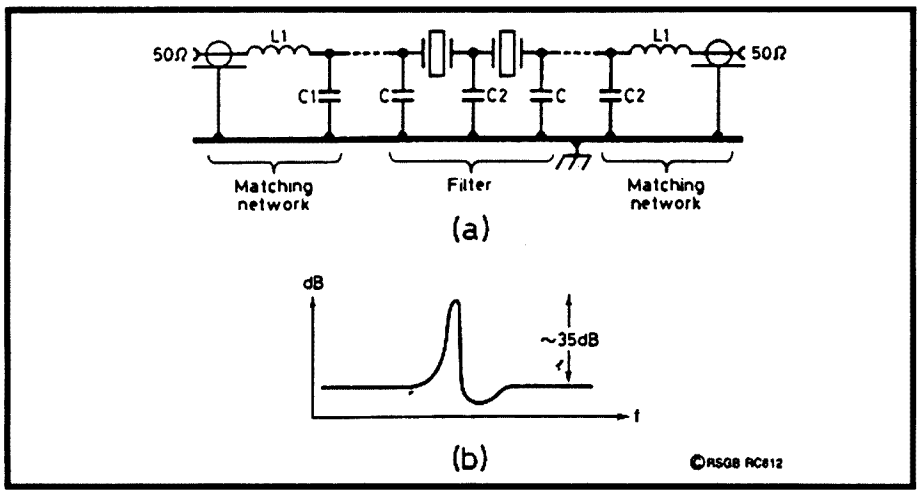

Figure 2 (a) Prototype two crystal ladder filter. (b) Passband shape of prototype.

across the band to see what you can find.

Note that, if you are using a transceiver in lieu of a communications receiver, you must ensure that you do not inadvertently transmit while the interface is connected!

The method relies on leakage of the sub-carrier signal through the audio stage of the FM receiver. If the receiver has significant attenuation to signals above the normal audio range you may not have as satisfactory results as Damien, but it is a very simple way to look for ACS signals.

Improved Stopband of Crystal Ladder Filters

The use of readily available cheap crystals in ladder filters has increased for home construction projects. An interesting technique to improve the stopband attenuation appeared in Pat Hawker G3VA's *Technical Topics* column in *Rad Com* for December 1995. The idea originally came from Stein Torp LA7MI.

Stein built a filter using fifth overtone HC18/U type crystals at their fundamental frequency of 18.556 MHz. The crystals were marked with their fifth overtone frequency of 92.861 MHz. On their fundamental they were free of spurious responses and the filter and its response is shown in Fig 2. This is a prototype 2 crystal ladder filter which had a stopband attenuation of 35 dB.

To obtain a better filter the matching network was modified and arrangements were made to neutralise the capacitance of the crystal. This was approximately 3.8 pF. The filter was carefully screened and the circuit and the improved response can be seen in Fig 3. The stopband is now close to 90 dB, which is quite an improvment. The inductors were wound on Amidon T37-2 toroids using 16 bifilar turns of 0.25 mm dia wire. The 51 pF capacitors are polystyrene. The passband is more symmetrical and the insertion loss is 1.5 dB.

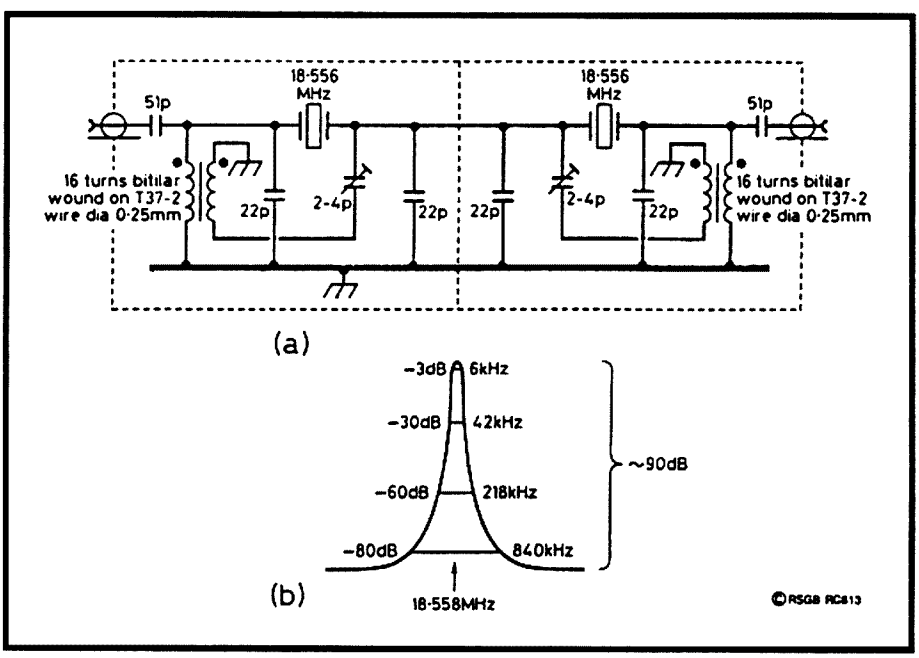

Figure 3 (a) LA7MI's improved two crystal 18.556 MHz filter. (b) Response of improved filter.

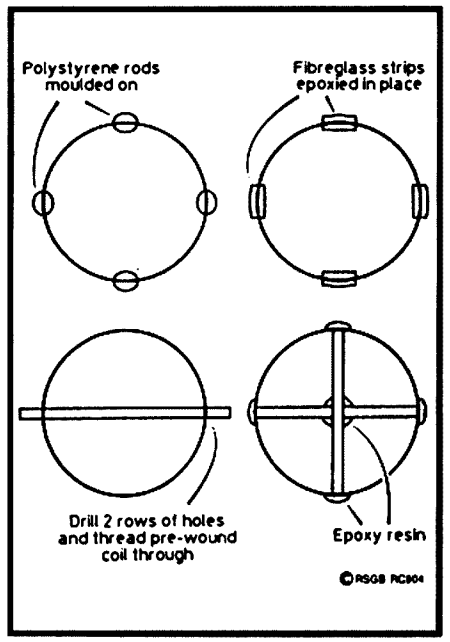

Figure 4 - Almost self supporting coil methods of support.

High Q Coils

High Q coils are desirable to minimise losses. The dielectric of a former can produce losses which limit the Q. The airwound self-supporting coil is one way to minimise losses. A close approach to this airwound coil was the miniductor stock which used a minimum of supports.

There are a number of ways to minimise coil former losses and these were presented by Ian White G3SEK in his *In Practice* column in *Rad Com* for November 1995. These are shown in Fig 4.

One method, which mimics the miniductor, uses strips of fibreglass PC board stock epoxy-glued in place just like the supports of the miniductor airwound stock.

A variation of the PC board approach is to wind the coil around PC Board strips glued at right angles to each other. The turns of the coil are glued to the outer edges of the supporting PC boards.

Another technique uses a strip of plastic with two parallel rows of holes

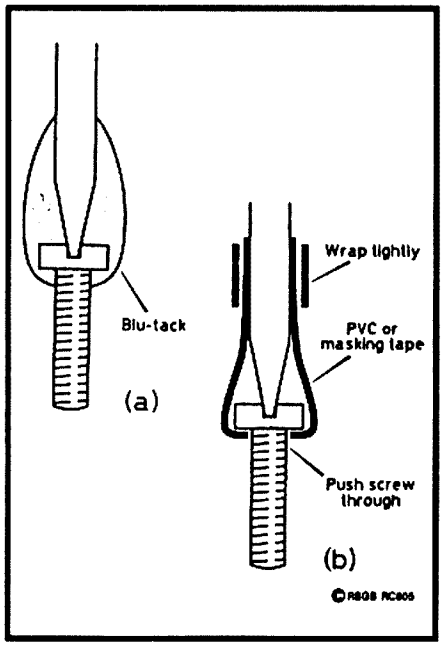

Figure 5 – Two ways to start screws in inaccessible places.

drilled to take the turns of the coil. The holes in each strip are offset by half the pitch of the coil. The coil is wound on a separate mandrel and is then wound into the holes in the plastic strip.

The plastic used should be low loss. If you are unsure about the plastic you can check it by placing a test strip in a microwave oven with a mug of water. By a series of tests of increasing duration you can soon see if the plastic test strip is lossy. Don't neglect the mug of water, though, as the oven needs some load. Similarly, creep up on the result and don't try to melt the test strip. The oven may never be the same if the test strip is heated too vigorously.

Starting Screws and Nuts

Also in *Rad Com* for November 1995, Ian White G3SEK gave some tips on starting screws and nuts in inaccessible places. Two techniques are shown in Fig 5.

The first uses Blu Tack which is the sticky stuff used to hold posters, etc on walls. A blob of Blu Tack on the screw head will hold it in contact with the screw driver and allow you to start the thread. Hopefully, the Blu Tack will come away on the screwdriver blade after you have started the screw.

The second method is to use some PVC tape or paper masking tape to hold the screw to the driver long enough to start the thread. The tape should come away with the driver.

C/o PO Box 2175, Caulfield Junction VIC 3161

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■ Antennas

Random Radiators

*with Ron Cook VK3AFW and Ron Fisher VK3OM**

A Simple and Effective Two Band ATU

Here is a circuit for an ATU, copied from an old journal some 30 years ago, which is simple and effective and covers both 80 and 40 metres.

Unfortunately, the original reference, possibly in a UK magazine, was not recorded at the time, so credit for the original idea is not possible here. We apologise for this.

The Circuit

The basic circuit is of a tuned circuit, comprising a coil and variable capacitor. This is shown in Fig 1. An inductive link coil is placed at one end of the coil and a switch added so as to place the antenna across the tuned circuit (parallel connection) or in series with the capacitor and inductor (series connection). The transmitter/ transceiver is connected to the link via the usual coax cable.

That's all there is to it. The deluxe version has one or more small light globes (pea lamps) connected in series with the tuned circuit as a tuning aid instead of an SWR meter.

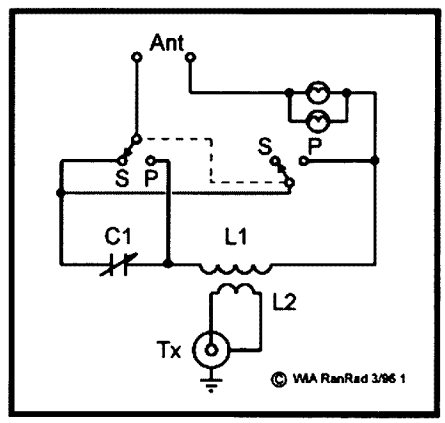

Figure 1 – Simple ATU.
C1 nominally 0-200 pF.
L1 26 turns #26 spaced one turn, wound on 32 mm (1 1/4") diameter former.
L2 4 turns #26 spaced 2 mm from end of L1, close wound on same former. (The original circuit had L2 internal to L1, but this is not always convenient.)
S = series position of the DPST switch.
P = parallel position of the DPST switch.

Theory of Operation

Consider the suggested antenna in Fig 2. On 7 MHz the shorter feeder will present a high impedance at the shack end. If this is connected across the coil of a tuned circuit, any reactance can be tuned out by adjusting the tuning capacitor to resonate the whole system. The link coil then sees a resistance which, in this case, will be close to 50 ohms. For the longer feeder, the impedance at the shack end will be low. It can then be connected in series with the tuned circuit and any residual reactance tuned out. Again a low VSWR will be seen by the transceiver.

If the lamps are included, tune-up

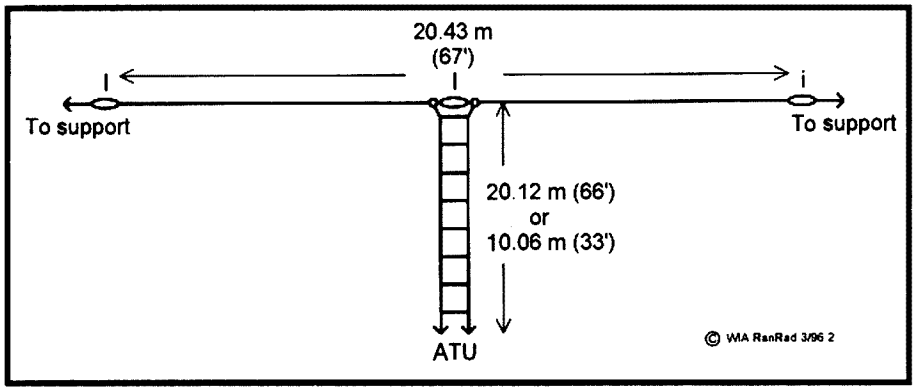

Figure 2 – 80 and 40 metre antenna.
I = insulators. A 75 mm length of 20 mm electrician's plastic conduit can be used here.
If ladder line with significant dielectric between conductors is used for the feeders, then the length should be shortened according to the velocity factor of the line.

consists of tuning for the brightest glow. The lamps will need to be selected according to the power of the transmitter. Torch globes or dial lamps should be suitable. Instead of using two lamps in parallel, a shunt resistance could be used to limit the power in the lamp.

The antenna shown can also be used on 80 metres with this tuner as a tuning range of about 3 to 8 MHz can be obtained. I used this system in the late 1960s with an "invisible" version of the antenna shown. An attempt to use a different coil to operate on 20 metres did not succeed; however, it should be possible to use the same basic design to do so. Perhaps one of our readers might like to pursue modifications to achieve operation on other bands.

The Components

Virtually any former of plastic tubing, or even cardboard, can be used to wind the core on. The tuning capacitor will need to be air spaced except for QRP operation. Almost any variable capacitor used in broadcast band receivers could be used for 100 watt operation. I was fortunate in getting a single gang unit with nearly 1 mm spacing from a now defunct disposal store. Hamfests are still a good source for such items. High power capacitors can be purchased new from Daycom Communications P/L.

Antenna wire, insulators and balanced feeder can be purchased from Daycom and ATN Antennas. Other suppliers may also have the required components. Many readers will have all the parts in their "junk boxes" and so won't need to spend an extra dollar. If you do make this handy ATU up from your store of treasures, make the point to the XYL that you have found a good use for those parts hoarded for so long!

The series/parallel switch can be a slide or toggle switch rated at 240 VAC.

Construction

The ATU can be built in any convenient configuration, ranging from total enclosure in a metal box to an open arrangement on a wooden L-shaped frame. Keep the coil one diameter away from any metal sheet to maximise unloaded Q and circuit losses.

The coil could be made to plug into a socket if multi-band operation were considered, although switching out part of the coil might also work.

As the capacitor rotor is "hot" when a balanced feeder is used, it is necessary to mount the capacitor on insulators and use an insulated extension rod for connection to the tuning knob. A reduction drive is not necessary so long as a large knob is used.

The antenna can be made in inverted vee configuration, run as a sloper or placed horizontally between two supports. It might be possible to use it fed off-centre if this is more convenient. Moving the feed point from the half length point to the one-third length point should not affect the operation and the ATU will probably match the system, although this has not been tried.

Conclusion

This is a handy unit for restricted budget operators, particularly those looking for operation on 80 and 40 metres with a backyard sized antenna. We look forward to hearing from constructors who have made successful modifications to this basic design.

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WIA News

Australian military intruders on 7 MHz

Signals originating from Australian military services have been found intruding on the 7 MHz amateur band in recent months. WIA Intruder Watch Coordinator, Gordon Loveday VK4KAL, has advised WIA News that an Australian military forces beacon was logged on 7070 kHz at 2245 UTC, using A3H mode, last December.

A separate report, sourced from Darwin, said that the military has installed two radphones (radio telephones) in the Northern Territory, using 7070 kHz as one part of the circuit. One is located at the RAAF base in Darwin, the other at Tindal. It uses selective calling (selcall 0899 on the beacon) and telephone calls via the system have been logged.

The intrusion has been reported to the SMA.

In addition, an over-the-horizon radar system has been logged on 10,130 kHz and 18,050 kHz, with a 50 kHz-wide signal at 2252 and 1830 UTC respectively, and on 21,100 kHz at 0930 UTC.

This has also been reported to the SMA, but further log reports from radio amateurs would be welcomed.

Observation log reports, or requests for more information, should be sent to Gordon Loveday VK4KAL, Freepost Rubyvale 4702 Old.

New WIA Members

The WIA bids a warm welcome to the following new members who were entered into the WIA Membership Register during the month of January 1996.

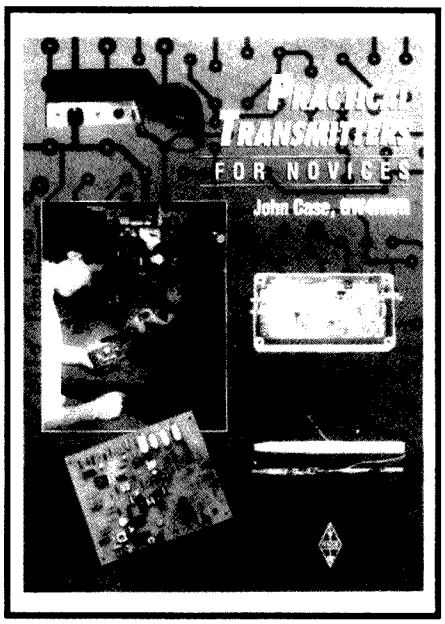
L30925	MR O G BARBER
L30927	MR W HOLLIER
L50337	MR H W SCHEER
VK3AXT	MR D MEW
VK3EDW	MR J GILBERT
VK3LCM	MR C WILSON
VK3MLQ	MR D A WILLARD
VK3NDS	MR D SIMPSON
VK5NWD	MR W J DAY
VK5VD	MR R W HUGHES
VK5ZRA	MR A J ROSS
VK6BMT	MR M A THOMAS
VK7ZTT	MR A M LOHREY

In addition, we apologise for the omission of new member VK3BMD MR J HORSKY from the list of new members during 1995. VK3BMD joined during May 1995.

■ Book Review

Practical Transmitters for Novices

Publisher: *Published by Radio Society of Great Britain 1995*
Author: *John Case GW4HWR*
Reviewed by: *Evan Jarman VK3ANI*
Paperback, 245 mm by 183 mm, 132 pages
ISBN 1 872309 21 6



"The intent behind the book was to describe a number of "easy to build" *transmitters but it became obvious that some theory needed to be included."* So says the author, but this is always the best way to describe a construction project: a balance of how and why. This applies to novice and expert.

A number of novice type projects are described with introductory chapters in each section giving some of the theory behind the operation of the equipment involved.

The book tends to the UHF frequencies and above but some attention is given to the 160 and 80 m bands. The bands covered are 1.8, 3.5 and 50 MHz, plus 1.3 and 10 GHz. The title may be more applicable to British Novices as the frequency allocations in our two countries do not match. It could not be recommended as a practical book for Novices in Australia, although some chapters are recommended reading.

The book should appeal to a hobbyist tackling the world of UHF or higher for a first or second time, particularly 1.3 GHz. There is a good variety of test and transmission equipment to build, most of it fairly simple.

Also included are chapters on construction techniques and the obligatory chapter on looking after your tools. The author appears to have kept it simple, although some projects would require more than the odd weekend to build. The drafting is the usual Derek Cole standard making the diagrams very easy to understand with no ambiguity. Some of the projects come from the RSGB magazine *Radio Communications.*

For the VHF/UHF dabbler, this book is worth looking at; for the Australian Novice there are better books.

The review copy was supplied direct from the RSGB. ar

Have you advised the WIA Federal Office of your new call sign? Use the form on the reverse of the *Amateur Radio* address flysheet.

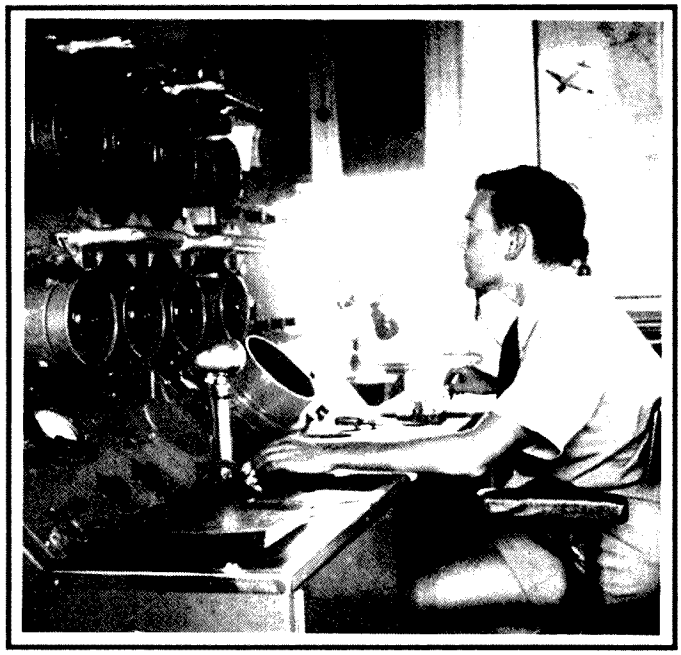
■ History

HF DF

Lee Hitchins VK6HC reminisces about an interesting piece of wartime equipment, fondly known as "Huff Duff".

The recent excellent series of articles in *Amateur Radio* on the development of the Kingsley AR7 receiver prompts me to write a brief article on another great piece of wartime equipment, namely the Adcock High Frequency Cathode Ray Direction Finder.

Designed and built by AWA, it was used throughout Australia and New Guinea during World War 2 and for some years afterwards. Its primary use was to assist in air navigation but it was also very much in use for Japanese "intercepts" where not only were stations identified and copied, but positions noted as well. A further use was for long range weather forecasting by means of all stations simultaneously noting lightning flashes, and their approximate intensity and direction, thereby indicating approaching fronts.



The author operating an Adcock High Frequency Cathode Ray Direction Finder in 1942.

The equipment consisted of twin high frequency receivers of precisely equal gain, each being fed by two of four vertical antennas accurately positioned at North, South, East and West. Both receivers had an antenna, two RF stages and a mixer, with an oscillator common to both and providing the master tuning control. After detection the separate IFs were then fed to the North-South (vertical) and East-West (horizontal) plates of a 5BP1 cathode ray tube which was surrounded by a rotatable compass rose. Precise tuning and equality of gain was achieved by tuning each of the antenna, RF and mixer stages, and with the IF stages all being provided with individual gain controls. An external low powered oscillator was located at 045 degrees to provide visual alignment and a known test bearing.

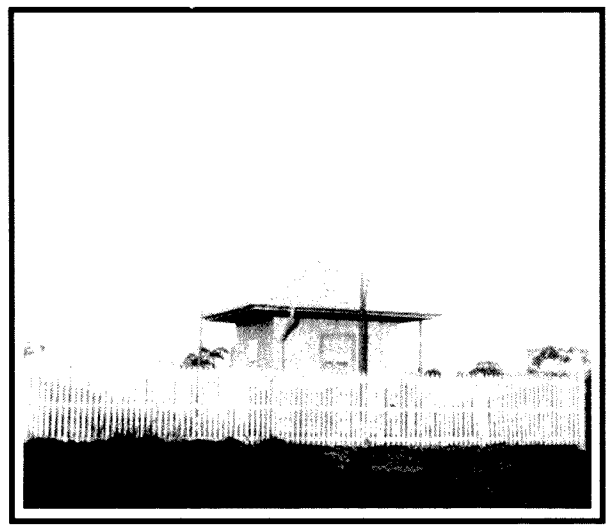
The frequency range was approximately from 2.5 to 8.5 MHz and major changes were made by changing large pairs of plug-in coils. A complete frequency change and re-alignment could be achieved in one minute. Once aligned, an incoming signal was displayed as a straight line across the screen and the compass rose swung to obtain the bearing and reciprocal. Sense was determined by switching out one antenna and noting any change of quadrant.

An experienced operator could obtain a bearing on either a "dot" of CW or a static flash due to the screen persistence. All of which refers to ideal conditions always determined by ionospheric conditions, time of day or night, and weather. Bearings were always given as first, second or third class depending on perceived accuracy depending on the strength and stability of the signal.

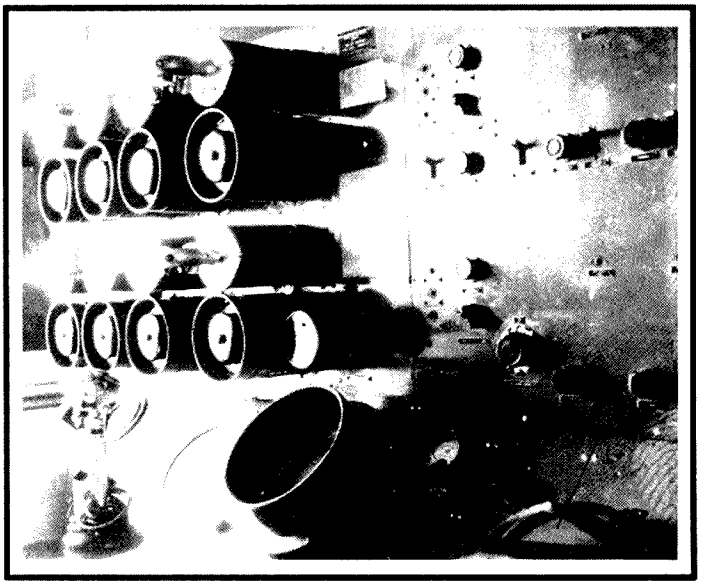
The very first time that I operated the gear "solo" I was asked for an urgent bearing from a very worried "rookie" pilot. Instead of a nice definite straight line on the screen I was confronted by an ovoid that vaguely drifted on the screen. Taking a hurried mean on this, I gave "a course to steer" and was later visited by the pilot who thanked me profusely for getting him home. Later on I realised how lucky we both had been and was certainly taught to be cautious.

Strict procedures existed in that bearings were only given provided that the pilot responded correctly to the code of the day. Not always so easy for pilots who had other things on their minds. I was once hauled over the coals for giving a bearing to a pilot who had not responded correctly. "How did you know that it was not an enemy?" I was asked. "Sir, when after several challenges the pilot radioed "for .....'s sake give me a ....ing bearing" I assumed he was Australian".

The DF hut was always in an isolated area which was as clear as possible from anything which may have compromised the accuracy of bearings and calibration procedures. Photos of the equipment show the pairs of plug-in coils on the left. To the right are the IFs with their switches and gain controls. In the centre is the large main tuning control with the cathode ray tube and compass rose below. The sloping front panel also contained the audio and filament controls.



The DF hut and the four vertical antennas accurately positioned at North, South, East and West.



The Adcock High Frequency Cathode Ray Direction Finder.

Most communications, provided by remote transmitters, were on CW with phone for closer approaching aircraft. Watches were always on a 24 hour basis with only three operators, one on duty, one sleeping and one hopefully on leave. It tended to be a somewhat lonely business as one had relatively little personal contact with fellow operators or even other signals people.

Still, a most interesting business with not only aircraft operating but also close co-operation with Aeradio, the flying doctor and often naval operations as well. The ubiquitous AR7 was usually on standby for distress and other frequencies. Spare time activities included calibration checking, "intercepts" and the retransmission of the received "kana" code on landline.

The latter activity at least had its more interesting and personal side since the retransmission to HQ was generally via country telephone exchanges at night. Have you ever heard the stories young ladies exchange during the silent watches of the night?!.

23 Robins Road, Kalamunda WA 6076

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■ Antennas

How to ... Load up a Tree or Confuse your Contact

Steve Bushell VK3HK presents what seems to be a plausible account of his experiment. We hope to hear more in due course.*

Last Sunday I decided to prove, one way or the other, if what I had heard some time ago about activities undertaken by the American armed forces, were indeed possible.

Some one had told me that trees were being used as antennas.

As the odd eucalypt is often what I use to support a not-too-efficient portable aerial, I decided, after a lot of soul searching, to give it a go. That did not detract for one minute from my sense of inadequacy and I have to admit feeling like a real mug setting up my HF gear on an outdoor table in the back yard with the view to using a 14 metre high blue gum as a sky hook!

I started proceedings by driving an earth stake several feet into the soil immediately below the tree in order to obtain a counter connection point for my 300 ohm balanced transmission line. The other side of this line was attached via an alligator clip to a screw driver hammered into the trunk about one metre above ground.

In between the feed line and my transceiver was an ATU with which I hoped I would possibly be able to obtain some degree of matching, if in fact this rumour had any credence at all.

I started on 21.3 MHz by dropping a carrier for tuning purposes and, surprisingly, I found no trouble at all in easily taming the impedances. As a matter of fact, the tuning point for the tree was remarkably close to the settings I use for my 40 metre dipole.

OK, I thought. So it takes power reasonably well. But so too does a dummy load!

However, on the other hand, "Perhaps the Yanks got it right this time". As it happened, though, I was destined not to find out on this band. It was as dead as a dodo bird.

Not wanting to be too pretentious, I decided to give the 14 MHz band a miss and dropped down to 7 MHz where there is usually good activity. A quick tune up and then a snoop around the band revealed many stations both local and interstate and at very good signal strengths.

Many contacts ensued with stations as far afield as Perth, and Cairns with my average signal report being R5 S8. You can imagine the response from these stations when informed of the aerial in use and, more often than not, the other operator was still none the wiser at sign off as to what antenna "I had in the tree".

I was also able to hear stations from South America and Southern Europe but, as there appeared to be a contest on, I decided against calling them.

For those intrepid experimenters amongst my readers I will mention a few points of interest in order that you may obtain a degree of expertise in the art of tree feeding.

a. Useful signals were achieved with the matching impedance varying in the range 50 ohms through 600 ohms. After this, performance deteriorated such that a piece of wet string would most likely have served more purpose.

b. Adjusting the feed point on the trunk to a height about 0.125 of a wavelength above ground provided optimum signal, both transmitted and received.

c. A good ground connection was found to be essential.

d. I expect that a balun would prove effective in conjunction with a coax feed.

e. It is my summation that, as good local signals were achieved with an Australian Blue Gum, DX should be practical with the use of such trees as Canadian Spruce, Baltic Pine, Californian Redwood and English Elm.

20 Allendale Crescent, Mulgrave VIC 3170

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■ Amateur Radio Events

The South East Radio Group (SERG) Annual Convention

A Technical Review and User's Guide

*Based on personal experience by Alex Edmonds VK3BQN**

Specifications

Frequency	:	One cycle per year
Duration	:	Two Days (Saturday and Sunday)
Timing	:	Queen's Birthday weekend
Location	:	Showgrounds Hall, Mt Gambier South Australia
Cost	:	Extremely variable. Membership can be chosen for one or both days, including meals on the Sunday, but the major costs will be: (a) accommodation, varying from tolerable to luxurious depending upon what you are willing to spend; and (b) the amount of money spent on equipment.
Accommodation	:	There are often several different events taking place in Mt Gambier on this weekend. As a result, some hotels are booked out months in advance (one team several years ago arrived extremely late at night due to car trouble, and spent the weekend camping in the motel laundry). Lists of motel ratings were available from SERG at one stage, but they were based solely on how good a radio location each provided, rather than motel quality.
Terrain	:	One extinct volcano with three lakes in the craters, hilly ground, pine forest plantations and (if you go in the fox-hunts) "roads" that would have to be significantly improved in order to be classed as goat tracks.
Age of Basic Design:		30 years.
Schematics	:	List of events supplied in advance by SERG, or on registration at the hall.
Operating climate	:	Usually cold. Usually raining. Sometimes foggy. Sometimes all three at once. 1994 actually had some sunshine. This may be regarded as possible proof of the theory of global warming.

Basic Explanation

1. South East of where?
   The organisation that runs the event is situated in the South East of South Australia.
2. Purpose?
   An amateur radio convention to view trade displays, buy and sell new and secondhand equipment, meet other amateurs, and compete in fox-hunting (no "Scrambles" were run in 1994 due to the fact that in previous years the results have tended to be something like a five way tie between the five teams competing.)

Comment

If you are planning to travel across from Melbourne, it is recommended that you do so on the Friday night, in order to give your team time to recover from the long drive.

Report on the 1994 Model

This event once again attracted large numbers of VK3s, including a large infestation of "NERGs". These are the "North East Radio Group", from the North East of Melbourne, Victoria, and perhaps better described as the "Let's go to Mt Gambier, win all the contests, and annoy the South Australians Radio Club". They are identified by their dark blue windcheaters marked "NERG" with what appears to be a large fuzzy thing of some type, and their mating call of "where's the bloody fox" or some variation.

There is also a small but exclusive group noted for their white windcheaters with "NUKE THE NERG'S" and a small fuzzy thing hanging upside down.

This has started something of a trend and a number of serious hunting teams now have their own identifying uniforms.

Trade Displays Were Run By:

Dick Smith Electronics

Stewart Electronics (Daycom)

ICOM in association with Jensen Communications

Kenwood

The SA Division of the WIA components sales service

Anybody trying to flog something they thought they could get rid of.

If you do plan to go fox-hunting, grab whatever time you can to look at the displays during the day. By the time you return from the third or second last hunt, most of them will be shutting up. (If you go on the last hunt, they'll all have closed by the time you get back to the hall.)

A Word of Caution for Beginning Fox-hunters

The standard of some of the teams competing in the fox-hunts is VERY high. Consequently, the hunts tend to be:-

a) long,

b) difficult, or

c) long and difficult

The vehicle of choice for fox-hunting is, if possible, a four-wheel drive. Always carry a communications radio to call for help when you get bogged. Carry a tow rope for when you (or other people) get bogged.

The SERG uses a system of "drawing tickets" for starting position in the fox hunts, in order to avoid the mass rush for the gates that used to occur.

Pine plantations play absolute hell with radio signals. When you get completely lost (and you will), call the showgrounds hall for help. With any luck, somebody there will be listening and should know what's going on.

What do you do if you're starting out on a hunt and can't hear anything?

Follow somebody. The trick is in knowing **WHO** to follow. (**DO NOT, repeat DO NOT follow us!**)

Note that, while this is accepted practice in getting to a point where you can hear the signal, it is regarded as being "bad form" to simply follow someone for the entire hunt and hope they'll find it for you. Nor does the hunt always go to those with the best equipment, drivers and navigators.

One team has been known to take out second place in competitions using a 1960s vintage Short Wave transistor radio, with a ferrite rod inside it, held up in the back seat.

Hunting includes HF, VHF and UHF events. As a result different types of antenna and equipment are required for different hunts.

Six metres is difficult because the frequency is too high for a good DF loop,

and too low for most other types (it has to fit on a car, remember?)

Doppler shift systems are popular for two metres, but would obviously be impossible to use for anything lower in frequency. Most people go for the simplicity of a beam, but some teams have automatic rotators (geared down from old electric motor-mower engines) and four element quad antennas (with, in one case, a CRO display of a cardioid pattern to indicate bearing).

DF loops (10 m, 6 m) are difficult to work with. Ferrite rod antennas (80 m, 10 m) are small and inefficient.

Over complexity can also lead to problems. One team had the slight problem that on the 80 metre hunt the engine ignition system produced such a powerful signal that they had to switch off the engine to take a bearing.

This is not a good system.

Rules the Fox Must Obey

1. Go somewhere and put out some amount of signal sometime until found and sufficient time has elapsed for the hunt to end. For example, talk as much or as little as you like. Transmit carrier if and when you feel like it. Lie to people about your location and what you can see, whenever it feels right. Change transmitters and power levels. Move around before and after people have found you if it seems like fun.
2. Rule 1 is not binding.

Rules the Hounds Must Obey

1. Obey the road laws.
2. Obey specified local fox-hunt rules. (For example, only one sniffer per car may be a rule specified).
3. Expect to spend a lot of time, a lot of effort, a lot of petrol money, and get really, really lost.
4. Be at least slightly mad (optional but recommended).
5. Do not trust the other hunters. Some will give honest directions, but some will take great delight in mis-directing you. This is recognised as a fact by all experienced hunters.

Other Events

There is also a home-building competition which is apparently being encouraged to some extent by some anonymous "donor", although if he was there in 1993 I'm sure he was cheesed off. That was the year I entered the home-built competition simply because so few other people had. I won a prize, basically for entering.

In 1994, however, they ran a competition for different grades of home builder, and the number of entries was much higher than in the last few years, ranging from 10 GHz transceiver equipment to complex fox-hunting and sniffer equipment, and replicas of early valve broadcast receivers.

The quality of all the entries appeared to be very good, and most people had provided circuit diagrams and explanatory details that were very helpful in understanding the equipment.

The Fox-hunting

Having arrived in Mt Gambier on the Friday evening, we had time for seeing some of the town in the morning. It also, of course, gave us plenty of time to check out our equipment, which, of course, we totally failed to do.

We therefore followed the long standing tradition of discovering one hour before the first event (two metre fox-hunt, 146.000 MHz, 1430 local time) that I had, with my customary foresight, left behind two vital pieces of the roof mounting system that was supposed to hold the beam. This led to a rapid search of the "city" which was, for the most part, closed, in order to find a new set of brackets.

Failing in this, we bought a cheap set of "ski bars" at K-mart and rushed back to the hall to begin the attempted high speed modification of the mountings.

We, of course, lost track of time and while making the changes to the mounting, we observed the rest of those involved driving off to start the hunt from the other side of the hall.

We therefore sent a message to the organisers that we intended to start as soon as we had finished the changes.

The delays because of my errors didn't matter greatly in the end, because when we said we were going to try hunting, we didn't get the message that the frequency being used for the hunt was not actually that listed on the program and consequently we never heard the damn thing at all!

Believing that, from this start, things could only get better, we drew a number and lined up for the start of event two, (70 cm fox-hunt, 439.000 MHz, 1520 local time).

This time we got to a position quite near the fox before he shut down, but well behind the leaders.

The main point of interest in this hunt was which of the navigators in the various cars was correct. That is, was the fox "a good 500 metres inside South Australia" as he claims, or was he actually over the border in Victoria as claimed by most of the teams hunting? (not that there's anything in the rules against it, but it was a very long way from Mt Gambier either way).

Event three was the multi-stage night fox hunt, beginning at 1600 local time. We did not at any stage really consider entering this event for one simple reason. It is, and always has been, **a complete Bastard!** *(Type of language made for fox hunting! Ed)*

This time it involved four stages, one stage each on two metres, 70 cm, 10 metres and six metres. The order and frequency of these stages is not given out in advance. Consequently, anybody who wishes to enter seriously requires a system that allows rapid changeover of equipment.

Which does not change the fact that, typically, it lasts for well over four hours, more than 200 kilometres and has, at least once, been won by a team that had to stop and change a flat tyre during one of the stages. The second place team in 1994 year did 205 km, and finished around 2330 or 2345 hrs. This is **NOT** a hunt for beginners.

This finished the events for the Saturday.

Sunday began at 0930 with a sniffer hunt on 144.000 MHz. This is made more difficult than it sounds by a small timing circuit attached to the transmitter so that it puts out a half second pulse of signal roughly every 20 seconds. Personally, I never heard it. I'm not entirely sure I believe it was switched on, despite the fact that somebody else found it!

This was followed by a three stage two metre transmitter hunt, with a choice of two different frequencies on the final leg.

We found (eventually) the first two stages, but did not hear any signal from the third. All else failing, we headed back to the mountain to get some height and hope for a signal. We also changed to the other frequency to see if we could hear that transmitter.

It was later explained to us that this had possibly been a tactical error, since the "alternative" transmitter we were looking for had, upon switch on, produced large quantities of smoke, burning smells, and no signal whatsoever.

This was followed by lunch.

After lunch, another sniffer hunt (about which the less said the better). This was followed by a six metre fox hunt on which we heard the signal, but could get no bearing, and thus spent our time circling 15 km from the transmitter, and an 80 metre fox hunt on which we never heard the fox at all.

Event nine was another two metre fox hunt, in which we got to within approximately one kilometre of the fox before several other people, but had to give up, go back and take the long way round due to the path ahead of us being totally unsuitable for anything not fitted with four-wheel drive (as proven by one of the teams behind us, who did go along it and managed to hit the ground with the bottom of the car several times).

Going the long way around we got there.

Last.

BUT WE GOT THERE.

We did not attempt the 1296 MHz hunt (although I can tell you that, traditionally, it is either right at the bottom of the crater, or right at the top of one of the lookouts).

(Mysteriously, the account by Alex ceases at this point. Could it be that he found further fox-hunting memories too painful? Ed)

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■ ANTENNAS

Some Useful Wire Antennas for HF

Part 1

Rob S Gurr VK5RG shares his comprehensive knowledge of wire antennas with us.*

When a new amateur operator makes his first enquiries to those already on the air, seeking advice on the best antenna to erect, he is frequently greeted with a short answer, which is actually an amateur callsign. "The G5RV" will be the response from some, the "G8PO" from others, and perhaps even the "ZL Special" from a few. Others may recommend a "W8JK", a "HB9CV", or a ..... These names mean very little to a beginner who is looking to establish his own station. What do these and other similar titles mean, and what benefits does he get by using such an antenna? Why are there so many choices, and why can't he go straight to the best type, fully confident that it will work first try? In this article I will discuss the above antennas, and also describe some other very useful HF wire antennas which, as yet, have not been given a title that identifies a person, rather than a physical item. Firstly, though, a few general matters about antennas.

Some Wire Antenna Considerations

The Wire

A 100 metre reel of 2.5 mm^2 stranded copper earth wire with PVC insulation costs about $35.00 from electrical trade outlets. Don't buy it by the metre at retail hardware shops or you may pay up to three times this price. One hundred metres may last a long while; however, a friend may share the cost with you. In most cases, by the time an antenna and feedline are constructed, there will be little surplus. Also available is electric fence wire, from farming supply outlets; a sample reveals this to be multi-stranded steel wire, with one conductor of copper.

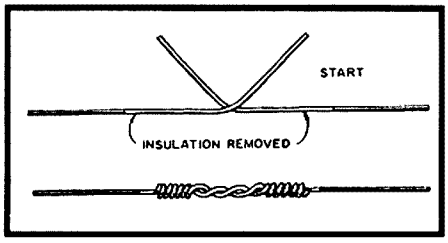

Figure 1 – Splicing antenna wire.
(Reprinted from The ARRL Antenna Book 15th Edition, page 21-3)

Connectors

Soldering wire joints outdoors is not always practical. The use of commercial brass earth connectors, such as Clipsal Type 563/2, or similar, is recommended. These may be covered over with insulation tape or, additionally, silicone rubber, if improved weatherproofing is required. The soldered joint is to be preferred; however, it should be a mechanically suitable joint, with wires twisted a number of times, or clamped, before solder is applied. I have had satisfactory experience with the "Post Office", or "Lineman's Joint", and find them quite suitable for copper wire aerial connections (see Figs 1 & 2).

Masts

Steel tubes, sectionalised masts, wooden or bamboo poles are all suitable. The use of trees, house fascias, and other elevated supports is also possible, providing suitable anchoring techniques are used. "U" bolts, turnbuckles, etc, are a standard hardware shop line. Height above ground will generally legally be restricted to 10 metres. However, if you are willing to obtain the necessary permit, heights up to 15 metres may be used in a number of suburban installations. There is, unfortunately, a significant disadvantage in using this additional height on some frequencies. With trees, due to wind sway, use of halyards and pulleys utilising springs and counterweights is recommended. Wet foliage under certain circumstances may be a problem.

Guy Wires

Stranded steel galvanised wire may be used, and often surplus stainless steel rope is available. Joints can be made using clamps, turn-buckles and thimbles, as well as the above-mentioned Post Office splice

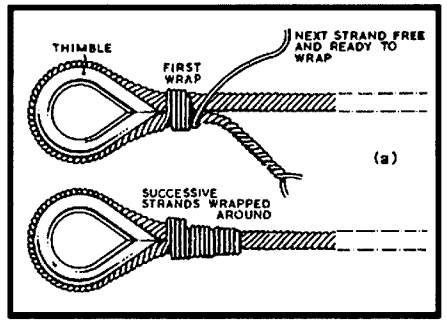

Figure 2 – The "Post Office" splice for securing stranded wire around a thimble or insulator.
(Reprinted from the RSGB Radio Communication Handbook, fifth edition, page 12.91)

(see Fig 2) method. It is good practice to use insulators liberally (about every 3 metres), however, if a one-length guy wire is preferred, an insulator at the top and bottom is essential. This requirement is to ensure that the length of wire associated with any unbonded metal-to-metal contact (thimble through the eye of a turnbuckle) is as short as possible. This prevents large signal pickup and subsequent re-radiation should corrosion at the junction occur. We are all familiar with unexplained "crackles" on our receivers, and also with cross-modulation involving broadcast stations, which mysteriously worsens on dry windy days!

Should it be necessary to have a long length of guy wire, or a cable catenary system that cannot be broken up with insulators, all metal to metal flexible contacts should be bonded over, or liberally coated with a graphite (conducting) grease; EMF Welder Grease, by Golden Fleece, has been my favourite, but other brands are available. It is not necessary to break guy wires into short sections using insulators. If you are inclined to do so, break them at quarter wavelengths on the highest frequency in use, ie every 2.5 metres for 28 MHz.

Transmission Lines and Spreaders

The construction of a suitable open wire line can be simplified by the use of 16 mm, or 20 mm, heavy duty electrical conduit.

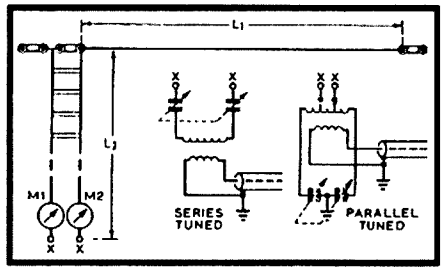

Figure 3 – End Fed Zepp.
(Reprinted from the RSGB Radio Communication Handbook, fifth edition, page 12.61)

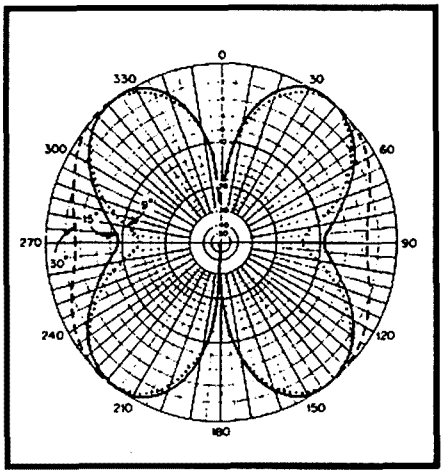

Figure 4 – Horizontal patterns of radiation from a full-wave antenna.
(Reprinted from the ARRL Handbook, 1988 Edition, page 17-8)

Doubts may be held by some readers about the suitability of plastic as an insulator for feedlines in this manner, but I don't think a contact has ever been lost due to such small losses. Another insulator material, already protected for UV radiation, is the popular black garden automatic water sprinkler hose, about 4 mm diameter.

Feedlines should be drawn away from antenna arrays at right angles, particularly where close to towers and other metallic supports. The use of UPVC to ensure minimum deterioration due to ultraviolet radiation is not considered necessary. Holes in the conduit to allow the wire to pass through, and a smaller diameter tie wire to prevent the spacer slipping down the feedline are required.

Textbooks and practical experience vary. A line constructed for 300 to 800 ohms would be suitable in most cases, eg the 300 ohm open wire TV ladder line is satisfactory; however, do not use any other type of 300 ohm commercial feed line. A home-made line, of spacing between 50 and 150 mm is recommended, with spacers installed every 300 mm for narrow spaced lines and every one metre for wide spaced lines.

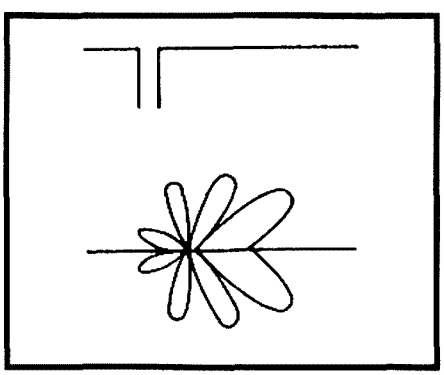

Figure 5 – Radiation pattern of a long wire antenna fed from a low impedance point near one end.
(Reprinted from the Radio Handbook, twenty-first edition, page 28-3)

Lines could be pulled tight, but a loose hanging line with no right angle bends is acceptable. Wind sway may be a minor problem unless the lines are running close to earthed metal surfaces such as roofs, towers, etc. I would inject a word of warning here. Do not treat a tiled roof as an unearthed surface. Usually below the tiles you will find hot and cold water, and gas pipes, electrical wiring, TV antennas and associated cables, telephone wires, etc, all of which have an influence on any nearby aerials or feedlines. The entry of the feedline (2 x 2.5 mm^2 insulated copper stranded wire) to the radio room is best via feed-through insulators; there are many variants available, most of which suggest themselves.

Do not run through a metal frame window and close the window on the line. The window may be at a quarter wave point and the high voltage will burn the insulation through, and so on. Brickwork entry is possible using small diameter glass tubes in mortar courses, etc.

Be certain to maintain the same spacing between the conductors for the full length of the line to the ATU. A good test of a feedline is to listen on it, through the ATU, when the aerial is disconnected. If you hear nothing, then it is balanced.

It is good practice to have an integral number of quarter waves in a feedline; however, random lengths do not inhibit good results, they only make the ATU work into complex reactive loads.

In some cases a number of ATUs, tuned for separate bands, may be remotely located and fed from the transmitter through coaxial cable.

Element Spreaders

Spreaders for separating the elements can also be made from electrical conduit, with a wooden dowel, or fibreglass rod, inserted internally to give rigidity. The conduit lengths available are regrettably a maximum of four metres. Some ingenuity may be required to make simple spreaders longer than this. Aluminium tube, 25 mm in diameter, may be suitable for up to five or six metres and, as it is usually at right angles to the antenna wires, should have little effect on radiation. Short aluminium tube lengths may be also used for joining wooden dowels, prior to enclosure in PVC conduit. Conduit end caps (Clipsal 252 series) are recommended, to finally enclose the spreader.

Fibre glass rods may also be fabricated to form elongated "cages" for spreaders up to five metres long.

Coupling Units

Most of the antennas to be described are balanced and symmetrical. The feedlines are not always "flat" (SWR terminology) and the impedances presented at the amateur equipment may vary from less than 20 to over 1000 ohms. Most multipurpose ATUs ("Z" Match, "T" match with balun) may be adjusted, with the assistance of a suitable SWR meter, to convert these impedances to 50 ohms to interface with standard amateur equipment. The description of a suitable ATU is included at the end of this article.

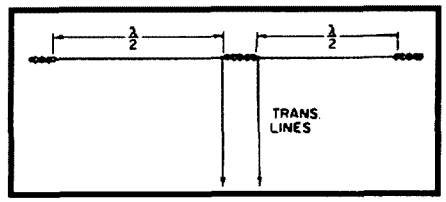

Figure 6 – A two-element collinear array (two half waves in phase).
(Reprinted from The ARRL Antenna Book 15th Edition, page 8-32)

Earthing Systems

It is desirable for all aerial installations to have a good RF earth, and when using end-fed wire antennas (verticals or horizontal), it is essential. There are many practical reasons for this, and if one very good earth point can be established immediately adjacent to the ATU, and all other equipment bonded back to this point, it should be sufficient for most applications. The earth lead should be as short as possible as the ATU is part of the antenna system. All bonding earths to equipment are ancillary to this main lead.

(It should be remembered that the amateur equipment itself should be separately earthed through the three wire power cable. The General Purpose Outlet, and the whole electrical system, all complying to the requirements of the SAA Wiring Rules AS3000).

A suitable earth stake may be a two metre length of 20 mm water pipe driven

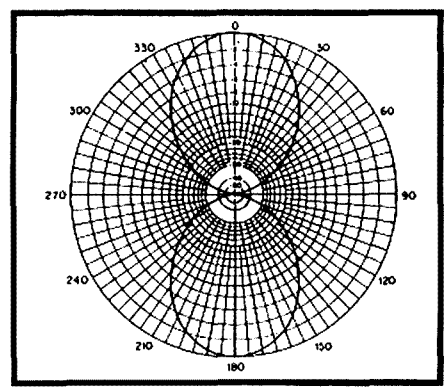

Figure 7 – Free-space E-plane directive diagram for a two-element collinear array.
(Reprinted from The ARRL Antenna Book 15th Edition, page 8-32)

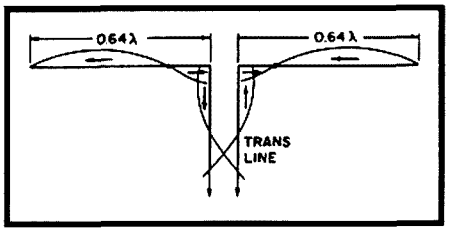

Figure 8 – The extended double Zepp. This system gives somewhat more gain than two half-wave collinear elements.
(Reprinted from The ARRL Antenna Book 15th Edition, page 8-34)

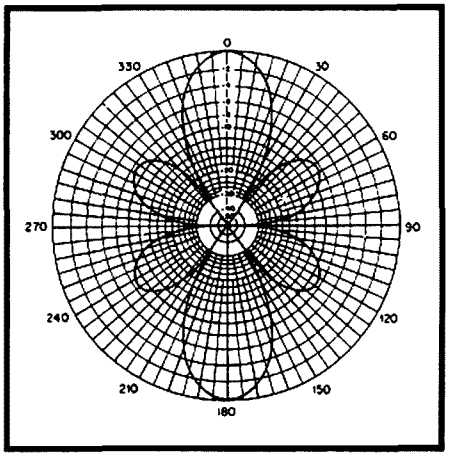

Figure 8a – E-plane pattern for the extended double Zepp.
(Reprinted from The ARRL Antenna Book 15th Edition, page 8-34)

into the ground, with a standard electrical earth clamp for connection of the wire. In the case of end-fed wires, or ground planes, all nearby exposed metal such as carport supports, roof decking, galvanised fences, domestic water pipes, should be bonded back to the earth stake. A suitable wire is 6 mm² insulated earth wire (Green/Yellow) from an electrical trade outlet. Remember, the longer the earth lead, the higher the ATU is above radio frequency ground. The reason you get "bites" from microphone cases and equipment is that these items are often a quarter wave above ground where a high RF voltage exists.

Never rely on the mains earth as it may be a long way to the main switchboard, and even longer to the main earth stake. These aspects are most important in the end-fed antenna situation. In a practical situation, most amateurs should be able to achieve an earth wire of no more than a metre in length. Do not place your ATU at the top of everything else, or you may easily encounter that undesirable quarter-wave!

End Fed "Zeppelin"

A halfwave dipole, fed at one end with a non-radiating feedline, exhibits bi-directional radiation properties near its resonant frequency and on lower frequencies only (see Fig 3). At higher frequencies, major and minor lobes appear and its use on harmonics for multiband operation provides useful gain, particularly when considering harmonics above the fourth or fifth (see Fig 4).

One such aerial is usually known as the end-fed "Zepp". Actually, the figure eight pattern of the dipole radiation, and symmetry of the lobes on harmonics, is somewhat distorted, to give a directional radiation away from the feeder end (Fig 5). These aspects are worthy of further reading; however, for a "backyard" installation, its application is somewhat limited if directivity is required. The above aspects do not preclude the end-fed dipole being used as the driven element of a co-linear phased array. In fact, some physical layouts may require such a feed (sometimes the line of support poles may be at right angles to that necessary for the use of an alternative directional array). Such arrays stay bi-directional, in a direction at right angles to the line of their support masts.

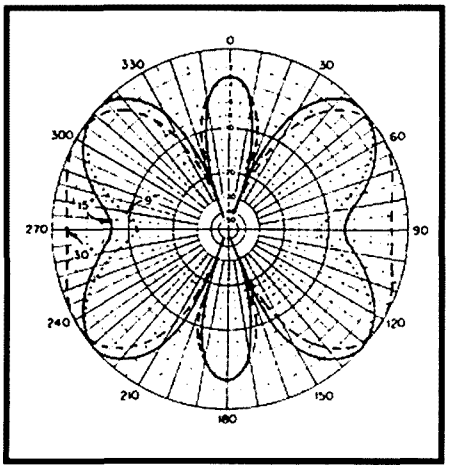

Figure 9 – Horizontal patterns of radiation from an antenna three half-waves long.
(Reprinted from the ARRL Handbook, 1988 Edition, page 17-8)

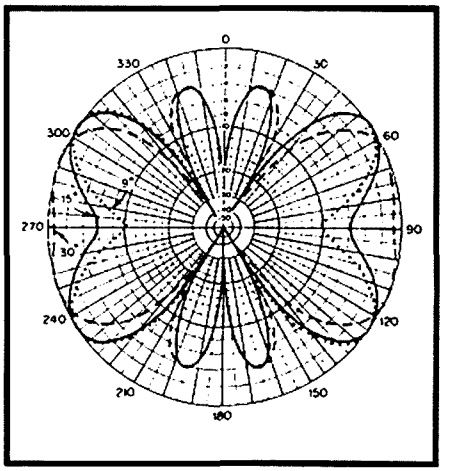

Figure 10 – Horizontal patterns of radiation from an antenna two wavelengths long.
(Reprinted from the ARRL Handbook, 1988 Edition, page 17-8)

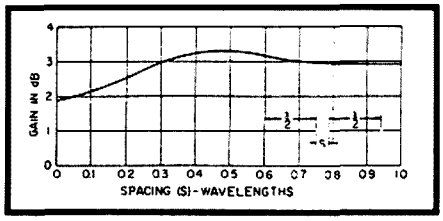

Figure 11 – Gain of two collinear half-wavelength elements as a function of spacing between the adjacent ends.
(Reprinted from The ARRL Antenna Book 15th Edition, page 8-32)

Centre Fed "Zepp"

An array of two in-line (collinear) half-wave elements (Fig 6), fed in the centre with a tuned feeder, exhibits a gain of 1.8 dBd (4 dBi) (see Fig 7). This is known generally as two half waves in phase. By extending the dipole lengths to 5/8 wave, the array becomes two extended half-waves in phase (Double Extended Zepp), with a gain of 3 dBd (5.2 dBi) (see Fig 8). Such an antenna, usually with end feed, is well known to 144 MHz operators as a "Ringo".

When such an array is erected and tuned for 14 MHz, it is coincidentally two half waves in phase on 10.1 MHz. On 7 and 3.5 MHz the array is effectively a long dipole, and a short dipole respectively, but with still the same bi-directional radiation. We now have a bi-directional array for 3.5 to 14 MHz, with a useful gain on both 10 and 14 MHz. On higher bands the bi-directional lobes are replaced by multiple lobes (Fig 9), at various angles, however the main lobes continue to exhibit even higher gain. Regrettably, they may not be in the direction that you may wish to frequently contact (Fig 10).

Specific dimension for this is simply calculated by assuming a design frequency of 10.1 MHz, where a half wavelength is 14.85 Metres. This gives a somewhat improved DX performance on the G5RV (mentioned later), where bidirectional properties occur on the 3.5 and 7 MHz bands only, and multi-directional lobes become evident on 10.1 MHz.

As an ATU is necessary to get multi band operation from this antenna and a G5RV, this shorter antenna has more to offer.

Maximum gain possible in any combination of two dipoles is 3 dBd, ie two arrays with unity power can only produce twice power under any condition. This is an important fundamental in understanding antenna gain (Fig 11).

Part 2 of Some Useful Wire Antennas for HF will appear in next month's issue of *Amateur Radio*.

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■ People

International Travel Host Exchange

Ash Nallawalla VK3CIT, Federal Coordinator, ITHE*

It has been eight years since an in-depth article about the International Travel Host Exchange (ITHE) scheme was published (*Amateur Radio*, May 1987, p3), so here is an update.

ITHE is a free program administered by the American Radio Relay League (ARRL) since 1984. Its aims are to foster international goodwill and friendship between radio amateurs who are lucky enough to travel to another country or another part of their own country. A master list of participants is maintained by the ARRL and co-ordinators in sister societies, such as the WIA, help to keep the list up to date.

Participants are interested radio amateurs who wish to meet or host fellow operators from near and afar. Your name does not have to be on the list for you to take advantage of such hospitality, and you can do so when travelling around our own country. Once you are on the list you might receive mail from prospective visitors, and it is perfectly acceptable to politely decline a request if you are unavailable.

How to Participate

To have your name added to the list, you need to supply your name, callsign, postal address, home phone number, languages you know, and whether you wish to host or just meet visitors. Send this information to me and I will send it to the ARRL. After a few weeks, the ARRL will send you a copy of the full list just once. If you are a prospective traveller, you can ask the WIA Federal Office for a relevant extract of the list covering your destination. It is not practical to send the entire list owing to its size.

Request to Participants

Some participants have moved, changed telephone numbers, post codes, callsigns, and the like, since they first joined the scheme. Unless you notify me separately, the ITHE information will not change. To assist in bringing the list up to date, a list of VK participants is published at the end of this article.

Recent Experiences

I asked a couple of VK participants to share their views on the subject, and here they are. John Richardson VK2NET, writes:

Travel, one of the few pastimes that helps to unite the world, breaks down the barriers of race, colour and creed. It's the best leveller I know.

Having been an inveterate traveller for more years than I care to admit, I can't say I'm an expert, but I can say that I know a few of the ropes. I know how to get in and out of trouble and most of all, through research before a trip, know how to behave in a foreign culture and become accepted into the daily routine.

The limiting factor to the amount of travel I would do is money, just like 99% of the would-be travelling population. I follow the old adage, "If Mahommed can't go to the mountain, take the mountain to Mahommed", and solve the problem somewhat of not being able to board a plane or ship. In other words, if I can't travel, I bring the travellers to me.

The ITHE scheme is a good way of doing this and all it costs is a couple of meals, a bed, and a bit of petrol. A small price to pay for a lot of enjoyment and a learning experience. The usual format is to receive a letter from a prospective traveller advising the date of arrival, plans for their trip and a request for an eyeball.

My wife and I automatically reply with an invitation to stay with us for a night or two; more if they want. For a few days we have in our home a little bit of America, Japan, UK, or wherever else the travellers may come from.

They have the opportunity to experience first-hand the way an Australian family lives, the day-to-day problems, real or perceived by us locals, taste the different style of cooking, and the like. But most of all, they live with our culture and isn't that what travelling is really all about? We too learn, question, compare.

Time passes all too quickly. It is time to say goodbye to our new-found friends and invariably the last words are "Catch you later" or something similar, and a sincere invitation to visit them when it is our turn to go to their country. There is no doubt that we will be taking them up on their generosity.

These experiences have been brought about by a common interest in amateur radio and the ITHE. I heartily recommend that you get on "the list" and make the time to welcome our foreign visitors into your home. I guarantee that the rewards will be great. For the occasional or armchair traveller, what better way to meet the world?

John Miller, VK3DJM/GW3WIT writes:

I first heard about ITHE when I read a letter from Douglas G3KPO, in Amateur Radio, in 1988 I think, thanking all the VK2s he had met under the scheme. What attracted my interest was not so much the scheme as the fact that my original callsign was G3WIT, issued in 1967 on the Isle of Wight, and Douglas also lives on the Island. As I was planning a trip back to the UK at the time I wrote to Douglas but, that time he was unable to offer me accommodation as he had already booked his own holiday for just the time we would be there. Douglas was, however, able to arrange for us to stay at a local bed and breakfast establishment run by some friends of his.

During the planning of another trip to the UK, in 1991, I again got out the list of ITHE stations and selected a couple of them to help me. Unfortunately one of them whom I wrote to had moved house since the list was printed, but a few phone calls soon traced him, the cost being negligible compared to the total cost of the trip. Unfortunately, he was also going to be away when we were in his area; some people just don't have any luck do they!

As we were flying back to Australia from London's Gatwick airport Ash VK3CIT, the local co-ordinator for ITHE, suggested I contact Roger G3LQP, as he lives about half an hour's drive from Gatwick. I had also mentioned to Ash that I was born in Wales and he said that Roger was an ex-GW. As part of my preparation for the trip I had compiled a list of names and telephone numbers, of people we were staying with, but I hadn't intended to leave it at home. When I rang directory enquiries and gave them Roger's name and address I was told that it was a silent number! The only thing to do was to get a taxi from the railway station and hope someone was in, otherwise camp on his doorstep. Roger was doing a bit of decorating when we got there and had been waiting for us to arrive. Needless to say we all had a good laugh. The next day Roger drove us to Gatwick to catch the plane home via Houston.

Well that's on the receiving help side; now for the giving. In the several years I have been a member of ITHE I have only had two requests for help. The first one was from a young American couple who were coming out here on their honeymoon. Unfortunately, they had made all their bookings by the time their photocopied

Continued on page 55

ALARA

Sally Grattidge VK4SHE, ALARA Publicity Officer*

Results of 15th ALARA Contest, November 1995

1	FK8FA	Aimee	548	Top overall
				Top DX ALARA Member
				Top Phone
				Top Pacific Islands
2	G0VDR	Lynda	345	Top UK ALARA Member
3	VK3DYL	Gwen	330	Top VK YL
				Top VK3 ALARA Member
4	VK4RL	Robyn	295	Top VK4 ALARA Member
5	VK6DE	Bev	249	Top VK6 ALARA Member
6	VK5BMT	Maria	246	Top VK5 ALARA Member
7	VK5AOV	Meg	186	
8	VK4NBC	Bev	179	Top VK Novice
9	G0KMU	Joan	171	Top UK Non-member
10	VK3OZ	Pat	170	Top VK YL CW
11	VK8AV	Alan	165	Top OM
12	ZL2AGX	Dawn	164	Top ZL ALARA Member
13	VK4VR	Val	144	
14	VK3KS	Mavis	135	
15	VK3XB	Ivor	115	
16	ZL1ALK	Celia	111	
17	VK4AOE	Margaret	101	
18	VK6YF	Poppy	100	
19	VK5GGA	SA Girl Guide Ass	99	Top Club Station
20	VK4SHE	Sally	82	
21	VK5ANW	Jenny	69	
22	ZL1OS	Bev	65	Top ZL Non-member
23	VK3DVT	Valda	63	
24	VK2DDB	Dot	61	Top VK2 ALARA Member
25	VK3ALD	Len	40	
26	VK4DRL	Dist Radio Ladies	30	
27	ZL1ANN	Ann	25	
28	VE7YL	Elizabeth	24	Top VE ALARA Member
29	VK3DMS	Marilyn	Check	

Well, despite all my hopes, there were fewer cobwebs blown out of rigs this year, mainly due to somewhat bad conditions. I even heard of one YL who "forgot" about the contest, but perhaps she just did not want to damage her eardrums with the noise on 80 m! However, all those who took part mentioned that they enjoyed the contest, so I guess it achieved its purpose admirably. Contests were reported by one member as "the only time the family leave me alone at the radio". I can vouch for that myself!

It was great to hear the Girl Guides from South Australia using their Club Call and joining in. I am sure they enjoyed catching so many ALARA members on the air and using their radio skills. I understand that they intend to make our contest an annual event for training.

Congratulations again to Aimee FK8FA who worked hard to take the overall winner again as well as the top DX YL award. Lynda G0VDR also sent in a great log with a magnificent score working from England, and came second overall. She mentions that she enjoyed working the contest very much even if some explanation was needed at that end of the world!

Mention must also be made of Mavis VK3KS and Ivor VK3XB who worked all their contacts QRP, and did remarkably well under difficult conditions. Gwen VK3DYL is our top VK YL this time, a great effort as she spent more time calling CQ than getting contacts. Alan VK8AV, working portable from his caravan, gained a very good score, but was disappointed that so few girls wanted a CW contact.

That, of course, means that we have no winner for the Florence McKenzie trophy this year. Of course, most of our members upgrade their calls, so there are very few Novices to have a try. Anyone with any ideas on how interest can be raised is welcome to let me know. Probably we will have to wait another year or two until propagation improves.

Thanks to everyone who did send in their log, and let's hope that the numbers get better over the next few years. Perhaps members will be inspired after the ALARAMEET in Perth next September to catch up with each other again in November.

Marilyn Syme VK3DMS, ALARA Contest Manager

Thanks to Marilyn for doing a great job as Contest Manager. As for the Florence McKenzie Trophy, I can only suggest that we organise a CW YL net for a bit of a chat, then practise sending numbers contest style. I am sure there are many out there who find their brains seize up when they actually try CW on air, and a friendly sympathetic group could do much to give people confidence and improve operating skills. The net could even meet on SSB to overcome the initial terror... go to CW, then back to SSB (to find out what everyone has said!) Anyone willing to give it a go?

Marilyn and OM Geoff are going to be super busy from now on. If you are passing through Mildura any time, be sure to seek out the local stamp and coin shop and say hello to them behind the counter.

From Across the Pond

WARO's new callsign is ZL6YL. The official net is on Mondays at 8.00 pm (NZ time) on 3.695 MHz +/-.

QSP News

Late Delivery of February *Amateur Radio*

The *Amateur Radio* mailing house which has served us well for many years, was quite recently bought out by another company. The first delivery of *Amateur Radio* by the new company was the February 1996 issue of our magazine.

The labels, inserts and the magazine were delivered to the new mail distribution house by 25 January 1996. Despite daily telephone calls by the Federal Office, the magazines were not delivered to Australia Post by the mailing house until Tuesday, 13 February. Not good enough, is it?

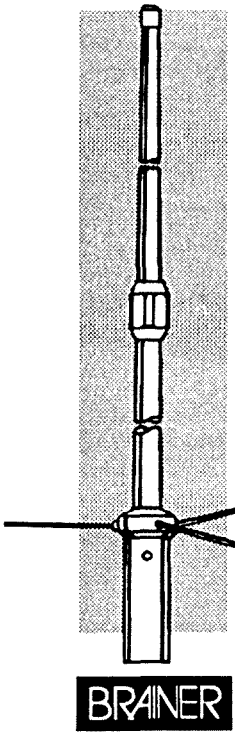
Needless to say, as you can see on page 1 of this issue, *Amateur Radio* now has a new mailing house.

For Great Communciation...

A Great Range Of Accessories!

High Performance 2m/70cm Base Station Antennas

Our range of top-name Brainer base station antennas offer outstanding quality and exceptional value. They are stacked colinear types providing high gain, wide bandwidth and a low radiation angle for extended range. The fibreglass reinforced polyester (FRP) outer tubing randome and gasket seals provide excellent all-weather operation, and they are supplied with compact ground-plane radials for a clean radiation pattern. Stainless-steel mounting hardware ensures a long trouble-free life. They also feature comprehensive instruction sheets to make installation and set-up easier. Both come with a 1 year warranty.



2m/70cm GST-1
Frequency: 144-148MHz, 430-450MHz
Gain: 6dB on 2m, 8dB on 70cm
Max. Power: 200W
Length 2.5m
Type: 2 x 5/8 wave (2m)
4 x 5/8 wave (70cm)
Connector: SO-239 socket

$199

Cat. D-4830

2m/70cm GST-3
Frequency: 144-148MHz, 430-440MHz
Gain: 7.9dB on 2m, 11.7dB on 70cm
Max. Power: 200W
Length: 4.4m
Type: 3 x 5/8 wave (2m)
7 x 5/8 wave (70cm)
Connector: SO-239 socket

$299

Cat. D-4835

Mastercharger 1 Fast Desktop Charger

Made in the USA, the Mastercharger 1 is a compact fast charger that operates from 13.5V DC and uses switch-mode technology plus a Philips battery charge monitor IC (with -Δ V full charge detection) to safely charge NiCad batteries between 6V and 13.2V. Suitable for the FT23/73, FT-411/411e, FT-470, FT-26, FT-415/815 and FT-530, its charging cradle can easily be replaced, allowing the insertion of a new cradle to suit other Yaesu transceivers (eg FT-11R) or different brands/model of hand-helds. The Mastercharger 1 requires 12-15V DC at 1.3A, and is supplied with a fused cigarette lighter cable for vehicle use.

Cat D-3850

$129.95

Now available - Charging cradles to suit various Kenwood, Icom and Alinco hand-helds.

Rugged HF 5-Band Trap Vertical Antenna

The rugged 5BTV incorporates Hustler's exclusive trap design (25mm solid fibreglass formers, high tolerance trap covers and low loss windings) for accurate trap resonance with 1kW (PEP) power handling. Wide-band coverage is provided on the 10, 15, 20 and 40m bands (SWR typically 1.15:1 at resonance, <2:1 SWR at band edges) with 80kHz bandwidth typical on 80m at less than 2:1 SWR. An optional 30m resonator kit can also be installed without affecting other bands. High strength aluminium and a 4mm (wall thickness) extra heavy-duty base section guarantee optimum mechanical stability. At just 7.65m, the 5BTV can be ground mounted (with or without radials, although radials are recommended), or it can be mounted in an elevated position with a radial system. Unlike other antenna designs, the 5BTV can be fed with any length of 50ohm coax cable.

Cat D-4920

HUSTLER **$349**

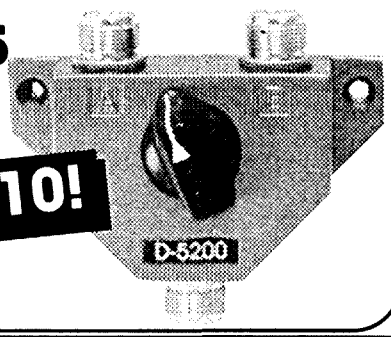
2-Way Coax Switch

A heavy-duty, 2-way coax switch that's suitable for Amateur, CB or commercial applications. It's well constructed with a die-cast case and can handle up to 2kW PEP or 1kW CW at 30MHz with less than 0.2dB insertion loss.

Cat D-5200

$29.95

SAVE $10!

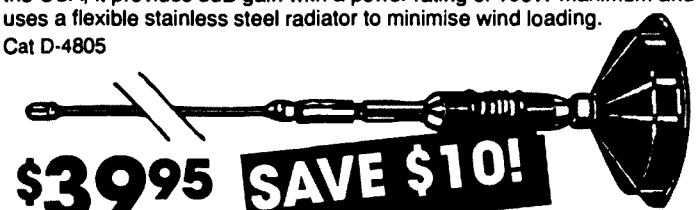


Hustler RX-2 2m 5/8 Wave Mobile Antenna

HUSTLER

A quality 2m 5/8 wave magnetic mount antenna for mobile or temporary base station use. Supplied with 4.5m coax (PL259 attached). Made in the USA, it provides 3dB gain with a power rating of 100W maximum and uses a flexible stainless steel radiator to minimise wind loading.

Cat D-4805



$39.95 SAVE $10!

FT-290RII 2m All-Mode Transportable

Covers 144-148MHz and features FM, SSB (USB/LSB), and CW operation with 2.5W or 250mW switchable output power, twin VFOs and 10 memories that store mode and simplex or repeater frequencies. Selectable tuning rates are provided for SSB/CW and FM (SSB- 25Hz/100Hz/2.5kHz and 100kHz; FM- 5/10/20kHz and 1MHz). Mode specific features such as a noise blanker and clarifier control for SSB/CW, plus a full set of functions for FM repeater operation make this unit very simple to operate. It comes with a flexible rubber antenna, an FBA-8 battery holder which takes 9 x 'C' size batteries (standard or NiCad) and a hand-held microphone.

Cat D-2875

2 YEAR WARRANTY

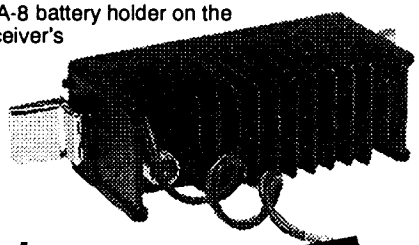
$999

FL-2025 2m Amp

Turn your FT-290II into a powerful mobile/base transceiver - this bolt-on RF amplifier will replace the FBA-8 battery holder on the FT-290RII, and boost the transceiver's output to 25 watts.
Requires 13.8V DC.

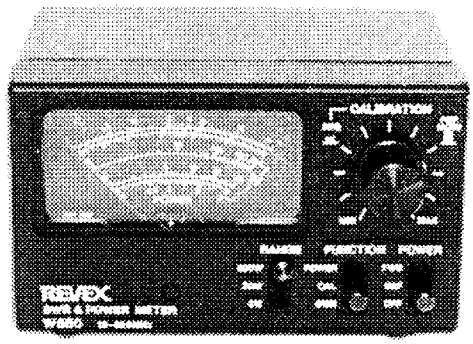
Cat D-2863

$299



Buy both for just

$1195 **SAVE $100!**



Revex W56ON HF/VHF/UHF SWR/PWR Meter

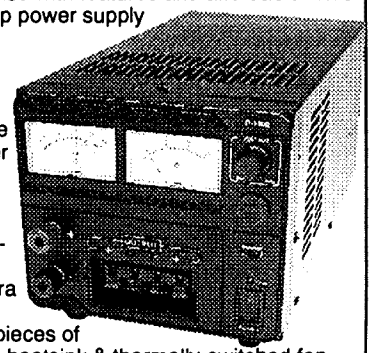
Quality Revex wide-band SWR meter, offering 2 in-built sensors for 1.8MHz to 525MHz coverage! Provides measurement of 3 power levels (3W, 20W, 200W), and SWR. Uses an N-type socket for the VHF/UHF sensor to ensure minimal loss. Measures 120 x 80 x 85mm.

Cat D-1375

$329

3-15V 25A Power Supply

Like no other - packed with features and affordable! This linear-type benchtop power supply is ideal for service departments, laboratories, ham shacks, and those needing a low-noise regulated DC power source. With front-panel metering, plus high current banana-style & low-current output connections for extra flexibility when powering different pieces of equipment. Internal heatsink & thermally-switched fan provides cooling without protrusions from the metal case (which is just 320 x 150 x 145mm). Specially modified for more reliable long-term operation, it uses a rugged 50 amp bridge rectifier & trifilar transformer. Plus extensive overload protection through dissipation limiting circuitry for the main pass transistors, a 30 amp instantaneous current limit, AC mains circuit breaker, a transformer thermal fuse & fused auxiliary secondary winding.



Cat D-3800

$299

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Sydney and Enquiries - 9937 3366
Fax: (02) 805 1986 or write to:
Dick Smith Electronics, Mail Orders, Reply Paid 160
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Up North

Not only are the ZL YLs planning to invade the ALARAMEET in Perth, but they are also considering entering a team in the second IARU Region 3 Amateur Radio Direction Finding Contest in Townsville, 15 – 20 July 1996. Are there any Aussie YLs who would like to compete? If so, please contact Wally Watkins VK4DO, PO Box 432, Proserpine Qld 4800 who is looking for YLs to make up the Australian team. This is your chance for fame and glory, and to represent your country.

Welcome New Members

Dawn VK4HER, joined 27 Nov 95, sponsored by Val VK4VR (congratulations Dawn, you are our first H call in ALARA).

Ngaire ZL2UJT, joined 27 Nov 95, sponsored by Margaret VK3MAS.

Barbara KR4SJ, joined 27 Nov 95, sponsored by Christine VK5CTY.

Beverley ZL1OS, joined 5 Jan 96, sponsored by Mary VK3FMC.

A Bit of DX with Mavis VK3KS

On 29 November last year Mavis worked a YL, Saijai, on 21 MHz CW at 0917 UTC. Saijai is a very good CW operator and she also uses 7 and 14 MHz. She is 28 years old, has only been on the air for a year, and is the only YL station in Kanchanaburi.

Saijai sent Mavis a card, and says she also works on LSB on 7060 kHz in the Thailand net at 1300 UTC every day, so look for her there if you would like a contact. Saijai's address is Saijai Charoenkitkan, Box 9, Kanchanaburi 71120, Thailand.

On 27 December, Mavis had a visit from Jerrie K6INK whom she has sponsored since 1979, and her companion Bruce W6JWL. It was wonderful to be able to meet after being in touch for so long. Mavis's OM, Ivor VK3XB, consulted the old log books and found he had contacted Bruce in the ARRL CW contest in 1939, 56 years before they met!

**C/o PO Woodstock, QLD 4816*

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AMSAT Australia

*Bill Magnusson VK3JT**

National co-ordinator
Graham Ratcliff VK5AGR
Packet: VK5AGR@VK5WI

AMSAT Australia net:
Control station VK5AGR
Bulletin normally commences at 1000 UTC, or 0900 UTC on Sunday evening depending on daylight saving and propagation. Check-ins commence 15 minutes prior to the bulletin.

Frequencies (again depending on propagation conditions):

Primary 7.064 MHz (usually during summer).

Secondary 3.685 MHz (usually during winter).

Frequencies +/- QRM.

AMSAT Australia newsletter and software service
The newsletter is published monthly by Graham VK5AGR. Subscription is $30 for Australia, $35 for New Zealand and $40 for other countries by AIR MAIL. It is payable to AMSAT Australia addressed as follows:

AMSAT Australia
GPO Box 2141
Adelaide SA 5001

The Day of the Specialist

I'm told that a specialist is someone who learns more and more about less and less until eventually they know everything about nothing. Right or wrong, this is the day of the specialist.

When I started in amateur radio, starry eyed and with a brand new AOCP, in 1950, specialists were thin on the ground. Everyone wanted to know all there was to know about the various aspects of amateur radio. Your shack just had to have bits and pieces relating to every facet of the hobby. 80 and 40 metre gear. 20 metre DX rig. VHF of course....the epitome.

To aspire to DXing on 166 MHz AM was a mark of distinction. All gear was home made. Yep, we did it all! Today people specialise. There is the DXhound, the six metre specialist, the CW brass pounder, the packet network enthusiast and, of course, the satellite operator.

Each area calls for a specialised knowledge of the subject. Take satelliting. There is orbital geometry, Doppler shift, keplerian elements, computing, circular polarisation, digital encoding, imaging, telemetry and more. Even within satellite operating there is specialisation. Some satellite operators specialise in the digital birds. Some in exotic modes like "S" mode. Some treat the high flying birds like orbiting repeaters. Some poor souls, like me, even poke about with telemetry. Most specialise to some degree or other. Why? Because the field is wide and expanding, that's why!

It started to expand when amateur radio came into being and I believe it will continue to expand in the future and take directions we can't dream of at present. We hear the knockers say that amateur radio is finished. Only a closed mind could consider it so. Amateur radio is just beginning. Nowhere is this more true than in satellite operation.

Satellite Imagery

Two areas of satellite operation that I find especially fascinating and addictive are imagery and telemetry. Weather satellites like the NOAAs can provide the devotee with endless hours of learning and entertaining experiences. NOAA ground stations are easily within the grasp of the amateur.

Even closer to home, a number of amateur radio satellites carry CCD cameras for remote imaging. The UoSats have carried such cameras for years. UO-9 had one before Joe Public had ever heard of a CCD camera. The signals are easily captured and software is available for the decoding and display of the images.

I recently downloaded a number of image files from KO-25 and processed them using software written by Colin Hirst VK5HI and Jeff Ward G0/K8KA. The narrow field views are of comparable quality to the NOAAs. They clearly show streams, rivers, mountains and coastal features. It is interesting to note the time that the image was taken and run it through InstantTrack. You can see just where the satellite was when the camera was fired. With luck you can rotate the image and line up features with a map.

Beyond 2000

Some interesting and mildly disturbing stuff has been emerging of late regarding the turn of the century and its effects on computer time keeping. It seems that much software development occurred at a time when 31 Dec 1999 was either too far away to bother about or was not seen as a problem.

Try it out on your favourite tracking program. Alter your computer clock to a couple of minutes before midnight on 31 Dec 1999 and watch while your tracking program tracks a satellite through midnight. Some versions of DOS do strange things to the TZ environment variable. It appears that big business is gearing up to spend millions of dollars to cope with problems that are yet to surface. Maybe we will have to look at it too.

There is another debate raging about the turn of the century and millennium. It concerns just when it actually happens.

One school of thought says that the century, and therefore the millennium, ends at midnight on 31 Dec 1999. This is likely to be the popular opinion. There's something magical about those figures 2000.

Closer examination, however, reveals that there was no year ZERO. The first year of our current calendar began with the first second of the first day of the first month of 0001 AD. Now a century requires 100 years to pass. Therefore, the end of the first century AD did not come around until the last tick of 100 AD (not the first tick!). Carry that forward and you can see that the current century and millennium will not end until the last tick of 2000 AD. If ever there was an excuse for TWO slap-up, knock-down, drag-em-out parties this is it!

RS-12

It has been reported that the rarely turned-on RS-12 mode "T" transponder is working. This will give an opportunity for modestly equipped satellite users to participate. The mode "T" uplinks between 21.210 MHz and 21.250 MHz, while the downlink is between 145.910 MHz and 145.950 MHz. The transponder inverts the passband. You can use SSB or CW on this device.

*359 Williamstown Rd, Yarraville VIC 3013
Packet: VK3JT@VK3BBS.#MEL.VIC.AUS.OC
CompuServe: 100352,3065*

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Awards

*John Kelleher VK3DP - Federal Awards Manager**

Additional Countries Added to the DXCC List

Hot on the heels of the operation by OH2AM (et al) from P5 North Korea, comes news of the addition of Pratas Island and Scarborough Reef to the DXCC countries list. I will quote from the official news releases for both new entries.

"The ARRL DX Advisory Committee (DXAC) has voted 12 to 4, and the Awards Committee have voted unanimously, to add Pratas Island, BV9P, for contacts made 1 January 1994 and after. This is based on DXCC Rules Section II, point 2(a) – Separation by Water. Pratas Island, located in the South China Sea, is administered by Taiwan.

QSL cards will be received by the ARRL DXCC Desk starting 1 April 1996. Cards received before that date will be returned without action.

Because of QSL Card irregularities, it will be necessary for anyone who has a picture card from the January or March 1994 operations to obtain a replacement card from QSL Manager KU9C. The picture cards are not acceptable for DXCC Credit."

The second new addition comes in an ARRL news release dated 23 January 1996. *"The ARRL Board of Directors at their meeting in Savannah, Georgia, approved a Membership Services Committee recommendation to add Scarborough Reef to the ARRL DXCC Countries List. The vote was 11-yes, three-no, and one abstention. Scarborough Reef is added to the list based on DXCC Rules Section II, point 2(a) – Separation by water.*

QSL cards will be received by the ARRL DXCC Desk starting 1 April 1996. Cards received before that date will be returned without action. The ARRL DXCC Desk has announced that the start date for Scarborough Reef is 1 January 1995. Only QSOs made on, or after, that date will be eligible for DXCC credit. The first accredited operation took place in April of 1995. The 1994 DXpedition did not qualify as a "land-based operation".

Full details of the proposed 1996-1997 operation to Heard Island will be published shortly. Administration of this expedition appears to be going well.

For those interested in the K1BV *Directory of DX Awards*, which now lists 2409 awards (and growing), the address is Ted Melinosky, 65 Glebe Road, Spofford, NH 03462-4411. Ted is offering this comprehensive publication to VK operators for $US17.00 (surface mail) and $US28.00 (airmail). I rely on this Directory for many of the awards that have been published in this magazine, and it is an excellent reference for requests that I have received from time to time.

CW Operators of the British Commonwealth Award (Canada)

Make CW contacts with British Commonwealth stations after 1 January 1980. SWL OK. Basic certificate is earned by completing requirements for Class 1, then higher levels individually or all at once.

Class 1
1. ZL-North Island
1. ZL-South Island
3. VK1-5 or 7.
1. V85 VS6 or 9M2, 6, 8.
2. VU2
3. ZS1-6.
2. VP2, or V2, 3, 4.
3. VE, VO, VY2 or 3.
6. G.

A total of 22 QSOs.

Class 2
1. ZK or ZL Island.
1. P2 or VK Island.
2. VK6 or VK8.
1. 8Q, VU7, 4S7, or 9V.
1. C5, 9J, 9G or ZD8.
1. VP8 or 9.
4. VE2 VE3 or VY9.
3. VE4, 5, 6 or 7.
3. GI and GM.
2. GW
2. GD GJ or GU.
1. ZB2.

A total of 28 QSOs.

Class A1

QSO 15 more stations in 15 different call areas from the following: A2, A3, C2, C6, H4, J3, J6, J7, S2, S7, T2, T3, VE8, VP5, VR6, VQ, VY1, YJ8, Z2, ZC, ZD7, ZD9, ZS8, 3B, 3D, 5B, 5H, 5N, 5W, 5X, 5Z, 6Y, 7P, 7Q, 8P, 8Q, 8P, 8Q, 8R, 9H, 9L, 9X and 9Y. A total of 15 QSOs, and a grand total of 65 QSOs for all classes.

A GCR list is acceptable. There is no charge for the award but at least five IRCs are needed to cover postage. Apply to Vince Thorneycroft VE1RJ, 35 Clearview Avenue, Fredericton NB, Canada E3A 1J9.

PO Box 2175 Caulfield Junction 3161

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Club Corner

Riverland Radio Club Inc

Communications 96

"Communications 96" is the theme which will be sponsored by the Riverland Radio Club Inc, with support from the VK5 Division of the WIA, for the 1996 convention to be held on Saturday, 27 April 1996.

In the past, the type of convention held was usually only amateur radio related. Whilst we are still catering for the amateur and general radio people, this year we will be endeavouring to emphasise all facets of the latest technology in communications. This will present a larger spectrum for public interest.

"Communications 96" will be held in the K M Tucker pavilion at the Renmark Show Grounds. The doors will be open to the public from 9.30 am.

If you want to have a buy or sell stall, it is advisable to book your site early. Bookings are $10 per trestle and can be lodged with the Secretary, Riverland Radio Club, PO Box 646, Renmark SA 5341. Enquiries can be made to the Secretary on 085 955 320, or the Co-ordinator on packet VK5BM@VK5BRL.RIV.AUS.SA.OC.

A large number of commercial companies have shown their interest. A "Communications 96" dinner will be held at the Renmark Hotel on the Saturday night. Bookings with the Secretary are essential for this dinner.

Once again we look forward to your company on the day.

Les Williams VK5BM, Co-ordinator
Doug Tamblyn VK5GA, Secretary

Australia Amateur Packet Radio Association

Things move fast in the packet world these days and the Australia Amateur Packet Radio Association (AAPRA) has to keep up. We have come a long way from the days of Commodore 64 and Microbee computers running with simple but effective modems, supplied by AAPRA.

All that has changed thanks to lower priced IBM compatible computers. Current computers are really fast, too fast for us to use their full capacity for packet radio. They can store loads of data and match the speed of packet modems which can run at speeds of up to 9600 baud.

AAPRA is speeding up its network linking to 4800 and 9600 baud. Increasingly the links are being moved to the UHF band to reduce congestion on two metres. As well as wormhole links within Australia, several gateways provide instant connects to USA, the UK and other distant places. The link to KO4KS-1 in Florida provides access to their ROSE net which is a good starting point for exploring the American network. The links to London and Lancashire rely on Netrom to get around but this seems slower in the UK due to congestion.

The AAPRA Newsletter DIGIPEAT keeps members informed about all this and more. It lists the packet programs which AAPRA distributes, including both the software and English manuals, eg paKet 6 and Baycom. Our software library of shareware disks includes titles of interest to all amateur operators such as Winpak and Ultrapak which run in the Windows environment and the NOS family of programs including NOSview the version supporting the book "NOSintro" written by Ian Wade and available from WIA bookshops.

Amateurs wanting information about membership or other packet related subjects are invited to phone (02) 489 4393 or write to VK2IN QTHR.

Geoff Page VK2BQ
Publicity Officer AAPRA

Radio Amateur Old Timers Club (RAOTC)

Test Succeeds

The 20 m VK3OTN broadcast to VK6 on Monday, 5 February was re-transmitted locally on the WIA VK6 2 m and 70 cm repeater network, as well as on 80 m.

Our thanks are due to Clem VK6CW who thought up the idea, Don VK6HK who controlled the repeater network, the team who helped him, and the WIA VK6 Division who made the repeater network available.

Annual Meeting

The annual meeting and election of office bearers will be on Wednesday, 6 March at the Bentleigh Club in Yawla Street, Bentleigh. Be there at 12.30 pm for a 1.00 pm start. The cost will be advised and bookings are essential with the Secretary, Arthur Evans VK3UQ, QTHR.

Readers who are not members of the RAOTC are very welcome to attend provided that they book. We recommend attendance as we have been fortunate to arrange Jack Bleakley as the speaker. Jack was a Kana code operator in one of the very top-secret RAAF Wireless Units which went all the way to the Philippines with General Douglas Macarthur. Jack is the author of the sold-out book "The Eavesdroppers". Don't miss it!

Allan Doble VK3AMD
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Contests

*Peter Nesbit VK3APN - Federal Contest Coordinator**

Contest Calendar March – May 96

Mar 2/3	ARRL DX SSB Contest	(Jan 96)
Mar 9/10	BERU CW Contest	(Feb 96)
Mar 16/17	WIA John Moyle Field Day	(Feb 96)
Mar 16/17	BARTG RTTY Contest	
Mar 23/24	CQ WPX SSB Contest	(Feb 96)
Apr 6/7	SP DX SSB Contest	
Apr 6/7	Israel DX Contest	
Apr 12/14	JA DX CW Contest (High Bands)	
Apr 13/14	International Grid Location Contest	
Apr 27/28	Helvetia DX Contest	
May 4/5	ARI Contest CW/SSB/RTTY	
May 11/12	CQ-M Contest	
May 25/26	CQ WPX CW Contest	(Feb 96)

Although multioperator contesting is fairly common overseas, it has yet to really catch on in Australia. An exception is the John Moyle Field Day, of course, which always attracts a good multi-operator contingent. This makes good sense for a field day, because extra pairs of hands are always welcome when setting up the site, not to mention the assistance with operating. And if that's not enough, there's the simple pleasure of sharing a unique experience, away from it all in some remote location, with like minded souls. Even if you don't win, a great time can still be had by all!

Unfortunately, the multi-operator sections in our other contests attract far fewer entries. This is understandable, given the lower density of amateur stations here than in, say, the USA, Russia, and the Ukraine (where multi-operator contesting is very popular). In those countries, many operators have one or more "big guns" a stone's throw away, and it is often much better to band together with friends and enjoy contesting from a single optimum location. Fortunately, few of us have to contend with local big guns (or bigger guns than ours, err... us), so there is less incentive to go to the bother of establishing a multi-operator or club station.

What are the ramifications of all this? I think we tend to view amateur radio as a sociable activity. After all, our core activity is *talking to people*. We talk from our homes, our cars, our campsites, and bits of rock in the ocean. We are on first name terms with dozens or even hundreds of people around the world, many of whom would be delighted to put us up for a few nights and show us around, if we were to visit their countries.

Ironically, this very sociability can often lead to us sitting alone in our ham shacks, cut off from our families and other sources of "warm" human contact, and all but written off as *unsociable* by others who do not understand our hobby!

Many of us obtained our licences at a young age. We had few responsibilities, and many friends. Our considerable spare time was spent visiting other amateurs, going to radio club meetings, and generally having a ball. Contests were an opportunity for friendly competition with our friends, and after each event we would eagerly get together to compare notes. The friendship aspect was so strong that I vividly remember, around the age of 18, jumping on my pushbike and riding 5 km to a friend's place at *two thirty in the morning, right in the middle of the VK/ZL Contest*, just to share the excitement and to see how the DX sounded around there. Then, after a couple of hours chatting, I jumped on the bike and rode back home, just in time for the pre-dawn opening. Neither of us set any records that weekend; however, it still stands out in my memory, nearly 30 years later, as one of those wonderful times one never forgets.

Another memorable experience concerns the 1968 ARRL DX Contest, which in those days occupied two weekends per mode in February and March (ie a total of four weekends). That year, my friends and I decided to try a multi-operator entry, so we spent several weekends getting the equipment set up, and we even went to the trouble of installing a 15 m beam (loaned by one of the other operators) on to my tower. When the contest arrived, my mother (who was always ready for a party) set up a sort of marquee in the back yard, and reminded me to have a bottle of beer ready "in case the boys would like some refreshment". Well, that sort of invitation needed no repetition and, as I recall, we started the contest with about three dozen bottles of beer (to share between four people)!!!

Now, in those days, EMC was something only fastidious types worried about, and after all we were amateurs "able to bend the laws of physics". We truly believed (well, sort of hoped, actually) that our three antennas in the backyard would be able to co-exist, and started out with all three transmitters going on three different bands at once! What chaos! Of course none of us could hear anything, and even worse, we were keying each other's T/R switches. So even if we managed to find frequencies which were clear of cross-interference, the receivers would still go dead in unison with the transmissions on the other bands. So, we reduced it to two transmitters, and found that by transmitting at more or less the same time, we could just about work two bands simultaneously! Unfortunately, no two QSOs were ever the same length, so it was extremely hard to stay synchronised. I pity the poor Ws and VEs who were trying to work us, and wondering why there were all these gaps in our transmissions. Well, at our end the shack was full of operators shouting "wait" and "go" to each other, to make the other operator stop just long enough for us to get a callsign or number, and vice versa! If it all sounds slightly wacky, well, that's exactly what it was.

Anyway, as the evening wore on, the beer was progressively consumed, until the party aspect took over. Operators were staggering out the shack door "for fresh air", and one of them was later discovered lying in the front yard ("just looking at the stars, folks!"). I was in such a merry mood that the others nearly did away with me, just to put an end to the stupid jokes I kept playing on them. In short, we ended up having a very good time, and even managed to work some stations to boot!

The second weekend was more organised than the first, but very hot. So half way through, in true contest spirit, we adjourned to the beach for several hours "to further plan our invincible contest attack". Of course the only thing we attacked was the odd bit of seaweed, and occasionally each other, but once again it was good fun.

As the years went by, one by one we got married and moved interstate or overseas, and our regular get-togethers ceased. Contesting became a solitary effort, and these days there is the nagging feeling that something is missing. Now, whilst these are my own personal experiences, I'm sure there are many readers with similar stories to share about the friendships and good times they have had through amateur radio, and who might also suspect that contesting should mean more than sitting alone in a shack, and receiving the odd certificate.

Well, here's the secret, and it's very simple. Before the next big contest, contact several friends and suggest putting together a multi-operator entry. Maybe you'll win, or maybe you won't, but that is not the main point. The main point is to get together with friends and do something different for a change, share the experience, and hopefully score well. You will find all the old enthusiasm returning, and you will certainly feel you've done something special and memorable.

The next major contest is the John Moyle Field Day which, of course, is ideal for trying out some multi-operator activity. If you hurry, there should still be enough time to arrange something. If you really can't get out on that date, remember the RD and VK/ZL contests later this year, which can always do with more multi-operator entries. The next step is up to you. So, pick up the phone and dial a friend... now!

Congratulations to Martin VK5GN and David VK2AYD, who have been selected as Australia's representatives for this year's World Team Radio Competition, to be held in northern California this July. The WTRC runs under the auspices of the IARU DX Contest, and is a special event in which countries around the world are each invited to send a team of two top ranking contest operators. The teams are given the use of various well-equipped contest stations belonging to local amateurs, and allocated special contest callsigns. The event is designed to put all competitors on an equal footing. I'm sure you will all join me in congratulating Martin and David on their selection, and wish them good luck in this most prestigious event. More will be reported as it comes to hand.

Many thanks this month to VK3KWA, VK5GN, HB9DDZ, KA5WSS, SPDXC, *CQ, Radio Communications,* and *QST.* Until next month, good contesting!

73s, Peter

SP DX Contest (1996-SSB)
1500z Sat to 1500z Sun, 6/7 April

This contest is held on the first full weekend of April, and usually has a good level of Eastern European activity. Categories include single operator (single or all band), multioperator, and SWL. Bands are 160-10 m. Send RS plus serial number; SPs will send RS plus a two letter province code. Score three points per QSO with each Polish station, and obtain the final score by multiplying by the number of provinces worked (max 49). In this contest, multipliers are counted only once, even if worked on more than one band.

SWLs must receive the callsign and number sent by Polish stations, plus the callsign worked. Each SP may be logged only once per band.

Send your log, summary sheet, and multiplier check list to arrive by 30 April to Polski Zwiazek Krotkofalowcow, SPDX Contest Committee, Box 320, 00-950 Warsaw, Poland (note the tight deadline). Disk logs are welcome (ARRL/ASCII file format).

Polish provinces are SP1: KO, SL, SZ; SP2: BY, GD, EL, TO, WL; SP3: GO, KL, KN, LE, PI, PO, ZG; SP4: BK, LO, OL, SU; SP5: CI, OS, PL, SE, WA; SP6: JG, LG, OP, WB, WR; SP7: KI, LD, PT, RA, SI, SK, TG; SP8: BP, CH, KS, LU, PR, RZ, ZA; SP9: BB, CZ, KA, KR, NS, TA.

Note that this contest alternates between SSB and CW, so next year's event will be CW only.

Israel "Holyland" DX CW/SSB Contest
1800z Sat – 1800z Sun, 6/7 April

This contest is designed to promote contacts between Israeli amateurs and the rest of the world on CW and/or SSB. Classes are single operator all bands, multi-operator, SWL. Send RS(T) plus serial number; Israeli stations will add their area abbreviation. Score two points per 160-40 m QSO with Israeli stations, and one point per QSO on other bands. The multiplier equals the total Israeli areas from each band (counted separately on each band). Final score equals total points times total multiplier. Send logs postmarked by 31 May to The Contest Manager, Israeli Amateur Radio Club, Box 17600, Tel Aviv 61176, Israel. Awards include a trophy to the outright winner, wall plaques, and certificates to the top scorers in each country (minimum of 50 QSO points).

Japan DX CW Contest (High Band)
2300z Fri to 2300z Sun, 12/14 April

The object of this contest is to contact as many Japanese stations as possible on 14, 21 and 28 MHz CW. Classes include single operator (single and multiband), single operator QRP (5 W max O/P), and multi-operator (one Tx). Max operating period for single operator stations is 30 hours (show rest breaks clearly in log); multioperator stations full 48 hours. Multi-op stations must remain on a band for 10 mins min.

Send RST plus CQ zone number; JAs will send RST plus prefecture number (01 – 50). Score one point per JA QSO on 14 & 21 MHz, and two points on 28 MHz. Points are doubled for QSOs with QRP stations (QRP stations must send /QRP). The multiplier equals JA prefectures + Ogasawara Isl (JD1) + Minami-Torishima Isl (JD1) + Okino-Torishima Isl. Send log postmarked by 10 May to Five-Nine Magazine, Box 59, Kamata, Tokyo 144, Japan. *(Rules for this year's contest were not received by the magazine deadline, so the details are subject to confirmation).*

Second International Grid Location Contest
1200z Sat to 1200z Sun, 13/14 April

This is a fairly new, and unusual, independent HF contest, organised by WB5VZL and KA5WSS and promoted via the Internet. The objective is to contact other amateurs in as many Maidenhead grid squares as possible. Classes include: single operator (phone, CW, and mixed); multioperator two transmitter mixed mode; and rover mixed mode. Maximum power for all stations is 150 W.

All HF bands may be used, excluding the WARC bands (30, 17, 12 m). Stations may be contacted once per band per mode, except for rover stations who can be worked once per band per mode per grid square they visit. Rovers will sign "rover" on phone, and /R on CW.

Exchange Maidenhead grid square (eg EM10) plus operator's name. (The rules don't state whether RS(T) is necessary, or if the name is mandatory. Just listen in and go with the flow ...Peter). If the grid square is unknown, the QSO is valid for points credit only. Count one point for each valid QSO. The multiplier equals the number of grid locators worked on each band, summed for all bands, regardless of mode. For non-rovers, the final score equals the total QSO points times the total multiplier. For rovers, the final score equals the total QSO points from each grid times the total multiplier from each grid.

Send your log within 30 days to Gridloc Contest, PO Box 180703, Austin, Texas 78718-0703, USA, or via the Internet to geoiii@bga.com. Awards will go to the leading stations in each continent, the top ten scorers in each division worldwide, and to other leading entrants depending on the amount of activity. Note that this is an "open log" contest, meaning that logs will be made available electronically to anyone who is interested. (Just in case the results don't make it past the Internet, anyone seeing them please send me a copy for publication). See below for information on the locator system.

Helvetia DX CW/SSB Contest
1300z Sat to 1300z Sun, 27/28 April

Work only Swiss stations, CW on 160-10 m and SSB on 80-10 m. You may work a station only once per band, regardless of mode. Score three points per QSO; multiplier is the total number of Swiss cantons worked (max 26 per band). Send log to be received by 14 June to Niklaus Zinsstag HB9DDZ, Salmendorfli 568, CH-4338 Rheinsulz, Switzerland. Cantons are AG, AI, AR, BE, BL, BS, FR, GE, GL, GR, JU, LU, NE, NW, OW, SG, SH, SO, SZ, TG, TI, UR, VD, VS, ZG, ZH.

Maidenhead Locator

For those who are not familiar with it, the Maidenhead Locator system means the division of the earth's surface into a rectangular grid, with each rectangle of the grid measuring two degrees wide (longitude) by one degree high (latitude). Each grid square is uniquely identified by two letters and two numbers, termed the locator.

The letters refer to coarse squares, measuring 20 degrees longitude by 10 degrees latitude. These squares start where the international date line meets the South Pole, and moves north and east from there. The starting point is therefore 180 degrees west of Greenwich, and 90 degrees south. So if you look at your map, the square immediately above and to the right of the starting point is identified AA. The opposite corner of this square is at 160 degrees west, 80 degrees south. The first letter increments as you move in an easterly direction, and the second increments as you move north. The highest letters are RR.

Each of these large squares is divided into 100 smaller squares, (ie Maidenhead squares), arranged 10 high by 10 wide. The square at the lower left is identified 00, and the one at the upper right is 99. As with the letters, the first number increments as you move in an easterly direction, and the second increments as you move north.

A map of Australia overlaid with the Maidenhead grid squares is shown on page 35 of November 1987 *Amateur Radio,* and a procedure for finding your locator is described on the following page. For those who do not have access to that issue, here are the locators for the capital cities around Australia (where two locators are shown, you will have to determine whether you are north or south of a one degree latitude line passing through your city):

Canberra QF44
Sydney QF55/56
Melbourne QF22
Brisbane QG62
Adelaide PF94/95
Perth OF77/78
Hobart QE36/37
Darwin PH57

Those who live elsewhere will have to ask around, refer to the map, or else determine their locator using a computer program. A suitable program was written by John Martin VK3KWA (ex ZJC), and published on page 34 of December 1990 *Amateur Radio* (the program calculates a six digit locator, so just ignore the last two letters). John has since written a more accurate version of the program, which takes account of the non-spherical shape of the earth, and he will be happy to supply a copy upon receipt of a disk and return postage. His address is QTHR, or via the Federal Office. This program will also be published in the magazine later this year, prior to the next Ross Hull Contest.

**PO Box 2175, Caulfield Junction, VIC 3175*

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Silent Keys

Due to space demands obituaries should be no longer than 200 words.

The WIA regrets to announce the recent passing of:-

R B (Raymond)	WILSON	L20519
G E (George)	BAKER	VK2CGB
D D (Don)	FRAKES	VK2ETC
W (Bill)	YATES	VK3SB
RH	BAILEY	VK6AWN
RL	TREPP	VK6BT

George Edward Baker VK2CGB

George Baker was born on 23 January 1922 at West End, Brisbane. On leaving school he qualified as an electrician and followed this trade until he entered the Air Force in 1940, aged 18 years, as an electrical mechanic with the 21st Squadron station in Malaya.

When the Japanese invaded in 1941 he was one of a party who escaped in a small boat. After a perilous journey he arrived back in Australia and was re-posted to New Guinea, where he served until hostilities ceased.

On return to civilian life, George married Laurie May Hopper in 1947 and resumed work in the electrical trade in Newcastle where he carried on his own business. On retirement, he and Laurie settled at Manning Point in 1980, and he obtained his amateur licence. He served for 15 years as a member of the volunteer bushfire brigade and was an enthusiastic amateur until illness curtailed his activities. He was well known to east coast amateurs especially those of Taree, Great Lakes, Oxley and Westlake Radio Clubs.

He passed away at Manning Base Hospital on 23 January 1996, his 74th birthday. Condolence is expressed to wife Laurie, sons Warren and Ian and their families.

A large gathering including many amateurs attended his funeral service at Taree Salvation Army Citadel.

G Hunziker VK2BGF

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Divisional Notes

Forward Bias - VK1 Notes

Peter Parker VK1PK

VK1RAC Gets New Antenna

Users of the Black Hill 6900 repeater should notice improved coverage since the replacement of the repeater's lightning-damaged antenna. The antenna was replaced on 13 January by members of the VK1 Repeater Committee. Experimental tests confirm that the new antenna has boosted the repeater's signal by approximately 6 dB. This means a better signal from the repeater in marginal areas.

Novice Theory Classes

These classes started last month. For information on these or future licence classes, please phone our Education Officer, Jeff VK1JE on 294 1688.

EME Video Shown at Meeting

Local amateurs enjoyed a video presentation on December's Moonbounce experiments, at the Divisional meeting on 21 January, thanks to Chris VK1DO and Geoff VK1CO. The video, which included shots of the 10 metre dish at the University of Canberra, equipment used, and EME contacts to the other side of the world, was enjoyed by all who attended. Those present were particularly impressed by the quality of the presentation.

Amateur Radio on Show

Several VK1s took the time to operate amateur station VK1BP, transmitting from the 1996 ACT Scout Summer Camp, located at Camp Cottermouth. Stations from all states of Australia, New Zealand and China were contacted. During the time of the camp, attended by approximately 400 scouts and leaders, dozens of young people were exposed to amateur radio. At least one scout intends to become an amateur himself. The amateur station, established in an old bus, was set up by Dave VK1DL. Operators included John VK1AJM, Gar VK1KGR and Neil VK1KNP. If you would like to become involved in future activities of this type, please phone Dave VK1DL on 291 0097.

John Moyle Coming Up

The John Moyle Field Day is just one or two weeks away, and it is not too late to set up a field station. There are sections for single and multi-operator stations, and you do not have to be a club to be able to set up a multi-operator station. It would be good to have several portable stations operational from VK1 this year. So, reserve at least part of the weekend of 16 and 17 March for your participation in the 1996 John Moyle Field Day.

Malta Station Seeks Moonbounce Skeds

Last December's Marconi Day 70 cm EME experiments from VK1 have attracted world-wide attention. After the tests were finished, Jim VK1FF received an e-mail message from an EME enthusiast in Malta.

The message reads, *I have read all about your activity commemorating the 100th anniversary of Marconi's first experiments. Unfortunately, I am not active on those frequencies (70 cm), otherwise I would have contacted you earlier.*

I wonder whether you know of anyone in your institution who would be interested to set up skeds with me on two metres EME. I would be grateful if you would pass the word around on your local packet and/or radio magazine. My INTERNET e-mail address is henrygs@mbox.vol.it. My Station is a TS850SAT to a LT2S Transverter, and 2 x 4CX250B, putting out 650 watts, @x 3219CC, MGF 1302 preamp, DSP59+ audio filter.

Many thanks in advance for all that you can do to propagate my invitation.

Meanwhile I would kindly extend my greetings for a Merry Christmas and a Happy New Year to you and all members of the VK1 Division.

73 from Henry 9H1CD

Stolen Equipment

A local amateur had his vehicle and contents stolen on the evening of 31 December 1995. The vehicle taken was a 1987 Ford Fairmont Ghia, white in colour. It included a 1/4 wave magnetic mount antenna on the boot and the contents of the vehicle included a Yaesu FT212RH two metre mobile transceiver (details appear elsewhere in this issue of *Amateur Radio* in the **Stolen** column).

VK2 Notes

Richard Murnane VK2SKY

Annual General Meeting

The Annual General Meeting of the NSW Division will take place on Saturday, 20 April at Amateur Radio House, Parramatta **(NB, not Doonside!)**. Please read the Division's Annual Report, and the AGM agenda, particularly any motions that may be listed. If you are unable to attend, please give your proxy to someone who is, so your voice as a member of the VK2 Division may be heard.

NSW Clubs List on Web

Clubs that responded to the Council's request for updated club details are now listed on the Divisional World Wide Web page. Please note, however, that currently each entry contains only the club name, correspondence address, contact phone number, and whether the club runs classes and/or examinations. If you would like further details to appear on the Web page, such as your club's special interests and projects, please advise the Divisional office.

Dave Horsfall VK2KFU reports that, during the first two months of operation, the Divisional Web page was "visited" on average about 80 times per day. The visitors were mainly from Australia, New Zealand, and the United States, with a fair scattering of European countries for good measure. There are many potential WIA and NSW club members out there, so it makes sense to provide them with the information they need to find (and join) your club.

Thought for the month: *Why kill time when you can employ it? — French proverb.*

VK3 Notes

Jim Linton VK3PC

Special Projects - Financial Assistance

Limited funds are again available to affiliated clubs or individual members who wish to undertake projects of general benefit to members and our hobby. Requests for assistance will be considered on their merit, and will be conditional on an application meeting specified criteria. Prior to making application for assistance, a copy of the criteria and conditions should be obtained by writing to the WIA Victoria Secretary.

Requests for assistance will be considered conjointly at a meeting of Council, and funding allocated according to the merit of the project, and the demonstrable benefit to members. Special consideration will be given to projects that are innovative in concept, and recognise the advances in communications technology today.

Project scope is not limited and does not necessarily have to include construction or installation of electronic equipment. Applications close on 30 May 1996, and will be evaluated in June.

Invitation - WIA Victoria 2010 Forum

The WIA Victoria Council would like to hear from members interested in attending an open forum to discuss:

1. amateur radio in today's society, and how we must adapt to changing technology and community attitudes; and
2. how WIA Victoria can better serve the needs of newcomers to the hobby.

WIA Victoria must have a long term plan for the future as it heads for its centenary in the year 2010. This needs to be solidly based on the expectation of members and the resources they are prepared to provide.

The forum is intended to be a forward looking "think tank" to assist in providing achievable goals and preferred future direction. It is not for airing of parochial and internal political differences and problems.

If there is sufficient interest it is proposed the forum will be conducted on a Sunday from 10 am to 3 pm early in May, and that it will be conducted in accord with an agenda provided by the members attending.

The WIA Victoria Secretary would like to receive a written expression of interest by 5 April from any member wishing to attend and actively participate. This should include a suggested discussion item for the agenda. Dependent on the number of members who display an interest, a suitable venue will be arranged and a written invitation sent to all who wish to take part.

It is time we forgot petty differences of opinion and personality clashes and did something positive and constructive to preserve our hobby and bring it into the next century. It may very soon be too late for us as an "endangered species" and we will become an extinct breed.

News and Information

A reminder that the VK3BWI voice broadcast now goes to air on the first and third Sunday of the month. However, there will not be a broadcast on the first Sunday in April, which is Easter Sunday.

The broadcast continues to break news items of interest to radio amateurs and shortwave listeners, which occasionally re-appear on other broadcasts up to six weeks later. One interstate broadcast had no less than half a dozen items first broadcast on VK3BWI.

The packet bulletins of WIA Victoria News & Info, which began in their current format last year, are continuing to be extremely popular. The number of pick-ups of these items issued under the callsign VK3WI shows they are widely read.

Contributions of material for inclusion in the VK3BWI voice broadcast and packet bulletins are most welcome. They should be sent to Broadcast News, WIA Victoria, 40G Victory Blvd, Ashburton 3142, or fax on (03) 9885 9298.

VK6 Notes

John R Morgan VK6NT

General Meetings

During 1996, the Wireless Institute of Australia (WA Division) will hold its General Meetings on the LAST TUESDAY of the month. This change has been necessitated by a room-booking problem, and it is possible that it can be reversed mid-year. If in doubt, listen to the VK6WIA News Broadcasts, or telephone the Secretary on (09) 351-8873. The following are the remaining meeting dates for this year: 26 March, 30 April (AGM), 28 May, 25 June, 30 July, 27 August, 24 September, 29 October and 26 November.

These meetings are held in the Theatrette on the second floor of the Westrail Centre, East Perth, commencing at 8 pm. All interested persons (members and non-members, licensed or listener) will be made welcome. Free coffee and biscuits are available at "half time".

It should be noted that, as a consequence of the same problem, the monthly meetings of Council have been relocated to the library of the Medical Physics Department at the Royal Perth Hospital. For directions, contact Bruce Hedland-Thomas VK6OO on (09) 224-2267 during working hours.

January General Meeting

More than 50 members attended the first GM of the year, which was the best attendance for many months.

The change in meeting-dates means that Jim Rumble VK6RU, who has run the VK6 QSL Bureau since 1937, can no longer attend every GM. His proposal that the Bureau become a by-mail-only service, as is the case with all the other Divisions, was discussed, but not decided. Jim stated that, in fact, the great majority of his users have been operating this way for many years. To participate by mail, send your stamped, self-addressed envelopes to VK6 QSL Bureau, PO Box F319, Perth WA 6001.

It was announced that the SMA had rejected the Federal WIA's application for all Australian radio amateurs to be permitted to use the AX or VI prefix on the recent Australia Day. It was stated that the SMA's reason was that they did not consider the occasion to be of sufficient national importance! There was embittered laughter.

Following the business meeting, there was a discussion concerning the decline in the attendance at the monthly meetings, and whether the meetings should be discontinued. Many opinions were expressed, and various possible causes and ideas proposed, but the final vote was about 10-to-1 in favour of continuing the monthly meetings. Since the Division is required, by its constitution, to hold monthly meetings, this vote would not seem to have resolved the problem.

Annual General Meeting

The VK6 Division's AGM will be held on 30 April 1995 at the Westrail Centre, East Perth, following the General Meeting which starts at 8 pm. For more detail, please refer to the "VK6 Notes" in the February 1996 issue of *Amateur Radio.*

South-West 'Fest

The South-West Amateur Radio Group (SWARG) has announced, via the packet radio system, that it will hold a "bring-buy-swap-sell" meeting on Sunday 21 April 1996, from 11 am to 4 pm, at the Club Rooms on the corner of Symmonds Street and Ocean Drive, Bunbury. To help with directions, the organisers will monitor both the Bunbury (VK6RBY, 146.650 MHz) and Mt William (VK6RMW, 146.900 MHz) repeaters.

You are invited to "bring the family" as there is easy access to the nearby beach. Food and drink will be available during the event, and there will be a "sausage sizzle" at the end of the day. The sausages will be provided!

For additional information, please contact SWARG's President, Bob VK6ZRT, or Vice President, Brian VK6DT. They are correct in the call-book, and are both @VK6AJJ.

If You Have Material ...

All material for inclusion in this column must arrive on or before the first day of the month preceding publication. Packet mail may be sent to VK6NT@VK6ZSE.#PER.#WA.AUS.OC, or write to PO Box 169, Kalamunda WA 6076, or telephone (09) 291-8275 any time.

"QRM" News from the Tasmanian Division

Robin L Harwood VK7RH

This is a formal reminder that the Divisional Annual General Meeting will be held on Saturday, 23 March at 1400 hours Eastern Daylight Time at the Domain Activity Centre. Time has elapsed for the tabling of Notices of Motion and for Nomination. As this column is being compiled on 30 January, I cannot gaze into a crystal ball and say what these are. Please check for a formal notice in the Public Notices Column of both the Launceston "Examiner" and Hobart "Mercury" as per the requirements of

Corporate Affairs, where these will be listed.

At the Annual General Meeting of the Northern Branch, which was held on 14 February, at St Patrick's College, the following officers were elected unopposed: President, John Cornish VK7KJC; Secretary, Tony Cordwell VK7ZAC; and Treasurer, Ian Hart VK7KIH. Bob Richards VK7KRR stood down as secretary/ treasurer due to ill health.

CW Questionnaire

In the January issue of this magazine, there was an insert to gauge the opinions of the members as to whether or not CW should be retained as part of the NAOCP and AOCP examinations. With one day remaining before the polls close, the preliminary count indicates that most favour the retention. Of the 76 so far received, out of a total of approximately 280, 41 have indicated their preference for the status quo whilst 27 favoured CW being dropped. There were three votes in favour of retaining CW for the AOCP, whilst dropping CW for the Novice, and three voted that CW be dropped for the AOCP but retained for the Novice.

Please note that VK7RAF on Mount Faulkner has moved to 146.650 MHz with negative offset. Also, I believe that several UHF repeaters in the Northwest and on the West coast, plus the 2 metre East Coast repeater VK7REC, are now interlinked by means of inserting DTMF tones. I don't have the exact sequence but I am sure that these can be obtained on request. VK7RAF on 2 metres is also interlinked with VK7RAB on UHF at Mount Arthur and also with the Northeastern 2 metre repeater VK7RNE at Tower Hill by inserting a 141.3 Hz tone. Antennas on VK7RAA at Mount Barrow have now been fixed, courtesy of Joe VK7JG and Peter VK7PF.

Meetings for March

Southern Branch on Wednesday, 6 March at 2000 hours local at Domain Activity Centre.

Northwestern Branch on Tuesday, 12 March at 1945 hours local. For venue listen to VK7WI.

Northern Branch on Wednesday, 13 March at 1930 hours local at St Patrick's College, Westbury Road, Prospect.

Divisional Annual General Meeting on Saturday, 23 March at 1400 local at Domain Activity Centre, Queen's Domain, Hobart.

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How's DX

*Stephen Pall VK2PS**

If you are a true DXer, you ought to know the rules of the game. The ARRL produces at least three to four updated versions of the DXCC rules and lists of the DXCC countries each year. If you follow the published lists of the DXers, the so called "DX ladder", you will observe that some of the DXers, from time to time, miraculously climb the DXCC ladder to an excessive height in a very short time.

Is there some cheating along the route to these heights?

Here are some extracts from an article written by Bill Kennamer K5FUV, the Manager of the DXCC Desk, as it appeared in the October 1995 issue of *OST*. *"It is sad to report that there are still a few pretenders out there who somehow, although they probably have the station and the skill, want the rewards of being known as great DXers without doing the work. For them there is always the easy way. Get a card any way possible, and pretend they've worked that 3Y0 station on 160 metres or the BV2 at noon on 80. If necessary they even print their own cards.*

So far this year we've disqualified six DXers who tried to push the limits too far. As usual, since the first disqualifications in 1937, we won't be giving these people further recognition by printing their callsign again. You won't be seeing their callsign in the listings any more for a while, in fact quite a while. For those who do not know, the penalty is pretty stiff for someone who's accomplished a lot, or at least says they have. First the DXer's record is cleared from the ARRL data base, even the legitimate contacts. Then the DXer must wait five years before reapplying to the Awards Committee for entry into the program. No contacts will be accepted for the period from disqualification to re-entry. The DXer will have a fresh start. One other thing. His record will be flagged forever, noting that he didn't play by the rules once, and his QSL cards will be subjected to greater scrutiny and random audits.

The six disqualified DXers this year is probably a record. But the year is not over yet and there are four more cases waiting on the desk for further action. One of those will be positively brought before the Awards Committee soon, probably before you read this, and the others are awaiting confirmation from DX operators and QSL managers. It is likely that the number of disqualifications may go even higher before the year is over.

If anyone is considering trying to get away with something, or who may have in the past, remember that every submission may be subject to scrutiny. Enough said this year. Let's hope this isn't the subject we'll have to cover every year, or even every ten. But even if someone gets by with it once, maybe even twice, it still is likely they'll get caught."

Groote Eylandt – VK8NSB/P – IOTA OC-141

Stuart VK8NSB, a Novice operator, had a very successful mini-DXpedition of two weeks on the Island from the QTH of Terry VK8ETC. He operated only on the Novice sections of the 80, 15 and 10 metre bands on SSB and CW. In total he had 1973 QSOs, out of which 514 were in the CW mode. He had about 100 contacts on 80 metres CW/SSB, including five DXCC countries.

His QSL Manager is VK8HA, at the call book address, but Stuart will also reply to QSLs directed to him, Stuart Birkin, PO Box 205, Karama, Darwin, NT 0812, Australia. The usual direct QSLing rules apply, that is a self addressed envelope and adequate return postage.

Stuart hopes to activate three more new islands during this year, possibly with the help of a full call "island hopper".

Deal Island – IOTA OC-195 – VK7DI

News of the start of the expedition reached me too late to appear in the February issue of *Amateur Radio*. The activity took place from 31 January until 6 February 1996. The expedition reached the island, which is in the Furneaux Group, by a ferry licensed to carry ten passengers and an amount of limited cargo.

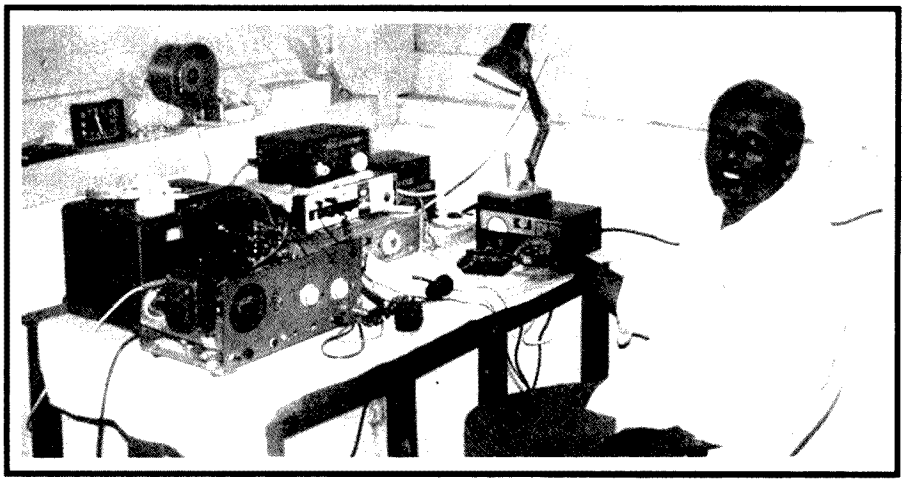
The island is administered by the Tasmanian Government and is off-limits to the general public. Special Government approval was necessary for the landing.

The operators were George VK3OO, Mirek VK3DIX, Tad VK3UX, Slav VK3CTN, Mark VK3DO, Steve VK3OT, Jack VK5CJC, Wim SP5DDJ and Wayne VK3TWE. They used the callsign VK7DI.

All bands were used on CW, SSB and RTTY with the help of Yagi, vertical and wire antennas. A colour QSL card will be sent to those who request it. QSL via the VK3 QSL Bureau or direct to Tad Dobrostanski VK3UX, 17 Sunburst Ave, North Balwyn, VIC 3104, Australia. Please include a SAE and return postage (two IRCs are requested from overseas amateurs).

Scarborough Reef – BS7H

As predicted in the last issue of *Amateur Radio*, the ARRL Board of Directors, at their meeting on 19/20 January, accepted Scarborough Reef as a new DXCC country,



Mani VU2JPS and his equipment.

as from 1 January 1995. The 1994 DXpedition did not qualify as a land based operation.

The voting was 11 for acceptance and three against acceptance, with one vote abstaining. QSLs will be accepted after 1 April 1996 by the DXCC desk. Early in 1995 there were 326 DXCC countries, then came North Korea (P5), Pratas Island (BV9P) and now Scarborough Reef.

Andaman Island - VU4

In the past few months quite a lot has been written, and even more comments made on the air, about the activities of Mani VU2JPS, who is now stationed in Port Blair, Andaman Island. Andaman Island is a very rare DXCC country.

Mani's signals were weak. He listened on SSB and replied in CW. He was assisted by Praran VU2AU who took a list on 20 metres. Later, Denver 4S7DA came to his assistance. Again, Mani received the signals in SSB and replied in the AM mode. He was very weak but a number of VKs and ZLs made the contact. The reason for his weak signals is simple. All the equipment in Mani's shack is home-built with minimum costs. His 20 metre transmitter has CW and AM capabilities with a very low power output . His amplifier has to be seen to be believed.

Incidentally, Mani is the Senior Engineer's assistant, and he is employed on the technical staff of "All India Radio", the national broadcaster. His wife Mala is also licensed as VU2MTC. They live very modestly in a two roomed house.

Jim VK9NS, last year in September on his way to Europe, visited Mani and spent a few days with him. During this time, with Jim's assistance, Mani's antennas were improved and a plan has been developed to assist him with modern equipment which already has been donated for this purpose.

However, the Indian red tape bureaucracy works very slowly, and the importation of amateur radio equipment is linked to an actual VU licence and requires an import certificate issued by the WPC amateur radio section of the Ministry of Communications.

After many months of waiting, Jim VK9NS has now obtained an Indian amateur licence, with the probable callsign of VU2JBS. Jim hopes to be in India by mid-March. He will go to Port Blair via New Delhi, where the donated equipment, which he will carry himself, will be cleared by customs. The main purpose of his visit is to get the equipment, including coax cables, and beam antenna, etc, safely to Mani. Whether Jim will operate from Port Blair has not been decided yet, but it is not likely that he will operate from there. Mani has applied for a VU4 prefix callsign, and this will be forthcoming sometime in the future.

Whilst all this is happening, an Indian Government official, who is also a licensed radio amateur, will travel to Port Blair, and thence to Nicobar Island where he will spend four to five days. Later, the same person will travel west to India's other island group, the Laccadives, VU7, where he will stay for the next two years. During that time he will train the locals, at least those who are interested, in amateur radio. He will then examine them, license them, and establish a local Amateur Radio Club with the view of substantial activity from this other much sought after DXCC country.

Incidentally, the DXCC is still hesitant to accept Mani's activity from Andaman as legal. They want some clarification as to whether or not Mani can operate without further clearances from someone other than the Indian PTT. It appears to be a security matter, as other Indian hams, according to the DXCC, cannot get permission to operate from Port Blair.

According to Jim VK9NS the situation in India is that one needs a general security clearance before one can operate amateur radio. (Please note! In the 1950s, in Australia, one could not get an amateur

licence if one was not an Australian citizen and a British subject; and in those times it was a five years waiting period before one could become an Australian citizen.)

Indian amateur licences and residential addresses are interlocked. If you change your residence, your licence has to be endorsed in writing, with your new address. This procedure will cost you money and a waiting period of many weeks or months. During this time you are not permitted to operate. If the change of address involves a distance of many hundreds of kilometres, say from one district into another, one needs a new security clearance which will take many months. Again, you are not permitted to operate during this transitional period.

No wonder the average Indian amateur, with limited financial resources and a binding job, is not inclined to travel great distances in India for DXing purposes. Mani was in Port Blair for many, many months before he appeared on the air. Only time will tell and one always lives in hope.

Pratas Island - BV9P

This is a new DXCC country as from 1 January 1994 with QSL cards to be accepted by the ARRL DXCC desk from 1 April 1996.

It was three years ago when the process began to add Tung-Sha-Dao (Pratas Island) to the DXCC list. In January 1994 a group of amateurs visited Pratas Island but, because no non-Taiwanese amateurs were permitted to remain on the island, Martii Laine VR6BH operated for about two hours during the refuelling stop of the aircraft, before returning to Taiwan.

Later, in March 1994, another Pratas trip was organised and conducted by a group of Taiwanese. This expedition produced, over a five day period, in excess of 5000 QSOs with all parts of the world.

About that time, William Wu BV2VA started to organise a bigger activity to take place in 1995. Taiwanese Senator Ken Chang BV2RA was very helpful in succeeding to get an authorisation to invite non-Taiwanese to remain on the island during the expedition. Originally, approximately eighteen amateurs were included on the flight to Pratas, but only eight stayed on the island, among them Jun JH4RHF, Mike JH1KRC and Wayne N7NG. The remainder returned with the C-130 flight later in the afternoon. Martii was on the flight to Pratas, and made the first QSOs. However, due to business obligations, he was unable to remain during the expedition.

Conditions were not the best and, at times, AC power supply problems limited the transmitter outputs and they were forced to operate from batteries, running the transceivers at about 25 to 50 watts. The Taiwanese army assisted by providing large batteries. The food was basic army issue and sleeping quarters were air-conditioned. The DXpedition made about 25,000 QSOs, out of which 4200 were made with North and South America, 7500 with Europe, and the rest with Japan and the local area.

Future DX Activity

* Martin VE3MR, and his wife Truus VE3MRS, will be active from Aruba as P40MR and P40TR respectively. QSL via home calls

* Andy will be active from Bangladesh for more than a year on all bands using the callsign S21YE. QSL via G0EHX.

* Gary E Neil, who operated from the Central African Republic as TL8NG, is now in Scutari, Albania, where he should stay until September. He operates under the callsign ZA5B. QSL via WA1ECA

* Laura Marcelle 3A2MD is active every day between 1400 and 1600 UTC on 14175-14180 kHz.

* A group of American operators is planning to activate Midway Island KH4, in March. All bands, all mode activity is planned.

* Barry ZS1FJ/G4MFW expects to be active from 3B6 Agalega and St Brandon Islands.

* There is a move to activate Melville Island, north of Darwin in the Northern Territory, by Stuart VK8NSB and another "island hopper" early in March as VK8MI. The activity will be for four days. (See "From Here There and Everywhere" Ed)

* FR5HR is waiting for a ship to go to Crozet, Kerguelen and Amsterdam Islands. He was planning to leave on 12 February with a stop at Crozet at the end of February.

* Gerard F2JD is now active from the Malagasy Republic as 5R8JD until September on all bands and all modes. QSL to F6AJA.

* Jim G0IXC will be active from Praslin Island (AF-024) until 13 March as S79XC on SSB IOTA frequencies of 7055, 14260, 21260, and 28460 kHz. QSL to his home call.

* Paul KK6H will be operating from the Kingdom of Tonga as A35RK until 20 March, mainly on CW and RTTY. QSL via W7TSQ.

* Expect quite a lot of DX activity with a lot of "strange" prefixes in the CQ WW WPX SSB Contest, which will take place in March.

* Frank DL8HYR will operate from Tunisia, from 1 to 10 March with the ARC callsign 3V8BB.

* FR5ZQ/G was spotted on a US DX Packet cluster at 1900 UTC and 1933 UTC on 14023 kHz.

Interesting QSOs and QSL Information

* 9N1AA – Satis – 14207 – SSB – 1156 – Jan (E). QSL to PO Box 4292, Kathmandu, Nepal.

* KC6JF – Joe – 14255 – SSB – 1147 – Jan (E). QSL to PO Box 66, Koror, 96940, The Republic of Palau.

* YI1ZN – Raxaq – 1420 – SSB – 1044 – Jan (E). QSL to PO Box 55072, Baghdad, Iraq.

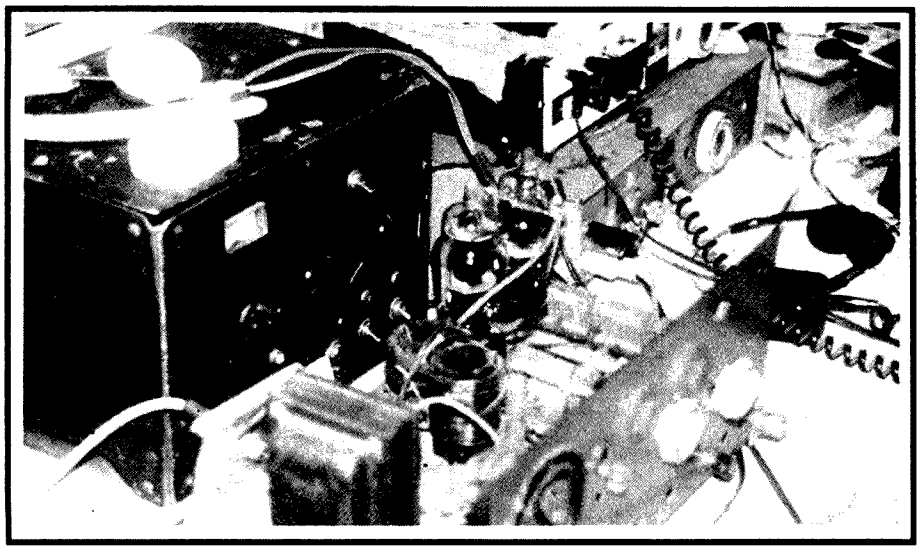
* JU5R – Khos – 14015 – CW – 0532 – Jan (E). QSL to JT1KAA, PO Box 639, Ulan Bator 13, Mongolia.

* CE0Y/JA7AYE – Nob – 14008 – CW – 0644 – Jan (E). QSL to JA7AYE, Noboyasu Hosaka, 98-115 Haramae, Dogawara, Miyagi, Japan

* 4X3000/4X1BD – Ben – 14198 – SSB – 1217 – Jan (E). QSL to 4X1BD, Ben Zion Dalfen, Box 23010, Jerusalem, 91230, Israel, or via the QSL Bureau.

* OY9JD – Jon – 7044 – SSB – 1052 – Jan (E). QSL to Jon Ingolvur Dam, Marknagilsvegur 26, FR-100, Torshaven, Faroes.

* 3W6GM – Franz – 14198 – SSB – 1242 – Jan (E). QSL to DF5GF, Franz Rebholz,



The home-built 40 m amplifier of Mani VU2JPS.

Torackerstr 5, D-79183, Waldrich, Germany.

* OA461QV – Cesar – 14255 – 1141 – Jan (E). QSL to OA4QV, Cesar Armando Aguirre Mesinas, Box 957, Lima 18, Peru.

* ZL2000 – Rib – 14175 – 0716 – Jan (E). QSL to Gisborne 2000 Award, PO Box 1017, Gisborne, 3801, New Zealand.

* W4PGX/KH9 – Bob – 14255 – SSB – 0518 – Jan (E). QSL to KB4VHW, Robert C Ave, 3260 Desert St, Pensacola, FL-32514 USA.

* VK9XZ/P/6 – Bill – 14260 – SSB – 0614 – Jan (E). QSL to VK6UE, W Billington, 30 Bindaree Tce, Kingsley, WA 6026.

From Here There and Everywhere

* The Melville Island IOTA DXpedition (OC-173) will be from 8 to 11 March 1996. Two operators, VK8NSB and VK8HZ, with two stations, will be active on all bands from 6 to 80 metres. Permission has been obtained from the local Aboriginal Council who owns the land. QSL via VK4AAR, A Roocroft, C/o Post Office, Dalveen, QLD 4374 Australia (direct only).

* Interesting statistics from the latest DXCC news release. During 1995 a total of 6044 applications (544,368 QSLs) were received at the DXCC Desk. This compares with 8187 (673,321) during 1994.

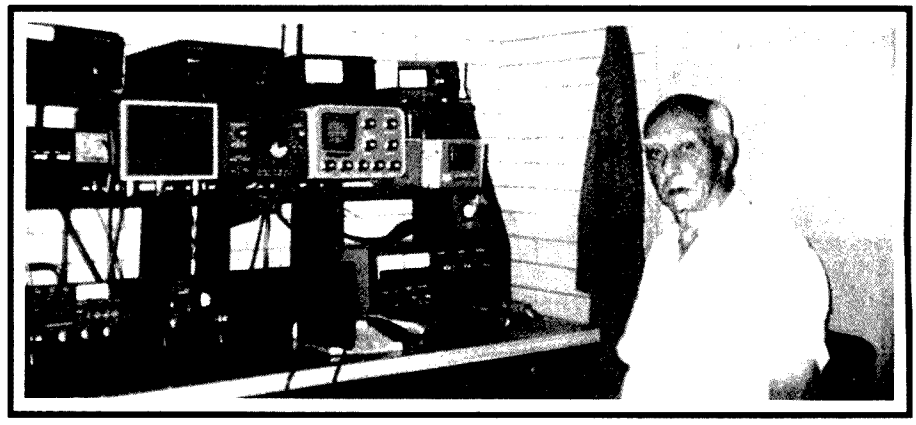
* Bob ZL1RS (R J Sutton, 109 Wright Rd, RD2, Katikati 3063, NZ) is the QSL Manager for stations ZL2AWJ, ZL4DO, ZK2RS, ZK1RS/South Cook, ZK1RS/North Cook, A35RS, and ZL8RS. Bob has returned from an 18 months overseas assignment, has moved QTH, and has now settled down to QSLing.

* Many of you had contacts with an "Independent North Somalia" amateur radio station with the callsign of 6O0A or similar. According to Bill Kennamer K5FUV, DXCC Manager, that operation is not acceptable for DXCC purposes.

* Percy VK4APC is the originator and principal net controller of the "ANZA" net. The net was started by Percy on 20 May 1970 (twenty six years ago!) on 21300 kHz, and was moved later to 21205 kHz (each day at 0500 UTC). The net has operated without interruption ever since. During the past two years, due to deteriorating propagation, the net has opened up a secondary frequency on 14164 kHz. To read more about this remarkable DXer, see the September 1990 issue of *'Amateur Radio.* Our photo shows Percy, who will be 87 years old this year, with his equipment. Congratulations.

* The DXCC Desk is still waiting on some documentation from 5A1A that would show that the Government has authorised an amateur radio station.

* ZS64RI was active from Robben Island (AF-064) from 26-29 January on all bands CW, SSB, RTTY. This is the island where the present South African President, Nelson Mandela, was imprisoned for many years. QSL to KA1JC.



"ANZA" Net founder Percy VK4CPA, formerly VK3PA.

* Bill Horner, VK4CRR of Mellish fame, has a new callsign, VK4FW.

* In March, Tom 9K2ZC and his wife Donna 9K2YY, will leave Kuwait.

* Hazel AL7OT/TN7OT will leave the Congo in April and will start QSLing after she returns home to Alaska.

* The American SSB DX Group meets on 7195 kHz at 0700 daily.

* Ron Wright ZL1AMO has asked that everyone be informed that he is no longer connected in any way with the group planning the Kermadec ZL8 trip for May this year. He was involved, but is no longer.

* Mome Z32ZM says DO NOT SEND "green stamps" because they are removed by postal workers and the rest is thrown away. Send two IRCs, no reply envelope, but a return address label. QSL to callbook address of YU5CXY, but do not write any callsign on the envelope.

* GB50SWL is commemorating the 50th anniversary of the International Short Wave League (ISWL) during 1996. QSL via G0DBX.

* GB60BBC is commemorating the 60th anniversary of the starting of a regular high-definition TV Service in November 1936. QSL via the RSGB QSL bureau.

* According to C31HK licences for guest operators no longer will be issued in Andorra.

* XV7SW is licensed to operate on 1827, 3505, 7013, 14016, 21016, 21019, 28016 and 28019 kHz. QSL via SM3CXS or direct to Rolf Salme, Embassy of Sweden, Box 9, Hanoi, Vietnam.

* PS7KM has a new address: Karl M Leite, Rua Estacio de SA 1838, 59054, 580 Natal, R N Brazil. Please, no callsign on envelopes.

* The DXCC, in a News Release dated 9 January 1996, has approved the following operations as valid for the award: 3A/I1YRL, 3A/IK1OWC, 3A/I2MOV, 3A/I1ZB, 3A/I8FXT, 3W5FM, 4B9CQ, 6Y5/DL1DA, 7P8CW, 7Q7DC, 8Q7CW, 9J2CE, 9N1AN, 9N1SXW, 9R1A, CN2NI, D2RU, DU1/SM5ENX, HI/DL1DA, HS0ZCJ, HS/DF8AN, HS/KM4P, J3J, J3X, J3Y, TT8BP, TY8G, VK9LX, VK9LZ, VK9NM, VK9XRS, VR2/DF8AN, VU2/DJ9RB, XT2DP, XZ1A, XY1HT, XZ1X, XZ1Z, ZA5B, ZA9B, ZA/PB0AIO, ZA/PA0HTR, ZK1DI, ZL7CW, ZL7PYD and ZV0TI. In an earlier press release, dated 4 October 1995, the following activities were approved: 3A/IK1SLP, 3A/IK4WMG, 3D2CT, 3D2CU, 4H1TR, 4J0/IK2BHX, 4K1HX, 4S7FEG, 4S7ZAG, 5H1CK, 5H3CK, 5N3/SP5XAR, 5R8EI, 5R8EJ, 5R8EH, 5T0AS, 5T6E, 5X4A, 5X4B, 5X5THW, 6Y5/JR7QKH, 9A9JH, 9G1YR, 9M8BC, 9M8HN, 9N1WT, 9X/ON4WW, 9X/SM7KOJ, CE0Z, CN2AW, CN2SR, CN5I, CY9/WA4DAN, CY9/AA4VK, CY9/KW2P, CY9/W5IJU, CY9/K4TVE, D68QM, DU9/KG8QH, EA8/PA3GIO, ED8USA, EY8/K4YT, H44/DJ9RB, LX/DL3FCP, LX/DL4FCH, P29VDI, S79NEO, SV5/PA3GIO, SV8/G3SWH, T5RM, TA/UA3AB, TG9/F5UKV, TI9JJP, TN7OT, TR8SF, TT8AB, TT8NU, TU2/KM4P, V2/G4DIY, VK9CJ, VK9XI, VP2MFM, XT/TU5BA, XU6WV, XT2CH, Z38/DL1SCQ, Z38/DL2SCQ, ZL8/G4MFW, A7IA/IV3TMM and C9/W6RJ.

QSLs Received

3W5FM (2 m – mgr Nataly Stechelokov, PO Box 66, Vladimir, 600011, Russia) – T30DP (4 w VK4CRR) – 4L50 (6 m TA7A) – 3B8CF (5 w op) – CE0Z (4 m K0IYF) – T32ZB (3 m op).

Thank You

Many thanks to my helpers who supply me with the information which makes this column possible. Special thanks to VK2FH, VK2KFU, VK2TJF, VK2XH, VK3UX, VK4AAR, VK4MZ, VK5WO, VK8NSB, VK9NS, ARRL DXCC Desk, and the publications *QRZ DX, The DX Bulletin, The DX News Sheet, QST, INDEXA, The 425 DX News, and GO list QSL Managers list.*

*PO Box 93, Dural NSW 2158

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Over to You – Members' Opinions

All letters from members will be considered for publication, but should be less than 300 words. The WIA accepts no responsibility for opinions expressed by correspondents.

Hamad Second Chance

I placed a Hamad under the Miscellaneous heading, *Will give away to a good home Rola 33B magnetic tape reproducer.....* which appeared in the December 1995 issue of *Amateur Radio*. The response was almost instantaneous. It went to the first to call, who convinced me that not only had he a good home for it, but also good use.

About an hour and a half later, a collector of vintage tape recording equipment rang and introduced himself, but I did not note his name. He was rather disappointed, and we parted after a short conversation which also related to a South Australian pioneer of tape recording, by the name of (Jack?) Ferry. He (the caller) said that someone (who obviously read Hamads in *Amateur Radio)* told him about the advertisement.

Some time later I realised that I have an old Akai tape recorder, as well as typewritten notes on tape recording in general, written by the above Mr Ferry.

Perhaps they may be of interest to this person. Could his informer please contact him again.

Yuri Slovachevsky VK5ZYS
5 Bowen Avenue
Seaton SA 5023

Cardsorter's Complaint

This is by way of an appeal to all of you who send QSL cards. I am a volunteer handler and have just sorted over one thousand cards, and my eyes simply ache.

Most volunteers are seniors and many of us have a spot of trouble reading callsigns. Especially those made on a computerised system. I mean the ones with all the information cramped on a label the size of a postage stamp.

Come on, fellas, please make the callsign easily readable and legible.

Would it not be possible to design a standard reverse side to these cards? One clearly stating all pertinent information, especially the callsign of the recipient.

I realise this is a pipe dream, but please make the effort and print the call to be at least readable without the use of a magnifying glass.

Another gripe whilst I am on the subject. PLEASE keep your cards to the standard postcard size. Many beautiful cards are ruined because they are oversized and the edges become frayed.

So, friends around the world, take pity on the bureau handlers and make your cards easily readable.

Ron E Martin VA3RON .. G0UNW
(VE3ORN @ VA3BBS)
44 Threadneedle Street
Willowdale ONT M2H 1Z6
Canada

CREST Information

Your favourable comment regarding CREST in the December editorial was much appreciated. It is refreshing to see somebody open-minded enough to realise that both CB and amateur networks can work when needed.

However, it may interest your readers to know about the current capabilities of CREST NSW Inc. Other states could also have similar capabilities.

As your comment implies, our primary frequencies are 27 MHz and 477 MHz, but we also have a frequency allocated just above the 40 metre band as well as Royal Flying Doctor Service frequencies.

Along with this, most NSW Police have one or both of the CBRS transceivers accessible to them as well as other services such as SES, Ambulance, some country hospitals, NSW Bushfire Brigade vehicles, some NSW Fire Brigade units, etc. Fire Brigade also have CBRS radios installed in depots and vehicles.

The general impression that CREST is made up of ratbag CBers has subsided greatly in this area as people discover the procedures and discipline involved with our organisation. CREST has been in operation now for almost 20 years and, in my experience, is well organised and ready to operate.

In the Hunter region, CREST has a favourable working relationship with WICEN (both Hunter and Central Coast regions) and we are respected for our standards and infrastructure. We realise that we do not have all the capabilities of the amateur service, but maybe we are not as limited in our operations as some may presume.

In response to the licence debate, my personal view (not associated with CREST NSW Inc) is that as soon as licence fees were discarded on the CBRS bands it left open slather for large and small commercial companies to use these frequencies to their hearts' content. This would not cause a problem except that now there is no need for them to have discrete frequency commercial radios. So the SMA loses more revenue and we, as private citizens operating radio purely for recreational or experimental purposes, bear the brunt of it.

Thank you for your time and attention and all the best to *Amateur Radio* for 1996.

Jeff Green VK2MCD
PO Box 455
Cessnock NSW 2325
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WIA News

Alien alert

Australia's 64 metre diameter radio telescope at Parkes, in NSW, was the scene of some excitement recently when signals were received by the sensitive equipment at about the same time every evening during radio astronomy observations of deep space.

Over four months last year, Professor Peter Backus, of the California-based Project Phoenix, picked up the mysterious signals each evening with the Parkes radio telescope, the largest in the southern hemisphere.

Following exhaustive investigations, the source proved to be much closer to home – the microwave oven downstairs below the 64 metre dish, where staff were cooking their frozen dinners, according to Australian Associated Press.

Professor Backus told a conference of the American Astronomical Society in San Antonio, Texas, that a sign has since been stuck on the microwave, asking staff not to use it when the telescope is being used.

International Amateur Radio Union Monitoring Service (IARUMS) – Intruder Watch

*Gordon Loveday VK4KAL**

The IARU Monitoring System – Part 3

(See January and February 1996 issues of *Amateur Radio* magazine for parts 1 and 2 of this continuing series about the IARU Monitoring System.)

Section 5 – Personnel

1. Personnel

Personnel in any section of the Monitoring System are, in general, volunteers. Their experience will range from a few weeks to many years. Some may not hold a transmitting licence, that is they are SWLs only.

Technical knowledge of monitoring personnel may vary from the simple to the very complex. Regardless of their level of skill, ALL monitors are capable of providing useful input to their section of the Monitoring System.

2. Equipment

The basic equipment of any monitoring station is a radio receiver, and a pair of ears (one will do!) plus the operator's ability to learn the limitations of each. The degree of sophistication that may be achieved beyond the basics is entirely a matter for the operator concerned. In some cases the national societies provide equipment for the use of their Monitoring Service management.

3. Hours of Work

Being volunteers, monitors must be free to dedicate as much of their time to the Monitoring System as their personal commitments permit. Within that framework a monitor should strive to apply time to a specific task that may be set by the Manager (Co-ordinator) or to general monitoring for a minimum of two to three hours each week.

It is suggested that LESS than two hours weekly results in loss of familiarity with patterns on the bands being monitored.

4. Types of Monitoring

Monitors who wish to specialise in specific types of transmission, ie A1A or F1B only, should do so. Each complements the other. Some observers prefer a particular band. This is encouraged. The end result is a person with an intimate knowledge of the particular band.

5. Pointers

Amateurs with previous monitoring experience or technical qualifications, will find the following discussion very basic, but basic pointers are included for those with limited know-how.

6. Receivers

The modern radio receiver, with its in-built frequency counter and digital display, makes for reasonable accuracy in frequency measuring. But not all amateurs can afford such equipment and may have to rely on older designs. The dial readings of these older units can be improved by maintaining the operating room at an even temperature, using a crystal calibrator to check dial accuracy against a recognised frequency standard such as WWV, and making allowance for errors.

All calibrations should be done on the band and in the mode being used to detect the intruding signal. It is not appropriate to dictate absolute standards because the equipment in use by monitoring stations varies. However, allowances should be made, where applicable, for any in-built frequency offset that results in erroneous dial readings of the measured frequency.

Federal Intruder Watch Co-Ordinator, Freepost No 4 Rubyvale QLD 4702 or VK4KAL@VK4UN-1

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Stolen Equipment

The following equipment has been reported stolen. If you have any information that may lead to the recovery of the equipment, please get in touch with the advised contact as soon as practicable.

Make:	ICOM
Model:	IC2GAT
Serial Number:	726-001849
Type:	Handheld
Accessories:	Wall charger
Modifications:	Engraved with VK4QO, VK3QG, VK6BAM
Stolen from:	Yeppoon, QLD
Date:	7 December 1995
Other items taken:	Cobra SR15 Handheld scanner, s/n 83000144, engraved VK4QO, VK4QG
Reported to:	Yeppoon Police
Owner:	Ron O'Grady
Callsign:	VK4QO
Contact details:	079 395 158

Make:	Yaesu
Model:	FT212RH
Serial Number:	21960647
Type:	2 m mobile transceiver
Accessories:	1/4 wave magnetic mount antenna
Stolen from/with:	White 1987 Ford Fairmont Ghia
Date:	31 December 1995
Owner:	Nick Philippa
Callsign:	VK1NK
Contact details:	6 Macquoid Pl, Kambah ACT 2902

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Packet World

*Grant Willis VK5ZWI**

Introduction

First of all, welcome everyone to 1996! This year I hope to maintain a slightly more regular column, starting with a series compiled by John Woolner VK1ZAO for the Canberra Packet Radio Group's Technical Symposium which was held last year. The first series is going to cover the basics of Packet Radio transmissions and look at how AX.25 packet radio, and later TCP/IP packet radio, works. Other topics that are intended to be covered this year include the "DUAL' protocol designed by Warren VK1XWT and also a look at the Amateur Wormhole Networks and how to get the most use out of them. If anyone has any topics they would like me to cover, please send in your suggestions!

Introduction to AX.25 and TCP/IP

John Woolner VK1ZAO

Abstract

AX.25 is a protocol that all Amateur Packet users use, but also one that very many do not understand. This paper seeks to present an introduction to "AX.25" and "TCP/IP over AX.25" as used in Amateur Packet Radio, at a level that will be comfortable to the beginning packeteer, but still informative to those with more experience. Maybe, with some insight into the functioning of packet radio, we can all help make the system hum along much better. We shall talk a little about the history of packet radio, the topology of a typical amateur packet radio "cell", the IOS-OSI layer model, the AX.25 protocol, CSMA and TCP/IP as implemented over AX.25.

Packet Radio the Early Days

Amateur radio is not the only user of packet radio, nor was it the first. The Aloha network was first operational in 1971. This system uses packet radio to link seven campuses located on four different islands to the central campus in Honolulu. This is a Star Topology with each node talking only to the central node, but some outer nodes are not able to hear each other (sound familiar?)

PRNET ran in the San Francisco Bay area for four and a half years from December 1979. This was an experimental network for the testing and development of packet radio and its protocols, consisting of four or more base stations communicating with mobile vans.

Amateurs have been involved in packet radio since the late 1970s when Canada relaxed its rules. Following this was the adoption of AX.25 as the standard link level protocol in 1982, initial experiments with TCP/IP about 1985, and NET/ROM, TEXNET and ROSE by about 1987.

Topology of an Amateur Radio Area

One of the things that really confounds the establishment of an Amateur Radio Network is the resultant interconnection of the hosts.

* We do not want to force stations to communicate only with "Master" stations, ie BBSs or Cluster controllers; all stations therefore share an equal weight in the control of the network.

* We do not want to force only one pair of stations to communicate on a frequency or pair of frequencies; we share a single or pair of frequencies with all those in the area much the same as all computers on an Ethernet LAN can share the one interconnect cable.

* It is certain that some stations will not be able to hear other stations (hidden transmitter):

  Station A talks with station B but cannot hear station C

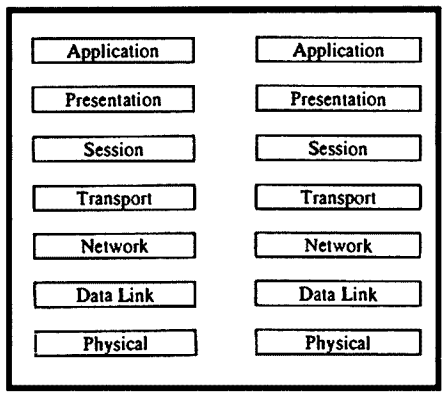
  Station B can hear station A and station C

  Station A may send a packet to station B at the same time that station C sends a packet – leading to corruption of the data received at station B.

* It may be that a station in an exposed location can hear a large majority of stations including those well out of its service area. This station may unduly limit its own transmissions.

* Some stations may logically belong to two or more areas at the same time.

The Amateur network in any one area can therefore be modelled as an interlinked series of "broken bus-topology" segments.



ISO-OSI Layered Protocol Model

"Protocol" – Observance of official formality and etiquette – formal statement of a transaction. [Concise Oxford]

To establish communication between two parties, we must define the rules and functions required to accomplish that communication. The International Organisation of Standardisation (ISO) has defined a layer of protocol levels to help facilitate development of data communications between computer systems. The classic ISO model has seven layers:-

In this model each layer only needs to be able exchange data with the layers immediately above and below it. Each layer needs only to be able to understand messages from its companion layer in another stack. A protocol stack built in this manner allows for specific tasks to be defined at each level greatly easing the design of the communication mechanism.

Let's describe each level of the ISO model in an ideal implementation, remembering that, in the real world, some of these functions may in fact be assigned to layers other than those I will describe, and in some cases the separation of layers may be rather confused.

* **Physical:** Responsible for the physical transfer of data from one location to another.

* **Data Link:** Usually associated with flow control over the physical link and possibly also data integrity (error control).

* **Network:** Route selection – best way to get the data to the destination.

Congestion Control – the amount of data queued for transmission.

Data sequencing and Error Control.

Multiplexing – several different transport protocols may be being used on the one physical network.

* **Transport:** Additional flow control mainly concerned with ensuring that faster hosts do not flood slower hosts.

* **Session:** Users interface to the Network – establishment of connections, access security, recovery from broken connections.

* **Presentation:** Message interpretation – understanding that a request is for a particular service, and the location and format of various parts of the message.

* **Application:** The program that actually performs the task, eg file server, printer server or read keyboard and display text.

So, for example, the Data-Link layer knows how to take data from the Network layer and pass it to the Physical layer (and vice-versa). It does not know how the Network layer got the data, or how the Physical layer will move the data across the Network. It does, however, know how to tell the Data-link layer of another stack to slow down (or speed up) and also how to tell that there has been a transmission error.

The Network layer knows how to pass data to the Data-Link layer and to one (or possibly more) transport layers. We may be running TCP/IP and NETBUI on the one Ethernet cable – or NET/ROM and TCP/IP and AX.25-L3 on the one radio channel. It may have to re-sequence data that has been received out of order, or flag that a packet has been lost.

Conclusion

Next month, John VK1ZAO takes a look at the AX.25 Link Layer, giving details of what is inside each of the packets that people transmit.

'C/o GPO Box 1234, Adelaide SA 5001
Packet: VK5ZWI @ VK5TTY.#ADL.#SA.AUS.OC
Internet: gwillis@eleceng.adelaide.edu.au

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Pounding Brass

*Stephen P Smith VK2SPS**

This month we will look at "Signal Reporting".

What is signal reporting? It's a means of informing another station about the quality of his/her radio transmission. Signal reporting is internationally recognised throughout the world and is known as the "RST" system. RST stands for Readability, Signal Strength and Tone.

Each part of the RST system is broken down and given a particular number. For example, Readability ranges from one to five. Each number is given a particular meaning relating to readability, with 1 being the lowest and standing for unreadable, and 5 being the highest indicating perfectly readable.

This system also applies to Signal Strength and to Tone. However, instead of being graded 1 to 5, these two are graded from 1 to 9. To help you understand look at the following:

The RST System

Readability

1 – Unreadable
2 – Barely readable, occasional words distinguishable
3 – Readable with considerable difficulty
4 – Readable with practically no difficulty
5 – Perfectly Readable

Signal Strength

1 – Faint signals barely perceptible
2 – Very weak signals
3 – Weak signals
4 – Fair signals
5 – Fairly good signals
6 – Good signals
7 – Moderately Strong signals
8 – Strong signals
9 – Extremely strong signals

Tone

1 – Fifty cycle AC or less, very rough and broad
2 – Very rough AC, very harsh and broad
3 – Rough AC tone, rectified but not filtered
4 – Rough note, some trace of filtering
5 – Filtered rectified AC but strongly ripple-modulated
6 – Filtered tone, definite trace of ripple modulation
7 – Near pure tone, trace of ripple modulation
8 – Near perfect tone, slight trace of modulation
9 – Perfect tone, no trace of ripple or modulation of any kind

Tone in the RST system is something a lot of operators don't fully understand. Nearly everybody I hear gives T9, *perfect tone, no trace of ripple or modulation of any kind.*

Maybe it's just for convenience sake so as not to upset the other operator by giving him a poor report? In any case, be honest with him; even if he goes QRT, you know you have done the right thing.

The Tone report refers only to the purity of the signal and has nothing to do with its stability or the freedom from *chirps* or *key clicks* which are more common with home brew equipment. If the signal has the characteristic steadiness of crystal control, with no drift whatsoever, add an X to the RST report, eg RST 459 X. If the transmission contains *chirp* or *tail*, either on break or make, add C, eg 478 C.

If it has clicks or any other transients, add K, eg 468 K. Under certain circumstances the transmissions might contain both key clicks and chirp. In this case add both C and K to the RST report, eg RST 458 CK.

Unfortunately, we don't have many reports like this on the air today, as most publications only mention the standard RST System. If it could be incorporated with the RST it would give the operator a better understanding of his or her transmission.

The operator could easily send QSD *(your keying is defective)* which could mean a number of things. I would then ask the operator in question what difficulties is he experiencing with my transmission. This could turn out to be a lengthy process, without even taking into account band conditions at the time. This could easily be rectified by sending either X, C or K, or a combination of these as described above, which could be sent in one over.

If you are honest with an operator, especially if his signal contains key clicks or chirp, and you advise him of the problem, I'm sure he will appreciate the report so that he can rectify the problem as soon as possible. If no one tells him that he's putting out a really rough signal, then he will continue sending, not realising the interference he may be causing to other band users.

This is so when working Russian stations. Most Russian operators do not use commercial radios. The majority of their transmitters are home brewed, and often suffer a lot from chirp and other associated problems. Here are some phrases you can use and send to our U friends:

Your signal is very bad
U WAS OYBNX PLOMOJ SIG

You have got harmonics all over the band
OT WAS MNOGO GARMONIK PO DIAPAZONU

Your signal is very wide
WAIII SIG OYBNX III I ROKIJ
(III = ——Y = —)

Remember common sense, a good working knowledge of the RST system, plus experience, make you a more professional operator.

In any case have fun with the Russians.

'PO Box 361, Mona Vale NSW 2103

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Repeater Link

*Will McGhie VK6UU**

E Band to 6 m

The difficult part of converting the Philips E band 828 to six metres is the exciter. Not too difficult, but requiring the most modification. Don VK6HK converted an E band 828 to six metres for our replacement 50 MHz beacon in VK6, using a different approach. The conversion followed the G band 828 idea. The G band is the 35 MHz version of the 828, rare, but can be found.

The E band 828 was not designed to go as low as 50 MHz and will not without modification. Rather than push the VCO lower, the alternate approach is to tune it higher to twice the required frequency and then divide it by two. The VCO was designed to go as high as 90 MHz and the extra 10 MHz or so does not seem to be a problem.

The divide by two circuit already exists in the 828 design, so it only requires changing the take off point from the VCO directly, to the output of the divide by two circuit. Also required is the crystal reference oscillator running at twice the frequency. This is no problem as the oscillator works fine at 12 MHz while not without modification at 6 MHz. The phase mod coils are tuned to 12 MHz rather than 6 MHz.

Hopefully, the block diagram will make it clear. The top diagram is the standard 828 and the lower diagram the modification. Unfortunately, there is not enough drive from the divider circuit and an amplifier is needed between the divider and the power amplifier. The design shown is from the G band 828. I don't know if the BSX20 transistors can be found easily but other types could be used.

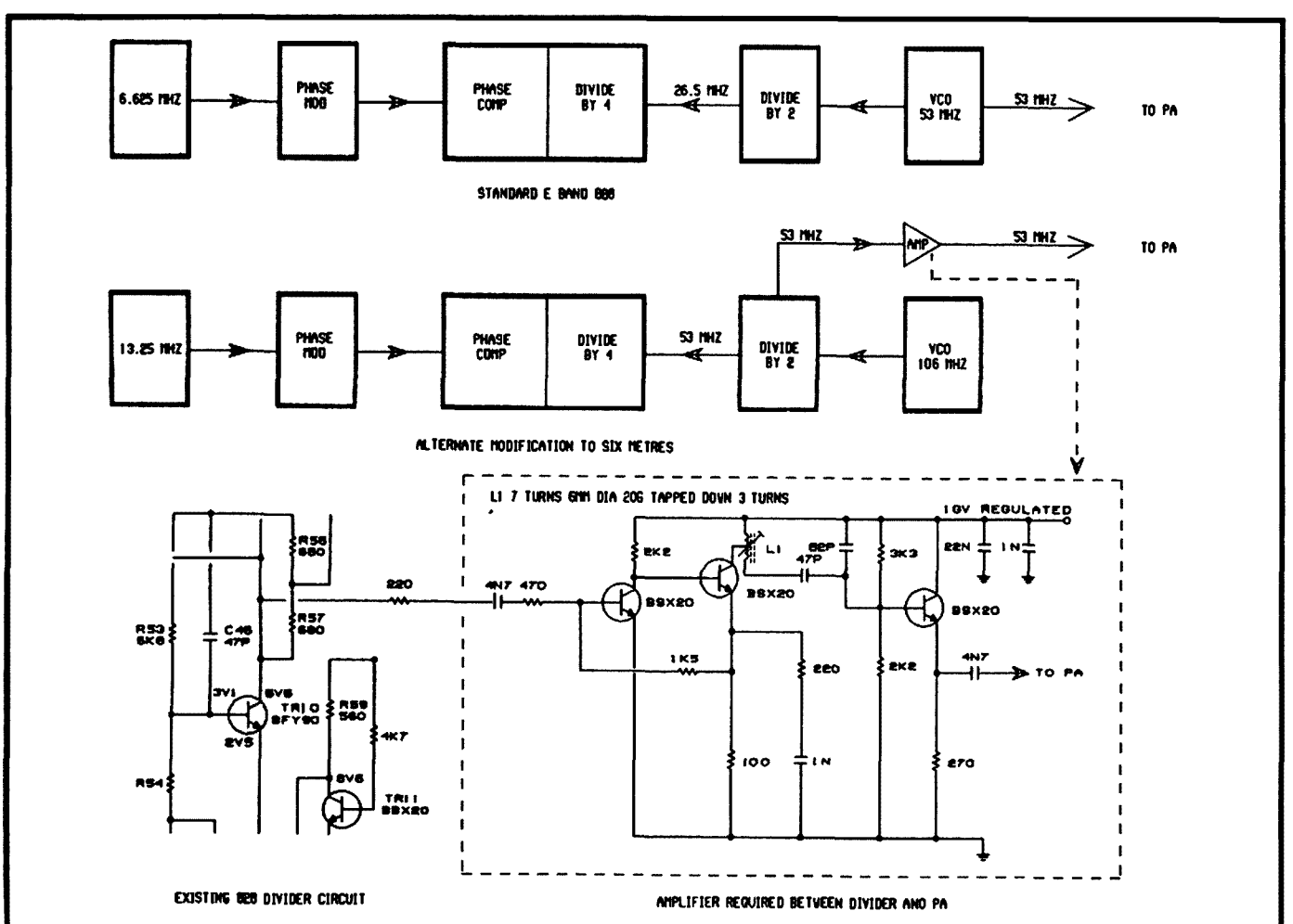
I have not tried this conversion idea but it sure works on the VK6 50 MHz beacon. The beacon is FSK and does not use the phase modulator on the exciter board. One concern is, as the phase mod coils operate at 12 MHz rather than 6 MHz, it may be difficult to obtain sufficient deviation. I don't know the answer to this. Also the phase mod coils may require a reduction in capacitance in order to resonate.

You may like this approach and try the idea. Let me know how it works on 53 MHz.

Changing Frequency

As mentioned before in *Repeater Link*, the changes to repeater licensing are resulting in increased costs. One such example is where a two metre repeater is forced to shift frequency due to unsolvable pager interference. In the past, this was annoying but involved only time and the cost of crystals and a couple of site visits. Now the SMA charge for the frequency change! Due to no fault of the repeater, a frequency change is forced due to interference to our prime two metre band and we are charged for the administrative costs. This is unfair and is the result of bad spectrum management by placing pagers so close to two metres. Why should the amateur community have to pay for someone else's poor management?

As an example I read a packet bulletin released by Stan VK2DDL on a frequency



change of VK6RGL. The packet information was brief so I asked Stan for details on the frequency shift. This is his reply.

From:
VK2DDL@VK2EO.NSW.AUS.OC
To:
VK6UU@VK6BBR.#PER.#WA.AUS.OC

The records of our pager problems extend back over seven years and are far too extensive to document in full. In any case, the details are already known to the SMA in Newcastle.

In summary, the repeater channel was allocated initially by the WIA NSW Divisional Repeater Committee and was not requested by our club. Pager interference was encountered on the input frequency of 147.975 MHz soon after commissioning the repeater. It took some time to identify the problem as a transmitted third order harmonic (2A-B) resulting from a mixing of two pager frequencies and resulting in a spurious signal on 147.9875 MHz. It also took some time to convince the SMA that the interference was not a receiver front-end overload, by establishing that the nearest pager installation was some 25 kilometres away.

A Radio Inspector eventually visited the repeater site and took directional measurements which revealed two sources of the spurious signals, both being Telecom pager installations having transmitters on the two frequencies involved working via a combiner into common aerials. Non-linearity in the combining unit was responsible for generation of the spurious signal. The problem was cured by the insertion of "circulators" or ring isolators in each aerial circuit.

There was freedom from pager noise for one or two months and then a further spurious signal appeared on 147.9625 MHz. This signal was again traced to a different third order harmonic generated in the same way as before. One source was traced and cleared by the SMA in the same way However, a second source was found to be outside the Newcastle jurisdiction. Approaches were made to the SMA Sydney office for investigation, but little action was taken. It was learned that more and more installations of this pager combination would be made, and that most would not be equipped with circulators, which were expensive.

Our club decided that we would apply for a frequency change for the repeater. This was initially unsuccessful because of the unavailability of a repeater channel. We then learned that the Westlakes club to our south had a repeater on 147.7/147.1 MHz at Mt Arthur, near Muswellbrook, which had been closed down for some years because of co-sited pager interference and the same lack of an alternative frequency. We investigated the band-plan and came up with a suggestion of a frequency change for Mt Arthur which seemed compatible with existing users and which would free its existing frequencies for our use. The Westlakes club agreed and joint applications were made to the WIA NSW Divisional Committee, NTAC. Their passage through NTAC was facilitated by the NTAC chairman, who is a member of both clubs. Approval was forwarded to the SMA and the frequency changes effected.

Both clubs were charged for the frequency changes at $91 per hour for periods of 1½ hours – $136.50.

If further detail of any aspect of this history is required, please advise me and it will be supplied if available.

Regards,
Stan Ellis, VK2DDL.

Due to no fault of a repeater installation, a shift in frequency was required and the SMA charged for doing the paper work. It could be argued that the repeater receive frequency of 147.975 is asking for trouble, being so close to the pager band, and I mean close! But the point is, it was the only frequency available and is an amateur repeater input in an amateur band. It is the pager band that is at fault. It is an engineering impossibility to put a receiver on 147.975 and not be affected by pager transmitters only tens of kilohertz away. What this means, in effect, is the top end of our two metre band must be interfered with by pagers. It is just not possible to put high power transmissions so close to any receiver no matter how good it is and not expect it to be interfered with. To rub salt into the wound we have to pay for the problem. I believe this to be wrong.

More examples like this need to be documented and sent to the WIA for presentation to the SMA. The SMA are prepared to listen to our problems and this may result in engineering standards being imposed on pager installations. At the moment there appears to be few installation standards on pagers. To give you an example. At one of our repeater sites in Perth, on a high mast of 250', two pagers are installed, each running into separate antennas. The antennas overlap by two thirds of their respective lengths, and are separated horizontally by only 1.3 metres! That is right, the pager antennas are very closely coupled together. The radiation of one pager into the other pager via this close antenna spacing would be very high.

Many watts from one pager are able to find their way back into the power amplifier of the other pager. This not good. Mixing can occur in each other's power amplifiers with the likely result of other frequencies being radiated. Neither of these pagers are fitted with cavity filters or isolators to reduce energy from coupling between the pagers. Poor engineering aside, the pager company believed the antennas were vertically separated by at least two metres. When it was pointed out this was not the situation, the antennas were vertically separated by three metres.

How many other pager installations are poorly installed causing problems? The pager company may believe it has done the right thing but it is possible that whoever installs a pager antenna may not know of the problems caused by close spacing. The antenna installer may not know what antenna it is next to the antenna he is installing.

In fairness to pager companies, some installations are of a high standard. I have seen such an installation in Perth. Two pagers on the one site, each with large cavity filters and isolators. The antennas are separated by the recommended distance. These standards need to be applied to all pager installations. It won't fix most of our pager problems, as they are receiver caused, but it would fix some of them.

By the way, the SMA officer in the field knows of the problems pagers cause. It is not these SMA people that need convincing but senior SMA people who may not be aware of the pager interference to *our two metre* band.

If you have had problems with pagers, or are having problems with pagers, document it and send me the details. I will see the information makes it to the WIA.

**21 Waterloo Crescent, Lesmurdie 6076*
VK6UU @ VK6BBR
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Spotlight on SWLing

*Robin L Harwood VK7RH**

Well, Autumn is here and already I am noticing big changes in propagation. The higher frequencies this summer were rather disappointing and are rapidly dropping off, whilst the lower allocations are becoming increasingly active in the daytime to early evening. The word is that a new sunspot cycle is under way and we have reached the lowest trough of the previous cycle. Now the long haul upwards.

This month also sees the majority of broadcasters on HF alter both their times and frequencies to take account of the introduction of daylight saving in the northern hemisphere. Some minor alterations will take place on 3 March at 0100z. But most of these will be taking place on 31 March when, by international convention, the majority of Europe and the CIS adopt daylight saving. North America changes at the end of next month.

Also, Radio Canada International is due to cease broadcasting on shortwave from 31 March. A predictable outcry was made when it was announced early in December. The majority of those leading this has been expatriate Canadians, followed by the loyal worldwide RCI listeners. Apparently, the parent public broadcasting organisation, the CBC, have had severe budgetary cutbacks and could no longer keep RCI afloat. They passed the buck back to the Canadian government through its Foreign Affairs Ministry, who previously helped fund RCI. Several of those wishing to save RCI started to fax the Canadian PM and even posted his fax number on the Internet. The story even made it on to the Canadian domestic print media, yet it seems to have had no effect. The closures will go ahead on 31 March.

However, the transmitting centre in Sackville, New Brunswick is also utilised extensively by other co-operating broadcasters, such as Deutsche Welle in Cologne, the BBC World Service, Radio Austria International, Radio Korea International and Radio Japan. This site is used for North and Central America yet propagates further than that. If Sackville is retained by these international broadcasters, perhaps we will continue to hear Canada on shortwave but, alas, no Canadian-based programming.

For many years, Teheran has been easily heard during our daylight hours on 15084 kHz. Most of the broadcasts are in Farsi, which is the main language in Iran, but I have heard French and Spanish programs. Imagine my surprise to hear the "Voice of the Islamic Republic of Iran (VOIRI)" in English coming from Teheran! I heard it on 11835 kHz at 1130z. The broadcast was at fair to good strength, yet the audio quality was poor. There was a very nasty hum present, which was annoying. They announced several parallel channels but the only one audible was well underneath the VOA Indonesian service. Program content was also interesting, being naturally pro-Shi-ite and quite anti-Western.

Interesting to note, also, that one of the intruders from the past has made a re-appearance on the 40 metre ham exclusive portion. It used to be known as the Funnan Front Station and the "Voice of the PLA", but has now been largely absorbed into the main Central People's Broadcasting System and the Taiwan Network. Based opposite the Taiwanese Straits near Amoy, it is targeted at the tiny islands off the Chinese mainland and Taiwan itself.

Tensions have markedly increased ever since the Americans allowed the President of Taiwan to visit the US for a college re-union last year. Beijing regards Taiwan as a renegade province and made several missile tests very close to Taiwan. The re-appearance of this clandestine station on 7080 kHz, between 1100 and 1130z, may have more to do with propagation, however. The CPBS Taiwan Network was on 11000, 11040 and 11100 kHz, but not lately.

The NATO IFOR Operation in Bosnia has been under way since December and there is an extensive airlift backup and resupply network. Quite a lot of flight movements are being co-ordinated over Europe and the North Atlantic on 11175 kHz. This channel is quite busy at times as it carries most of the American Defense Networks worldwide. Listening there brings back memories of the days when there were thousands of aircraft in the Pacific en route to Vietnam. They were very audible too, even on a dual-wave Philips 2262 that didn't have an inbuilt BFO for resolution of SSB.

Well, that is all for this month. Don't forget if you wish to contact me on e-mail, you can reach me at robroy@tamarcom.com.au and I have renewed my fidonet account. It is 3:670/301. Until then the best good listening and 73.

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Internet: robroy@tamarcom.com.au
fidonet: 3:670/301

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WIA MORSE PRACTICE TRANSMISSIONS

VK2BWI	Nightly at 2000 local on 3550 kHz
VK2RCW	Continuous on 3699 kHz and 144.950 MHz 5 wpm, 8 wpm, 12 wpm
VK3COD	Nightly (weekdays) at 1030 UTC on 28.340 MHz and 147.425 MHz
VK3RCW	Continuous on 144.975 MHz, 5 wpm, 10 wpm
VK4WIT	Monday at 0930 UTC on 3535 kHz
VK4WCH	Wednesday at 1000 UTC on 3535 kHz
VK4AV	Thursday at 0930 UTC on 3535 kHz
VK4WIS	Sunday at 0930 UTC on 3535 kHz
VK5AWI	Nightly at 2030 local on 3550 kHz
VK5RCW	Continuous on 144.975 MHz, 5 wpm to 12 wpm
VK6RCW	Continuous on 147.375 MHz, 4 wpm to 11 wpm
VK6WIA	Nightly at 1930 local on 146.700 MHz and nightly (except Saturday) at 1200 UTC on 3.555 MHz

Update

WIA DXCC Standings (page 22, February 1996 *Amateur Radio*)

Due to a simple keying error in the Federal Office WIA DXCC Standings computer database, VK5UO, with a listing of "99/101", was accidentally elevated to the top of the **Phone** Honour Roll from his correct position at the bottom of the General Listing (the listing was keyed in as "99 /101" instead of "099/101"). And, as "Murphy's Law" will always have it, the keen eyes of the proof-readers (who generally don't miss much) missed this mistake.

Our apologies to both VK5UO and VK6RU.

It might be a good idea to correct your copy of the February 1996 issue of *Amateur Radio* now.

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VHF/UHF – An Expanding World

*Eric Jamieson VK5LP**

All times are UTC.

News from VK6

Wal VK6KZ and **Neil VK6BHT** have extended their distance worked on 24 GHz. At Christmas, Neil operated from Reabold Hill in Perth. Wal went first to Karnet, a lookout point on the edge of the Darling Scarp south of Perth, and they worked the 57.1 km path at 5x8. Proceeding further south and over a non-optical path of 69.2 km, Wal worked Neil at 5x2 each way. This will be a claim for a new Australian record. Also, the 10 GHz 378 km path to Geraldton is being thoroughly explored by Neil VK6BHT and VK6KZ with almost nightly contacts.

Wal said: *Your January comments regarding the probable VK2XSO 24 GHz contact were of interest. I was unable to find a phone number for him. The distance of 396 km is the current world record and was achieved with narrow-band equipment so that, if achieved with wide-band gear, we all would like to know who participated, what was the path and the prevailing conditions. I hope that someone answers your query.*

The VK6 VHF Group Field Day was successful with serious efforts made by several operators new to portable activity. Notable in the field were Bob Pine VK6ZFY, Bruce Douglas VK6BMD, Al Edgar VK6ZAY, Terry Leitch VK6ZLT and myself VK6KZ. Activity included all bands to 10 GHz (with the omission of 5.7 GHz due to the absence overseas of the organiser Alan Woods VK6ZWZ).

Terrestrial activity on 2400 MHz has increased. VK6KZ was portable at Torbay (25 km west of Albany) on 16-17/1 and, besides working into VK5 on 144, 432 and 1296 MHz, heard the VK5VF beacon on 2403.450 MHz at 519 between 1645 and 1725. It may have been there earlier and later but most attention was given to 10 GHz, where tests with Roger VK5NY/p between 1610 and 1730 were unsuccessful.

*50 MHz has at last shown some life in the Ross Hull period after being lively prior to Christmas. The best opening may have been on 19/1 when John Pearce VK6JJ worked over 40 stations including ZLs. During that opening Ross Tolchard **VK6KAT** worked David Minchin **VK5KK** on 144 MHz sporadic E, about 2000 km. Alerted by hearing Ross, VK6KZ also worked David at 0744. As expected, nothing was heard by VK6KZ of a test transmission on 432 MHz by VK5KK.*

Al Edgar VK6ZAY/p at Busselton, about 190 km south of Perth, had contacts on 144, 432 and 1296 MHz with Alan Woods VK6ZWZ, but little success on 2.4 GHz. Conditions were not good during the attempts.

A few comments about the Ross Hull Contest Rules. The scoring table needs a revamp. The latest effort to fix the 50 MHz points has been a disaster with efforts by a serious operator on that band not really warranted. VK6/ZL at 10 points! It is far easier to use gunnplexers on 10 GHz across town for 16 predictable points. One would need to work 26 ZLs from here to exceed a month of contacts on 10 GHz! The time commitment for six metres can be overwhelming for little reward!

I am, of course, biased, but at least knowledgeable regarding the microwave bands. Relating points to uniform 100 km rings for all bands ignores the real challenges. For example, exceeding the world record distance of 396 km on 24 GHz would bring only 64 points.

Notwithstanding these comments, I think that having points for minimal distances on 50, 144 and 432 MHz are worth retaining for the benefit of encouraging activity. The excellent system of limiting log entries for the best 100 contacts takes care of the issue of those who would simply accumulate local contacts.

I would like to see the re-introduction of a table of band, distances and points which reflect the best estimates of propagation and degrees of difficulty. I will be passing these comments to John Martin. Contest Managers are sitting ducks for criticism but are to be admired for their efforts to encourage activity and give everyone a fair go.

VK5KK Returns to the Bands

The big day was 13/1/96. David VK5KK is now operational on 50, 144, 432, 1296 and 2401 MHz, using a 12 m self-supporting tower. QTH PF95IF, 180 metres ASL.

VK5KK Portable Operations

I can operate portable on the following frequencies. When I say portable I mean carry up the hill with two hands portable!

***144 MHz:** 10 watts to a three element beam, useful for good sites as a link for higher frequencies. **1296 MHz:** 10 Watts to a 22 element if necessary, otherwise using a one watt hand held. **3456** MHz: five watts to a 60 cm dish, but I haven't found any one else with gear to operate portable. I have a second transverter which I can loan out! All SSB narrow-band stuff.*

***10368** MHz: one watt portable to a 60 cm dish, SSB, etc. Actually I have two complete 10 GHz stations; the old one runs 200 mW to a 60 cm dish and can be loaned to anyone prepared to go narrow-band mountain topping. Other bands are possible, eg 432 MHz. For 2403 MHz I am working on a five watt transverter. I can run one watt on 2304 MHz where still permitted!*

Summary of Workings

During Field Day contest, 13/1, I worked VK2EFA/p at Broken Hill on 144.110 MHz at 1305. 16-17-18/1 open to VK6 via tropo. VK6KZ/p heard VK5VF beacon on 2403.450 at 1645, which adds weight to the selection of this band as a useful propagation indicator for western path tropo openings on SHF.

Using VK5VF on 2.4 GHz as a prime SHF westerly indicator is possibly the most accurate tool for 10 GHz. The evidence of two loosely separated types of openings:

(1) Those that peak at 144 MHz and become worse as you go higher; and

(2) Those that seem to favour a much higher frequency, typified by good conditions on 432/1296 leading to 2, 3 or 10 GHz conditions.

It is not known just where the turn around frequency ranges are for this second mode of propagation. However, evidence suggests that this mode involves a relatively low level inversion layer, due to the timing of around 2-3 hours from sunset or sunrise.

Whilst 1296 MHz seems to peak with a good 432 opening, 2403 is high enough to suffer from differing path loss factors (and being 1/4 of 10 GHz), the aim of the exercise is hopefully to provide a more accurate warning for 3, 5 and 10 GHz. The beam pattern of the 2403 MHz antenna has been deliberately angled so its main lobe hits the Gulf waters (ie down about two degrees). Past experience shows that if you are above an inversion, you can sneak under it and bounce the first wave off water, as long as the layer is not too solid. Previous 10 GHz to VK6KZ in 1994 exhibited this same low angle, pointing at the water for best signals. Reports from Europe on Water Path Tropo on 10 GHz confirms that this layer can be as low as 100 feet! Maybe in ten years we will have a better understanding!

16/1 out portable at Mt Gawler, PF95JF, 540 m ASL. Worked VK5LP on two metres and heard him on 1296 MHz with a handheld (160 km). Worked VK5NC at Cape Northumberland on two metres (400 km), tried 10 GHz but no propagation. VK3ZQB (Port Fairy) and VK3XPD (Mt Macedon) both out portable on 10 GHz, conditions poor, only VK5NC worked VK3ZQB on 10 GHz. Too cold for VK5NY to go out!

19/1/96 worked Perth on two metres Es to VK6KAT and VK6KZ around 0740, band open for about ten minutes.

VK5VF Beacons

The **3456.45 MHz beacon** will be installed in March, details as follows: frequency 3456.450 MHz, F1 keying, power output 600 mW to a 14 dBi directional antenna pointing west.

Modifications to the VK5VF 1296 MHz beacon. The main directional antenna will be turned west, with a secondary Yagi beam fed via a power divider and pointed south east. 3 dB points will be 125° (Melbourne) and 155° (Mount Gambier). EIRP in this direction should be around 100 watts, about a 12 dB improvement over the current situation.

All reports/requests to be forwarded to VK5KK 018 825628.

Six Metres

Cliff Betson ZL1MQ writes that *1995 will be remembered for the exceptional conditions which occurred on the bands with the assistance of Es and weather fronts extending from the east coast of VK to all ZL districts.*

***50 MHz:** The Es spread to all ZL districts but ZL1 enjoyed the most openings. After an absence of several years, **Jim VK9NS** on Norfolk Island re-appeared on 10/12 and worked ZL4TBN. On 11/12 Jim worked ZL4TBN and ZL3NE. On 17/12 **VK9YQS** on Lord Howe Island worked ZL2KT, ZL4LV and ZL3TLG, and on 30/12 ZL1AKW, ZL1TMF, ZL1MQ and ZL3NE.*

Double-hop Es appeared on 18/12 with ZL2AGI working VK6RO, VK6HK, VK6JJ and VK6YU. On 21/12 ZL2AGI to VK6HK, VK6JJ and VK6BE; ZL3NE to VK6JJ. These contacts were around 5500 km. On 24/12 VK8RH in Darwin was worked by ZL2AGI, and again on 5/1/96 by ZL3NE and ZL1MQ – distance about 5200 km. These contacts resulted in ZLs working all states of Australia, a feat not often accomplished in a few weeks.

There were scores of additional contacts between ZL and VK but reports have failed to be lodged. (I know the feeling Cliff, apart from VK6KZ telling me that VK6JJ worked more than 40 stations, including ZLs, on 19/1, I have not received ONE written report of December or January Es activity from VK stations! If it were not for your well documented information I would have little to report. ... VK5LP)

***144 MHz:** First contacts to Norfolk Island occurred on 30/11 when ZL4AAA copied 100 MHz FM from there and phoned VK9NS to come on 144 MHz. Contact was made by ZL4AAA and ZL1IU.*

The DX season on the band was the best ever and favoured the ZL1 area. ZL3NE/1 worked 80 VKs, ZL1TWR 28 and ZL2TAL worked VK2BA. Christchurch in ZL3 had contacts but there are no details. That area hears the VK 148+ MHz paging systems more often than ZL1.

Last month covered the period of ZL openings to 10/12. This report is from 11/12 to 5/1. On **50 MHz** the band opened to VK on 11, 12, 14, 15, 16, 17, 18, 19, 20, 21, 24, 25, 27, 28, 29, 30, 31/12, 1/1 and 5/1, a total of 19 days in four weeks. Those worked were VKs 1BG, 1MJ, 2AIF, 2AKF, 2ANS, 2AXH, 2BA, 2BIT, 2BRG, 2FK, 2FLI, 2FZ/4, 2KZU, 2PB, 2XKJ, 2YDC, 2YHN, 2YKN, 2YLO, 3ADM, 3AL, 3ALM, 3AMK, 3ANP, 3ATQ, 3AZY, 3BRZ, 3DLM, 3DUQ, 3DUT, 3DY, 3JDO, 3LK, 3OT, 3OW, 3RZ, 3WN, 3XQ, 3YDE, 3YDF, 4AFL, 4AR, 4ARN, 4BKM, 4DO, 4GPS, 4JH, 4KK, 4KMA, 4KR, 4OE, 4PU, 5AKK, 5BC, 5BZK, 5KK, 5NC, 6BE, 6HK, 6JJ, 6RO, 6YU, 7AB, 8RH. ZLs to work them included ZL1MQ, ZL2AGI who each worked 57 and ZL3NE worked 152 stations. VK9YQS was worked on 17/12 and 30/12 by ZL1AKW, ZL1MQ, ZL1TMF, ZL2KT, ZL3NE, ZL3TLG and ZL4LV.

On **144 MHz** stations were worked on 21, 24, 25, 27, 28 and 31/12, for 38 contacts additional to those published last month. Stations worked included VKs 2ADY, 2APG, 2BA, 2BBF, 2BZE, 2FLI, 2FZ/4, 2VC, 2XKE, 2ZAV, 4ABW, 4ARN, 4BRG, 4DH, 4GPS, 4IC, 4JSR, 4KK, 4LP, 4PGS, 4RX, 4YOO and 4ZDR. ZLs to work them were ZL1AVZ, ZL1HR, ZL1IU, ZL1TWR, ZL2TAL and ZL3NE. Thanks for the report Cliff.

There seems little doubt that the 1995/96 summer period has been exceptionally good on 50 and 144 MHz in particular, rivalling the results obtained in the northern hemisphere summer. 20/1 was particularly good with Australia-wide contacts possible. At 0453 I heard Ross VK2DVZ at 5x5 on 144.100 and quickly called him but received no reply as the band closed after 15 seconds!

Also on 20/1, at 0600 P29CW was working Melbourne to VK3AMK and VK3AMX in particular. At 0630 ZL3s were working many VK2s on two metres, the band having opened at 0230. I was still working ZLs on 50 MHz at 1030.

Beacon News

A fax from **Andrew Perkins VK7KAP** advises that the VK7 beacons are again operational, now from Kelcy Tiers near Devonport, the VK7RAE site. I assume the callsign is now VK7RAE not VK7RNW. Terry VK7ZTI, Andrew VK7XR, Ron VK7RN and Andrew VK7KAP were responsible for the re-commissioning. Favourable reports of their reception have been received from mainland users. The propagation from the new site, which is of similar elevation to Lonah, appears to be good. Frequencies are 50.057, 144.474 and 432.474 MHz, with work proceeding on another beacon to operate on 1296.474 MHz.

Special thanks are due to **Ron VK7RN** for providing continuing support for the VK7RAE site, as it is powered from Ron's domestic supply. This is in contrast to over $1200 per year demanded by the Hydro Electric Commission.

VHF/UHF Field Day

The weather seems to make a habit of upsetting contacts in the annual 24 hour Field Day, this year commencing on 13/1. In some areas of VK5 temperatures rose to 41°C which can be decidedly uncomfortable if you are perched in a caravan or tent. Last year it was heavy rain!

Nevertheless, there were some good tallies as the final results will eventually show, but with many stations electing to use separate logs on each band, total contacts were not easily ascertained. From my home station I managed to chalk up helpful contacts on the bands 50 to 1296 MHz inclusive. An aurora around 0830 on 13/1 may have assisted some operators – VK3OT worked several Melbourne stations using that mode.

Transequatorial Contacts

Following the contacts between ZLs and JAs on 3/11 and to VK4 on 7-8/11, the TEP opened again on 15/1 from about 0545 when Asian TV was observed. From 0600 **VK3OT** worked JAs on CW in districts 2, 3 and 4. **VK8RH** in Darwin was also noted working JAs.

The occurrence of TEP on 15/1 came two days after the aurora. Also observed was P29KFS working Melbourne stations around 0500. Needless to say, it reinforces the view that one should never take six metres for granted, surprises are always occurring. I especially await the news of a 50 MHz contact between Australia and South Africa via Antarctica, I am sure it will eventually happen!

Europe

Ted Collins G4UPS sent no news sheet with his December log coverage, but in the log he refers to the heavy frosts and snow they were experiencing. His daily QSOs with G3CCH and SM7AED seemed relatively unaffected by the cold conditions, with signals from SM7AED reaching 579 frequently, and 599 on 30/12. All three have small stations and antennas but they are good CW operators.

Recently, I asked Ted to elaborate on his regular contacts with G3CCH and SM7AED. He replied with a very interesting letter which should interest readers; I hope to include it in my notes when space is available.

Calling Frequencies

Again! The recent Ross Hull Memorial Contest and the VHF/UHF Field Day have brought the use of 50.110 in particular and also 144.100 MHz to the fore. Several strongly worded messages appeared on the packet system condemning the use of calling frequencies for contest contacts, Es contacts and testing of stations etc.

I often monitored 50.110 and 144.100. Certainly there were many CQ calls made on 50.110, but at least most operators did move to another frequency to continue the contact. I noted plenty of activity between 50.120 and 50.200. Those who remain on 50.110 don't care anyway and are unlikely to shift whatever may be said or written. Over the years I've done my best to have operators keep the frequency for international DX working, so it seems we are forced to live with the situation. It occurs overseas, so I assume it is a universal problem.

Personally, I would prefer that the matter be approached from another angle. For the purposes of all calling, except for international DX which remains on 50.110, we should mutually agree upon a VK/ZL call frequency, to be used only for establishing a contact before moving elsewhere. May I have the temerity to suggest that 50.130 MHz be established for such purposes. If all those who care, and they are the majority, want to originate a call on a set frequency, then use 50.130 and ignore those who call on 50.110, but you will need strength of character to do it!

I understand that Europe uses 50.125 as an Es and local calling frequency. Using 50.130 reduces the possibility of splatter on 50.110 from very strong SSB stations and key clicks from some CW stations. If 50.130 should not be used for a particular reason, then someone please tell me. To go back to 52.050 or 52.100 MHz, as has been suggested, is a backward step and is unlikely to be supported by six metre operators!

From here on, for VK/VK, VK/ZL and ZL/ZL contacts, let us commence calling on 50.130 MHz, then move HIGHER for a contact. By moving higher you leave a space for a genuine DX station to move off 50.110 after establishing contact. Set your second VFO on 50.110 so you can quickly switch to that frequency for monitoring purposes. DX calls on 50.110 should not mean you are seeking an answer from VK or ZL stations. Let us give it a try as of now. WIA members spread the word to others.

From VK3SIX

Progress of Cycle 23.

The regression model (SESC) of Cycle 23 has been revised. The curve has been steepened and will be one-third the way to the peak by early 1998. It will depart from the projected curve about midway through next year with an SSN expected to be approx 75. The present SSN is 20 so its going to rise quickly. This projection is a mean approximation.

DXpedition VK9X and VK9Y/C

A German group, QSL via DK7NP, will activate Christmas Island VK9XY from 4/2, and Cocos/Keeling VK9CR until 23/2. Six metre operations will occur.

Closure

Out of space, must close.

Thought 1: Winning isn't everything – but wanting to win is; and

Thought 2: Bad conscience is a conscience doing its duty.

73 from The Voice by the Lake.
**PO Box 169, Meningie SA 5264*
Fax: (085) 751 043
Packet: VK5LP@VK5WI.#ADL.#SA.AUS.OC

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What's New

Bob Tait VK3UI introduces new products of interest to radio amateurs*

Casspak Modem

Geoff Page of the **Australian Amateur Packet Radio Association** (AAPRA) advises about the release of "Casspak" from AAPRA. As the name implies, "Casspak is a simple packet modem built into a cassette case". Casspak comes complete with leads to connect it between the COM port of your computer and the radio.

AAPRA recommend that if you load Baycom software into your computer, you may obtain a registered copy and manual from AAPRA.

For further information write to AAPRA at 59 Westbrook Ave Wahroonga NSW 2076 or phone (02) 489 4393

Kenwood Open Day

Kevin Cavanagh and **Kenwood** will be holding an open day in Brisbane on 30 March at the Greek Community Centre, 29-31 Edmondstone St, South Brisbane at 9:00 am.

If you want to see the latest in amateur equipment, mark this date in your diary. The event will be opened by the Wireless Institute of Australia Queensland Division President Mr G Sanders VK4KEL. A number of presentations will be held throughout the day.

New from Kevin Cavanagh

Kevin advises that he has a number of new items this month which include the:

- HAL Communications P38 DSP multi-mode data controller, a full size plug-in card for your computer which will run RTTY, AMTOR, Pactor and Clover II waveforms.
- Advanced Electronic Applications DSP-232 which uses the 32 bit Motorola 68340 processor and Analog Devices 21o5 DSP, includes 17 modems in total including two BPSK satellite modems, and can handle new coding systems as they are developed, according to AEA.
- Patcomm PC1600, a state-of-the-art HF transceiver designed for digital modes of communication, with standard software supports for RTTY, ASCII, CW, AMTOR, Pactor, and packet, covers 1.5 to 30 MHz, and includes a direct IBM keyboard interface allowing full control.

For further details contact Kevin Cavanagh on (074) 643 963 or write to 222 Brisbane Valley Highway, Wanora, QLD 4306.

**C/o PO Box 2175, Caulfield Junction VIC 3161*

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HF PREDICTIONS

Evan Jarman VK3ANI

The Tables Explained

These charts were prepared using one of the IPS stand-alone prediction systems. They show the diurnal variation in ionospheric conditions. The legend below indicates how each of the frequencies is plotted.

Those frequencies are:-

ALF Absorption limiting frequency
MUF Maximum useable frequency
OWF Optimum working frequency

The T index used is shown in the legend.

Also included is the path bearing for the Australian station of each circuit. The short path is displayed unless indicated.

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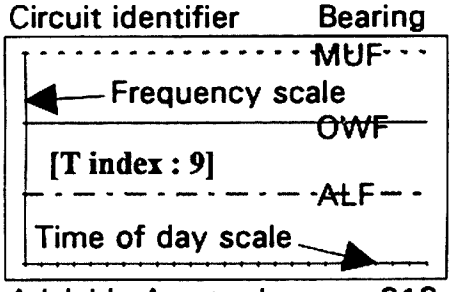
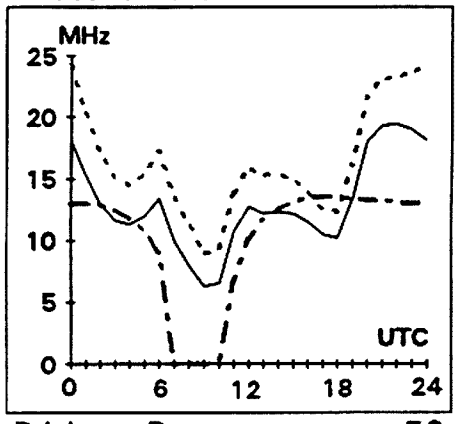
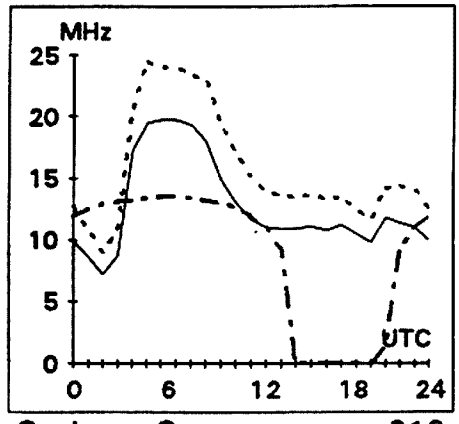


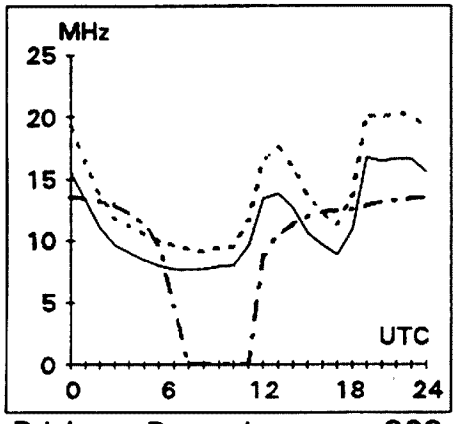
Brisbane-Barbados 109



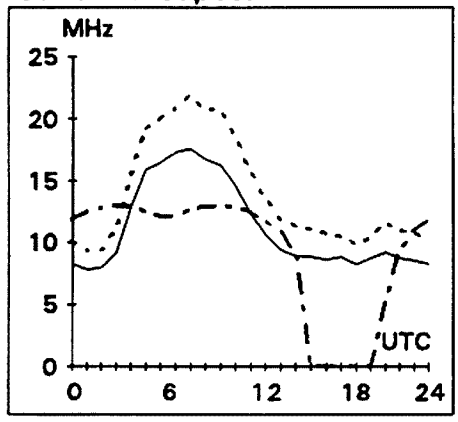
Canberra-Cairo 283



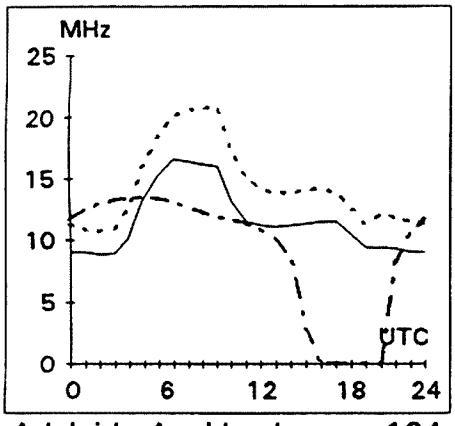
Brisbane-Boston 56



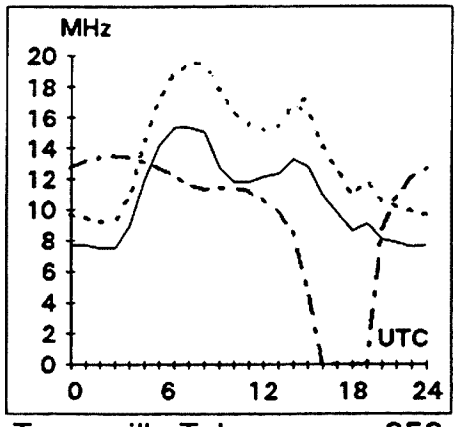
Canberra-Capetown 219



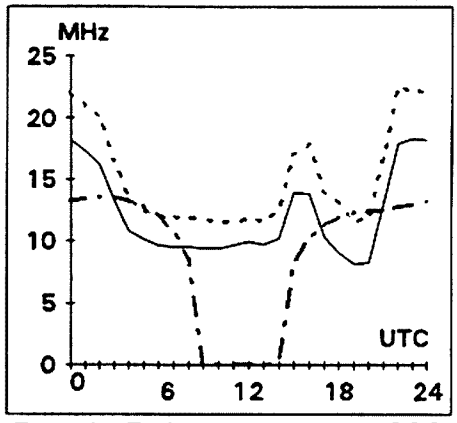
Adelaide-Amsterdam 313



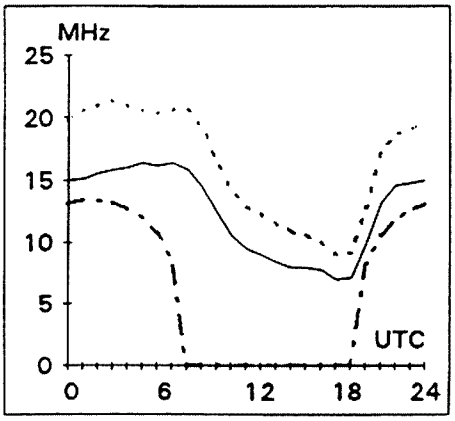
Brisbane-Brussels 323



Darwin-Denver 50



Adelaide-Auckland 104



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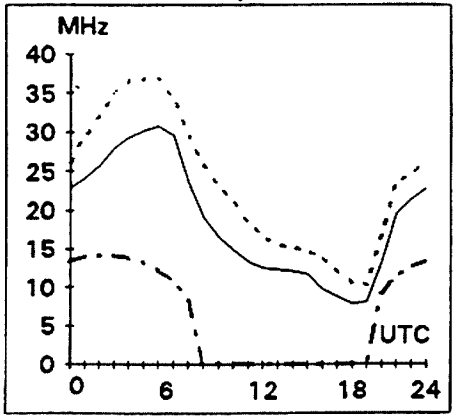

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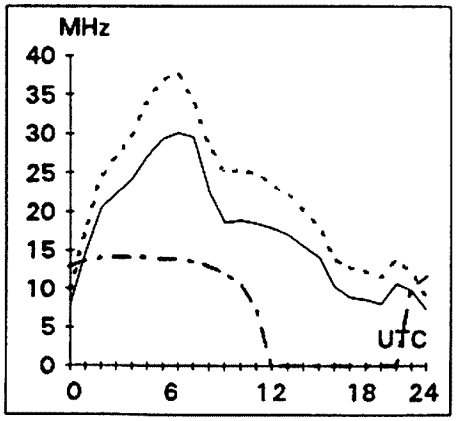

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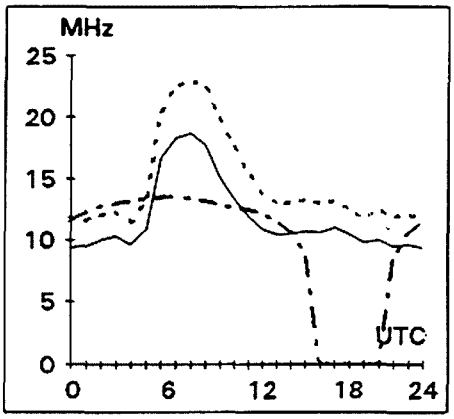
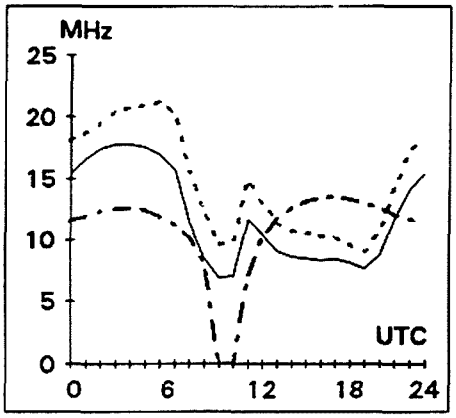
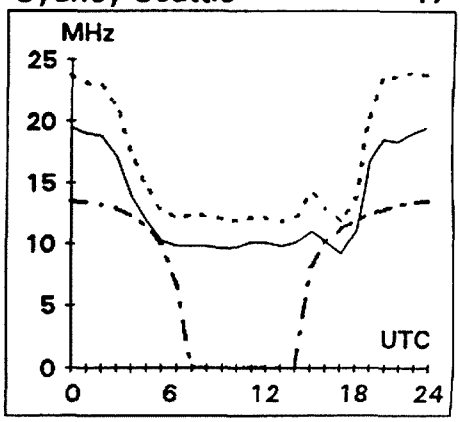


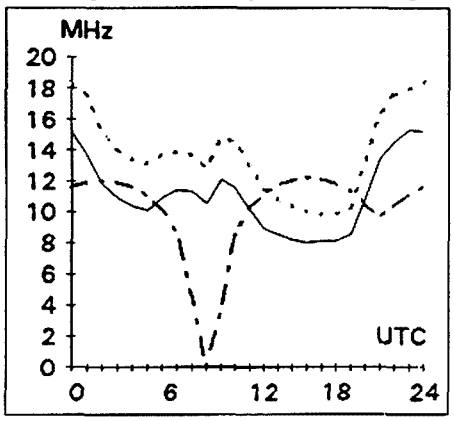
Perth-Panama 145



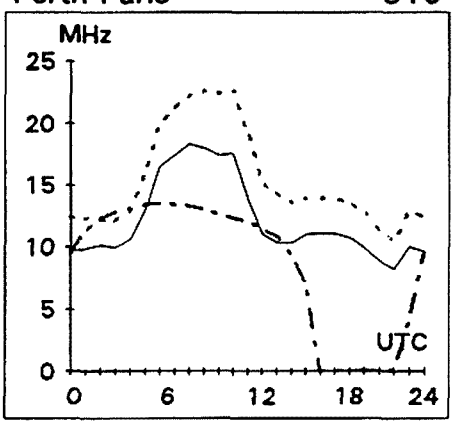
Sydney-Seattle 47



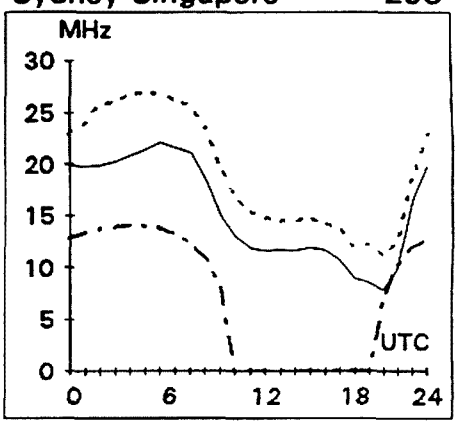
Melbourne-Montevideo 162



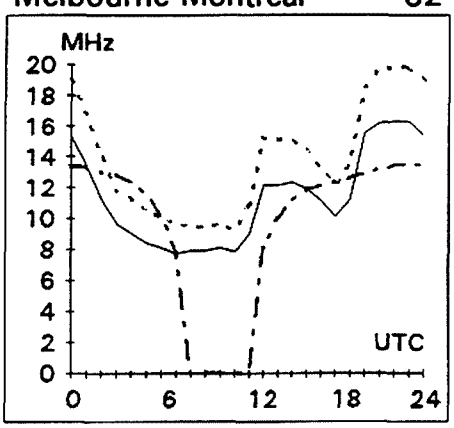
Perth-Paris 310



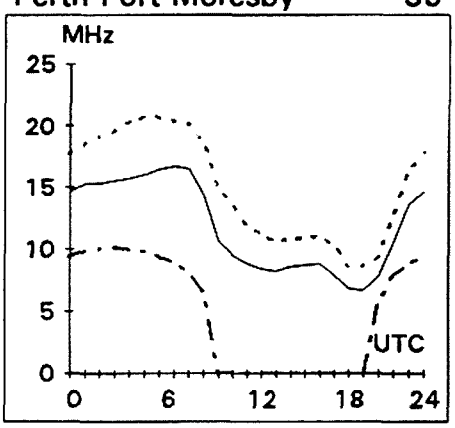
Sydney-Singapore 298



Melbourne-Montreal 62



Perth-Port Moresby 59



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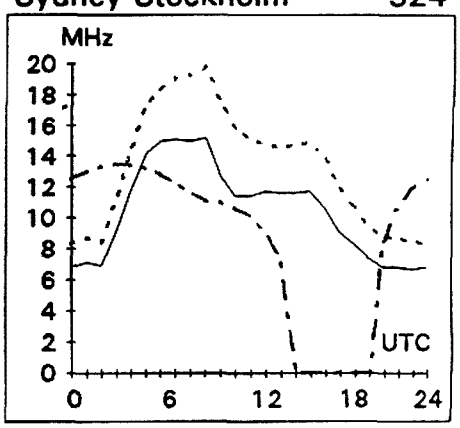

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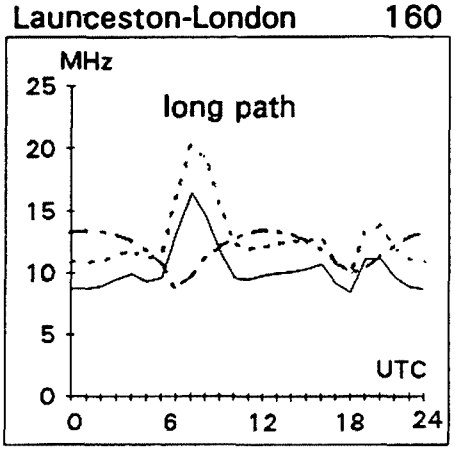

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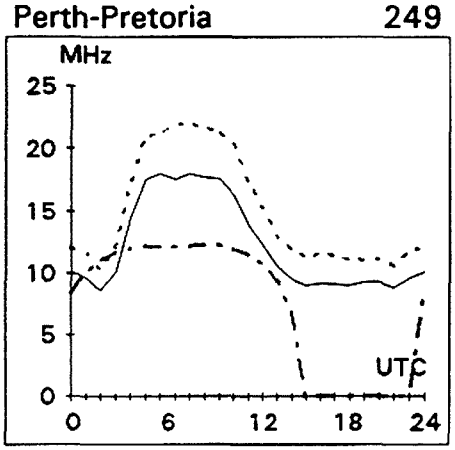

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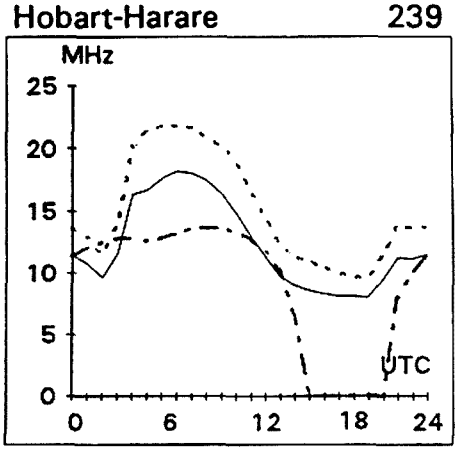

HAMADS

TRADE ADS

• AMIDON Ferromagnetic Cores: For all RF applications. Send business size SASE for data/price to **RJ & US Imports,** PO Box 431, Kiama NSW 2533 (no enquiries at office please ... 14 Boanyo Ave Kiama). Agencies at: Geoff Wood Electronics, Sydney: Webb Electronics, Albury: Assoc TV Service, Hobart: Truscotts Electronic World, Melbourne and Mildura: Alpha Tango Products, Perth: Haven Electronics, Nowra: and WIA Equipment Supplies, Adelaide.

•. WEATHER FAX programs for IBM XT/ATs *** "RADFAX2" $35.00, is a high resolution shortwave weatherfax, Morse and RTTY receiving program. Suitable for CGA, EGA, VGA and Hercules cards (state which). Needs SSB HF radio and RADFAX decoder. *** "SATFAX" $45.00, is a NOAA, Meteor and GMS weather satellite picture receiving program. Needs EGA or VGA & WEATHER FAX PC card, + 137 MHz Receiver. *** "MAXISAT" $75.00 is similar to SATFAX but needs 2 MB of expanded memory (EMS 3.6 or 4.0) and 1024 x 768 SVGA card. All programs are on 5.25" or 3.5" disks (state which) plus documentation, add $3.00 postage. ONLY from **M Delahuntly,** 42 Villiers St, New Farm QLD 4005. Ph (07) 358 2785.

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ACT - VK1

• **Uniden** 2020 transceiver, manual, mic, matching speaker, low pass filter, $500; Ant **KWMatch,** $100; **18AVQ,** 5 band vertical, $100; **SWR bridge,** $75; Set of **5 helical whips,** spring mount, $150. Ev VK1BE QTHR (06) 281 3301.

NSW - VK2

• **Swan T/M** 700CX s/n 19372, power supply 230X, s/n 2253, crystal filter 16 pole, complete with circuits, spare valves 8950, $700; **KDK F/M2016A/E** 2 m/TM NR5581 with 5 amp power supply, manuals, swr bridge, $200. Large range **home brew items.** Licd amateurs only. H Chapman (047) 33 4641.

• **Model 15 teleprinter.** Any offers? Noel VK2YXM (02) 871 3079.

• **10 el 2 m beam,** rotator, control, swr, coax, purchaser to remove, $20; **Sullivan precision osc,** 0-12 kHz, rack 52 cm x 183 cm $0; Thorn TV cam spare vidicons lens, $20; **Aust GE PE cell unit,** timer, light source, $10; GR (USA) precision "condenser", $5; **Coil winder** trans, core bobbins, winding wires 30 spools, baking oven, $30; **Square wave generator,** $10; **Noise and distortion meter,** $15. Arthur Brown VK2IK QTHR (02) 876 1465.

• **Laptop Compaq,** 12 V or AC, 286, LCD, $200; Faulty Compaq LTE-286 (no hardisk), $100; 486 **DX2/66,** 4/525, 14" SVGA monitor, key/b, mouse, $1,200. Neville VK2QF QTHR (063) 73 8624.

• **Eddystone** shipboard LF, MF and HF mantel Rx in excellent working order, $150; **BC221** freq meter, refurbished, with PSU, $65. Brian VK2GCE QTHR (02) 545 2650.

VIC - VK3

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• **FT101E,** ec, cables, workshop manual, no mods, $500; Try RTTY, **Tono 7000E,** manual, $350; **On-glass** antenna, 144-174 MHz, new, $90. Bob VK3UY (03) 9374 2416.

• **Kenwood TS660** tribander, 21-24-28-50 MHz, with microphone and instruction book, $475; **Kenwood TS520S** HF transceiver, with desk mike and instruction book, $390. B. Sparks VK3TCM (050) 25 7297.

• **Yaesu FTDX401** HF xcvr, 400 W o/p, **FV401** ext VFO, matching speaker, desk microphone, **YC601** digital display, all in vgc, used 10 times in last 6 years, $600 ono the lot. Steve VK3TSR (018) 103 487 BH or (059) 64 7742 AH. LAO.

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• **Kenwood TS850S** HF transceiver, with inbuilt ATU, 14 months old, vgc, $3,300. Jim VK3NR (03) 9367 6920.

• **Estate clearance** VK3MKC. **Kenwood TS450SAT, PS32,** $2,200; **Icom R71A** HF receiver, $1,000; **Icom** R7000 VHF/UHF receiver, $1,200. All equipment ono. Enquiries, Lee VK3PK (052) 50 1105 AH.

SA - VK5

• **Shack clearance.** Antennas, new and used radio equipment, RF adaptors, RFDS antenna base with spring, much more. All must be sold. Send SASE to PO Box 76, Peterborough SA 5422, or phone Paul VK5MAP (086) 51 2398.

• **Hills** 12.6 m, 2 **section,** cyclonic, triangular, **winch-up tower,** includes antenna, cable and guy wire. To be removed by purchaser, $900. This is part of a deceased estate. Phone (086) 82 2168 for further information. Henry VK5KUJ.

WA - VK6

• Triangular **Hills** 75 foot, three section, telescopic, **windup mast,** tilt over facility, with accessories, in excellent condition, $400. Sydney VK6HE (09) 293 2347.

WANTED

NSW - VK2

• Australian and NZ **WWII HF military comms equip** and documentation. Pay cash or trade for US military similar. Brian VK2GCE QTHR (02) 545 2650 AH or fax (02) 221 7774.

• **Morse keys,** especially Mecograph or The McDonald Pendograph or any unusual Australian keys or Jiggers. Pay top dollar for any of the above. Steve VK2SPS (02) 9999 2933 after 6.00 pm.

• **HF linear amplifier,** minimum power 400 W pep. R Jensen VK2BJE (02) 9966 1150 AH or fax (02) 9966 1165.

• **D/F loop and visual indicator,** for a restoration of an R1155 receiver. I need a direction finding loop from an aircraft of 1940-60 vintage and a visual indicator instrument, which is a meter with two needles and a scale labeled L and R. Any help welcome. Ray VK2ZON QTHR (02) 489 8561.

QLD - VK4

• **TS830S, TS930S** or similar transceiver, must include narrow CW filter and be fully operational. Russ VK4XA QTHR (07) 3263 6812.

SA - VK5

• **Volt meter 0-20 V** 70 mm x 70 mm, must be in good condition and good working order. **Also** EAT300 Emtron tuner (not cross needle), must be in good condition. Paul VK5MAP (086) 51 2398.

• **Kenwood TR9000** 2 m transceiver, GWC and manual. Eric VK5LP (085) 75 1531 after 0000z.

MISCELLANEOUS

•. The WIA QSL Collection requires QSLs. All types welcome, especially rare DX pictorial cards, special issue. Please contact Hon Curator Ken Matchett VK3TL, 4 Sunrise Hill Road, Montrose Vic 3765, Tel (03) 728 5350.

•. Remember HAMAD in the December issue about giving away **Rola 33B magnetic tape reproducer?** Please read "Over to You". Yuri VK5ZYS QTHR (08) 45 8492.

ar

Technical Correspondence

All technical correspondence from members will be considered for publication, but should be less than 300 words.

TH3JR Problems

Referring to the article by Gerry Wild VK6GW on his TH3JR antenna in the December 1995 issue of *Amateur Radio*, I would like to mention the problem I had with mine.

It was due entirely to corrosion around the head of the screw (see Fig 1 of Gerry's article), with resultant loss of contact between the inner and outer tubes.

The original screws were cad-plated steel self-tappers, so I replaced the lot with similar stainless steel screws. Since then I have had no further trouble.

I hope this fix will be of interest to owners of the TH3JR antenna.

Stewart Backhouse VK3NV
34-36 Seaview Parade
Dromana VIC 3936
ar

■ **People**

International Travel Host Exchange

Continued from page 25

letter reached me and it was too late to be of much help, but I am on their list for another trip down here. A few months ago I had a letter from a ZL asking for advice and although I replied both by mail and to the packet address he gave I have heard nothing from him.

List of VK Participants

VK1HK Mr Harvey Kenneth Skegg, 85 Summerland Circuit, Kambah ACT 2902. 06 2314852

VK2CWS Mr & Mrs Casey & Mary Schreuder, 33 Gwydir St, Engadine NSW 2233. 02 5204424

VK2EJH Mr Jim Hayes, 1 Kathleen Cres, Woonona NSW 2517. 042 849317

VK2GKA Mr Karl Ahamer, 30 Ascot Rd, Bowral NSW 2576. 048 612702

VK2KUZ & VK2MKJ Mr Barry & Mrs Anne Gilmour, PO Box 12, Mount Austin NSW 2650. 069 254878

VK2NET Mr John Richardson, 13 Ranch Ave, Glenbrook NSW 2773. 047 393525

VK2SW Mr & Mrs Sid Ward, 33 White Ave, Wagga Wagga NSW 2650. 069 226082

VK2YXM Mr Noel May, 88 New North Rocks Rd, North Rocks NSW 2151. 02 8713079

VK3BR Mr Bill Roper, 3 Tamar Court, Mentone VIC 3194. 03 95849512

VK3CIT Mr Ash Nallawalla, PO Box 539, Werribee VIC 3030. 03 97419302

VK3DJM/GW3WIT Mr John Miller, 16 Omaroo Rd, Frankston VIC 3199. 03 97896587

VK3KSE Mr Eric Simpson, 11 Drury Lane, Hoppers Crossing VIC 3029. 03 97492040

VK3OM Mr Ron Fisher, 24 Sugarloaf Rd, Beaconsfield Upper VIC 3808. 059 443019

VK3QQ Mr Tony Tregale, 73 Nepean St, Watsonia VIC 3087. 03 94343810

VK4??? Mr Alan Viegas (ex VK8AV), Box 2274, Chermside Centre, QLD 4053

VK4FVC Mr Vernon Crabb, 'Stirling' Balgal Rd, Rollingstone QLD 4816

VK4UA Mr William A Wells, Lot 20 Kiama Ct, Pimpama QLD 4209. 075 467041

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VK6LT Mr Bill Toussaint, 9 Desford Close, Shelley WA 6155

VK7JK Mr John Rogers, 1 Darville Court, Blackman's Bay TAS 7052. 002 293402

**PO Box 539, Werribee VIC 3030*
E-mail: ash@melbpc.org.au
Fax: (03) 9742 4566 BH & AH
ar

Hamads

Please Note: If you are advertising items For Sale and Wanted please use a separate form for each. Include all details: eg Name, Address, Telephone Number (and STD code), on both form. Please print copy for your Hamad as clearly as possible.
* Eight lines per issue free to all WIA members, ninth line for name and address Commercial rates apply for non-members. Please enclose a mailing label from this magazine with your Hamad.
* Deceased Estates: The full Hamad will appear in AR, even if the ad is not fully radio equipment.
* Copy typed or in block letters to PO Box 2175, Caulfield Junction, Vic 3161, by the deadlines as indicated on page 1 of each issue.
* QTHR means address is correct as set out in the WIA current Call Book.

* WIA policy recommends that Hamads include the serial numb,er of all equipment offered for sale.
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Ordinary Hamads submitted from members who are deemed to be in general electronics retail and wholesale distributive trades should be certified as referring only to private articles not being re-sold for merchandising purposes.
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WIA Divisions

The WIA consists of seven autonomous State Divisions. Each member of the WIA is a member of a Division, usually in their residential State or Territory, and each Division looks after amateur radio affairs within its area.

Division	Address	Officers			Weekly News Broadcasts		1996 Fees
VK1	ACT Division GPO Box 600 Canberra ACT 2601	President Secretary Treasurer	Rob Apathy Len Jones Alex Colquitt	VK1KRA VK1NLJ VK1AC	3.570 MHz LSB, 146.900 MHz FM each Wednesday evening commencing at 8.00 pm local time. The broadcast text is available on packet, on Internet aus.radio.amateur.misc newsgroup, and on the VK1 Home Page http://email.nla.gov.au/~cmakin/wiaact.html	(F) (G) (S) (X)	$70.00 $56.00 $42.00
VK2	NSW Division 109 Wigram St Parramatta NSW (PO Box 1066 Parramatta 2124 Phone (02) 689 2417 Freecall 1800 817 644 Fax (02) 633 1525	President Secretary Treasurer (Office hours Web:http://sydney.dialix.ozau/~wiansw e-mail address: wiansw@sydney.dialix.oz.au	Michael Corbin Eric Fossey Eric Van De Weyer Mon-Sat 11.00-14.00 Mon 1900-2100)	VK2YC VK2EFY VK2KUR	From VK2WI 1.845, 3.595, 7.146*, 10.125, 24.950, 28.320, 29.120, 52.120, 52.525, 144.150, 147.000, 438.525, 1281.750 (* morning only) with relays to some of 14.160, 18.120, 21.170, 584.750 ATV sound. Many country regions relay on 2 m or 70 cm repeaters. Sunday 1000 and 1930. Highlights included in VK2AWX Newcastle news, Monday 1930 on 3.593 plus 10 m, 2 m, 70 cm, 23 cm. The broadcast text is available on packet.	(F) (G) (S) (X)	$66.75 $53.40 $38.75
VK3	Victorian Division 40G Victory Boulevard Ashburton Vic 3147 Phone (03) 9885 9261 Fax (03) 9885 9298	President Secretary Treasurer (Office hours Tue & Thur 0830-1530)	Jim Linton Barry Wilton Rob Hailey	VK3PC VK3XV VK3NC	VK3BWI broadcasts on the 1st and 3rd Sunday of the month, starts 10.30 am. Primary frequencies 3.615 LSB, 7.085 LSB, and FM(R)s 146.700 Mt Dandenong, 147.250 Mt Macedon, 147.225 Mt Baw Baw, and 2 m FM(R)s VK3RMA, VK3RSH and VK3ROW. 70 cm FM(R)s VK3ROU and VK3RGL. Major news under call VK3WI on Victorian packet BBS.	(F) (G) (S) (X)	$72.00 $58.00 $44.00
VK4	Queensland Division GPO Box 638 Brisbane QLD 4001 Phone (074) 96 4714	President Secretary Treasurer	Geoff Sanders John Stevens John Presotto	VK4KEL VK4AFS VK4WX	1.825 MHz SSB, 3.605 MHz SSB, 7.118 MHz SSB, 14.342 MHz SSB, 28.400 MHz SSB, 29.220 MHz FM, 52.525 MHz FM, 146.700 MHz FM, 147.000 MHz FM, 438.525 MHz (Brisbane only), regional VHF/UHF repeaters at 0900 hrs Sunday. Repeated on 3.605 MHz SSB & 147.000 MHz FM, regional VHF/UHF repeaters at 1930 hrs EAST Monday. Broadcast news in text form on packet under WIAQ@VKNET.	(F) (G) (S) (X)	$72.00 $58.00 $44.00
VK5	South Australian Division 34 West Thebarton Rd Thebarton SA 5031 (GPO Box 1234 Adelaide SA 5001) Phone (08) 352 3428	President Secretary Treasurer	Garry Herden Maurie Hooper Charles McEachern	VK5ZK VK5EA VK5KDK	1827 kHz AM, 3.550 MHz LSB, 7.095 AM, 14.175 USB, 28.470 USB, 53.100 FM, 147.000 FM Adelaide, 146.700 FM Mid North, 146.800 FM Mildura, 146.825 FM Barossa Valley, 146.900 FM South East, 146.925 FM Central North, 147.825 FM Gawler, 438.425 FM Barossa Valley, 438.475 FM Adelaide North, ATV Ch 35 579.250 Adelaide. (NT) 3.555 USB, 7.065 USB, 10.125 USB, 146.700 FM, 0900 hrs Sunday	(F) (G) (S) (X)	$72.00 $58.00 $44.00
VK6	West Australian Division PO Box 10 West Perth WA 6872 Phone (09) 351 8873	President Secretary Treasurer	Cliff Bastin Mark Bastin Bruce Hedland-Thomas	VK6LZ VK6OO	146.700 FM(R) Perth, at 0930 hrs Sunday, relayed on 1.825, 3.560, 7.075, 14.116, 14.175, 21.185, 29.680 FM, 50.150 and 438.525 MHz. Country relays 3.582, 147.350(R) Busselton and 146.900(R) Mt William (Bunbury). Broadcast repeated on 146.700 at 1900 hrs Sunday. relayed on 1.865, 3.563 and 438.525 MHz; country relays on 146.350 and 146.900 MHz.	(F) (G) (S) (X)	$60.75 $48.60 $32.75
VK7	Tasmanian Division 52 Connaught Crescent West Launceston TAS 7250 Phone (003) 31 9608	President Secretary Treasurer	Andrew Dixon Robin Harwood Terry Ives	VK7GL VK7RH VK7ZTI	146.700 MHz FM (VK7RHT) at 0930 hrs Sunday relayed on 147.000 (VK7RAA), 146.725 (VK7RNE), 146.625 (VK7RMD), 3.570, 7.090, 14.130, 52.100, 144.150 (Hobart) Repeated Tues 3.590 at 1930 hrs.	(F) (G) (S) (X)	$72.00 $58.00 $44.00
VK8	(Northern Territory is part of the VK5 Division and relays broadcasts from VK5 as shown received on 14 or 28 MHz).						

Note: All times are local. All frequencies MHz.

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Amateur Radio

APRIL 1996
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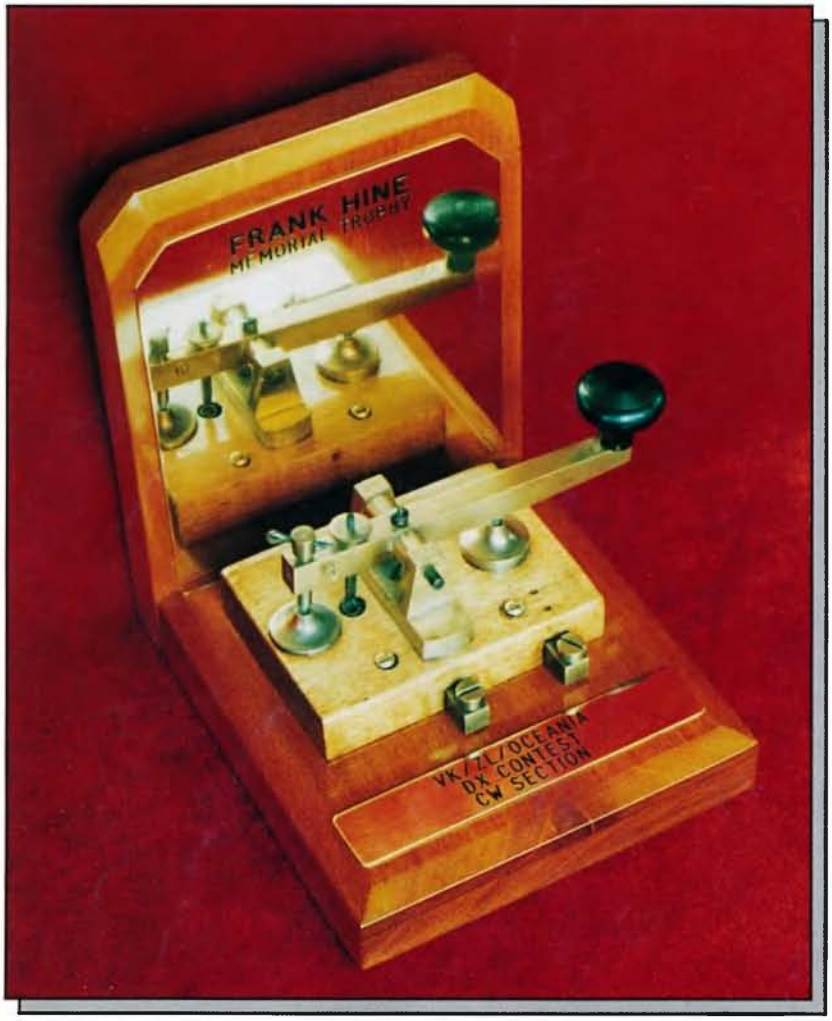
Journal of the Wireless Institute of Australia



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IN THIS ISSUE:

* Part 2 of VK5RG's series - *Some Useful Wire Antennas for HF*

* VK5BR explores the *Output Balance of the Z Match*

* VK3KRO asks, *Is Your Mobile Gear Insured?*

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Amateur Radio

Journal of the Wireless Institute of Australia

Vol 64 No 4 ISSN 0002-6859 April 1996

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Cover

This magnificent trophy, the Frank Hine Memorial Trophy for the VK/ZL/Oceania DX Contest CW Section, was donated to the WIA by Susan Hine, the daughter of the late Frank Hine VK2QL (see the article on page 25). The trophy features the original Morse key used by Frank Hine when he first became an amateur radio operator in 1935.

BACK ISSUES
Available, only until stocks are exhausted, at $4.00 each (including postage within Australia) to members.

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When back issues are no longer available, photocopies of articles are available to members at $2.50 each (plus $2.00 for each additional issue in which the article appears).

The opinions expressed in this publication do not necessarily reflect the official view of the WIA, and the WIA cannot be held responsible for incorrect information published.

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Representing the Australian Amateur Radio Service - Member of the International Amateur Radio Union
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Editor's Comment

More Survey Results

As mentioned in the February *Editor's Comment*, the closing date for survey responses was extended to 28 February. This has brought in a good number of additional entries; in fact, almost doubling the total to about 8% of membership.

In addition to the preliminary figures given in the March *Editor's Comment* on the topics which you would like to see increased or reduced, we now have a larger and more statistically significant sample. But there has been very little change in the percentages, so the original 4% sample was probably large enough to be quite valid.

More difficult to assess is the range of viewpoints covered by the "write- in" questions 8 and 9. It was very interesting to see how wide a span of opinions was revealed. For example, a few saw little merit in *Over to You* and thought it should be scrapped! Almost as many valued it so much that they thought it should be expanded to occupy all non-technical space!

Perhaps, when I referred in March to the probability of many younger amateurs being on the Internet, it was partly a joke. I had not, at that stage, seen the detailed returns but, of those who want more topics covered by *Amateur Radio*, a large proportion want columns on computers and digital technology and interfacing to amateur systems.

We have only two problems as regards a computer column. To make space we will have to reduce something else (difficult, but not impossible), and we need a competent person to write it. Do we have any volunteers? There may be merit in expanding the *Packet World* segment to include other computer applications, but its author, Grant Willis VK5ZWI, would need to become a team!

Many members used their survey form to complain about late delivery of the February issue. This was completely out of our control, and the reason was explained on page 26 of the March issue of *Amateur Radio*. We hope such a mailing delay is never repeated.

Another frequent comment was on the size of type in *Amateur Radio*. A number would like it to be larger; but some also wanted it smaller! With this issue we are changing to a different style of typeface, hopefully more readable, as suggested by its use in the vast majority of newspapers.

There are many other suggestions which have been made. In most cases they show a praiseworthy depth of interest in the future of amateur radio and this magazine. Over the next few months we will be considering them in detail. But, to conclude this month's brief review, we have been flattered by the number of readers who want no change to the magazine; something like 35% of respondents are happy with *Amateur Radio* "as-is". We must be doing some things the right way!

Survey Winner

By a process of random selection of survey responses, the lucky winner of a year's free WIA subscription is Bob Gebhardt VK5RI. Congratulations Bob!

Bill Rice VK3ABP — Editor

CONTRIBUTIONS TO AMATEUR RADIO

Amateur Radio is a forum for WIA members' amateur radio technical experiments, experiences, opinions and news. Manuscripts with drawings and/or photos are always welcome and will be considered for possible publication. Articles on computer disk are especially welcome. The WIA cannot assume responsibility for loss or damage to any material. *"How to Write for Amateur Radio"* was published in the August 1992 issue of *Amateur Radio*. A photocopy is available on receipt of a stamped, self addressed envelope.

■ WIA News

Roger Harrison VK2ZRH, Federal Media Liaison Officer

Submission on Licensing Circulated to Parliamentarians and Election Candidates

During the week before the 2 March federal election, the Federal WIA released an "Exposure Draft" of the Submission to the Parliament on Amateur Radio Licensing. Copies of the 40-page document were circulated to candidates standing for the federal election for the House of Representatives and half the Senate. Copies were also sent to sitting members of the Senate. In all, some 500 copies were distributed.

All WIA Divisions and Federal Councillors were sent copies of the Submission.

The Exposure Draft is published as a 16-page supplement in this issue.

When the new Government's ministry was announced in early March, the WIA wrote a follow-up letter to the new Minister for Communications and the Arts, Senator Richard Alston.

The initial objective of the Exposure Draft is to gain exposure for our cause. This Exposure Draft is **NOT** the final Submission; that will come later and is expected to include considerably more detail evidencing the value of amateur radio to the community. In the final event, the WIA will be dealing with the 38th Parliament on this issue, negotiating for the benefit of all Australian radio amateurs. In order to successfully pass through the committee systems of the Lower House and the Senate, we need to gain the interest and support, not only of the Government, but the Opposition and minority party members of Parliament.

The Submission has necessarily taken time to develop, needing research into what the WIA had previously thought and advocated in earlier submissions to Government and the regulators. It required research into what issues Parliamentarians were sensitive to, and which amateur radio activities to promote particularly.

The legislative actions of the Parliament and the policies of the major parties have been drawn upon to support the Submission's line of argument, which should certainly resonate with Parliamentarians.

It could never have been expected that a hastily devised submission of a few short pages, relying on irrelevant history and emotive argument would achieve much, other than parliamentary scorn. Simply demanding a change to administrative arrangements from the Government last year was considered to expose the Amateur Radio Service to further administrative changes in years to come under a different Government or administration; it was felt that a more permanent change was called for, or else amateurs would be battling further unwarranted fee rises in years to come. For these reasons, the Submission proposes changes to the Radiocommunications Act to effect a more permanent status for the licensing of the Amateur Radio Service and to separate it from the policy of price-based access to spectrum which contributed to the proposed huge rise in fees 15 months ago, to which the amateur radio fraternity objected.

It is expected that the Exposure Draft of the Submission will flush out opposition to the arguments and proposals. This will allow the Institute to see where the opposition arises and provide a chance to counter it effectively in a second draft. The publication and circulation of the Exposure Draft will also allow time for further discussion within the amateur radio fraternity, time for the Institute to advocate the objectives of the proposals and refine the details and supporting material in response to feedback. It will also provide time to search out allies to our cause within the radiocommunications community, and perhaps elsewhere.

Following this process, a final Submission will be drafted. This process parallels the Parliamentary process in developing policy and legislation, and will thus be seen by Parliamentarians as legitimising the Submission.

Submission Summary

The goals of the Submission are threefold:

1. to achieve formal recognition by the Parliament that the Amateur Radio Service is of value to the Australian community in a variety of ways;
2. that there is a better way for the administration to license radio amateurs;
3. that there is consequently a way in which licence fees can be greatly reduced.

The Submission presents a detailed picture of the different ways in which the Amateur Radio Service is of value to the community. Six key areas are highlighted:

1. education and self-training;
2. motivating young people to take up scientific or technological careers;
3. contribution to the advancement of scientific knowledge;
4. contribution to the development of technology;
5. providing communications during emergencies; and
6. supporting community events.

Issues raised in key public service and Government research reports, papers and statements are related to the evidence presented in the Submission, showing how the Amateur Radio Service impinges on the issues of concern, and contributes value to the community.

The Submission details the current three licensing systems:

Apparatus Licensing – under which radio amateurs are licensed; Class Licensing; and Spectrum Licensing; and shows why none of these three systems suits the Amateur Radio Service.

Apparatus Licensing is a poor licensing model for amateur radio because it is prescriptive, focusing on equipment, its location, and uses. The licence fee policy for Apparatus Licensing puts a value on the "scarcity" of, and "demand" for, spectrum and acts as a "rationing" device – all economic concepts entirely unsuited to the Amateur Radio Service, which is, by definition, non-commercial.

The Apparatus Licence fee framework has been severely distorted to arrive at the current amateur licence fee, making a mockery of the policy.

Class Licensing is for equipment of specified kinds and/or for a specified purpose, and Class Licences are not issued to individual users. The Submission argues that this is of no use to radio amateurs.

Spectrum Licensing also has limitations for the Amateur Radio Service. Firstly, it has a clear commercial purpose, as it is policy that Spectrum Licences will be allocated by a price-based allocation system. That is, spectrum will be auctioned. In any case, Spectrum Licences have a 10-year tenure, and there's no automatic right of renewal. This, also, is of no use to radio amateurs.

In the light of all this, the WIA Submission *proposes* that the 38th Parliament establish a new licensing category under the Radiocommunications Act, to be known as the **Amateur Operator** Licence.

The present seven licence sub-types would remain. That is: Unrestricted, Limited, Intermediate, Novice, Novice Limited, Beacon and Repeater.

Further, the Submission proposes that **no spectrum tax** be levied, in recognition of the value of amateur radio to the community. The net cost of this to the Government would be just $200,000. The present $3 Spectrum Management charge would be retained.

The Submission proposes that administrative charges could be reduced through reduction in the administrative contact between radio amateurs and the SMA. It is pointed out that the administrative charge proposed in 1994 was $25, which rose to $38 when the $51 licence fee was introduced in March 1995. This rise has never been explained.

Administrative charges could be reduced, firstly, by having a licence term of five years, which is already allowed under the Act.

Secondly, it is proposed to separate the *issue* of a licence and the *allocation* of a call sign. Call sign administration is proposed to be devolved to the WIA. Call signs don't need to be "renewed" in the same way the licence needs to be renewed. Annual renewal would be unnecessary. Most amateurs keep a call sign for an average of ten years anyway, according to the SMA. Those amateurs who upgrade their licence change their call sign more frequently. The WIA would provide licensees' call signs to the SMA for their database in a block, say every quarter, which would reduce the SMA's administrative expenses.

The present routine for obtaining a licence would be retained. Candidates would still obtain the relevant qualification for a Certificate of Proficiency through the present amateur examination system, which was devolved to the WIA in 1992. In future, it is envisaged that issuing of Certificates of Proficiency might also be devolved to the WIA.

When the time comes to formally approach the Government with the final submission, our position will be much stronger because we will be able to claim rightfully that the submission has been developed from debate within the amateur radio fraternity.

We have a long way to go, but the first big step has been made.

Call for Comment

Constructive commentary on the Exposure Draft is encouraged. It should be addressed to your Division Federal Councillor. Questions on any aspect of the Exposure Draft should also be addressed through your Federal Councillor.

Anyone with further information, or suggestions on sources for information, which may be relevant to the Submission, should contact the Federal Media Liaison Officer, Roger Harrison VK2ZRH, LMB 888, Woollahra NSW 2025.

Misleading Information on Submission Deadline

Letters from former Labor Government members, sent earlier this year to radio amateurs who'd enquired about Amateur Licence fees, contained an erroneous statement about the WIA allegedly agreeing to make a submission on Amateur Licence fees before the end of the 1995 financial year, that is, June.

No such commitment about the submission was made. In fact, the WIA was told by the Labor Government that the time frame to make a submission was "open ended."

The letters from Labor Government members referred to the March 1995 meeting between the WIA and the Government, saying: "... *the Government made a commitment to further review the licensing and fee structure for amateur radio operators as soon as possible. It invited the WIA to make a detailed submission on the issues affecting amateurs which the WIA agreed it would make before the end of the financial year.*"

The March 1995 meeting was with the Parliamentary Secretary to the Minister for Communications, Paul Elliott, during which the Institute was invited to make a "detailed submission" on how the Amateur Radio Service could be better licensed. In discussions with Paul Elliott's senior adviser subsequent to that meeting, the WIA outlined the difficulty in setting a short

time deadline for a "detailed submission" to be put to the Government. It was pointed out that a great deal of research would necessarily have to be put into it, evidence obtained from a wide variety of sources and a process of consultation among the seven WIA Divisions gone through. Mr Elliott's adviser generously suggested an open-ended time frame. This fact was subsequently reported in *Amateur Radio.*

As has also been published in *Amateur Radio* magazine, they said what the Government wanted was a detailed, well-argued submission and not just a further plea for reduced fees, the arguments for which were already well known. A framework for the submission was circulated and agreed by the WIA Federal Council in June last year, read out on Divisional broadcasts and published on the packet radio network, with input invited from the radio amateur community. A request for further, specific, information was circulated to Divisions in January and published on the packet radio network. The Institute has not been idle.

In a discussion between the WIA and the Minister for Communications Michael Lee's office on Thursday, 29 February 1996, the Minister's senior adviser said they were unaware that the invitation to put the submission was open-ended, and agreed that any future letters to amateurs would not mention the erroneous WIA 'commitment' to the ". . . end of the financial year" submission deadline.

As there was a change of Government on 2 March, and a new Minister for Communications and the Arts announced later (Senator Richard Alston), the WIA will be dealing in future with the new Minister.

Hang Glider Enthusiasts Moved from 2 m Amateur Band

Hang glider enthusiasts participating in a championship contest near Bright, in north-east Victoria, earlier this year were found to be using 2 m amateur transceivers for communications.

On being notified of this operation, the Spectrum Management Agency approached the contest organisers. It turns out that a few contestants from overseas were actually licensed amateurs and had obtained reciprocal licences. It seems local contestants used CB equipment, but some overseas contestants were using 2 m amateur equipment and did not have licences.

The SMA put an immediate stop to the unlicensed operations on the 2 m band and approached the Victorian Division of the WIA, asking if unlicensed contestants could be permitted to operate on a once-off, temporary basis.

Victorian President, Jim Linton VK3PC, refused as the 2 m band is one of very few exclusive amateur allocations above 30 MHz, unlicensed operation could not be condoned under the circumstances, and the Division was aware of some ill-tempered threats from local Victorian amateurs to jam the unlicensed operators that could present a safety-of-life threat, which nobody wanted.

The hang gliding contest was held up for a day while the SMA arranged licences for operation outside the 2 m band, charging each of the contestants a substantial fee for the temporary Apparatus Licence. The contest organisers were advised to make it a condition of entry in future that contestants must prove they have a licence for all radio equipment, which is the case with car rallies, for example.

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■ Antennas

Some Useful Wire Antennas for HF

Part 2

Rob S Gurr VK5RG continues sharing his knowledge of wire antennas with us.*

G5RV

This antenna is one of the most popular in use on HF. It first came to amateur attention in 1935, being a design for a multi-directional radiator for 14 MHz. In the late 1940s, G5RV promoted its use as a multiband antenna, fed with a matching stub, and a 75 ohm coaxial cable. The antenna on 14 MHz is 1½ wavelengths long and, with six useful lobes, was much better than a dipole (Fig 9). It followed that the SWR was low on 14 MHz, and on some other bands popular at the time, and its use as a universal antenna grew, particularly as any mismatch on these bands could be taken up by the pi network output stages in the valve transmitters in use in those days.

On 3.5 MHz it became a shortened dipole, and on 7 MHz the bi-directional characteristics of a full size dipole were evident. However, with the introduction of solid state equipment with a fixed 50 ohm output impedance, it became necessary to use an antenna coupler with the antenna, and subsequently the later articles show the antenna in the open wire configuration. The directional properties on the various bands were accepted without question, but many experimenters testing the antenna found that often the results obtained were not as good as a previously used dipole. This is common with a lot of short period tests of long wire antennas, where the stations being contacted are located in a deep "null" (Fig 9) giving poor results. However, a station on a bearing only a few degrees away, may be of good strength (this aspect of all antennas must be kept in mind when conducting such tests).

The antenna dimensions are 15.54 m each side of centre, and the matching section of open wire line is 10.36 m; however, any length of line should be suitable, if correctly matched with an ATU.

Terminated Vee Beam

Long wire antennas exhibit considerable gain, at little expense (compared to some commercial antennas) (see Fig 12). Regrettably, the gain in some cases is spread over four major "lobes" as well as some smaller lobes. Apart from having gain, there are, unfortunately, directions in between the main lobes where there is very little radiation, or "nulls". This latter property, mentioned before, explains why sometimes an unsuspecting amateur may build a long wire antenna and find it is ineffective, the only stations on the air during his trials probably being in the direction of these "nulls".

The angles of major radiation and the "nulls" can be determined from prepared charts, and a combination of "long wires" made to amalgamate these lobes into a useful directional "beam". Two popular antennas are the "Vee Beam", and the "Rhombic" which, in their standard form, are bidirectional, but when "terminated" become unidirectional in the direction of the termination.

The rhombic is a little large for suburban backyards, but where space is available, it is a high grade antenna. The

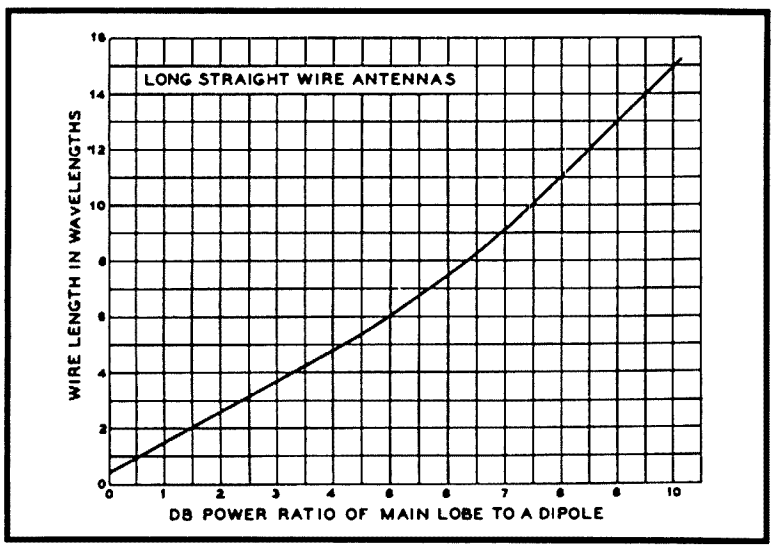


Figure 12 – Directive gain of long wire antenna.
(Reprinted from the Radio Handbook, twenty-first edition, page 28-3)

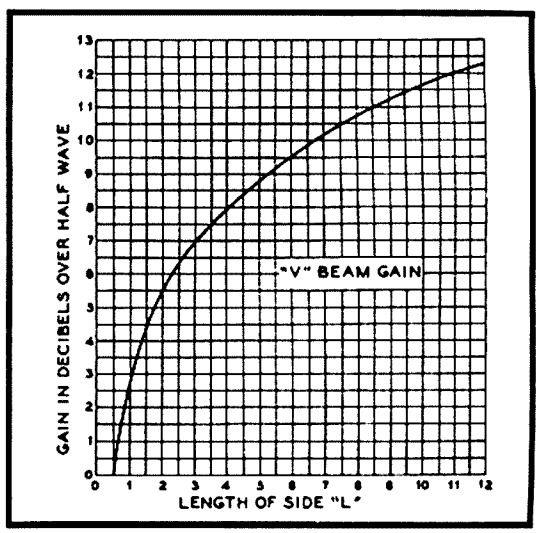


Figure 13 – Directive gain of a V beam.
(Reprinted from the Radio Handbook, twenty-first edition, page 28-5)

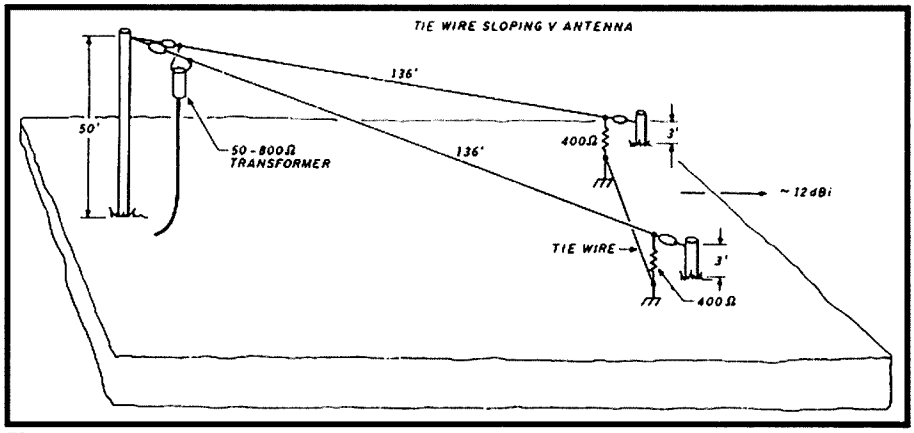


Figure 14 – Terminate V beam antenna.
(Reprinted from Ham Radio, May 1990, page 49)

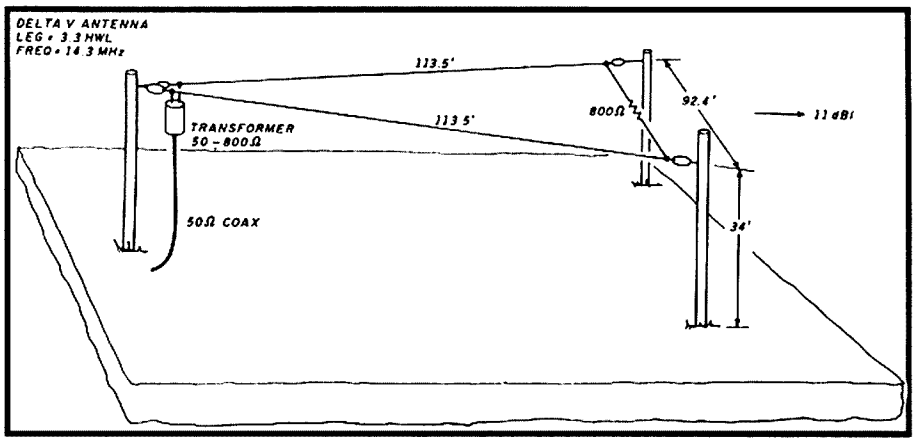


Figure 15 – Delta V antenna optimised for the 20 metre band.
(Reprinted from Ham Radio, May 1990, page 52)

"Vee" beam also requires a large area. However, in case a suitable space is available or there are some friendly neighbours, I will describe a terminated "Vee Beam" with special features.

The Beam

The lobes of two long wires may be combined into forming a Vee Beam, with gain, as shown in Fig 13. The resultant bi-directional pattern may be made unidirectional by terminating each distant end with a 400 ohm resistor to ground, with a benefit of up to 3 dB additional gain (Fig 14). The height of the apex of the "Vee" should be at least 10 metres, whilst that at the ends need only be adequate to clear pedestrians, and animals if on a farm paddock.

The slope of the wires gives further enhancement to the unidirectional properties. When the terminating resistors are returned to ground, the suitability of the ground conductivity is often suspect, to the extent some constructors put in a ground wire immediately below the antenna wires. A now popular method of avoiding this ground return problem is to connect the two wires together, across the base of the Vee, and connect them together with a termination resistor of double the value (ie 800 ohms).

Fig 15 shows the dimensions pictorially, and a chart showing potential gain is shown in Fig 16. As is evident, there is every reason to expect good results from such an antenna.

"Magic" leg lengths in half waves for delta and V antennas. (Other delta dimensions are not recommended.)

Leg length (half wavelength)	Delta Gain (dBi)	V Gain (dBi)	Comments
1.7	9.3	9.4	Compact antennas
2.1	9.9	9.9	Compact antennas
3.3	12.4	11.0	Best delta tradeoff
6.0	12.0	12.8	
7.5	12.8	13.6	
8.7	12.9	13.5	
10.0	13.1	14.9	Highest gain size

Figure 16 – Table 2.
(Reprinted from Ham Radio, May 1990, page 51)

The W8JK Antenna

First published in the late 1930s, an article on end-fire antenna arrays, by Dr John Kraus in the USA, presented to the engineering world an interesting multiband gain antenna, suitable for use by amateur and professional alike.

This is an end-fire array in which its elements are driven, compared to the Yagi which utilises parasitic elements. The driven elements can also be collinear elements, making a combination end-fire and collinear array (Fig 17). There are a number of useful features which make it attractive as a multipurpose, multiband antenna, including:

1. not as seriously influenced by height above ground as a similar sized Yagi array;
2. useful as a multiband antenna;
3. symmetrical in its construction;
4. adjustments made at the base of the feedline, not at the antenna;
5. has reasonable gain; and
6. is bi-directional.

My own experience has revealed the W8JK to be a good choice for a fixed wire antenna for any location. I have

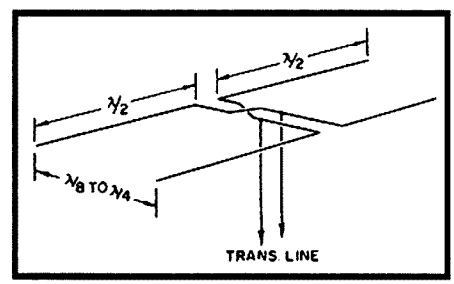
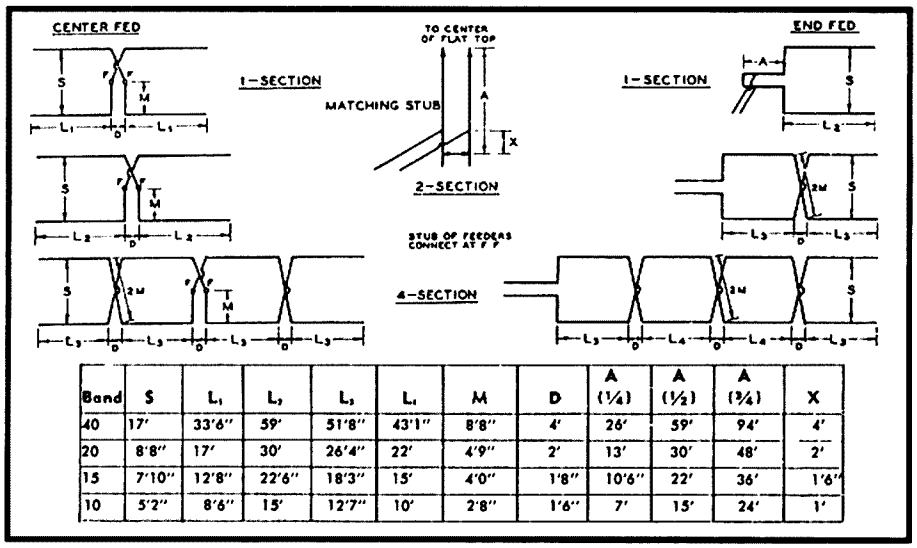


Figure 17 – A four-element array combining collinear broadside elements and parallel end-fire elements, popularly known as the W8JK array.
(Reprinted from The ARRL Antenna Book 15th Edition, page 8-37)



Band	S	L_1	L_2	L_3	L_4	M	D	A (¼)	A (½)	A (¾)	X
40	17'	33'6"	59'	51'8"	43'1"	8'8"	4'	26'	59'	94'	4'
20	8'8"	17'	30'	26'4"	22'	4'9"	2'	13'	30'	48'	2'
15	7'10"	12'8"	22'6"	18'3"	15'	4'0"	1'8"	10'6"	22'	36'	1'6"
10	5'2"	8'6"	15'	12'7"	10'	2'8"	1'6"	7'	15'	24'	1'

Figure 18 – W8JK array design data.
(Reprinted from the Radio Handbook, twenty-first edition, page 28-16)

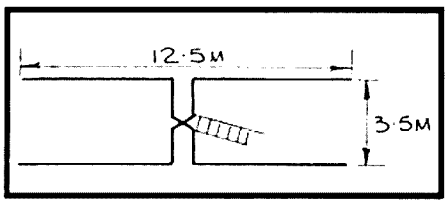


Figure 19 – A W8JK array for 10 MHz as a gain antenna, useful on various bands as follows:
10 MHz – single section W8JK with gain of 3 dB over dipole.
14 & 18 MHz – extended halfwaves for driven dipoles, for 4 dB gain.
21 MHz – driven elements equal to two halfwaves in phase, for 5 dB gain.
24 & 28 MHz – driven elements equal to two extended halfwaves in phase, for 6 dB gain.
(Reprinted from Amateur Radio, September 1984, page 17)

also used it as a rotary beam antenna and, as such, it only requires 180 degree rotation for all-round coverage.

A number of configurations using single, and double sections are possible (Fig 18). Stacking is also possible, for which an appropriate gain increase (max 3 dB) may be realised. The most successful simple version for suburban backyard use would be the single section array. With 10 metre half wave elements, and 2.5 m spacing, this combination gives 3, 4 and 5 dBd gain on 14, 21 and 28 MHz respectively (Fig 19). One other version uses two half-waves in phase, each driven, for gains of 5 dBd and 6 dBd on 14 and 21 MHz. On 28 MHz the lobes break up and, whilst having useful gain, are multi-directional.

Yet another arrangement has two extended half-waves in phase to give 6 dBd gain on 14 MHz. The lobes on 21 MHz and 28 MHz, whilst useful and possessing high gain, are in odd positions, and orientation of the antenna for directional use on 14 MHz only seems the most practical. It is not imperative that all elements be exactly a half wave, as long as they are equal in length and the whole configuration is symmetrical (Fig 20).

One major advantage is the ability of the array to operate over a 2.5 to 1 frequency range and maintain the bidirectional pattern, with gain increasing as the frequency is raised. Most designs show a spacing of 1/8 wavelength, but anything between this and 1/4 wave should give good results. The array may be erected less than a halfwave above ground, provided that the symmetry of the W8JK array is maintained (ie it is sufficiently far away from nearby structures, trees, etc). It gives good results on every band from 10 to 28 MHz (as well as good reception on the various broadcast bands).

ZL Special Antenna

This antenna is another version of the two element end-fire phased array (W8JK), but configured to give unidirectional radiation. The ZL Special is a popular antenna in its own right, and is used mainly on 14 MHz and above as a directional beam, with 4 to 5 dBd gain and a front-to-back ratio that is greater than 30 dB. It is also used on VHF and UHF as the major driven element in a multi-element long-boom Yagi (Fig 21).

It evolved from early experiments using two dipoles, spaced 1/8 wave, and

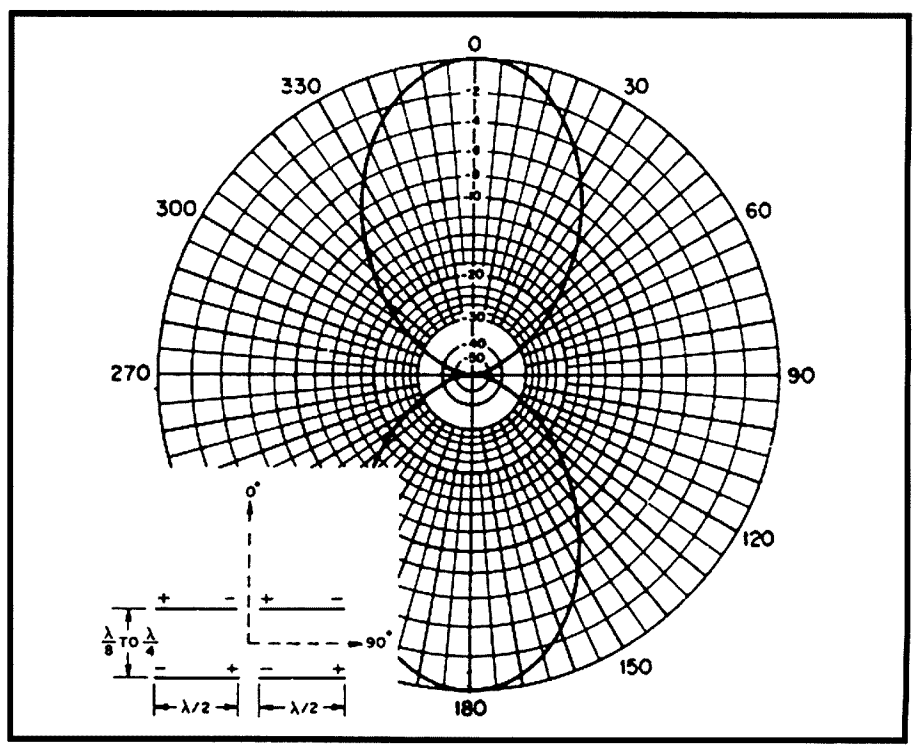


Figure 20 – E-plane pattern for the W8JK array. The elements are parallel to the 90° – 270° line in this diagram. Less than 1° change in half-power beamwidth results when the spacing is changed from 1/8 to 1/4 of a wavelength.
(Reprinted from The ARRL Antenna Book 15th Edition, page 8-37)

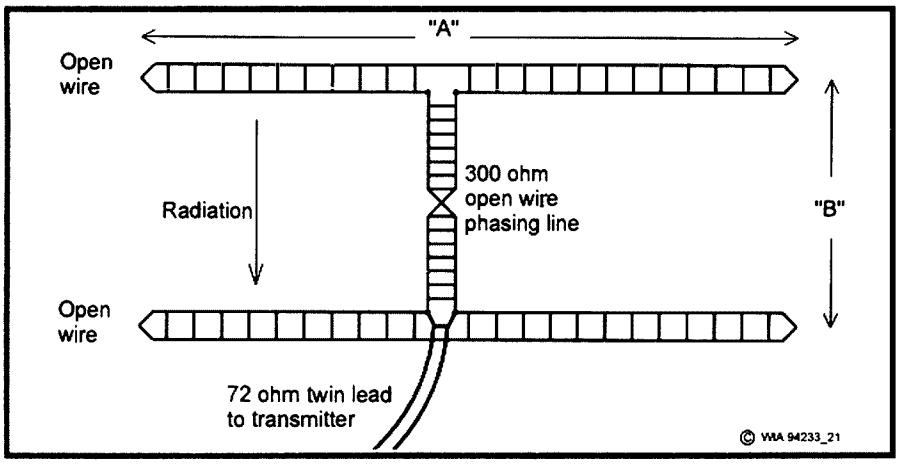


Figure 21 – The ZL-Special antenna has good gain and directional characteristics considering its overall size. For example, dimensions for 14.1 MHz are A = 31'6" and B = 8'8"

fed 135 degrees out of phase. This array (G8PO) used each dipole fed with an equal length of twin feed line, one line being transposed and fed in parallel with the other (180 degrees). A further phase shift was provided by an additional quarter wave line in one of the feedlines (45 degrees). This method of phasing can produce a number of interesting patterns, depending on the spacing and phase shift between two elements (Fig 22).

The ZL Special uses a phasing line connected directly between the elements at the top of the mast (so therefore has to be pre-cut to length), and only one feed line. The centre impedance is very low, being about 12.5 ohms. Matching stubs enable it to be driven by open wire lines or coaxial cable.

A similar antenna developed by HB9CV, and published in the European press, used a coaxial cable phasing line between the two elements, which are gamma matched to the diametrically opposite quadrants. This version has become very popular for VHF use as a fox hunting antenna, where its front to back ratio is extremely useful.

Remember to leave a three second break between overs when using a repeater

Construction

The use of "plumber's delight" methods is precluded in the ZL Special by the need to have an insulator in the centre of each element. The boom may be 50 to 70 mm aluminium tube, "U" bolted on to the vertical drive pipe. If, say, a 10 metre length of 32 mm diameter aluminium tubing (with appropriate tapering) is used for the elements, and split in the middle, cambric or fibre glass rod may be used for joiners, inserted into the central tube ends, to give an insulated "split" in the elements. This need only be 150 mm long, enough to use a "U bolt" style TV clamp to hold the element on to the boom.

For 14 MHz the tube length is 10 m and the element spacing 2.1 m. The phasing line is 72 ohm twin lead, 2.46 m long, transposed, whilst matching to a 300 ohm line is by a 3.6 m length of the same 70 ohm twin lead. A version using folded dipole elements is shown in Fig 21.

VHF Construction has been well recorded in Fred Judd's (G2BCX) article, ZL Special 2 m Beam, in "Out of Thin Air", a *Practical Wireless* publication.

Part 3, the final of the series on Some Useful Wire Antennas for HF, will appear in next month's issue of *Amateur Radio.*

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■ Antennas

Output Balance on the Z Match

Lloyd Butler VK5BR with more information on the ubiquitous Z match*

Introduction

Just when we thought we were all through with testing Z match tuners, something else turns up. Recently, Rob Gurr VK5RG brought my attention to an article in the Winter 1995 issue of *Communications Quarterly* by Charles A Lofgren W6JJK, titled "Beyond the Z Match".

In the article, the writer expresses concern that the assumed balanced output circuits of many of our antenna tuners actually introduce unbalanced currents on balanced lines. He points out that this becomes particularly serious when the load impedances become very high, such as when tuned feeders of certain critical lengths are used. The unbalance produces high radiation from the feedline, possibly encouraging RFI problems, unwanted RF in the shack and changes to the radiation pattern of the antenna.

One of the features we have promulgated for the Z match is that it is suitable for both unbalanced and balanced output and the point of my attention is that W6JJK targets the Z match as one of the tuners which introduce the unbalance mentioned.

Of all the test results I have previously submitted for various Z match models, none has included tests to assess output balance. Hence the question now arises of how good, or how bad, is the balance of the Z match output circuit and that is the subject of this article. In the following paragraphs I discuss tests to determine the degree of balance, the results obtained and an idea to improve the balance.

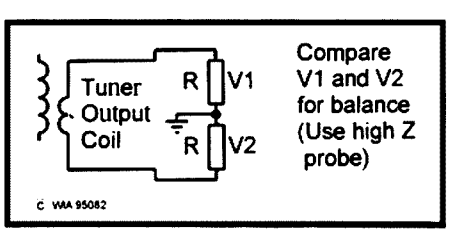

Figure 1 – Measurement of output balance.

Measurement of Balance

W6JJK describes a method of measurement to determine output circuit balance for a given load resistance. As shown in Figure 1, a resistor of half the load resistance value is connected from each balanced output leg to ground. RF power is fed into the tuner which is set up for a correct match into the resistance load. The voltage is measured across each leg to ground using a high impedance probe. The ratio between the two readings is a measure of the degree of balance.

I used the above method to measure the balance of a single coil Z match. We have described several versions of these in *Amateur Radio*, but the one used has the coil windings spiralled through the drilled perspex sheet and designed to operate over the 3.5 to 28 MHz range. I point this out because I suspect that this air spaced version would measure better than the version wound on coil formers. I used half watt terminating resistors and reduced the transmitter power to a very low value so that the resistors did not burn up. I have a 0.5 watt FSD scale on my SWR meter which enables me to monitor this. To measure the voltages across the resistors I used a high impedance RF probe with a VTVM.

Results

Measurements were carried out for loads of 200, 660, 1120 and 2000 ohms using resistors of 100, 330, 560 and 1000 ohms respectively. Frequencies of measurement were 3.5, 7, 14 and 21 MHz. The probe specification is quoted as 2.5 pF with several kilohms resistance (depending on frequency). This would seem adequate for the test, but I found it did tend to alter the loading a little at 21 MHz. I gave away the idea of recording measurements at 28 MHz as I felt the figures I obtained were too much affected by the probe. The results obtained are recorded in Table 1. The figures are given as the ratio of the lowest leg voltage to the highest leg voltage expressed as a percentage.

Band	Load resistance (ohms)			
(MHz)	200	660	1120	2000
3.5	94	98	91	92
7	97	93	84	74
14	95	85	83	50
21	88	78	61	42

Table 1 – Percentage balance at load.

Just what figure of balance is to be considered satisfactory is probably open to debate. For the purposes of definition I will nominate figures above 90% as being quite good and above 80% as being tolerable. Applying these rules we find that there is a good balance at 3.5 MHz for load resistances up to at least 2000 ohms, and a good or acceptable balance at 7 to 21 MHz for load resistances up to around 500 ohms. At higher resistances for these frequencies (and in particular at 14 and 21 MHz), the balance is not so good.

Improving the Balance

The main theme of the W6JJZ article is the introduction of a circuit, more complicated than the Z Match, specifically designed to improve the output balance. He has called this the IBZ Coupler. In his coupler he uses a tuned coil arrangement, which covers two tuning ranges as in the Single Coil Z Match, but the tuned circuit is balanced by a split coil and a four gang tuning capacitor instead of a two gang. The coil assembly has a primary and secondary winding, as in the Single Coil Z match, but the secondary is tuned, whereas the Z Match tunes the primary. Taps on the secondary are also switched to select different load impedance ranges.

Unfortunately, the W6JJZ design gets away from the simple concept of our *Amateur Radio* Single Coil Z Match with only a single coil assembly and no switches (refer *Amateur Radio*, April

1993). The four gang tuning capacitor is also a further complication. Two gang capacitors are difficult enough to find as it is. Fortunately, there is a simple way to improve the Z match output balance without circuit re-arrangement.

Recalling the results of my tests, output balance seems to be only of concern if you are using balanced lines which reflect a resistance component of above 500 ohms and the operating frequency is 7 MHz or above. If your operation does not include all those conditions, then there is no problem and there is no need for anything to be done. Even at 7 MHz the unbalance figures are not really that intolerable.

On the other hand, if you must operate high impedance balanced lines in the upper HF bands, you might consider a small modification to the Z Match which I will describe. However, before doing so, let's examine why the unbalance occurs. The unbalanced signal component is coupled longitudinally into the output secondary winding of the Z match coil via capacitance between the primary and secondary windings. Its voltage on one leg of the output winding relative to earth is different from the other leg because, generally, the capacitance of one leg to earth will differ from the other. A voltage balance can be achieved by altering the relative values of the two capacitances to earth. To do this, a small variable capacitor of around 20 to 25 pF is connected between earth and the output leg furthest from the cold, or earthy end, of the primary winding (refer figure 2).

I found that in my single coil Z match, the balancing capacitance added needed to be around 15 to 20 pF, its value being a little different for the different bands. To set the variable capacitor, the test set up with the two terminating resistors is again used and the capacitor is adjusted for equal voltage at the two output legs to earth. This could be set for balance on the band where it is most needed with, perhaps, some out-of-balance error on other bands.

The same unbalance test can also be carried out to check the coupled system using the actual balanced antenna instead of the terminating resistors and measuring the RF voltage at each leg to earth as before. This can give some surprises when you find out the balanced antenna line isn't quite balanced at all. When the line is connected to the tuner output, the line unbalance is either added to the tuner unbalance, or corrective of it, depending on which way around the line legs are connected. The balancing capacitor can be used to balance the resultant of the two together.

Adding capacitance at one leg might make the voltage unbalance worse. If this is the case, the balancing capacitor must be connected to the other leg. Incidentally, to determine whether any unbalance is in the antenna line itself, it is only a matter of observing the two leg voltages when the line connections are reversed. If the highest and lowest readings interchange, then there is unbalance in the line. Of course one should not get too pedantic about this as a small unbalance might have little effect on the overall performance of the antenna system.

More Tests on the Two Coil Unit

To get another assessment of output balance in the Z Match, I repeated the tests on the "Compact Coil" or "Rononymous" version of the two coil Z Match. The following is a summary of the results.

Good balance was achieved at 3.5 MHz using coil A for output loads up to 1000 ohms, but not at 2000 ohms. A good balance was also achieved at 7 MHz with coil A up to 660 ohms. Coil B gave surprisingly good balance at 14 MHz over the whole tested load range of 200 to 2000 ohms. By contrast, at 21 MHz with coil B, poor balance was experienced over the whole of the load range.

The results are somewhat more random than obtained using the single coil Z Match, but the general trend is the same with balance deteriorating at the higher frequencies and when the load resistance is very high.

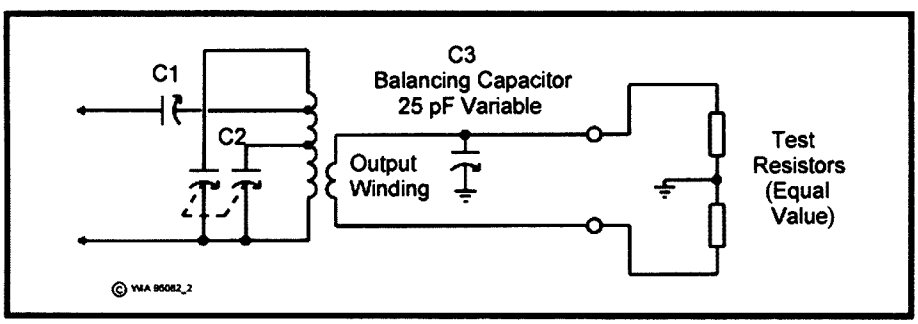

Figure 2 – Capacitor C3 added to correct for output balance.

Summary

One of the features of the Z Match tuner is that it is suitable for both unbalanced and balanced loads. Just how good a balance it provides on balanced loads has been questioned. Tests described indicate that the balance is quite good at the low end of the HF band, such as at 3.5 MHz and, to a lesser extent, at 7 MHz. At 14 MHz the balance seems reasonably good, provided the load resistance is not too high. At 21 MHz the balance for low load resistance appears tolerable for the Single Coil Z Match but not so good for the Compact Two Coil Z Match. No tests were carried out at 28 MHz.

Correction of the output circuit unbalance, using a small variable capacitor across one leg of the output circuit, has been discussed.

For most applications using the Z match tuner, one can forget about output balance. Our only concern is when we feed high impedance balanced lines on the upper HF bands.

References

1. *Charles A. Lofgren W6JJZ - Beyond the Z Match – Communications Quarterly, Winter 1995.*
2. *Lloyd Butler VK5BR – AR Single Coil Z Match – Amateur Radio, April & May 1993. – Also refer to Random Radiators – Amateur Radio, February 1993.*
3. *Lloyd Butler VK5BR – Tests on the Compact Coil Z Match – Amateur Radio, December 1990. Also refer to Random Radiators – Amateur Radio, March 1990.*

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■ Insurance

Is Your Mobile Gear Insured?

Michael Krochmal VK3KRO explains some facts about equipment insurance.*

Introduction

In reading back through some old issues of *Amateur Radio*, I encountered something of importance to, and containing implications for, radio amateurs. I refer to the matter of insurance of mobile communication equipment, which was mentioned, for instance, in a brief note in *Amateur Radio* for December 1988.

At the risk of insulting the more knowledgeable readers (who may like to find instant relief by turning to the next article in this issue) I would like to outline briefly the process of insurance. There seems to be a common misconception about what constitutes the commercial and contractual basis of an insurance policy of any kind and, more specifically, what are the entitlements and duties relating to insurance of mobile communication equipment.

The Dreary Legal Bit - Disclaimer

Please let me hasten to reveal, at the outset, that I do not work in the insurance industry, nor am I a property lawyer. I am an engineer, and must admit to a large degree of ignorance with respect to all aspects legal and insurance-related. The comments which follow are simply a summary of information I have gathered. They are intended as food for thought, and a stimulus for intelligent action, not as legal advice. I must therefore refuse to accept any legal liability for any events arising out of these comments and would strongly suggest that the individual reader seek the advice of a good insurance broker.

Insurance From the Ground Up

The basic mechanism of insurance is this:

The insured person owns property A (a car, for instance), and property B (a mobile transmitter and antenna, for instance). As protection against possible future loss, he/she negotiates an insurance policy over part or all of these goods. One typical type of policy often used for this purpose is one known as a Motor Vehicle Policy.

Generally, a Motor Vehicle Policy would not cover communication equipment for damage or loss at all

There are two possibilities:

1. only the car itself is insured; or
2. both the car and its "non-usual accessories" contents are insured. In this context, "non-usual" means anything fitted to the car which is not usually supplied with such a car at the time of purchase. Examples might be a very expensive sound system, amateur radio communication gear, etc. This definition is actually quite vague, but the main criterion which distinguishes usual from non-usual is basically price. (So, if the usual $300 radio is replaced with a surround-sound, super-sensational $3,000 radio, that definitely constitutes a non-usual accessory. If included with the list of objects insured, it substantially increases the financial risk to which the insurer is exposed).

In order to cover such equipment, it must be "specified". This means that it must be separately itemised as being covered by the insurance.

To make this quite clear. If a non-usual item is not specified, it is not insured.

An Alternative Cauldron Containing Piscatorial Entities (or, A Different Kettle of Fish)

Generally, a Motor Vehicle Policy would not cover communication equipment for damage or loss at all, unless that equipment was specified separately. If the equipment was covered, it would be covered by the normal motor vehicle conditions, which would not include some events that may actually be vital, such as loss or damage while the equipment was not in the vehicle (eg dropping unit while carrying from shack to vehicle or vice versa).

Even if the equipment WAS covered, payment of a claim for loss or damage to such equipment would be subject to the usual policy excess. This excess amount could be anything in the range of $300 to $1,500, depending on the make and model of the motor vehicle. In the event of a claim, the amount of the payout is reduced by the amount of the excess. The excess may actually exceed the value of the equipment in the first place.

An even more disturbing thought is that, because communication equipment is so attractive to would-be thieves, some insurers may actually refuse to insure it at all! And if they do insure it, the amount of the premium might be quite considerable.

You may like to explore another way of insuring the equipment, a General Property Policy. This is a policy similar to one you can use for insuring other portable goods such as expensive watches or necklaces (you know, the ones you put in hock to pay for the Kenwood!). Those policies are called "Personal Valuables Policies" and provide cover for **virtually** all physical loss or damage. For the General Property Policy, you would need to specify particular events, which would normally be fire, theft, malicious damage and **EITHER** accidental

damage **OR** accidental damage following collision or overturning of the conveying vehicle.

There are two great advantages of a General Property Policy over a Motor Vehicle Policy:

1. a General Property Policy can apply ANYWHERE IN AUSTRALIA and is not restricted to the equipment being in the car.
2. the amount of excess is likely to be lower than for a Motor Vehicle Policy.

There is one issue in particular to be careful about. Make sure that the policy does not contain a clause saying that cover for theft is only effective following forcible entry. This would mean that, unless the theft occurred from a locked motor vehicle or home, and forcible entry could be demonstrated, the insurance company would not come to the party. In particular, this would mean that if you left your HT on the beach, or it was taken while you were splashing about in the water with your Donald Duck lifesaver ring, such loss would not be covered.

What's Covered? – How Does a Claim Work?

Let's assume that the communication gear we are talking about has been specified under a Motor Vehicle Policy. You have items of property A and B (car and communication equipment), covered by insurance policy modules IPM_A and IPM_B. The contract between the insured person and the insurance company basically says *"If the items covered by the policy are damaged or destroyed, the insurance company undertakes to offer repair or compensation for loss of these items"*. (Notice I did not say replacement – we will come to that shortly).

As far as ownership of this property is concerned, the position is:

A. Before an event leading to a claim, ownership of the car and other equipment is clearly vested in you, the owner. The insurance company collects premiums in return for a promise of assistance in the event of an adverse situation. The insurance company basically takes a statistically (actuarially) based gamble that it will collect more revenue in premiums than it will pay out in claims. Sometimes this works, sometimes it does not (see Lloyd's of London).

B. Immediately after a (for you) disastrous event has taken place, you still own the (remains of) your car and communication equipment. You still have a contract with the insurance company, which will result in your being compensated for the disaster, provided that a number of conditions apply:

- **B1.** You have not been naughty (eg drunk driving, not telling the insurance company about prior events which might influence their decision to get into this risk-taking venture with you, etc).
- **B2.** The (for you) disaster has been one of a number of particular events. Usually, there are specific exclusions such as public riots (French nuclear testing?), "acts of God" (whatever they may be – isn't being born an act of God ?), and various other things. Note, however, that a Motor Vehicle Policy usually specifies "Physical Loss or Damage" being grounds for a claim. This includes accidental damage, malicious damage, theft of or from the vehicle (whether the vehicle is locked at the time or not!), and fire.
- **B3.** You have been a good boy/girl and paid your insurance premiums.
- **B4.** The claimed loss or damage actually exists! (This may surprise you, but there are some unscrupulous people in this world – detecting them is how insurance loss assessors earn their pay).

C. Having sustained the (for you) disastrous event, you can now choose to activate the agreement between you and the insurance company. Basically, it works like this. The ownership, for the moment, of the car and communication equipment, has not changed. You still own the damaged or lost car and communication equipment. What the insurance company does is to offer you a fair deal (which you may or may not think is fair). This may involve surrendering your ownership of the damaged property to the insurance company, in exchange for which the insurance company will perform one of a number of duties.

Before we get on to these, please note that, **until you agree to an exchange of ownership, the insured property belongs to YOU! An agreement must be signed by both you and the insurance company before a transfer of ownership can take place. Such an agreement would be signed as part of the performance of some of the following duties by the insurance company.**

The options are as follows. The insurance company can:

- **C1.** Repair the damaged property and return it to you, suitably repaired (in this instance, there is no exchange of ownership).
- **C2.** Compensate you for the loss of, or damage to, your property, by exchanging the ownership of such property for an agreed sum. In other words, they get the goods, you get the money. By the way, speaking of money, the actual amount is obviously of interest. There are some types of insurance where the amount is "replacement value". In other words, you will receive whatever it takes to go out and buy a new item. It is also possible to have a policy based on "market value", where the amount paid out is the amount which the property would currently bring if sold on the open market, or the amount required to buy a similarly used item. For communication equipment, these valuation types do not normally apply. Instead, the amount paid out is usually a fixed value agreed in advance. Depending on various market forces (new models being released, sunspot activity?) this may be a factor in your favour or to your detriment. Now what's in it for the insurance company? Obviously they can take your damaged property and either sell it for scrap, or fix it and sell it for what they can get for it.
- **C3.** You may prefer to do NOTHING!

(ie repair or replace the item yourself). The reason for this is something called an insurance policy excess. This is a sum of money which you must first pay before the insurance company comes to the party with the balance. Generally, there is some excess on nearly every insurance policy these days, in order to avoid minor "nuisance" claims, where the cost of administration and the time involved exceeds the benefit to either party. There may also be further excess amounts, and there can be various reasons for the incorporation of such extra excess amounts in your policy. One of them, in the case of a Motor Vehicle Policy, is if the car is driven by young people, on the assumption that young people are more often involved in accidents. This appears to be a fact which is supported by the statistics. (Whether they actually CAUSE these accidents or not is another issue – maybe yes, maybe no). Apart from all that, if you make a claim, the insurance company in many cases will decide that you are an increased risk, and may increase the amount of premium you have to pay (loss of no-claim bonus). So in some cases, the amount of the excess and the increased premium may well outweigh any advantages arising from a claim.

D. Having agreed with the insurance company about the course of action, you must of course stick to your part of the bargain. It would be unreasonable to expect the insurance company to pay you for your loss if there was no loss. What I mean is that, if you agree to be paid out for a total loss, then you can't also retrieve your communication gear. But this is a double- edged sword. If the insurance company disallows the claim and does not pay you the compensation, and you do not sign over ownership, then the gear is clearly still yours! They will, in due course, return the pieces of smouldering ruin or magnificently functioning equipment (as the case may be) to you.

What Does the Term "Communication Equipment" Apply To?

Please note that, throughout this article, I have mostly referred to "communication equipment" rather than mobile transceiver. The above considerations apply equally to amateur radio gear, mobile telephones, mobile faxes, fancy sound systems, and even (dare I even mention it without incurring indignant wrath from some quarters?) the dreaded CB radio gear.

Even a diamond-studded world globe indicating time zones and day/night terminator. In fact, anything which is not a usual piece of equipment in the car.

"Look Ma, No Hands!"

Closely related to this issue is the issue of driving while operating communication gear. This is an issue which is very dear to my heart, as I have several times been placed in jeopardy by blissfully unaware drivers prattling away on their mobile telephones while weaving all over the road!

I think that this is a dangerous habit which we, as a community, should stamp out. In my book, if you can afford a mobile (I call them Pose-a-Phones, but I recognise that they are essential for some people!), you can afford the hands-free kit. The reason I mention this here is that if you are in an accident and it can be demonstrated that the accident was caused by the fact that you were using a hand-held piece of equipment at the time, the insurance company will (surprisingly, in my book) still pay up (whereas they will not pay if you are drunk). However, you may face criminal charges, but that's beyond the scope of this opus major.

Steps You Can Take (No, Not Tango Lessons Again!)

Whatever eventuality you may plan for (and forewarned is forearmed), it is really a wise move to identify your communication equipment (in fact, it's a good move to identify ALL your valuables). This avoids a lot of grief in the event of disaster, whether the event is fire, theft, auto accident, or whatever (and may you never meet up with any of the above).

1. In the first place, try to avoid buying stolen goods. Check the regular "Stolen Equipment Register" in *Amateur Radio*. If you come across a piece of evidently stolen gear, ring the Federal Office of the WIA immediately. No doubt the civil libertarians will now immediately jump down my throat, but I'll take the risk. I believe that it would help a lot if journals taking advertisements for gear made it mandatory that serial numbers be disclosed in the advertisements (I'll brace myself for the onslaught of abusive letters in "Over To You"!).

2. "Having caught your rabbit, cook it" *(Mrs Beeton)* – having bought your piece of equipment, check out each item and make a note of the following data, and keep it in a secure place:

2.1 Manufacturer's name (eg ICOM)

2.2 Model name or number (IC-W2A)

2.3 Type of equipment (Dual-band HT)

2.4 Serial number (0006754)

2.5 Fitted options (Loud speaker/ microphone)

2.6 Any special identifying characteristics ("MUM" tattooed on bottom).

3. (I know that the purists will now wince!) If possible, apply a permanent, unique, mark to each item. This can be applied in a number of ways:

3.1 Use an engraving tool (Ouch! I can hear some of you saying)

3.2 Use a fluorescent pen, whose marks are invisible in ordinary light

3.3 If you are worried about compromising resale value, use an ordinary method, such as felt pen, paper label, etc in a very inaccessible place (such as inside the gear), where it would normally be overlooked by a prospective thief.

There is a range of information you can use for identification:

3.4 The most useful, probably, is the number of your driver's licence, with a "V" in front for Victoria (or whatever applies to your home state). This is a readily recognisable and easily traceable number.

3.5 Another possibility is your name. This may be OK if your name is Michael Krochmal (not too many of me around, I believe) but may be a problem if your name is John Smith (no offence intended, John Smith!).

Perhaps you could use a nickname if it's unusual.

3.6 Another is your callsign, but remember that this may be assigned to someone else one day, especially if you do not yet have a full call.

3.7 Keep in mind that telephone numbers and email addresses may also change.

4. If at all possible, take one or more good, clear photographs of the gear. Don't forget to add something in the photo which will give an idea of scale (such as a ruler or a box of matches or the wife/husband). This will help the police or anybody else whom you may want to help you to look for it – not everybody knows what your "homebrew ATU" looks like.

5. Other things you can do are:

5.1 Ensure that your car is locked at all times if left unattended. This may sound like trite advice, but it's amazing how many thefts take place from unlocked vehicles.

5.2 Don't put temptation in someone else's way: not everyone can resist the attraction of a gleaming panel of shiny buttons. If possible, try to cover the equipment. There have been articles published about dash-mounted equipment for which the owner has devised a "dress-panel" to get the gear out of view when not used.

5.3 Still in the spirit of the previous item: consider the setup offered with current commercial gear, where the main unit is actually in the car boot, and the dashboard incorporates only a small, more easily hidden, control panel. Can your gear be modified to emulate this? (A lot of units have computer-control interfaces – can you use this for frequency shifting, etc?) Maybe the boot's too far away, but you can still put the main unit under the driver or passenger seat? (Added advantage in winter – long overs will keep your bottom warm!). An added advantage is that it may be easier to find an insurance company willing to insure systems installed in this less prominent manner.

5.4 Consider carrying a fire extinguisher. With some insurers, you may perhaps qualify for a lower premium. If the worst comes to the worst, the extinguisher might come in handy for dousing the out-of- control BBQ at the field-day function.

5.5 Consider also installing a car burglar alarm if not already fitted. Fairly cheap ones are now available at the usual places and most radio amateurs ought to be sufficiently technically adept to install one. Consider the commercial risk and cost/benefit ratio: what's cheaper – a car alarm or repairing/replacing your car and contents? Try to get an alarm that's convenient to use – if you get lazy and don't turn it on EVERY TIME, you might as well forget it. There's a corollary to Murphy's Law called Krochmal's Korollary (a type of Japanese motor car): "Cars are always stolen on the ONLY occasion on which the car alarm has NOT been armed, no matter how many times the alarm actually HAS been set". It's

just like married life: it's not the 2,398 times you squeeze the toothpaste tube at the "politically correct" end – it's the one time you don't.

5.6 All of the foregoing applies also to your antenna, which may be quite an expensive item. It is also a great advertisement to a would-be thief that there is something worth stealing in the car. A removable unit is great, but may not always be practical. Magnetic mounts are good if you remember to take the antenna down and throw it in the boot each time (Kroch's Korollary again). There have been complaints that the magnetic mount still manages to scratch the car's Duco, and there have been many suggestions to avoid this, including putting a plastic shopping bag under the mount. Anyway, at least a magnetic mount will allow you to avoid drilling a nice big hole in the panel work of that brand new Porsche.

5.7 Another possibility is to mount your mobile unit in a cradle, so that you can take it with you when the car is unattended. Two issues: "Issue the first" – see Kroch's Korollary, item 5.5. "Issue the second" – the cradle itself may have some considerable value (platinum-plated contacts – who knows?). If the cradle is not specified in the policy, this would mean that the item is not intended to be covered, so you will not be compensated in the event of loss. (But you WILL own it in the event of a write-off, etc – see discussion of that issue above).

5.8 Try to keep away from the usual sleazy places which are havens for burglars: dark, lonely areas generally, and railway station car-parks and the vicinity of movie houses and shopping centres specifically. The reason is that would-be thieves know that you will most likely be gone for some time, and they have plenty of time to do their thing.

5.9 Easier said than done, this one, but still at least partly under your control: try not to get into an "accident" in the first place. These days, it's unfortunately more essential than ever to "drive for the other guy/gal" who may, for instance, be chewing the fat on the mobile telephone and not concentrating on driving (am I asking for another broadside in "Over To You"?). Your own skills are only half of the equation. Perhaps consider doing an advanced driving course (shock, horror!).

Summary

A brief outline has been presented of insurance of mobile communication equipment, and its ramifications.

A Big "Thank you"

I would like to particularly thank Mr G B Hiscock for his very kind assistance in supplying a wealth of insurance-related information. Any errors are all mine. I hope that this material will be of some small help to my fellow radio amateurs, and here's wishing that you will never have to activate a claim !

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Related Articles

A. Mobile communication equipment – insurance

1. "Car Insurance" ANARTS, supplied by VK2EMV.
   Amateur Radio Vol 56 No 12, December 1988 p57

B. Mobile communication equipment – legal aspects

1. "Communications Equipment", Excerpt from Victorian Road Safety (Traffic Regulations), 1988,
   Amateur Radio Vol 56 No 12, December 1988 p8
2. "Mobile Phone Ban", Information,
   Amateur Radio Vol 57 No 6, June 1989 p2
3. "Mobile Law", Over To You, George H Cranby VK3GI
   Amateur Radio Vol 57 No 10, December 1989 p60
4. "Hands Free", Over To You, Peter Russell L50567
   AR, Vol. 58 no. 1, January 1990 p. 58-59

C. Mobile communication equipment – practical aspects

1. "Mobile Operation", Graeme McDiarmid VK3NE,
   Amateur Radio Vol 60 No 3 March 1992 p11 – 12

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WIA News

New WIA Members

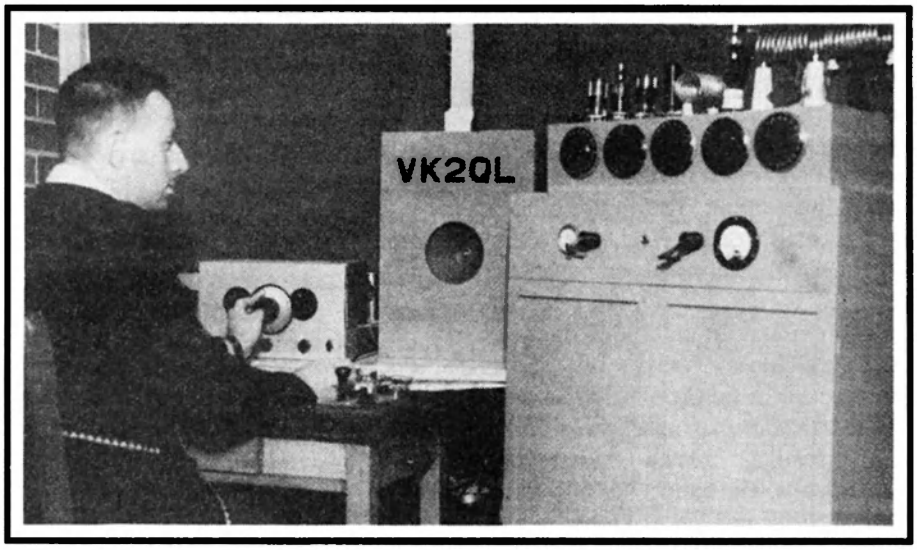
The WIA bids a warm welcome to the following new members who were entered into the WIA Membership Register during the month of February 1996.

JH1MOY	MR T JUNJI
L21011	MR G A FILLOY
L30928	MR J FOREMAN
L63045	MR H J TITCHEN
L70132	MISS A G CUNNINGHAM
L70133	MR F J BOLAND
VK1YYZ	MR H A BLEMINGS
VK2BJE	MR R J JENSEN
VK2BOL	MR H J BOLTON
VK2DMH	MR D M B HARVEY
VK2FJR	MR M J RODDEN
VK2HDM	MR D H MILNE
VK2JFP	MR J G WILSON
VK2KIS	MR G C PROUT
VK2UPB	MR P E BRADWELL
VK2XWI	MR R TANAKA
VK2ZGV	MR T J KEATING
VK3CM	MR M W HRYNYSZYN
VK3CTK	MR T KALKANDIS
VK3DOM	MR A PERRIGNON
VK3FRB	MR R B BOULTER
VK3JMA	MR M AITKEN
VK3MLN	MR D CARABOTT
VK3MLP	MR B SPALL
VK3TWO	MR H WALDER
VK4DMC	MR D MCCARTHY
VK4GCD	MR G C DUNLOP
VK4BAB	MR A BULLOCK
VK4KAC	MR B TERRY
VK4DD	MR N BAKER
VK4HOW	MR D BARNES
VK4PX	MR A JOHNSON
VK4WSS	SOUTHSIDE RADIO SOC
VK5EME	MR M A KILMIER
VK5TG	MR F TAYLOR
VK5UK	MR R J CUNNINGHAM
VK6LZO	MR K J KNOX
VK7HJ	MISS H J CUNNINGHAM
VK7KPG	MR P R GODDEN
VK7NGC	MRS G CUNNINGHAM
VK7XTC	MR D T CUNNINGHAM
VK7ZBT	MR G J STAMMERS
VK7ZFT	MR W J SPEERS

■ People

Frank Hine VK2QL

Susan Hine, Frank's daughter, donated the trophy featured on the front cover of this magazine. The trophy uses Frank's original Morse key. Here, Susan tells a little of her father's life.

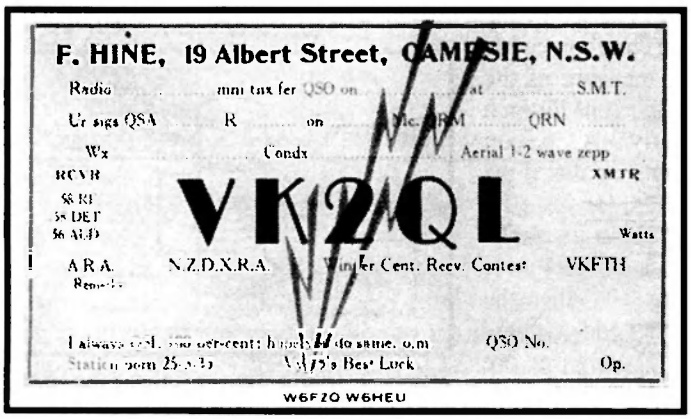


Frank Hine VK2QL operating his station in 1938, using the Morse key which is now part of the Frank Hine Memorial Trophy for the VK/ZL/Oceania DX Contest CW Section.

Frank Hine was born in Sydney on 6 October 1907. His father was a captain in the merchant navy and was often away from home. Frank was the oldest of seven children and the family first lived at Glebe and then Campsie.

When he left school he worked in a solicitor's office for approximately 12 months. He then gained an apprenticeship with the NSW Railways as a fitter and turner. Once he had completed his apprenticeship, he was laid off in 1930 during the Depression.

In order to gain work, he travelled to Temora where he worked on the railways and any other work he could find. It was here that he met Gordon Reid VK2OW who introduced him to amateur radio. He remained close friends with Gordon and Freda, his wife, until Gordon's death. He was best man at Gordon's wedding.



Frank's original QSL card, printed when he first became active as an amateur operator in 1935.

Frank made his first QSO on 30 March 1935. He had his "shack" set up in a small shed in the garden of the house in Campsie.

He joined the RAAF in 1935 and was stationed at Richmond where he met Marjorie Mortimer. They were married in August 1937. They had two children.

In the RAAF he was placed in the Signals section. During the war he was posted to Brisbane, New Guinea and Darwin. For part of this time he was in recruitment and was training new recruits in Morse Code. The VK2QL station was closed on 1 September 1939 owing to the declaration of war, and reopened on 3 February 1946. The only other time that VK2QL was not operating was when he spent approximately four years in Townsville with the RAAF. While in Queensland he had the call sign VK4QL.

He retired from the RAAF in 1956 and worked for Clyde Engineering for a time, and then Tooheys until he retired.

CW was his passion and he made most, if not all, his QSOs by key. He won or was highly placed in many contests over the years, his first being the Melbourne Centenary Contest in Receiving in 1934. He won, or was placed, in a number of the CW sections of the VK/ZL Oceania DX Contest.

Frank became very active in the NSW Branch of the WIA and, for a number of years, was the manager of the QSL Bureau. He took regular part in the broadcasts on Sundays and was involved in the setting up of VK2WI at Dural.

He regularly wrote for *Amateur Radio* magazine, particularly the Ionospheric Predictions.

He became a member of the FOC Club in January 1966. He and Marje went to America in 1974, 1981 and 1982 to the FOC Dinner and to meet many of the people with whom he had regular contact over so many years.

Although poor health prevented him from working on-air in the years just prior to his death, his last contact being in 1992, he kept his licence until his death on 26 March 1994 (Marje had died approximately 6 months before him).

Frank Hine had been a ham for 59 years. **ar**

■ Technical

Technical Abstracts

*Gil Sones VK3AUI**

LF News

In the January/February 1996 issue of the New Zealand *Break-In* magazine, there is some news regarding 160-190 kHz operation. In the LF Scene column of Andrew ZL2BBJ and Bob ZL2CA there is news of an allocation in Papua New Guinea from Rick Warnett, president of the Papua New Guinea Amateur Radio Society.

Apparently, in Papua New Guinea the band 160-190 kHz has been allocated with a power limit of 10 WEIRP. This is interesting and the power limit is reasonable considering the likely efficiency of aerials. There may well soon be contacts between PNG and New Zealand. To achieve the power limit with a 10% efficient aerial would take 100 watts and aerials are a lot less efficient at this frequency band. The limit is really not so bad.

Dual Band Mobile Comparison

Only a large organisation like the ARRL can afford to buy eight different mobile dual band transceivers to conduct a comparative review. Indeed, all reviews in *QST*, the ARRL journal, are of equipment purchased over the counter. The models in this review are similar to those available in Australia.

The review appeared in *QST* for November 1995, and was conducted by Steve Ford WB8IMY, *QST* Assistant Managing Editor. A panel of reviewers assessed the performance of the radios.

The technical measurements make interesting reading. The radios all met their specifications. Some measurements were, however, of parameters not specified.

A previous "Handheld Roundup" from the October 1992 issue of *QST* was summarised in the April 1993 issue of *Amateur Radio* magazine, on page 15. The results make interesting comparisons. The handhelds were fairly close in performance to the mobiles. The comparison of 9600 baud packet-ready radios in *QST* for May 1995 was given in *Amateur Radio* for October 1995 and this is also interesting reading.

The Bit Error Rate (BER) information is of interest to anyone contemplating 9600 baud packet. In general, 9600 baud operation is considerably more difficult than the usual 1200 baud VHF/UHF operation. This is reflected in the results obtained in the BER tests. The BER tests at 9600 baud were performed on those radios claimed to be 9600 baud packet ready.

The results obtained are contained in Table 1. The BER may be unfamiliar to readers. The BER is a measure of the performance of a digital communication circuit. It is simply a measure of the number of bits which are sent through the system incorrectly. A packet contains around 1000 bits, so that if the BER is around 1 per 1000 (or 1 x 10^{-3}) the system will be just about unusable. If the BER is 100 times better at 1 error per 100,000 bits (or 1 x 10^{-5}) then the system will be much better and you may not notice the losses. The figures are shown in Table 1.

The sensitivity of the receivers is given in dBm and the impedance is 50Ω. This is used in preference to the input voltage in microvolts and is quoted for 12 dB SINAD. This allows a more meaningful comparison once you have adjusted to the nomenclature. It also gives a better idea of how big a signal you will need to get good 9600 baud performance.

The interesting thing is that the receiver sensitivities are in the same range as the handhelds, whilst the intermodulation performance is only a little better in most cases. Small wonder that so many operators experience disturbance from adjacent services. You can't blame the pager most of the time.

The current drain is much higher than the handhelds and the current must be used to run the displays and the processor rather than provide superior receiver performance.

The HF transceiver has been considerably improved and the VHF/UHF transceiver is sorely in need of improvement. The techniques used are available at VHF and UHF and the improved strong signal performance is sorely needed.

The transmit to receive turn-around time is of interest for packet operation. However, the prime thing is to be receiving or transmitting intelligible packets, which is different to full audio or RF. The figure given, however, does give an indication.

The transmitter power levels reflect the use of power output modules.

Buzzer Noise Source

A handy non-critical noise source can be made from a buzzer and a battery. A modern version was described in *Radio Communications* magazine for January 1991 by David Sumner G3PVH. This

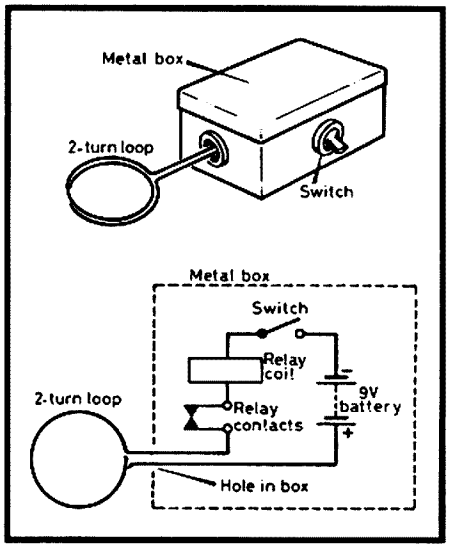


Figure 1 - Buzzer Noise Source.

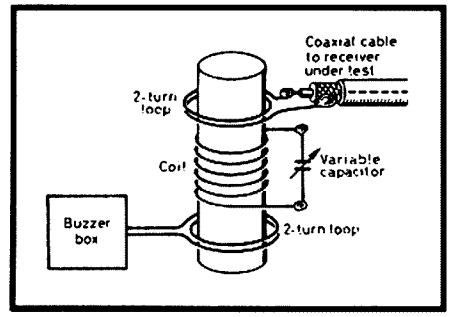


Figure 2 - Using Buzzer Noise Source to Find Resonance.

Table 1

Radio		IC2700H ICOM	IC2340H ICOM	TM742A KENWOOD	TM733A KENWOOD	C5718DA STANDARD	DR610T ALINCO	FT5200 YAESU	FT8500 YAESU
Sensitivity dbm for 12 dB	144 MHz	-123	-124	-125	-125	-123	-124	-125	-125
SINAD	432 MHz	-125	-123	-124	-124	-125	-123	-124	-124
Two Tone 3rd Order IMD	144 MHz	73	62	71	67	77	73	77	76
Dynamic Range 20 kHz Offset dB	432 MHz	70	64	70	64	72	75	69	62
	52 MHz			71					
Adjacent Channel Rejection dB	144 MHz	58	60	73	71	66	70	64	74
20 kHz Offset	432 MHz	59	63	66	67	65	67	70	70
	52 MHz			79					
Tx Output Power	144 MHz								
Watts	High	52	46	50	50	53	51	50	49
	Med	10	11	11	12	10	9		10
	Low	4	5	5	5	3	5	4	4
	432 MHz								
	High	37	33	33	36	35	35	33	32
	Med	11	11	11	12	8.5	9		9
	Low	5	5	4	5	3	4	4	4
	52 MHz								
	High			53					
	Med			11					
	Low			4					
Tx/Rx Turnaround	144 MHz	300	220	110	160	175	245	145	145
Time m/S	432 MHz	300	200	110	105	175	240	75	142
	52 MHz			110					
Rx/Tx Turnaround	144 MHz	225	225	100	110	150	104	93	25
Time m/S	432 MHz	225	240	104	125	150	108	64	70
	52 MHz			48					
Rx BER 9600 Baud									
at 12 dB SINAD	144 MHz				$1.5x10^{-3}$	$7.0x10^{-4}$	$1.0x10^{-3}$		$5.1x10^{-4}$
	432 MHz				$1.5x10^{-3}$	$1.0x10^{-3}$	$7.2x10^{-4}$		$4.1x10^{-4}$
Rx BER 9600 Baud									
at 16 dB SINAD	144 MHz				$4.8x10^{-5}$	$<1.0x10^{-5}$	$<1.0x10^{-5}$		$<1.0x10^{-5}$
	432 MHz				$6.2x10^{-5}$	$<1.4x10^{-5}$	$<1.0x10^{-5}$		$<1.0x10^{-5}$
Rx BER 9600 Baud									
at -50 dBm	144 MHz				$<1.0x10^{-5}$	$<1.0x10^{-5}$	$<1.0x10^{-5}$		$<1.0x10^{-5}$
	432 MHz				$<1.0x10^{-5}$	$<1.0x10^{-5}$	$<1.0x10^{-5}$		$<1.0x10^{-5}$
Tx BER 9600 Baud									
at 12 dB SINAD	144 MHz				$1.7x10^{-3}$	$4.3x10^{-3}$	$4.2x10^{-4}$		$2.4x10^{-3}$
(Rx Sig)	432 MHz				$3.4x10^{-3}$	$2.6x10^{-3}$	$4.7x10^{-3}$		$2.7x10^{-3}$
Tx BER 9600 Baud									
at 12 dB SINAD	144 MHz				$8.0x10^{-5}$	$3.4x10^{-4}$	$4.2x10^{-4}$		$1.2x10^{-4}$
+ 30 dB (Rx Sig)	432 MHz				$3.3x10^{-4}$	$2.0x10^{-4}$	$5.6x10^{-4}$		$6.6x10^{-4}$
Tx Current Amps		10.8	9.2	9.5	8.8	9.7	9.4	8.5	9.1
Rx Current Amps		1.4	1.1	1.2	0.8	1.0	0.8	0.9	0.9

uses a small relay connected so as to act as a buzzer.

A buzzer, by its action, provides noise both acoustic and radio. The radio noise is the result of the sparking due to the inductive spike as the coil current is interrupted. Mechanical buzzers are less common today and one can be made from a small relay connected as in Fig 1.

The buzzer should be built into a metal box to provide some screening and the relay should be wrapped with foam to attenuate the acoustic noise. A similar arrangement was used for continuity testing; to do this the loop of Fig 1 should be replaced by clip leads.

To find the resonant frequency of a tuned circuit the test setup of Fig 2 is used. The noise from the buzzer will peak at the resonant frequency of the tuned circuit. A simple transistor radio

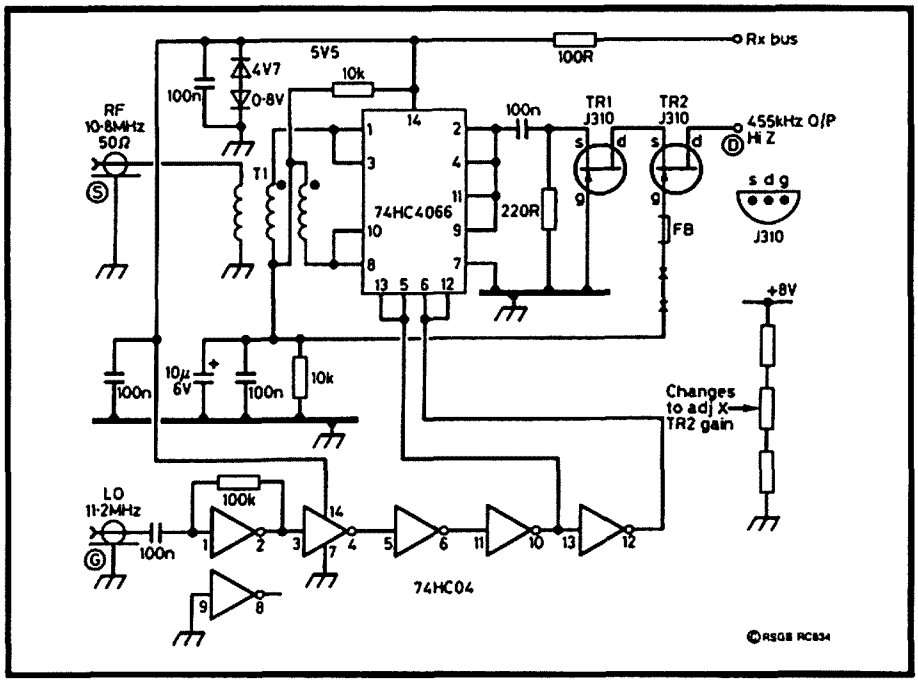


Figure 3 - Switching Second Mixer for FT726A.

with short wave coverage can be used as the detector to find the noise peak. A 10 turn coil of 30 mm diameter will resonate in the 10 MHz region with 100 pF.

The noise from the buzzer can be used as a simple check to see if a receiver is working. Switching it on and off in the vicinity should be detectable.

Do not couple the buzzer to an antenna as it will then try to act as a rudimentary spark transmitter. This could result in local interference.

Low Cost High Performance Mixer

A low cost high performance mixer appeared in the *Technical Topics* column of Pat Hawker G3VA in the January 1996 issue of the RSGB journal *Radio Communications*. The original idea for the mixer had appeared in RF Design for June 1995 and the author was P J Coetzee, who based his work on an idea by J M Grundlingh. The *RadCom* item reported further work by Giancarlo Moda I7SWX who adapted the idea to use readily available fast CMOS.

Giancarlo used a 74HC4066 quad switch as a replacement second mixer in a Yaesu FT726A. The aim is to provide superior intermod performance with superior dynamic range. This sort of mixer has been used at LF for many years and the use of fast CMOS has enabled use at much higher frequencies.

The mixer is shown in Fig 3. The S, D & G connections refer to the source, drain and gate connections to the original FT726A second mixer. The circuit was built on a small scrap of board to fit in the transceiver. The JFET post mixer amplifiers are needed to provide the same overall gain. The input transformer T1 was homemade with three bifilar windings of five turns of twisted enamelled wire. One of the Mini-Circuits miniature wideband transformers could be used.

Duplex Bell Circuit

Angus Donaldson VK4ABD has provided a simple circuit which has been around for quite a while in various forms. It allows two way signalling using a pair of wires and uses a couple of small bells. I have modified it slightly so that the fuse used to limit current under the simultaneous operation of the push buttons is replaced by a lamp used as a current limiter.

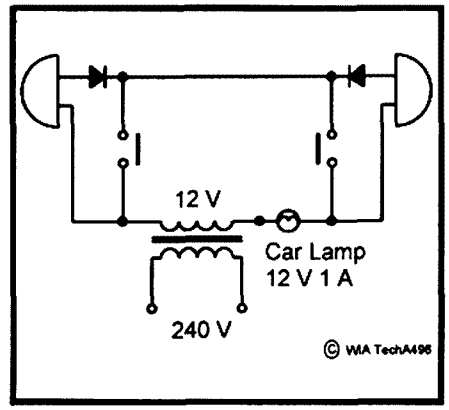


Figure 4 - Duplex Bell Circuit.

A bell circuit that works from both ends and uses only two connecting wires can be arranged as shown in Fig 4. It is powered from an ordinary bell transformer and uses any two power diodes connected in opposition.

Normally, no current will flow in the opposing diodes. Pressing either button shorts out the local bell and diode. The remote bell then rings on the half wave DC. The lamp limits current in the event of both buttons being simultaneously pressed. The lamp has a low cold resistance and so should not interfere with circuit operation as the bells draw less current than the lamp operating current.

C/o PO Box 2175, Caulfield Junction VIC 3161

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WIA News

M Prefix for G Hams

From 1 April, UK amateurs will be allocated call signs with an M prefix as the Radiocommunications Agency is running out of G-series call signs.

The first call sign issued in the new series is M0AAA, awarded to the Reading and District Amateur Radio Club, RADARC, (on behalf of the Reading Novices Amateur Aerial Association, according to the *ARRL* Letter of 9 February).

RADARC will use MX0AAA, the club version of the call sign, beginning 1 April, and is offering special QSL cards for contacts.

The same prefix pattern for the G-series calls will be followed by the Radiocommunications Agency: MI for Northern Island, MM for Scotland, MW for Wales.

ALARA

Sally Grattidge VK4SHE, ALARA Publicity Officer*

ALARAmeet Update: Perth WA, 28-29 September 1996

The registration form for this event is in the January Newsletter. If you do not have one, this means that either you have lost your newsletter or let your membership lapse. The first can be remedied by contacting the organiser direct, Bev Hebiton VK6DE, PO Box 299, Geraldton, WA 6530; and the second by sending your subscription to our Treasurer, Margaret Schwerin VK4AOE, PO Box 758, Dalby, QLD 4405.

Bev recommends that you do not leave it too late to book accommodation in Perth as it will be school holidays and Royal Show Time. At the last count 26 are definitely going to be there (of which 20 are ALARA members), and 60 have expressed interest, so it looks like being a big meet. Cost, once you get to Perth, is very reasonable, and an interesting and eventful weekend has been planned. The following Monday (30 September) is a public holiday and an extra tour will be arranged, if requested; another reason to get your registration in early. For those who are in Perth on Friday, 27 September, an evening meal will be arranged.

The venue for the meet is the White House in Ferndale, a mansion built in 1888 which is now a function centre. Visits will be made to Kings Park, overlooking the city and Swan River, also to historic and picturesque Fremantle of America's Cup fame. Be there!

Special Event Call

Stay tuned for this one. It was hoped to have VI21ALARA celebrating our 21st birthday, but there are some problems with this. Although it may end up being something different, it is hoped to avoid a state number as ALARA is an Australia-wide organisation. The special call will be run from June until the end of ALARAmeet 1996.

More News from the West

Bev VK6DE and OM Brian visited Norfolk Island last year and recommend a holiday there to anyone who has been thinking about it. Bev was able to meet Kirsti VK9NL and visit her shack (see photograph).

Bev was involved with JOTA as usual last year with Guides and Brownies visiting her shack. Norma VK6PNS operated for JOTA with the Peel Amateur Radio Club. The WA YLs hold monthly luncheons, and were pleased to report a visiting YL, June ZL2WE, attending in November, so if you are passing through Perth any time, contact Bev and find out when the next one is happening.

Kirsti VK9NL (seated) and Bev VK6DE in Kirsti's shack.

North Queensland

Townsville Amateur Radio Club Ladies net celebrated its seventh birthday in February. Ann VK4MUM has run this net, at 6 pm local time on the 2 m repeater (146.700 MHz) on Wednesday evenings, since it started. If you are in or near Townsville at that time, please call in.

The District Radio Ladies in the Rockhampton area are active as usual and held a Barbecue-in-the-Park in February. Regular nets are held on the first Thursday of the month at 8 pm (local) on 146.900 MHz, then at 8.30 pm on or near 3.565 MHz. Visiting YLs in the area are welcome to join in. Contact is Robyn VK4RL, and the ladies have their own call, VK4DRL.

Deep South

Helene VK7HD sends greetings from Tasmania. Helene and OM Peter spent five months on the mainland last year. They visited their son and daughter-in-law in Victoria where they bought and fitted out a caravan, and presided over the birth of a new grand-daughter, Ann-Marie. They were also able to see Bron VK3DYF at Rosebud, and take part in a caravan towing course before hitting the road.

They took the caravan north up the Newell Highway to Queensland as far as Rockhampton, enjoying the sights and meeting the people. Two weeks were spent at Hervey Bay where they were welcomed by the local radio club and were able to work VI50PEACE on VHF. Helene and Peter have high praise for the Travellers' Net and were impressed by the friendliness and efficiency of the operators. They were back in Victoria in time for Ann-Marie's christening and also visited Mavis VK3KS and Ivor VK3XB before returning home in time for Christmas. Both are "hooked" on caravan travelling so will hopefully be back soon for another trip.

Packet

It is hoped to list members' packet addresses in the Newsletter for quick reference, so if you are on packet (VK or DX) please send your details to Bron, VK3DYF@VK3COL.#MEL.VIC.AUS.OC. If you make use of the packet station of another callsign, include that

information. This list needs to be kept up-to-date, so please notify Bron promptly of any changes. For an organisation as spread-out as ALARA, packet is a great way to pass information accurately with much saving on stamps and phone calls.

Thelma Souper Memorial Contest 1996

This contest will be held on 13 and 14 April from 0700 to 1000 UTC. All contacts on 80 m, phone and CW. One contact per station each half hour.

Call "CQ WARO CONTEST", and exchange signal report plus serial numbers, commencing at 001. Scoring is one point per contact multiplied by the number of WARO stations and bonus station (ZL2YL) worked. Underline multiplier contacts in log. Logs should include a separate sheet with Callsign, Name, Address, Number of contacts, Number of WARO members, and Score. Enter date at beginning of each evening. Each entry is to contain Time, Callsign, Name, Number sent/received. Logs are to be sent to the Contest Manager, Chris Armstrong ZL1BQW, PO Box 209, Kawerau 3083, New Zealand no later than 11 May 1996 (more details are in the January Newsletter).

**C/o PO Woodstock, QLD 4816*

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AMSAT Australia

*Bill Magnusson VK3JT**

National co-ordinator
Graham Ratcliff VK5AGR
Packet: VK5AGR@VK5WI
AMSAT Australia net:
Control station VK5AGR
Bulletin normally commences at 1000 UTC, or 0900 UTC on Sunday evening depending on daylight saving and propagation. Check-ins commence 15 minutes prior to the bulletin.

Frequencies (again depending on propagation conditions):
Primary 7.064 MHz (usually during summer).

Secondary 3.685 MHz (usually during winter).

Frequencies +/– QRM.
AMSAT Australia newsletter and software service
The newsletter is published monthly by Graham VK5AGR. Subscription is $30 for Australia, $35 for New Zealand and $40 for other countries by AIR MAIL. It is payable to AMSAT Australia addressed as follows:

AMSAT Australia
GPO Box 2141
Adelaide SA 5001

An Interesting Statistic

You can't help noticing that the same call signs keep coming up on the digital birds. This prompted me to keep a log of call signs seen on UO-22, KO-23 and KO-25 over several months. VK2 scored the highest number with 13. VK3 followed not far behind with 11. VK4 was next with seven, followed closely by VK5 and VK6 with six each. Two stations were logged from VK7 whilst VK8 and VK1 had one each. This adds up to the grand total of 47.

I have expressed before in this column how difficult (and expensive) it can be to get up and running on the digital birds, but less than 50 stations Australia wide is a bit poor. I also logged New Zealand stations. ZL1 and ZL2 both had seven. ZL3 came in with four and a lone station was logged from ZL4, making a total of 21.

AO-13 Report

With the impending re-entry of this bird later in the year it will be hard for any satellite operator to ignore its last few months of operation. Let's all make an effort to give AO-13 a good send off. It has drifted into a quite favourable orbit for operators in the southern hemisphere and the final months should provide some of the best operating conditions we have ever experienced.

The provisional transponder schedule for the period 1 Apr to 10 Jun 1996 is as follows:

Mode — B : MA 0 to MA 70
Mode — BS : MA 70 to MA 110
Mode — S : MA 110 to MA 112 (beacon only)
Mode — S : MA 112 to MA 135
Mode — S : MA 135 to MA 140 (beacon only)
Mode — BS : MA 140 to MA 180
Mode — B : MA 180 to MA 256

The omni antennas will be switched on from MA 230 to MA 25. The attitude will be 180,0 with the move to attitude 220,0 beginning 1 Jun.

As you can see there will be lots of good operating for "S" mode and plenty of opportunity for listening to the all important telemetry from the "S" mode beacon.

AO-10 Report

I've noticed one or two reports of AO-10 being operational again. Most reports say that signals are still weak and unreliable. We'll probably have to wait another month or so for the "old faithful" to return to reliable operation. It will be interesting to compare received signals with the published "guesstimates" of the current attitude.

Uplink QRM on the Digital Birds

I was reminded the other day of the heady days of 1978 and Oscar-8 when we were confronted with the problems of "J" mode operation. It always seemed that the satellite was very insensitive on the uplink when over Asia to our north. Normally a few watts would suffice on two metres to access the transponder. However, when the satellite came up over our northern horizon 100 watts was insufficient.

Many theories were put forward, such as satellite antenna position, spacecraft attitude, etc. The only reasonable answer was extreme QRM on the two metre uplink. Close listening from a quiet location would reveal a multitude of weak signals usually concentrated at one end of the down link pass band. The non-amateur QRM continued for the life of Oscar-8 and was also audible on later satellites, including AO-13 when its "J" mode transponder was working.

The Jan/Feb 1996 edition of the *AMSAT Journal* features an excellent article by Cliff Ward WA5LVG on his maritime mobile satellite operation. Cliff operates from a large roll-on/roll-off cargo/container ship. The ship does the Pacific run and is often in the South East Asia region. To quote Cliff: *"How well does it work? I get into the satellites quite well except when the footprint includes The Philippines. There, two metre radios are used in taxi cabs and by various businesses, so there is tremendous two metre uplink QRM. Dave W1YRM (on Guam island) has difficulty in getting into the (digital) birds and he is using directional antennas. The satellite's receiver is just overwhelmed".*

Seems nothing much has changed in nearly 20 years! As I've mentioned before in this column, 5-10 watts is enough uplink power for the digital birds. When they come up over the northern horizon, however, 100 watts into a high gain cross-Yagi will often not get a response.

The Future of SAREX

Many satellite operators will have taken part in the various SAREX missions that have taken place on board the Space Shuttles. These have varied from highly organised school based contacts to casual voice QSOs with Shuttle Astronauts. SAREX will enter a new exciting phase in 1997 with the start of assembly of the International Space Station (ISS).

The "Habitation Module" is due to be installed in 2002. This will be the start of a permanent human presence on board the ISS. Amateur radio has become such an integral part of Shuttle missions that nearly every Astronaut is a licensed amateur radio operator. When the ISS becomes a reality it appears that a permanent amateur radio station will be part of the equipment. Negotiations are already under way for a permanent, earth pointing antenna system and equipment racks for currently envisaged and future modes including voice, packet and ATV. It is hoped that an external earth pointing camera and fast scan ATV transmitter will give ground based amateurs an "Astronaut's eye" view.

The ISS could eventually challenge the free flying OSCARs as our primary trackable object. Whatever happens, the next few years should be exciting for the amateur radio satellite community.

*359 Williamstown Rd, Yarraville VIC 3013
CompuServe: 100352,3065

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AWARDS

*John Kelleher VK3DP — Federal Awards Manager**

VK Awards List

In the mail, I often have requests from both here and overseas for a list of VK Awards. Apart from the Federal Awards, there is no such list, and I am left with egg on my face.

I have only to glance around the walls of my shack to notice the number of Radio Clubs who have sponsored "permanent" awards. I hate to repeat myself, but I have tried to raise interest in this situation by offering to publish details of Club sponsored awards in *Amateur Radio,* which is known internationally. At this point, I will go a step further, and offer to accept and collate any and all offerings into a booklet of State awards. My domain is WIA Federal Awards, but with a little help from the States, we could have the answer to the many requests that I have received. Please help.

In the wake of the recently published DXCC listings, I have received letters from interested parties, complaining that their callsign was not present in those listings. For their information, they are kept on the "active" list for 6 years. If, after those six years, they have not added to their DXCC listings, then they are placed in the "inactive" file. If I did not do this, I would have to build an extension onto my already crowded shack.

Worked All Indonesia Award (WAIA)

Issued for contact with stations in each of the Indonesia call areas (1 to 0) as follows:

DX stations, other than those in CQ Zone 28, need two stations in each area.

DX stations in Zone 8 need three stations in each call area.

Modes or bands may be mixed. SWL OK. Contacts after 7 September 1968.

GCR list and $US8.00 or equivalent to: Mr M Maruto YB0TK, PO Box 96, Jakarta 10002, Indonesia.

Cork Radio Club DX Award

Make contact with members of the Cork Radio Club, or EI stations in County Cork. EI/G need four, rest of Europe three, outside Europe, two QSOs.

Any band, any mode. SWL OK. GCR list and $US4.00 to: W O'Reilly EI8AU, Mount Oval, Rochestown, County Cork, Ireland.

Worked EI Counties Award

Work (or hear) at least 20 of the following counties after 1 January 1982: Carlow, Cavan, Clare, Cork, Donegal, Dublin, Galway, Kerry, Kildare, Kilkenny, Laois, Leitrim, Limerick, Longford, Louth, Mayo, Meath, Monaghan, Offaly, Roscommon, Sligo, Tipperary, Waterford, Westmeath, and Wexford.

Look for the rarer Irish counties which are activated each St Patrick's Day (17 March) by the IRTS. Amateurs with an Irish ancestry can join IRTS as honorary members. SASE to W2ORA for details.

GCR list and 10 IRCs or equivalent to: IRTS Award Manager, Box 462, Dublin 9, Ireland.

Israel Award

Work Israeli stations to qualify for a necessary 25 points. Each 4X above 10 MHz = one point, below 10 MHz = two points. Each station may be worked only once on each band.

Contacts must be after 1 January 1983. No restrictions on bands or modes. GCR list, plus 7 IRCs or equivalent to: Israel Award Manager, PO Box 4099, 61040 Tel Aviv, Israel.

*PO Box 2175 Caulfield Junction 3161

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Help stamp out stolen equipment — keep a record of all your equipment serial numbers in a safe place.

Contests

*Peter Nesbit VK3APN — Federal Contest Coordinator**

Contest Calendar April-June 1996

Apr 6/7	SP DX Contest (CW)	(Mar 96)
Apr 6/7	Israel DX Contest	(Mar 96)
Apr 12/14	JA DX CW Contest (High Bands)	(Mar 96)
Apr 13/14	International Grid Loc Contest	(Mar 96)
Apr 27/28	Helvetia DX Contest	(Mar 96)
May 4/5	ARI Contest CW/SSB/RTTY	
May 11/12	CQ-M Contest	
May 11/12	Sangster Shield (80 m ZL)	
May 25/26	CQ WPX CW Contest	(Feb 96)
Jun 3/4	RSGB Field Day CW	
Jun 10/11	ANARTS (VK) RTTY	
Jun 17/18	VK Novice Contest	
Jun 17/18	All Asia CW DX Contest	
Jun 24/25	ARRL Field Day	

This month's column contains the results of the VK/ZL/Oceania DX Contest. During the log checking process, it struck me that nearly all 160 m QSOs were with other local stations, or between VK and ZL. Several stations worked FK8, but no other DX was worked on that band. In the comments accompanying the logs, many VK and ZL entrants complained about the lack of activity on 160 m, and the fact that most of their CQs went unanswered. I don't think it was lack of effort on their part; in fact, many of these comments revealed a definite fondness for 160 m, tempered with a frustration that they didn't do as well there as they felt they should have.

This made me think about the effect on the contest overall. The logs of most of the top running operators showed that, despite spending a significant amount of time on 160 m, typically only a few QSOs resulted. Looking at it objectively, the amount of time spent there was out of all proportion to the number of QSOs which resulted and, furthermore, the band mainly yielded local multipliers, not DX ones.

This is not a desirable situation, because time spent on 160 m is time not spent on other bands, where DX is much more easily worked. If 160 m were to be dropped from the contest, there would be more VKs and ZLs on other bands, which would stimulate more DX activity.

The inclusion of this band seems to achieve very little in the way of DX, yet it creates a significant nuisance for entrants. In discussing these thoughts with one top contester, it turns out that he, and others, share similar sentiments.

One could argue that the demands of juggling precious time between 160 m and the other bands, in order to get a few more multipliers, is a good test of operator judgement. This would be well and good if DX was more readily workable on the band, or if VK/ZL activity was higher. However, the reality is otherwise, and the contest is poorer as a result. I think it's time to stop fooling ourselves that working stations in the next suburb is an adequate substitute for DX, and face the fact that the acceptance of such QSOs is little more than a kludge (largely unsuccessful) to stop operators falling asleep on 160 m due to boredom.

My proposal is therefore to drop 160 m from future VK/ZL/Oceania DX Contests, to allow entrants to focus more fully on the higher bands, and stimulate DX activity. This would also even things up for the majority of entrants who do not have large blocks of land and huge 160 m antennas. To compensate for the loss of 160 m, I strongly believe that a separate contest for 160 m only should be introduced for VK, ZL and Oceania amateurs, perhaps managed similarly to the VK/ZL/Oceania Contest. Many years ago the WIA ran such a contest, which was extremely popular but, unfortunately, it only ran once. Perhaps it's time to revive it.

One might argue that there are already three 160 m DX contests, so why introduce a fourth? Well, two of them are US contests, and the third is European. Whilst I know some hopeful VKs listen in, QSOs are extremely difficult, not only due to our extreme distance (in 160 m terms), but also the enormous QRM which we have to break through to obtain QSOs. If anyone needs convincing of the difficulties, one need look no further than the results of those contests, which rarely show a VK callsign.

What do you think? The first step is to identify the best time of the year for the proposed 160 m contest, what the overall objectives should be, and whether anyone is interested in managing it. Any and all suggestions are invited, and I look forward to hearing from you soon.

Thanks to VK3KWA for the results of the Ross Hull and VHF/UHF Field Day contests. As you see, the column is already packed, so entrants will have to wait in suspense until next month, to discover if they won!

73,
Peter VK3APN

ARI International DX Contest CW/SSB/RTTY

2000z Sat to 2000z Sun, 4/5 May

This contest occurs each year on the first full weekend of May. Anyone can work anyone else, and categories are single operator CW, SSB, RTTY or mixed; multi-operator single transmitter mixed; and SWL mixed. Bands are 160-10 m (no WARC). The same station can be worked on the same band once each on CW, SSB, and RTTY, but the multiplier can be claimed only once for that band. Once a band or mode has been used, 10 minutes must elapse before it can be changed. Send RS(T) plus serial number; Italian stations will send RS(T) plus province.

Score 10 points per Italian QSO, three points per QSO with stations in another continent, one point per QSO with stations in own continent, and zero points per QSO with stations in own country. Final score equals total points from all bands times total multipliers from all bands.

Multipliers are the sum of Italian provinces (max 103) and countries (excluding I and IS0) on each band. Province codes include: II: AL AT BI CN GE IM NO SP SV TO VB VC; IX1: AO; I2: BG BS CO CR LE LO MI MN PV SO VA; I3: BL PD RO TV VE VR VI; IN3: BZ TN; IV3: GO PN TS UD; I4: BO FE FO MO PR PC RA RE; I5: AR FI GR LI LU MS PI PT SI; I6: AN AP AQ CH MC PS PE TE; I7: BA BR FG LE MT TA; I8: AV BN CB CE CZ CS IS KR NA PZ RC SA VV; IT9: CL CT EN ME PA RG SR TP AG; I0: FR LT PG RI ROMA/RM TR VT; IS0: CA NU SS OR.

Use a separate log for each band, and a check log (ie sorted callsign list) for 100+ QSOs on any band. Send log within 30 days to: ARI Contest Manager I2UIY, PO Box 14, 27043 Broni (PV), Italy. Logs on disk are welcome, and an MS-DOS logging program is available from the contest manager for $US5.00 (to cover disk/postage).

CQ-M Contest (CW, Phone, Mixed)

2100z Sat to 2100z Sun, 11/12 May

Sponsored by the Krenkel Central Radio Club, this contest runs on the second full weekend of May each year. Categories are single operator, single and all band; multioperator single transmitter; 20 m SSTV; SWL. Bands are 160-10 m. No cross-mode QSOs please. Call "CQ-M", and exchange RS(T) (or RSV on SSTV) plus serial number. Score one point per QSO with own

country, two points with a different country in the same continent, and three points with other continents (continents as for WAC). The final score equals total points times total number of countries from each band.

Countries are according to the R-150-C list, which is similar to the ARRL DXCC list except for former USSR countries. Serious competitors should review the R-150-C list. Awards apply, and there are achievement awards for stations making 200+ QSOs. Mail logs by 1 July to: Krenkel Central Radio Club, CQ-M Contest Committee, Box 88, Moscow, Russia.

Sangster Shield

0800-1100z Sat & 0800z-1100z Sun, 11/12 May

This unusual contest emphasises low power operation. Work ZLs on 80 m CW. QSOs can be repeated once per 1/2 hour period, ie 0800-0830, 0830-0900, etc. At least five minutes must elapse between repeat QSOs with the same station, or else another station must be worked in between. Send RST plus power output; ZLs will send RST/branch/power. Non-ZLs using up to 5 W score 10 points per QSO with a ZL, if the ZL worked is using up to 5 W; or five points per ZL using over 5 W. Non-ZLs using *more than 5 W* score five points per QSO with a ZL using up to 5 W. QSOs between stations where both use more than 5 W are invalid for the contest. Final score equals total points times number of ZL branches worked. Send logs to reach: Contest Manager ZL3KR, 4 Exton Street, Christchurch 8005, NZ by 8 June. Certificates will be awarded to the highest scoring non-ZLs in their respective call areas.

Results of 1995 VK/ZL/Oceania DX Contest

Many thanks to all those who entered the 1995 contest, and especially those who took the trouble to send in their logs. Entries were slightly down from last year, and comprised 150 CW and 112 phone logs. This was due to the generally poor conditions, especially on the phone weekend, with Northern Europe appearing to suffer the most. As expected, 10 m continued to be difficult; however, those who persevered were rewarded with a good number of QSOs on that band.

At the other end of the frequency scale, 160 m QSOs were confined to VK and ZL, although several stations managed to work FK8. Considering how much time and effort this band can consume, and the negligible number of "real" DX QSOs it generally produces (from VK and ZL at any rate), I believe the time has come to drop 160 m from the contest.

An interesting feature of this year's contest was a considerable increase in the number of single band entries on 40 and 80 m, from both local and DX stations. Even as far away as the Netherlands, a PA managed a very creditable 1800 points on 80 m, on phone! It is clear that the revised scoring introduced several years ago for DX entrants, in which the lower frequency bands attract higher points, is having the desired effect in spreading activity to bands other than 20 and 15 m.

Some DX stations are still scoring their QSOs at two points each, regardless of the band. These logs were all re-scored, leading to large increases in the final scores in many instances. Other entrants may find their scores slightly reduced, due to log corrections. Although operating speed is clearly important, entrants should not overlook the need to copy callsigns and numbers accurately as well, to avoid the loss of QSO points and multipliers. In several cases, where scores were close, the battle for country and continental leadership was, in fact, decided according to which entrant had made the fewest errors.

As usual, a number of check logs were received. I don't fully understand why entrants would go to the considerable trouble of preparing and posting their logs, without spending the minute amount of extra time and effort to work out the score. Lack of current rules should not be an obstacle, because most contest managers (myself included) will readily score logs without penalty, unless it's a huge one (which is rare). In fact, many such entrants did themselves an injustice, because their logs were good enough to make them country and even continental leader! Therefore, these winning logs were promoted to full entries, and the entrants concerned should be delighted to find that they have received a certificate for their efforts.

The standard of logs continues to increase, with many now coming in the form of computer printouts and floppy disks. To those entrants who do not have access to a computer, I hasten to add that many top scoring logs were hand produced, so the lack of a computer is not necessarily a handicap.

A brief warning to those who send logs on disk. One disk was received partially bent, and had to be removed from its sleeve and inserted into a new one before it could be read. Another disk was received with bad blocks in the middle of the data, and had to be revived using Norton's Disk Doctor. Fortunately, enough data survived for the log to be usable. For the sake of your log, please use good quality disks (preferably 3½"), and/or include a paper backup. We are working towards getting a BBS number and/or Web page on the Internet for contest logs, which should resolve the problem in future.

Several entrants commented on the apparent lack of Pacific activity. Whilst only two Pacific area logs were received (from DU1 and KC6), a quick scan of logs shows plenty of Pacific prefixes in evidence. So, if you didn't work them, perhaps you weren't listening hard enough! And yes, we do publicise the contest widely.

Some outstanding scores were achieved, with special mention going to John Loftus VK4EMM for being the inaugural winner of the Frank Hine VK2QL Memorial Trophy, for the highest CW score. Not content with CW, John joined forces with Peter NN9K/VK4CWX to take out top phone multi-operator for VK, ahead of stiff competition from Martin VK5GN, assisted by VK5A1. Overseas, Nobuo JA6GCE put in an outstanding effort on both phone and CW, despite being beaten by a whisker on CW by Takeshi JA3AAW. I won't individually detail the remaining winners, except to congratulate them and refer you to their scores below.

The next VK/ZL/Oceania DX Contest will be sponsored by NZART, so please give it your full support.

73s, and I look forward to seeing you in our next contest!

Peter VK3APN

Results of 1995 VK/ZL/Oceania DX Contest
Frank Hine Memorial Trophy (Highest CW Score)

John Loftus VK4EMM, 2,440,370 pts

Continental Leaders

Continent	Single Operator		Multi-operator		SWL	
	CW	Phone	CW	Phone	CW	Phone
Oceania	VK4EMM	VK4MZ	—	VK4EMM	—	—
Africa	EA8CN	—	—	—	—	—
Asia	JA3AAW	JA6GCE	RKOQ	RKOQ	JA4-4665/1	JA4-4665/1
Europe	SP5CJQ	G3NAS	UU5J	UU5J	OM3-27707	ONL-383
North America	K2SX/1	W5FO	—	—	—	—
South America	YVIOB	—	—	—	—	—

Country Leaders (Single Operator)

Country	CW	Phone	COUNTRY	CW	Phone
Oceania					
Australia	VK4EMM	VK4MZ	Rep. of Palau	KC6HN	—
New Zealand	ZL1AIZ	ZL4NF	Philippines	—	DU1SAN
Africa					
Canary Isl.	EA8CN	—			
Asia					
Asiatic Russia	UAOLCZ	RAOFU	Taiwan	—	BV2FI
Japan	JA3AAW	JA6GCE			
Europe					
Aaland Island	OHO/OH3TY	—	Italy	—	IK4SWX
Belarus	EW2AA	EW2AA	Lithuania	LY3JY	LY1FW
Bulgaria	LZ1LZ	LZ1XQ	Moldova	ER1OA	—
Czech Republic	OK2EQ	—	Netherlands	PAOCYN	PA3EPN
Denmark	OZ5DX	OZ5KG	Norway	—	LA9JDA
England	G3GLL	G3NAS	Poland	SP5CJQ	SP7VCK
Eur. Russia	RA3XO	RU6BV	Slovakia	OM6KW	OM6KW
Finland	OH6IU	—	Spain	EA1AUI	—
Germany	DL6YK	DL1JPL	Sweden	SMONJO	—
Greece	—	SV2AVP	—	Switzerland	HB9ADD
Hungary	HAOEQ	—	Ukraine	UX7I	UR3I
Iceland	TF3DX	—	Yugoslavia	YU7SF	—

North America		South America	
United States	K2SX/1	Venezuela	YV1OB
	W5FO		—

Country Leaders (Multi-operator)

Australia	—	VK4EMM
Asiatic Russia	RKOQ	RKOQ
Eur. Russia	RZ4AYT	RZ4AYT
Japan	JA2YKA	JA1YAO
Ukraine	UU5J	UU5J

CW Results

Callsign		Band	160	80	40	20	15	10	Score
Single Operator									
Australia									
VK1FF	*	40		312285					312,285
VK1JE		40		845					845
VK2APK	*	A	120	47560	357380	48841	19092	504	1,660,531
VK2BQQ	*		80	27720					27,720
VK2DID		A		37370	675	900			68,094
VK2PS		A	240	1760	5580	15680	11792		158,760
VK2VM		A	120	22960	10800				73,870
VK2ZC		A		6460	21375	6279	6440		180,686
VK3APN		A		14570			8		15,642
VK3DXI	*	20				69225			69,225
VK3KS		A			80	110	608		2,070
VK3XB		A		40	4080	240	988		15,480
VK4EMM	*	A		15480	1105845	7227	27824	4050	2,440,370
VK4TT	*	20			44385				44,385
VK4XA	*	10						10296	10,296
VK5AGX		40			8750				8,750
VK5AI	*	40		30485					30,485
VK5GN	*	A	20	33120	40180	30058	22950	1980	662,355
VK6AJ		A	40		150	2880	3800	27	20,739
VK6IV	*	40			39200				39,200
VK8AV/8	*	15					2052		2,052
New Zealand									
ZL1AIZ	*	A	300	57850	187880	9408	6834		876,792
ZL1ALZ	*	80		11340					11,340
ZL1HV	*	40				46000			46,000
ZL1MH		A	40		46610	2992	9976	192	166,934
ZL1RAW		A		320	1800	9			4,575
ZL2AGY	*	80		104520					104,520
ZL2CD	*	A			10965	15000	7344		106,506
ZL2VS	*	20				2438			2,438
ZL3NB	*	A		2730	251810				309,400
ZL4OL	*	40			93790				93,790

Phone Results

Callsign		Band	160	80	40	20	15	10	Score
Single Operator									
Australia									
VK2ARJ		A	80	1540	6630	26875	126		120,400
VK2PS		A	800	3080	1200	22581	5796		161,690
VK2QG		A		7700	13005	19261	12028		234,668
VK2XT	*	A		4680	19500	9675	91392		433,810
VK3DXI	*	20				25422			25,422
VK4MZ	*	A	900	19040	49980	6120	32936	1953	570,304
VK5OE	*	A				169			169
VK6WJH	*	A	120	5520	1785	7140	10904		145,485
New Zealand									
ZL1BVK	*	A	1820	3960		486	4130		52,920
ZL1RGR		A		1980	1105	9			7,700
ZL3TX	*	A	500	41160	3120	144	60		105,230
ZL4NF	*	A	80	1280	16470	3927	23798		170,704
Multi-operator									
Australia									
VK1DX			800	6560	3840	43955	14632		322,816
VK4EMM	*		1000	2700	26975	25132	47124	11088	628,140
VK5GN			480	18620	29480	27306	22052	12	485,408

VK Comments

Full comments and all contestants' scores (not just for VK and ZL) will appear in the **Results Booklet.**

CW: Doubled my score from last year, and had a good time. A couple of good openings to Europe... *VK1FF.* I had to work Sunday, so could only devote a few hours to the contest. This was my first CW contest, and I learnt a lot. An electronic keyer would be very luxurious... *VK1JE.* We live in a retirement village where no masts are permitted, so our antenna is merely 38' of wire slung over the roof... *VK3XB & XYL VK3KS.* Pleased with the good level of participation on 40 m from Europe, Asia and North America. 10 m and 15 m were wide open to Asia/Pacific, but few stations were active. Got no response to my 160 m calls. Looking forward to another big effort next year... *VK4EMM.* Have been having a rough trot lately: Had a heart attack in August, and then a triple bypass in October. These heart attacks sure interfere with my contesting... *VK4TT.* Only a few European QSOs on Saturday, and none on Sunday. Enjoyed the struggle... *VK5AGX.* My first VK/ZL; I enjoyed my first ever CW pile-ups in 42 years of ham radio... *VK5AI.* Although my CW is improving, a year ago I was lucky to read 12 wpm, so the pile-ups are still challenging! Enjoyed myself, lots of good DX, great fun... *VK5GN.* The lack of sunspots made it hard to penetrate with QRP and my 10' copper pipe antenna... *VK8AV/P.*

Phone: Lots of fun, a real Pandora's box!... *VK2ARJ.* Not enough participation from our side. Do the Pacific countries know they can participate? Do they have advance notification, and is there any VK/ZL plan to encourage more Pacific activity?... *VK2PS (Agree; yes; yes. ZL1AAS and I have discussed it often, but it's easier said than done — Peter VK3APN).* We had a great time checking out a new antenna farm. The only drama was when the local cattle started chewing the coax! A good opening to Europe on 20 m, but condx were difficult on the lower bands, with high QRN... *VK4EMM.* Special thanks to the contest manager and all participants... *VK4MZ.* We had some clock problems with two ops and RF1 in the computer. I think the points for 160/80/40 are too high, which puts the average suburban station at a disadvantage compared to those on a few acres. Seems silly that a VK3 on 160 is worth almost 7 times a JA on 10!... *VK5GN.* Conditions here very poor, also QRM from an EA contest... *VK5OE.* Enjoyed it very much. Some DX openings, although propagation poor. I would have liked more 160 m QSOs, but there were none to be had... *VK6WJH.*

PO Box 2175, Caulfield Junction, VIC 3175

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Club Corner

Riverland Radio Club Inc Communications 96

"Communications 96" is the theme which will be sponsored by the Riverland Radio Club, with support from the South Australian Division of the WIA, on Saturday, 27 April 1996 in the K M Tucker pavilion at the Renmark Show grounds, Renmark.

"Communications 96" will be endeavouring to emphasise all facets of the latest technology in communications such as radio communications, satellite communications, mobile phones, computers, bulletin boards, Internet, packet radio and electronics.

Commercial interests involved in "Communications 96" include Daycom Communications, Hills Industries, ZRV Communications, Mike Iredale Communications, Johnston Electronics, ATN Antennas, Gardners, Riverland Computers and A-OK Communications.

Buy and sell stalls will be available to dispose of that unwanted radio and electronic equipment — book your stalls early. There will also be some excellent craft stalls for the ladies, as well as morning and afternoon tea, and lunch available. A dinner will be held in the Renmark Hotel at 6.30 pm, with a three course dinner costing only $18 per head. Bookings are essential.

For bookings and more information, contact the Riverland Radio club secretary, Doug Tamblyn VK5GA at Box 646, Renmark SA 5341, or by phone on 085 955 320.

Radio Amateurs Old Timers Club (RAOTC) Annual Meeting

The RAOTC Annual Meeting and election of office bearers was held at the Bentleigh Club on Wednesday, 6 March. The previous committee was re-elected, with the addition of Stewart Day VK3ESD after the meeting voted to increase committee members from five to six.

The seventy members and friends present listened with close attention to a talk about the top secret work of the RAAF "Wireless Units" during the war in the Pacific. Our speaker, Jack Bleakley, was one of the specially trained operators who had to master the 70 character Japanese Kana code and monitor Japanese military traffic.

Jack was in the first RAAF unit that General MacArthur took with him to the historic landing at Leyte in the Philippines and on to Manila.

Jack's book, *The Eavesdroppers,* was only allowed to be published in 1992 and has been sold out. Hopefully, it will be reprinted about the middle of this year.

Broadcasts

With the end of Daylight Saving in the eastern states, our monthly broadcasts will be at 1200z, 0100z, 0200z and 1030z.

Allan Doble VK3AMD
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Divisional Notes

Forward Bias — VK1 Notes

Peter Parker VK1PK

Divisional AGM Well Attended

More than 40 members attended the VK1 Divisional AGM, held at the Griffin Centre on Monday, 26 February. As the number of people seeking office equalled the number of positions, no election was required. Nevertheless, with last year's President, Secretary and Treasurer not standing in 1996, there has been a large infusion of new blood into this year's committee; seven of its eleven members are new this year.

Your Divisional Committee for 1996 consists of President, Phil Rayner VK1PJ; Vice President, Ian Cowan VK1BG; Secretary, John Woolner VK1ZAO; Treasurer, Bernie Kobier VK1KOX; and Federal Councillor, Richard Jenkins VK1RJ.

In addition, the councillors are Hugh Blemings VK1YYZ; Gil Hughes VK1GH; Jim Muller VK1FF (Inwards QSL Bureau Manager); Peter Parker VK1PK (Broadcast and Publicity Officer); Graham Trainor VK1KGT; and Simon Trotter VK1KFC.

As well, several local amateurs are active in particular aspects of Divisional affairs, but are not necessarily on the committee. These include those concerned with building and maintaining Canberra's repeaters, running education classes, JOTA, and the Outwards QSL Bureau, to name a few activities performed by them.

Committee Seeks Ideas at February's Meeting

Immediately after the AGM, a regular meeting was held. The first item on the agenda was a vote of thanks to the outgoing President, Rob VK1KRA, Secretary, Len VK1NLJ, and Treasurer, Alex VK1AC. Members present raised a variety of topics, including the need for a 1200 baud packet repeater. There was also some discussion on the optimum number of VHF/UHF amateur repeaters for Canberra; most who spoke thought that we had about the right number at the moment. As well, there was support for the Division to hold social functions as well as formal meetings.

The new committee is receptive to your ideas about how the Division can serve the membership better. If there is any matter that you would like to discuss, please phone the President, Phil VK1PJ, on 292 3260.

Repeater Committee's Weekly Meetings

A reminder that the VK1 Repeater Committee meets at 7 pm each Thursday at the Communications Laboratory, 14 Wales Street, Belconnen. For further information, contact Neil VK1KNP at home on 258 7803.

Still on repeater news, local amateurs will have noticed the improvement to the performance of the Black Hill 6900 Repeater during January, due to the fitting of a new antenna. More recently, coverage of the temporary Mt Ginini repeater was enhanced, again because of the Repeater Committee's work. Winter comes sooner than you think at Mt Ginini, and snow will soon be falling on the site of Australia's second-highest amateur repeater, making it inaccessible. For this reason, the replacement of the existing temporary repeater is unlikely before Spring.

Correction

February's *Forward Bias* carried an item regarding a local amateur whose packet radio station had been jammed on transmit for some time before being discovered. The story stated that the problem was due to a packet watchdog

timer that had failed. This statement was wrong. Instead, the fault was due to the relay in the transmitter concerned becoming stuck in the transmit position. The packet TNC's watchdog timer was operational at the time; however, as the fault was within the transceiver, the TNC would not have been able to shut down the transmitter. I apologise for any confusion or ill feeling that might have arisen from the story. Nevertheless, the basic theme of the item still stands; those who leave transmitting equipment operating in unattended mode owe it to their fellow amateurs to ensure that their equipment is reliable, and (preferably) fitted with a device that shuts down the transmitter after 10 minutes or so of continuous operation.

VK2 Notes

Richard Murnane VK2SKY

Divisional Membership Drive

In accordance with a Council resolution taken at the meeting in Tamworth in February, a new membership drive was commenced at the Wyong Field Day. The first stage of the promotion was that anyone who joined the VK2 Division at the Field Day went into a draw, the prize being $100 cash plus a refund of this year's membership fee. As a result, the Division gained 13 new members at the Field Day.

The second stage of the promotion has commenced, and the prize (generously donated by Cesar Miranda VK2TCM) is the "King of Word Processors", Word Perfect 6.1 for Windows. It's fully compatible with Windows 95 and carries a $565 price tag in most computer stores.

Who can Enter?

The promotion is open to all new members (in any category) who join the WIA (VK2 Division) from now until the Division's Annual General Meeting on 20 April 1996. The winner will be drawn at the AGM, and will be available for collection on the day. The lucky member will be announced on the Divisional broadcast, packet radio network, and in *Amateur Radio* magazine.

WIA membership nomination forms are available from the Divisional Office, or by contacting the Membership Secretary, Cesar Miranda VK2TCM, on (02) 831-8450, or by fax on (02) 621-1516.

Thought for the Month: The trouble with most of us is that we would rather be ruined by praise than saved by criticism.

VK3 Notes

Jim Linton VK3PC

Closing Date — Motions on Notice

The closing date for motions on notice for the 1996 Annual General Meeting of the WIA Victorian Division is 12 pm on Thursday, 18 April 1996. Motions must be lodged with the Secretary by the closing time, and be signed by three financial members.

Council Election and AGM

The WIA Victorian Division AGM will be held at St Michaels Community Centre, Ashburton, on the evening of Wednesday, 29 May. Formal notification of the AGM and the necessary forms for the election of the 1996/97 council will be sent to all members.

The 1995 company report, which includes the balance sheet and auditors report, will not be distributed in *Amateur Radio* magazine this year as it has in the past. This report, together with ballot papers and any notices of motion, will be mailed directly to financial members.

All members who wish to vote in the forthcoming election should ensure they remain financial at all times. When material is posted to members, records must be researched up to ten days prior to mailing in order to produce the address labels. Members who are not currently financial at this time will be excluded from any posting.

Financial members will receive, by mail, one only ballot paper for election of councils. No additional or duplicates will be available.

New Federal Councillor

The WIA Victoria Council has appointed Brenda Edmonds VK3KT as Federal Councillor. Brenda had volunteered to take on this role, and her first task will be attendance at the WIA Federal Convention (AGM) next month.

She is very familiar with the workings of the WIA Federation, having been long involved in that scene in several capacities, notably as Education Officer.

Victoria's representation on the Federal level also includes alternate Federal Councillors, Barry Wilton VK3XV and Jim Linton VK3PC.

Special Projects Fund — Reminder

Time is running out for requests for financial assistance from affiliated clubs or individual members for projects of general benefit to members and our hobby.

In these notes last month and on the VK3BWI twice monthly broadcast, members were advised about limited funding being available. Each application has to meet special criteria, a copy of which is available on request.

Applications close on May 30, 1996, and will be evaluated by the 1996-97 WIA Victoria Council.

Submission to Parliament

An exposure draft of the WIA submission on licensing for the Amateur Radio Service to the 38th parliament was released in late February. It was sent to the 200-odd candidates who contested the 2 March federal election, and sitting members of the Senate.

A copy has been sent to each of the radio clubs affiliated with WIA Victoria. Individual members may obtain a copy on request and by forwarding a self addressed A4 envelope to the Secretary.

Clubs or individual members wishing to comment on the draft submission should do so in writing to the WIA Victoria Secretary. The deadline is 12 April.

Melbourne DX Packet Cluster

Alerting DXers on activity of interest to them and providing a useful on-air database resource is the basic task of a DX Packet Cluster. The Melbourne Cluster operating under the callsign VK3UR can be accessed on 144.850 MHz by 1200 baud packet.

Its operation is similar to a packet BBS; however, its main aim is to log and alert users about DX stations. Currently sharing DX information on the cluster are 32 users. The DX listed includes HF, satellite, and terrestrial VHF/UHF DX paths.

Users can stay logged on to be alerted by fellow users of DX activity — a beeping sound is emitted by their PC; or they can review the current list of callsigns, times and frequencies of previous DX SPOTS.

Messages for SYS OP, Tony Burt VK3TZ, can be put on the cluster by using normal BBS mail commands sent to VK3UR on the cluster frequency.

Users having access difficulty may like to try to node hop to VK3IRW-2 which has an output port feeding the cluster; or simply packet message Tony VK3TZ at VK3ECC and he'll respond to your queries.

Novice Licence Conditions

Some Novice and Novice Limited licensees have been heard using the FM voice mode on their digital modes

segment of 144.700 to 145.200 MHz. This is not permitted under the Regulations and the Technical Licence Specifications.

Novices must confine themselves to digital modes such as RTTY or packet in this lower segment of the two metre band. FM telephony for Novices is above 146 MHz only. Also, a reminder about avoiding the use of 146.000 MHz for FM, because it does interfere with amateur satellites.

If an FM station operates on 146.000 MHz, half of its bandwidth will actually be inside the satellite band. The lowest FM channel in the band plan is 146.025 MHz.

VK6 Notes

John R Morgan VK6NT

Annual General Meeting

The VK6 Division's AGM will be held on 30 April 1995 at the Westrail Centre, East Perth, following the General Meeting that starts at 8 pm. For more detail, please refer to the "VK6 Notes" in the February 1996 issue of *Amateur Radio*.

Monthly Meetings

For 1996, the Wireless Institute of Australia (WA Division) has changed its General Meetings to the **LAST TUESDAY** of the month. This has been necessitated by a room-booking problem. If in doubt, listen to the weekly VK6WIA News Broadcasts, or telephone the Secretary on (09) 351-8873.

These meetings are held in the Theatrette on the second floor of the Westrail Centre, East Perth, commencing at 8 pm. All interested persons (members and non-members, licensed or listener) will be made welcome. Free coffee and biscuits are available at "half time".

The change in meeting-dates also means that the monthly meetings of Council have been relocated to the library of the Medical Physics Department at the Royal Perth Hospital. For directions, contact Bruce Hedland-Thomas VK6OO on (09) 224-2267 during working hours.

VK6 QSL Bureau

The VK6 QSL Bureau is now a by-mail-only service, as is the case with all the other Divisions. To receive their inward cards, members should send a few stamped self-addressed envelopes to: VK6 QSL Bureau, PO Box F319, Perth WA 6001. The same address is valid for out-going cards, and for the purchase of their required stickers. Arrangements are being made for stickers also to be on sale at the monthly meetings.

February General Meeting

More than 50 members attended the January GM, and voted 10-to-1 in favour of continuing the monthly meetings. At the February GM, only four weeks later, it was disappointing to observe that the attendance had returned to its previous level of being only just above the quorum of 25.

The lecture was by Bob VK6PO, and was simply entitled "Fuses". This is one of those topics about which the average amateur operator tends to think that he or she is already sufficiently knowledgeable. With well-structured examples, and many transparencies for the over-head projector, Bob proceeded to destroy any such self-deceptions! At the conclusion of his most-successful presentation, while Bob was answering numerous questions from the floor, it became clear that a follow-on lecture, entitled "Circuit Breakers", should it occur, will surely be similarly informative.

The business meeting followed, and included a few previously-agreed procedural innovations. First, the minutes and correspondence were circulated in written form, rather than being read out. Second, those members of Council who were present were seated on the stage, facing the members. The consequential increased interaction was most noticeable. Only one member of Council refused to participate.

Morse Beacon VK6RCW

The purpose of this system is to provide a continuous source of Morse-code text (sent at between three and 12 wpm) so that prospective radio amateurs, and licensed radio amateurs trying to upgrade, can practice their receiving skill, at any time of the day or night.

The system's format is based on an hourly cycle, which is divided into twelve five-minute segments. The speed (wpm) of each segment is as per the face of an analogue clock; for example, at 35 minutes past the hour, when the minute-hand is pointing to the digit 7, the seven wpm segment will begin. The only exceptions to this rule are at five and 10 minutes past the hour — these segments are at five and 10 wpm (the NAOCP and AOCP examination speeds).

The text of each segment is transmitted using a different audio pitch, which is also chosen at random by the computer's software. This feature is included so that your "ear" will not become attuned to one particular pitch.

The system is located in the Welshpool industrial area, and transmits on 147.375

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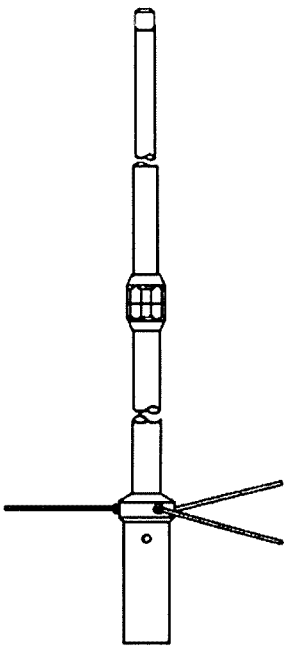

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Type: 2 x 5/8 wave (2m) 4 x 5/8 wave (70cm)
Connector: SO-239 socket

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Cat. D-4830

2m/70cm GST-3

Frequency: 144-148MHz, 430-440MHz
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Type: 3 x 5/8 wave (2m) 7 x 5/8 wave (70cm)
Connector: SO-239 socket

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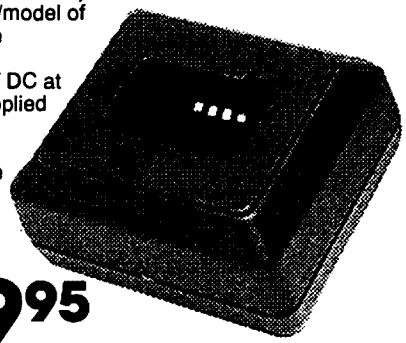
Mastercharger 1 Fast Desktop Charger

Made in the USA, the Mastercharger 1 is a compact fast charger that operates from 13.5V DC and uses switch-mode technology plus a Philips battery charge monitor IC (with -Δ V full charge detection) to safely charge NiCad batteries between 6V and 13.2V. Suitable for the FT23/73, FT-411/411e, FT-470, FT-26, FT-415/815 and FT-530, its charging cradle can easily be replaced, allowing the insertion of a new cradle to suit other Yaesu transceivers (eg FT-11R) or different brands/model of hand-helds. The Mastercharger 1 requires 12-15V DC at 1.3A, and is supplied with a fused cigarette lighter cable for vehicle use.

Cat D-3850



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MHz FM, using a WIA-funded Philips TX-814 transmitter which feeds 25 W to a folded dipole at 42 m AGL. Thanks to Air Group Australia for permission to use the site at no charge.

The system has recently been completely re-designed and re-built, and now uses a Motorola 6805 micro-controller, which is capable of driving the planned parallel output in the 80 m band, so that the system will reach beyond the metro area.

If You Have Material ...

All material for inclusion in this column must arrive on or before the first day of the month preceding publication. Packet mail may be sent to VK6NT@ VK6ZSE.#PER.#WA.AUS.OC, or write to PO Box 169, Kalamunda WA 6076, or telephone (09) 291-8275 any time.

"QRM" News from the Tasmanian Division

Robin L Harwood VK7RH

During the month of February, Annual General Meetings were held in the three branches. The Southern and Northwestern branches saw no alteration and the executive officers were returned. However, there were some changes in personnel in ex-officio positions, as can be expected. The Southern Branch president is Andrew Dixon, VK7GL; secretary is John Bates VK7RT; and treasurer is Mike Jenner VK7FB. The Northwestern Branch also saw the re-election of David Spicer VK7ZDJ as president; Ron Churcher VK7RN as secretary; and Phil Harbeck VK7PU as treasurer.

The Northern Branch had a complete turnover in positions. The new president is John Cornish VK7KJC; secretary is Anthony Cordwell VK7ZAC; and treasurer is Ian Hart VK7KIH. Instead of electing or appointing ex-officio positions, the branch president recommended that sub-committees be established to do the work previously done by these ex-officio positions. A decision was to be taken at the March meeting on the formation of these committees.

The Divisional Annual General Meeting was held on Saturday, 23 March in Hobart. There were 15 candidates for the eight positions on Divisional Council, which must be a record number. Results will appear in the May edition of *Amateur Radio*. There was a Notice of Motion from the Honorary Solicitor, Mr P Corby VK7ZAX, for the Articles of Association to be amended and updated to bring them into the 21st Century. Results of this will also appear in this column.

Tom Moffatt VK7TM is well known to many in the state and beyond through his writing. Division has been advised that he has moved to Washington State. We wish him well.

Congratulations go to Don Hopper VK7NN who was awarded the Order of Australia (OAM) in the Australia Day Honours, for emergency communications. He was NCS for many years of the VK Maritime Mobile Net, whilst resident in VK4. The OAM was specifically awarded for his work in amateur radio emergency communications. As a sidelight, it was Don who was one of the radio instructors at the RAAF wireless training school at Ballarat in WW2. One of those he trained was my father and my maternal uncle, who met and became friends at that particular school. My uncle was killed in the War and after the War ended, my father came over to Tasmania, met my uncle's family and married his younger sister, who is my mother. It really is a small world with Don being in the same Probus club as my father.

Don't forget the Sunday morning broadcast of VK7WI at 0930 EAST (2330 UT Saturdays) on the main two metre repeaters, and re-broadcast on 3570, 7080, 7090 and 14130 kHz. A 144.15 MHz SSB relay has been re-instituted, being provided by Frank VK7ZFT, who is at Arthurs Lake in the Central Highlands. From that high point he is able to reach a wide area of the State and, I am certain, welcomes reports of the 144.15 MHz signal.

Branch meetings for this month are in the South on 3 April at the Domain Activity Centre at 2000 hours; in the Northwest on Tuesday, 9 April at 1945 at the Penguin High School; and in the North on Wednesday, 10 April, again in the staff common room at 1930 hrs at St Patrick's College, Mount Leslie Road, Prospect.

That is all for April. Have a happy Easter and drive safely.

ar

Education Notes

Brenda M Edmonds VK3KT Federal Education Coordinator*

It is now some time since I last reported on the progress of the Question Bank Committee, which has been working on revision of the theory syllabuses and the review and extension of the Question Banks from which theory examinations are drawn.

When the WIA agreed to manage the examinations, the then DoTC passed over the Question Banks which had been in use. These were the same as those which were released to potential examiners under the original devolved examination system. A number of questions were added to those banks from WIA sources, and examination papers have been drawn from the extended bank ever since. However, even the extended banks were limited in scope and unbalanced in terms of emphasis on syllabus topics.

Over the last three years, the Question Bank Committee has extended and balanced all the Banks, and has reviewed and revised the syllabuses.

We started by changing the order of the Sections in the AOCP/AOLCP syllabus to align it with the Novice syllabus. (Incidentally, I have suggested to the SMA that we start using the terms "Advanced" for the AOCP/AOLCP/AOICP syllabus and "Novice" for the NAOCP/NAOLCP. Any comments?)

The content of the Advanced syllabus was not greatly extended, except for a re-write of the Interference Section. It was difficult to allow for the enormous advances in the field since the last syllabus review (1984) without raising the standard of the examination. There was not much that could be removed to compensate! However, we were conscious of this difficulty, and tried to allow for it by adjusting the standard of the questions.

It was necessary, though, to extend the Novice syllabus because of the increase in Novice privileges over the years. Admittedly it was extended slightly when Novices gained access to two metres, but they now have 70 cm and data modes as well. Again, we tried to compensate by adjusting the question standard.

In addition, at the request of the SMA, we produced a syllabus for the Regulations examination.

All three syllabuses are currently being considered by the SMA, and negotiations are proceeding. We expect to reach a final agreement very soon. Two matters are of concern to the SMA — that there should

not be changes which affect existing reciprocal agreements, and that our syllabuses line up with the European CEPT Harmonised licence proposals to facilitate negotiations on CEPT accreditation for Australian amateurs.

The Advanced Question Bank and the Regulations Bank are also awaiting approval from the SMA, and the Novice Bank is nearly ready for submission. When approval is received the Banks will be released for distribution to examiners, class instructors and candidates. They will then be put into use for the preparation of examination papers. In my next column, I will explain the structure of the banks and how papers are generated.

In conclusion, let me assure all candidates that there have been no changes made as yet to either the syllabuses or the Question Banks from which examination papers are currently drawn. When the time comes, there will be plenty of publicity to warn all concerned, and time will be allowed for an efficient change-over. Perhaps all those out there who are thinking about sitting for theory or regulations should make the attempt quickly, before the revisions are put into place!

PO Box 445, Blackburn VIC 3130
ar

How's DX

*Stephen Pall VK2PS**

There Are DXers and There Are DXers...

A few of the armchair DXers will do anything to obtain "that" missing card, while some of the active DXers will do anything to go to a much sought after country and operate from there.

The late Don Miller W9WNV in the 1960s operated from a variety of countries, which later turned out to be an untruthful claim to fame. In 1966 Don Miller "used" the callsign VK2ADY/VK0 and claimed to have been on Heard Island. In the end, truth caught up with him.

The ARRL Awards Committee released the following news on 21 February 1996: *"The ARRL Awards Committee met recently to review submitted documentation for the 1992-93 P5RS7 operation submitted by Romeo Stepanenko. After a review of all material available, the Awards Committee voted unanimously to disqualify Romeo Stepanenko from participation in the DXCC program.*

This disqualification is based upon Rule 12, Operations Ethics, and Rule 13. The disqualification means that Stepanenko is not eligible to participate in the DXCC program in any manner. This includes, as provided for under Rule 12, paragraph (b), disallowance of contacts made with any station or DXpedition operated by him from the time of this action."

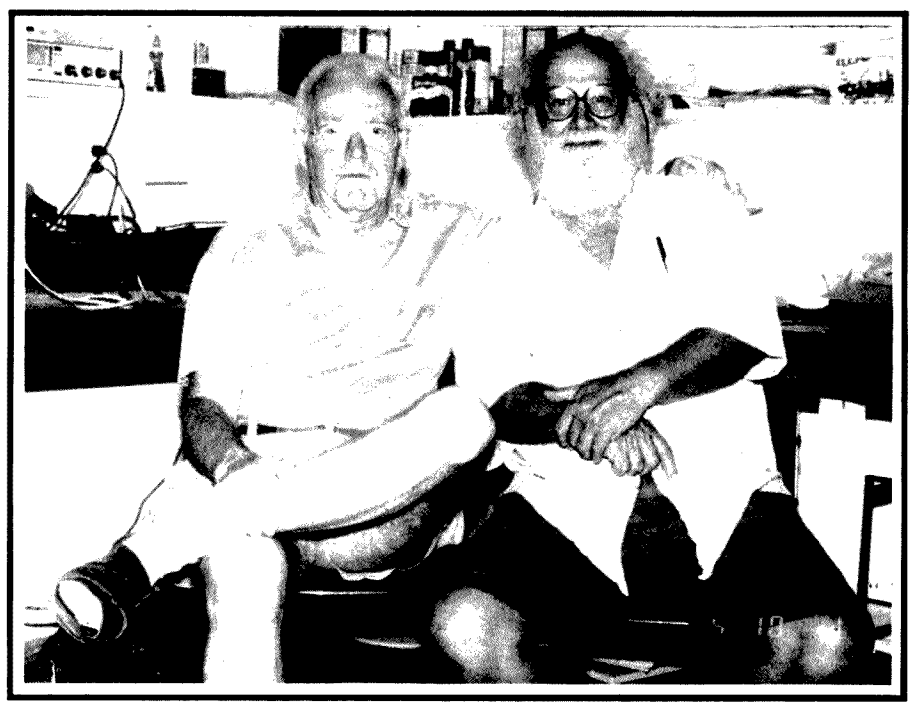
Heard Island — VK0 — 53° 05' S and 73° 30' E

During the past months the Heard Island Expedition has been re-organised for the 1996-97 southern hemisphere summer season. Given the revised schedule, and the necessity for rebuilding the team and financial resources, K0IR asked KK6EK and ON6TT to take primary responsibility for the 1996-97 Expedition. The project was brought under the auspices of Cordell Expeditions, which is a research organisation directed by KK6EK.

The Heard Island project is being implemented by the project directors Robert Schmieder KK6EK and Peter Casier ON6TT, assisted by Ralph Fedor K0IR, Bob Fabry N6EK and Carlos Nascimento NP4IW. The expedition is planned to depart from Reunion Island, off the east coast of Africa, on 3 January 1997. Operations will commence on Heard Island on 12 January, and end on 28 January, with the team returning to Reunion on 5 February. The total time away for the team members will be exactly five weeks.

The organisers of the expedition have successfully negotiated an agreement with the French Institute of Polar Research and Technology (IFRTP) for a return passage aboard their brand new 120 metre supply vessel, the "Marion Dufrese", which has 10,380 tons of displacement, 4900 tons of deadweight and a cruising speed of 15.7 knots. It has a crew of 25 and can carry 110 passengers in 59 cabins. The ship was specially built to supply and service the French sub-antarctic islands (Crozet, Amsterdam and Kerguelen), and can sail and work under any weather conditions in polar seas. It has the most sophisticated safety features, including polar life-crafts, helicopters and complete electronics. The ship was put into service on 23 June 1995 and has visited Heard Island, 200 miles from Kerguelen, several times.

During the voyage the vessel will make brief stops at Crozet and Kerguelen and the team may be able to operate from those islands.



Lothar T32ZB (l) and Phil T32O (r) in Phil's shack on Christmas Island.

Chartering vessels of this kind is not cheap. The total budget of the new expedition is $US320,000, out of which chartering of the vessel alone will cost $US200,000. There will be a 20 person radio amateur team who will pay $US10,000 each to participate. The rest of the budget will be funded by existing and future donations, sponsorship, and sale of souvenirs, video and other tapes. The radio team to go to Heard Island is EA8AFJ Michel Sabatino, G0LMX Vincent Denecker, HB9AHL Willy Rusch, JH4RHF Junicho Tanaka, KA6W Ted Algren, K0IR Ralph Fedor, K4UEE Bob Allpin, K9AJ Mike McGirr, KK6EK Robert Schmieder, N6EK Bob Fabry, NP4IW Carlos Nascimento, ON6TT Peter Casier, PA3DUU Arie Nugteren, RA3AUU Igor Harry Buklan, W60TC Glenn Vinson, W8FMG Wes Lamboley, WA0PUJ Glenn Johnson, WA3YVN Al Hernandez, and 9V1YC James Brooks.

You will note there is no VK radio amateur in the list. One such place was reserved for an Australian but no one was found, despite a diligent search on the west and east coast of Australia for a likely participant. Maybe the old spirit of "Aussie" adventure has died, or work, family and financial restrictions are the problem. Admittedly, the individual cost for a prospective Australian team member would run into some $AUS16,000 which includes the participation fee, return airfare to Reunion Island via Mauritius, and personal equipment such as sleeping gear, polar clothing, etc. So, if you feel that you are able to participate, there is a place reserved for you. If so, do not delay, and immediately contact Cordell Expeditions at the address below.

At the beginning of 1995, another group of DXpeditioners, the South Sandwich Island Antarctic DX Group (SSIDXG) planned to activate Heard Island starting from 2 December 1996. The leader of that expedition, Tony Deprato WA4JQS/VP8BZL issued a statement in February 1996 concerning the potential conflict between the two groups of Heard Island aspirants. Tony informed the DX Community that, with the re-activation of the KK6EK and ON6TT Heard Island DX Group's plans to go to Heard Island in January 1997, the SSIDXG has decided to step aside. Some of the reasons were that a major split would come about in the DX world as DXers would have to make a decision as to which DX group to support; and that the DX world could not afford to supply money wisely to two highly expensive DXpeditions to the same island. One has to say that this decision is very sportsmanlike and the SSDXG has to be congratulated on their commonsense approach to the problem. Tony said further, *"Even though the SSIDXG has worked out the transportation for the activity, I have been able to negotiate a deal for two other Antarctic islands later in the year".*

As always, the Heard Island DXpedition is looking for individual donations. If you need Heard Island for your DXCC, now is the time to support the team with your contributions, even if it is small. The address for donations or information is: Robert Schmieder, Cordell Expeditions, 4295 Walnut Blvd, Walnut Creek, CA 94596 USA — Tel: (510) 934 3735 (voice and fax) — e-mail: cordell@ccnet.com.

Lacepede Island — VK6ISL

Malcolm VK6LC will be operating from Lacepede Island from 16 to 21 May. He will be joined by Dave VK6DLB to activate this new IOTA island. It is located on the north-west coast about 120 km north west of Broome and about 45 km west of Beagle Bay at 16° 55' S and 122° 10' E. It is in a remote area infested with saltwater crocodiles.

Malcolm will use new 40 m four square phased vertical antennas manufactured especially for this expedition by ATN Antennas. The QSL manager for this activity is Gianni Varetto I1HYW, PO Box 1, 1-0060, Pancalieri (Torino), Italy.

Kermadec Island — ZL8RI

The Kermadec Island DXpedition Group is planning an 11 day activity from 4 to 14 May from Raoul Island in the Kermadec group. A "permit to land" and an "operating licence" have been issued, including the above callsign.

The group will have four complete HF stations on all bands, CW, SSB and RTTY. All the equipment is already in New Zealand and they are well equipped for low-band and new-band operation. The team has been given permission to remain on land the entire 11 days and operate around the clock. The expeditioners are Ken Holdom ZL2HU (leader), Chris Hannagan ZL2DX, Ron ZL2TT, Lee ZL2AL, Al WA3YVN, and one Japanese operator (to be announced later). The team will depart from New Zealand on 30 April aboard the research vessel "Evohe".

This modern ship has been inspected by members of the team in New Zealand and meets with their expectations regarding reliability and safety, and has some of the best communication, navigational and mechanical systems available. The ship has two Zodiacs and two additional landing craft. The charter cost of the boat is $US25,000 and your financial support is urgently needed. All donations will be used for non-personal expenses. Send your donations to Ken Holdom, Kermadec Expedition, 31 St Jones Terrace, Tawa or to PO Box 56099 Tawa, Wellington 6006, New Zealand. Ken is also the QSL Manager for the expedition.

North Korea — P5

The DPRK (Democratic Peoples Republic of Korea) project group, is headed by Mr Chen Ping BA1HAM, the Deputy Secretary General of the CRSA (Chinese Radio Sport Association), who was the organiser of the successful Scarborough Reef activity. The group has been busy maintaining multiple contacts and discussing additional steps required to establish amateur radio in the DPRK.

A major donation of amateur radio related equipment has been shipped to the DPRK Amateur Radio Association. As there are only sporadic flight connections from Beijing, and an exceptionally severe winter is affecting normal life in the country, the spring visit to North Korea was re-scheduled to the second part of April. The underlaying aim of the DPRK project is to establish permanent activity with the large base of radio communicating enthusiasts who are currently involved in amateur radio direction finding (ARDF) as well as in class room Morse competitions.

Callsigns of the Past

Following my list of past operators who were active from Macquarie Island, Ivan VK2NJ was kind enough to write to me and pass on some complementary information. Ivan was at Macquarie Island in 1960 as a radio officer and operated as VK0IT. Alf Kissick was his QSL Manager. He has a list of expeditioners who wintered on Macquarie from 1948-1994. Checking his list he makes the following observations: *"In 1948 I have no listing for Ted McCarthy VK1AA. Two things may have occurred. Either he was issued with the callsign prior to sailing and did not sail; or he was a supernumerary on the voyage (ie he sailed to Macquarie, but only assisted in the establishment of the base, then returned to Melbourne on the vessel).*

In 1950, VK1RF was Reg J Frost, who was the weather radio observer. Most of

the guys who wintered on the island used their own initials for their respective callsigns. In cases where there is only a first name in the list, I checked my original notes and have given the full name of who I think would have held the call. In 1953, VK1RF has the name Scott. It would be safe to assume that his full name is Scott Little who was the radio supervisor/radio-physicist. In 1953, VK1BA was Brian A Fiebig, radio officer. In 1957, VK0CJ was Colin J McNaughton, radio supervisor. In 1972, VK0RC was R "Chris" McPhee, senior radio technician. In 1980, VK0DB was David J Barrett, electronics engineer."

Thank you Ivan for your contribution which has greatly assisted to portray the past correctly.

Future DX Activity

* Mario HB9BRM will be active from Sri Lanka as 4S7BRG until 17 April, from 1600 to about 1900 UTC daily on the 14, 21, 7 and 3.7 MHz bands, using wire antennas. QSL to home call.

* Gustav DL30AY is the new operator of the DP0GVN station located on the German Antarctic Base Georg Neumayer (IOTA AN-016).

* Ron AA5DX will be active from Chagos Archipelago as VQ9DX on 40, 80 and 160 metres. QSL to Ron Marra, Marginal 301 C, La Rambla Suite 205, Ponce, PR 00731, Puerto Rico.

* Try to catch Andy G4ZVJ on St Helena until 12 April, operating as ZD7VJ on CW only on 1.827, 3.503, 7.003, 10.107, 14.027, 18.077, 21.027, 24.897 and 28.027 MHz, split, listening up. QSL to home call (new address), Andy Chadwick, 5 Thorpe Chase, Ripon, North Yorkshire, HG4 1UA, UK. Later (16 to 23 April) Andy could be active from Ascension Island as ZD8VJ.

* PY1UP will be active for four months from the Brazilian Naval Base on Trindade Island as PY0TI. QSL via PY1UP.

* Mike KB7HO will be signing VQ9HO. Active mainly on 20 metres SSB, split mode, from 1300 to 1500 UTC, transmitting on 14140 kHz and receiving between 14180 and 14190 kHz. QSL to KB7HO.

* Francois TJ1AG is active daily between 2000 and 2300 UTC in the African Net on 7065 kHz. QSL to F5RUQ.

* Hungary is celebrating the "Millecentenary", 1100 years of Hungarian nationhood. Some Hungarian amateurs are using the HAM prefix during 1996 instead of the customary HA.

* The vote on the DXCC status of Mt Athos, according to Garth VE3HO, Chairman of DXAC, has been postponed indefinitely.

* VG3CRC, a special event station, celebrates the 100th anniversary of the Red Cross in Canada. QSL to VA3CRC.

* Thierry FR5DT/J is on the air from Juan de Nova. He is not an experienced operator. He was heard working on 14122 at 1800 UTC. QSL to FR5DT/J, Traws, BP 386, 97410 Ile de La Reunion, via France.

* Michel FR5HG, who was on Comoro Islands, was heard to say that there is a good possibility for activity from Glorioso Islands in May.

Interesting QSOs and QSL Information

* AL7EL/KH9 — Tom — 14195 — SSB — 0612- Feb (E). QSL to Lloyd Westbrook K4HQI, Box 638, Commerce, GA 0529, USA.

* VK9XY — Jan — 14195 — SSB — 1123 — Feb (E). QSL to Rudi Hein DK7NP, Am Uferholz 7, D-96047, Bamberg, Germany.

* VR6CB — Clarice — 14174 — SSB — 0511 — Feb (E). QSL to PO Box 11, Pitcairn Island, South Pacific via New Zealand.

* T99T — Mustafa — 14267 — SSB — 0618 — Feb (E). QSL to Tomislav Dugec 9A2AA, Vetranica 13, HR-21000, Split, Croatia.

* ZL7BTB — 7003 — CW — 0735 — Feb (E). QSL to Antti Kantola OH5TB, Kalervonk 12 A-8, SF-00610, Helsinki, Finland.

* 9N1RHN — Rich — 14185 — SSB — 0345 — Feb (E). QSL to Rich Kingston, PO Box 10801, Kathmandu, Nepal (no callsigns on envelope!).

* 9N1ARB — Dick — 14210 — SSB — 0314 — Feb (E). QSL via VK6UE, W Billington, 30 Bindaree Tce, Kingsley, WA 6026.

* 8Q7BC — Harry — 14320 — SSB — Feb (E). QSL via David Schoen N2KK, 24307 Magic Mountain Parkway 114, Valencia, CA 91355, USA.

* F05PI — Lolo — 14232 — SSB — 0545 — Feb (E). QSL to PO Box 110402, Mahina Nr Papeete, French Polynesia.

* PJ8AD — Bert — 18130 — SSB — 1241 — Feb (E). QSL to POB 518, Saba, Netherlands Antilles, Caribbean.

* N2ZLG/HK6 — Fabius — 14210 — SSB — 0513 — Feb (E). QSL via the HK6 Bureau.

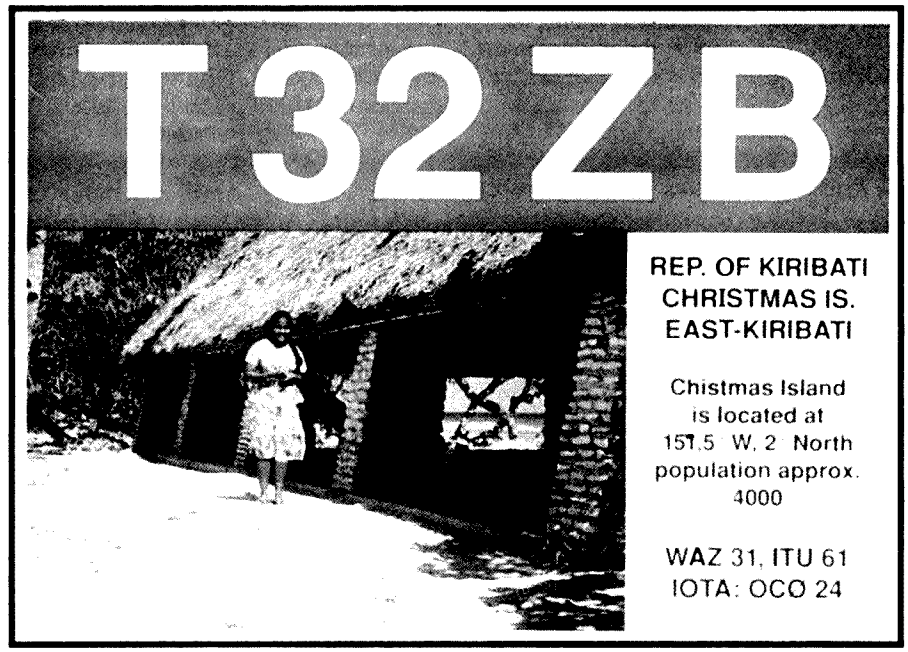
* T320 — Phil — 14190 — SSB — 0529 — Feb (E). QSL to Paul E Lange WC5P, 705 North Bend Rd, Weatherford, TX 76086, USA.

From Here There and Everywhere

* If you have worked VI75RAAF, the special event station celebrating the 75th anniversary of the Royal Australian Air Force, your QSL and Award manager ($5.00 for award) is Brian VK4LV, whose address is correct in the callbook.

* Graham ZL4MV, who was active as ZL9GD, has moved from Auckland Island and has gone to Chatham island where he operated as ZL7MV early in March.

* Frank DL7FT, who was active recently as TT8FT in Chad (the first German amateur to do so), advises that his address is incorrect in the 1995 Callbook and he was left out of the 1996 Callbook. He is correct in the 1994 Callbook. He is QSLing direct only under the two addresses: Frank Turek, Box DL7FT, D-14004, Berlin, Germany; or Frank Turek, Box 1421, D-14004, Berlin, Germany.



* The United Kingdom is running out of the familiar G-series callsigns which the Government has issued since the 1920s for most UK stations. The Radiocommunication Agency will begin issuing the M-series calls starting 1 April to all new full licences (both Class A and B). The new prefixes are: M (England), MW (Wales), MM (Scotland), MI (Northern Ireland), MD (Island of Man), MU (Guernsey), and MJ (Jersey). The special prefixes for radio clubs will be: MX (England), MC (Wales), MS (Scotland), MT (Island of Man), MN (Northern Ireland), MP (Guernsey), and MH (Jersey).

* According to a press release dated 1 March 1996, the central address for enquiries and administration of the RSGB IOTA (Islands on the Air) program is now: RSGB IOTA Program, PO Box 9, Potters Bar, Herts EN6 3RH, England. Roger Balister, who looked after the IOTA program in total, will become RSGB IOTA Manager. The authorised checkpoint for Australia, New Zealand and the Pacific, is Jim Smith VK9NS, HIDXA, PO Box 90, Norfolk Island 2899, Australia.

* According to Arie 4X6UO, residents in Gaza and Jericho will not obtain a new prefix from the ITU before 1997.

* Canadian radio amateurs might use the VC, VD, V07, V08, VY7, and VY8 special prefixes until 30 May to mark the 50th anniversary of UNICEF, the United Nations Children Protection Agency.

* Palmyra Atoll KH5, according to an article in *Pacific Daily News* of 12 February, was sold to a New York investment company which might use the island for scientific research and hotel development.

* The new address of Mike K9EC, QSL manager for VS6WO, is Michael Zeug, 3850 Sugar Pike Rd, Canton, GA-30115, USA. Please do not send QSL cards to the Hong Kong QSL Bureau.

* Rotuma Island (OC-060) now has its own resident Rotumian amateur under the callsign 3D2AA. QSL to VE6VK.

* The Pratas Island QSL cards, BV9P, are in the mail; several Australian and New Zealand operators have received them.

* As from 1 April, according to the DXCC desk, the DXCC countries list total will be 329 countries and it will take 320 countries to be on the Honour Roll.

* Warren VK0WH prefers the CW mode due to his receiver set up and, because, due to lots of man-made noise, he finds SSB difficult to use. He was not heard much during February. He is very busy with his professional work which carries a workload of sometimes 60 hours per week, leaving very little time for amateur radio.

* Gunther ZK1DI, who has been active since November, has ceased operations mid-March.

* According to several sources, IRCs are not acceptable in South Africa (ZS).

* The Town of Beaumaris on the Isle of Anglesey (UK) celebrates 700 years of its Charter, granted by Edward I in 1296. The special event station GB4BEA will take part in the celebrations by being on

the air from 0001 UTC on 18 May to 1600 UTC on 19 May. On 20 metres the frequencies will be 14270 and 14050 kHz. A special QSL card can be obtained from GW0ABL.

* The QSL manager for HC8A, HC8J, P4OJT, P4OBT and HC1OT, is Betsy WV7Y.

* Lothar DJ4ZB was kind enough to send his QSL card, together with a photo of himself and Phil T32O, to me, full of praise for the hospitality which he received on Christmas Island. He spent many happy days on the Island during the months of September, October and November 1995 as T32ZB. He reminds all the direct QSLers that postage rates are very expensive in Germany. One surface mail letter (outside Europe) of 20 gm costs DM2.00; and 50 gm costs DM3.00. An Airmail letter (outside Europe) of 20 gm costs DM3.00; and 50 gm costs DM4.00. But, for one IRC, he gets stamps only to the value of DM2.00, so you really should send him two IRCs. For one "green stamp" he gets approximately only DM1.40, so he needs two green stamps and one IRC. He is happy to answer cards via the Bureau; so if you are not in a hurry, send your card via the QSL Bureau.

* In January *Amateur Radio* I floated the theory that the "local area slim" who operates only CW could be a lonely ship's radio officer. I received two letters with a variety of theories about the possible suspect. The writers think the operator is a highly skilled CW person whose licence no longer allows operation on the 14 and 7 MHz bands, and it is more likely that he is a VK and not a ZL. The other opinion says that it could be an operator on any of the sailing ships, or a seasonal worker on a holiday cruise. The mystery deepens. However, our "slim" has not been heard for about four months.

* Graham ZL4MV was active for a short period on Auckland Island. He had only 24 hour notice to go on this trip so he went with minimum preparation, with only wire antennas and heavy duty batteries to operate from dry land. There was no generator, no amplifier and no beam antenna. He was heard at 0702 UTC on 20 February, huffing and puffing, telling his QSO partner that he just carried up-hill two heavy truck batteries which he used as a power supply. These batteries were brought ashore by a boat after they had been recharged. QSL goes to Graham L Dawson ZL4MV, 32 Vernon St, Invercargill, 9501, New Zealand.

QSLs Received

XZ1A (3 m JA1BK), YA9XL (2 w F5TCN), TJ1JB (8 m KE9A), 3V8AS (6 w IK5GQM), 8Q7CW (3 m DK9FN), ET3KV (3 m DL1VU).

Thank You

Many many thanks to all my friends who sent congratulatory messages in connection with the news as published in February *Amateur Radio*. It is your help, your encouragement and your assistance in sending me all the DX information, which makes writing this monthly column so much easier. Special thanks to VK2NJ, VK2XH, VK2KFU, VK2TJF, VK4GV, VK4AAR, VK5QW, VK5WO, VK6LC, DJ4ZB, DL7FT, GW0ABL, KK6EK, WV7Y, ARRL DXCC desk, and the publications *QRZ DX, The DX Bulletin, The DX News Sheet, INDEXA, The 425 DX News,* and *GO list QSL Managers list.*

PO Box 93, Dural NSW 2158

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FTAC Notes

*John Martin VK3KWA, Chairman, Federal Technical Advisory Committee**

New UHF and Microwave Records

On 12 December 1994, a contact between Russell Lemke VK3ZQB (near Port Fairy) and Roger Bowman VK5NY set new Victorian and South Australia records of 466.4 km for the 10 GHz band. On 30 December 1994, Roger set a new national and world record of 1912.1 km by working Wal Howse VK6KZ.

The world record still stands, but the Victorian 10 GHz record was broken twice on 13 January this year. Operating portable from Mount Dandenong, Alan Devlin VK3XPD worked Trevor Niven VK5NC over a distance of 500.8 km. Half an hour later he worked Roger VK5NY, who was operating portable at Mount Magnificent, a distance of 657.1 km.

The very extensive tropo opening in mid-February also resulted in new records on 432 and 1296 MHz. On 14 February, Cec Andrews VK6AO worked Colin Hutchesson VK5DK on 432 MHz, for a new South Australian record distance of 2361.3 km. This record fell three days later. On 17 February, Trevor VK5NC worked Don Graham VK6HK for a new South Australian 432 MHz record of 2371.9 km.

On 1296 MHz, Cec VK6AO worked Trevor VK5NC on 16 February and set a new South Australian distance record of 2364.2 km.

Finally, two more 1296 MHz records. On 16 December 1995, an RTTY contact between VK3ZQB and VK3KWA set an inaugural Digital Modes record for the 1296 MHz band, a distance of 268.6 km. On 16 February this year, Russell VK3ZQB worked Alan VK3XPD, who was operating mobile in the eastern suburbs of Melbourne. The distance has not been confirmed yet, but is around 260 km and will be a new 1296 MHz mobile record.

Congratulations to all those involved in setting these new records.

80 and 40 Metres — Digital Modes

No further responses have been received on the 80 metre digital modes segment. The existing 3620 — 3640 kHz segment is in line with other countries in the region, and with the North American packet segment of 3620 — 3635 kHz. Any change would cause a great deal of dislocation, so I suggest that we must leave this segment where it is. This does not allow much space for Novices to experiment with digital modes, but then no-one has enough space on 80 metres.

On 40 metres, the situation is different and it does not seem practical to leave things as they are. The RTTY segment in Region 1 is 7035 — 7045 kHz, and most international operation in Region 2 is around 7040 kHz. The Region 3 band plan is the "odd man out" with its RTTY segment at 7025 — 7040 kHz, which seems to be 5 kHz lower than the rest of the world.

It appears that our lower limit of 7030 kHz is reasonable, but it is not practical to allow only 5 kHz overlap between our RTTY segment and that used in Regions 1 and 2. I would suggest that our 40 metre band plan should be changed to extend the upper limit of the RTTY segment up to 7045 kHz. I would appreciate any further comments as soon as possible.

PO Box 2175, Caulfield Junction, VIC 3161

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Novice Notes

*Peter Parker VK1PK**

Homebrewing for the Novice

A longing to build a small transmitter, receiver or piece of test equipment is commonly expressed by many amateurs. All too often, however, the longing remains merely that, due to perceived difficulties in obtaining components, a lack of test equipment, or not having a suitable circuit diagram. Yet, these difficulties can be overcome, and the satisfaction of successfully completing a project is immense. This month's column aims to answer a few of the questions aspiring home-brewers ask.

Selecting a Project

The first step is to determine what you want out of a project that you are planning. Is the device being built for the experience and pleasure that its construction provides, or is it to test a particular circuit technique or component? Maybe the project is because commercially made equivalents are unavailable. Alternatively, it could purely be the satisfaction of working the world with a home built transmitter, or of making measurements with test equipment that would be unaffordable if purchased.

Whatever the reason for building, it is important that the features you want are defined, so that a design can be selected to suit your needs. It may happen that an article on a project with all the wanted features is found, and, furthermore, all parts for it are obtainable. A kit could even be available. Otherwise, the constructor may prefer to borrow stages from several circuits, and build a unique device that meets all requirements. This becomes particularly true for the more experienced experimenter who seldom follows published circuits exactly.

For the beginner, though, it is best to work from the one design and not from parts of several. The decision as to which one depends on available components, features provided, and the completeness of the project article, along with complexity and cost considerations.

Sources of Information

Home-brewers normally have a wealth of material on which to base projects. This is obtainable from:-

Books. Many publications are available to the amateur experimenter. As well as the conventional *RSGB* and *ARRL* handbooks, more specialised references cover practical aspects in greater detail. Titles to look out for (whether new or second-hand) are listed near the end of this article. Most are obtainable by mail order from Daycom Communications P/L in Melbourne, or via your WIA Divisional Bookshop.

Magazines. In addition to projects in the major amateur periodicals, such as *Amateur Radio, Radio and Communications, QST, 73, CQ Practical Wireless,* and *RadCom,* there occasionally appear radio projects in magazines such as *Electronics Australia and Silicon Chip.* Some magazine designs have the advantage of a kit being available. However, be wary when considering some of the transmitter projects featured; a crystal-locked 100 milliwatt 80 metre AM transmitter is simple and cheap, but could disappoint when used on-air under modern conditions.

As well as being stocked by newsagents, various local and overseas magazines are carried by public, TAFE and university libraries. Photocopying facilities are normally available.

In addition, QRP (low power) enthusiasts have their own publications. Probably the best known is *Sprat,* published by the G-QRP Club, renowned for its technical articles and circuit ideas. The US-based QRP Amateur Radio Club International issues *QRP Quarterly,* while the Australian-based CW Operators' QRP Club produces *Lo-Key.*

Travelling Circuit Books. This is a service to the VK CW Operators' QRP Club members. Consisting of approximately 100 pages of constructional articles, taken from various magazines, travelling circuit books are circulated among participating members. As the only cost involved is the postage of the book to the next member on the list, they are an economical way of gaining access to a wealth of information.

The Internet. With the rapid growth of the Internet, thousands of discussion groups (news groups) have sprung up, catering for a broad range of interests. The one for radio home-brewers is called rec.radio.amateur.homebrew. If you have a particular question, want to know how to obtain a part, or simply want to share your experiences with a particular component or circuit design, the newsgroup would be a good forum for your message. Serving a more specialised audience than newsgroups (such as QRP enthusiasts, for example) are mailing lists. To participate in a mailing list, all you have to do is to send an e-mail message to a particular address saying that you want to subscribe and, before long, you will receive the contents of the list as electronic mail.

Tools and Test Equipment

To complete most projects, only basic hand tools will be required. The following is a suggested priority list of other tools and test equipment that will be found useful. Essential and/or inexpensive items head the list, though the exact order of priority will vary with different projects.

15 to 25 watt soldering iron with fine tip.
Benchtop power supply (to suit projects being constructed)
Multimeter (analogue or digital).
General coverage receiver.
Various relative RF indicators (such as field strength meters and absorption wavemeters).
Dip Oscillator.
RF power meter and 50 ohm dummy load.
Frequency counter.
Inductance and capacitance meter(s).
RF signal generator.
Oscilloscope.

All items on the above list (except the oscilloscope and the general coverage receiver) can be assembled at home, with kits for some being available. It is not mandatory that the experimenter possess the full range of equipment listed, as improvisation is often possible. For example, an inexpensive AM/shortwave receiver can give a rough indication of a VFO's frequency, verify the operation of crystal oscillator stages, or even act as a crude signal generator. This is made possible by the use of the local oscillator signal generated from within the set; its frequency will normally be 455 kHz below that indicated on the dial.

Obtaining Components

The perceived scarcity of components is one of the reasons stated for people not building equipment. Yet, homebrewing

has never been cheaper or easier than it is right now, thanks to the throw-away society, and the rapid obsolescence of electronic equipment. While it is true that the conventional parts outlets do not stock many of the specialised components required by radio experimenters, these can be obtained by other means, including:-

Club or Divisional part supply facilities. Two of these are known to the author. Both are available to members only, and can supply a range of esoteric parts and kits at attractive prices. The first of these is the VK5 WIA Equipment Supply Committee. As well as stocking various RF components, an impressive range of kits is on offer. These include VHF/UHF transverters, packet radio modems and ATV transmitters. Mail orders are accepted from all states; the only requirement being that you are a WIA member. Send a SASE for the latest price list.

The CW Operators' QRP Club maintains its Kitsets Activity Centre for the benefit of members. While some kits are stocked, the emphasis is on components, with toroids, RF ICs, ceramic resonators, varicap diodes and FETs being among the parts obtainable. Again, a mail-order price list is available.

Hamfests and Junk Sales. Attendance at these is a must for radio experimenters; large quantities of components and surplus equipment can sometimes be had for just a few dollars. Apart from piles of ex-commercial VHF/UHF transceivers (from which components can be salvaged), items such as crystals, books, variable capacitors and vernier drives may also be available if you look hard enough.

Old radio and TV sets. While dismantling old radios and TV sets is time-consuming, the use of salvaged components can reduce construction costs. Rather than remove all parts from printed circuit boards and placing them in jars, it may be preferable to keep the boards intact, and remove components as and when required. Valve radios are particularly desirable for the tuning capacitors they contain, while the power transformer can be rewound for power supplies, or used as a source of wire for antennas.

Swap-meets, auctions, rubbish tips, second-hand shops. All of these are worth an occasional visit, as equipment of value to the experimenter (for salvage or conversion) may be on offer. In addition, items such as multimeters and tools can sometimes be purchased second-hand. Auction dates and venues are normally listed in the classified section of local newspapers.

Circuit Construction Methods

While the conventional printed circuit board is the standard for manufactured electronic equipment (though it is now being replaced by surface mount technology), there is no reason for the amateur to use this method for their own projects. While conventional PC boards look neater than other techniques, they suffer from the disadvantage of requiring a new board to be etched if substantial modifications to the project are desired. Further time is wasted if these do not perform as envisaged. Thus, unless you know the circuit is reliable, it is worthwhile to consider alternatives to PC boards, particularly if the project uses only discrete components.

One such alternative is to use an etched printed circuit board, but solder components onto the copper side of the board. This obviates the need to drill holes, and makes it easier to make changes. For smaller projects that do not use ICs, the use of small pieces of adhesive tape placed on the parts of the board where you want the copper to remain is suggested as a simple alternative to conventional methods of board production.

The "paddyboard" form of construction is also suited to projects for which the ultimate in miniaturisation is not required. While it uses PC board material, paddyboard requires no etching; component leads not connected to the copper surface are soldered to small insulated pads, made from spare PC board material. These pads may be glued or soldered to the main board. It is very easy to modify circuit layout and add extra components. Again, paddyboard is most suited to circuits not containing ICs, though this limitation can be overcome if ICs are mounted on small pieces of vero or matrix boards beforehand. The use of high-value resistors (several megohm) as standoff insulators, soldered to the main board is a similar approach that has worked well. All of the construction methods mentioned so far are suitable for audio, HF, VHF, and perhaps UHF projects.

If compact construction is required, but the constructor is unwilling to use a conventional PC board, matrix board is a good alternative. Having holes punched every 2.5 mm, IC projects can be quickly assembled. Matrix board works well for RF projects well into the VHF region, and is stocked by the normal parts suppliers.

A refinement of matrix board is veroboard. This is matrix board with a series of parallel copper strips, which can be cut as required by using a drill bit held in the hand. While suitable for power supply and audio projects, the capacitances between the long parallel strips may impair the performance of RF projects. Veroboard can be made into matrix board simply by immersing it in a bath of PCB etchant solution.

Construction and Troubleshooting

Once all components to build a particular project have been gathered, and a construction method has been decided, the project can now be assembled. If a simple project, or a well-known design, the entire board can be assembled in the one sitting. Otherwise, if the project is an unfamiliar circuit, or has various stages derived from several

sources, it is preferable to build and test one stage at a time, before moving on. For this type of construction, where the developmental prototype becomes the final model (possibly after several changes), one can easily see that an adaptable construction method, such as paddyboard, or the use of matrix board, is preferable to a PC board, where significant changes require a new board to be etched.

For a large project, such as a receiver or transceiver, it is desirable that, rather than mounting the entire circuitry on one large board, several smaller boards be used instead. This modular approach permits the project to be an evolving piece of equipment, with additions made as time, inclination and funds permit. This method is also compatible with the "build and test" approach recommended previously and the desirability of having RF-sensitive stages shielded from one another.

If the project involves RF (especially if it is a transmitter or power amplifier), the box housing it should be shielded. This does not necessarily mean a conventional metal case is required; boxes made from printed circuit board material are also effective.

The most important aid to trouble-shooting is an ability to think logically. The possession of the test equipment mentioned above, plus a schematic diagram of the circuit under test, is also desirable. Generally, with trouble-shooting, one checks the overall equipment, by identifying which functions do and do not work, and attempts to isolate the area of the fault.

In the case of home built equipment under development, it is often not so much a fault, but a performance deficiency that needs to be remedied. This may simply entail the use of a slightly different component value, or may require the redesign of a whole stage to perform to the specifications required.

Safety

It is not out of place here to discuss electrical safety. The construction of equipment containing high voltages require a change to one's working habits, to minimise the risk of electrocution. The following precautions should be taken:-
Do not work on live equipment (switching off is not sufficient — unplug it from the wall).
Discharge electrolytic capacitors before working on a project.
Insulate exposed high voltage points in equipment where possible.
The current ratings of fuses should be related to the expected current consumption of the project, and not to the contents of your junk box.
Check wiring after construction (preferably by someone other than yourself).
Use proper plugs for power connections.
Work with one hand behind your back if you must operate on live equipment.
Keep half-built projects and chassis locked away from children.

The above list is not complete, and further information can be found in some of the references mentioned below. Initially, it is wise to steer clear from high voltage projects if you have the slightest doubts as to your ability to construct them safely.

Conclusion

While the impression may be conveyed that constructing equipment is an activity calling for a high degree of specialised knowledge, and that it is all too hard for the average amateur, nothing can be further from the truth. By starting with simple one and two transistor projects and commercially available kits, one's knowledge will steadily increase to a point where more complex projects can be confidently tackled. By this time you will be able to construct an item merely from a schematic diagram, and start to develop your own designs from sections of circuits gleaned from various publications.

Appendix One

References for the Radio Experimenter

ARRL/RSGB Handbooks.
Solid State Design for the Radio Amateur (DeMaw/Hayward).
QRP Notebook (DeMaw).
Amateur Radio Techniques (Hawker).
G-QRP Club Circuit Handbook (Dobbs).
WIA Book (WIA).
Radio Projects for the Amateur (Diamond).

Appendix Two

Useful Addresses for the Homebrewer
(This list is not exhaustive; a more complete version appears in "Radio Projects for the Amateur".)

CW Operators QRP Club Kitsets Centre,
5 Joyce St, Glengowrie, 5044
(08) 295 8112

VK5 WIA Equipment Supplies Committee
PO Box 789, Salisbury, 5108

J&A Crystals
20 Delville Ave,
Mentone, 3194
(03) 9583 4533

Daycom Communications
37A Fenton St,
Huntingdale, 3166
(03) 9543 6444

Stewart Electronics
44 Stafford St,
Huntingdale, 3166
(03) 9543 3733

**7/1 Garran Place, Garran ACT 2605*
VK1PK @ VK1KCM.ACT.AUS.OC

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Silent Keys

Due to space demands obituaries should be no longer than 200 words.

The WIA regrets to announce the recent passing of:-

F J	ASTON	VK1FA
V (Val)	GODBEE	VK2AKV
G S	RADFORD	VK2LB
E	MANSON	VK3ADU
B R (Bruce)	MANN	VK3BM
A R	LAWSON	VK3PRL
K G	PEARSON	VK5APN
P H	RUMBLE	VK6NAT
J F	GRACE	VK7ZJG

Bruce Mann VK3BM

On reading his life story in the recent OT magazine, it is clear that Bruce wished to make his hobby a medium for world friendship through amateur radio. He was known throughout the world for his excellent phone signals. He always strived for perfection.

Over the years he entertained dozens of hams from all parts of the world and provided first class motel type accommodation for them. He even had the same service for groups of visitors from various radio clubs or other interested parties.

He was born at Quambatook in 1907, and died a few months before his 89th birthday. He had been involved in several accidents which hastened his demise. At the OT dinner a card, signed by the 70 hams who were present, was sent to his widow Margaret.

Murray Campbell VK3MR

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International Amateur Radio Union Monitoring Service (IARUMS) — Intruder Watch

*Gordon Loveday VK4KAL**

Improving band conditions have brought about a corresponding increase in the number of "sightings" of intrusions. The Indonesian problem is in full swing again with the logging season in that country being operational. All-out war has been declared by some irate amateurs. It is now quite rare for these intruders to be allowed to converse for any period of time in the ham bands. Alert hams find them and the process of elimination starts. This commendable practice has proven to be the only direct method of removal that offers speedy results.

CW buffs will be particularly affected by the heavy CB pollution on the bottom end of the 10 m band. Methods of reducing the effectiveness of interfering signals are available from the Monitoring Service Co-ordinator.

Two metre band intrusions have also been increasing, with reports from various parts of the country being sent in. Hang gliders, railway inspection teams, and transport operators are some of those detected. The majority of these sorts of intrusions are of short duration and very localised.

Another serious matter is the apparent use of amateur repeaters for work related matters. This is a case of misuse and is best dealt with by the trustees of the particular repeater concerned.

As mentioned above regarding the Indonesian intrusions, amateurs in our region have become increasingly militant and frequently subject these intruders to a barrage of CW signals and plain language requests to MOVE! This action has had its successes with some intruders migrating to band edge areas.

It was reported in the Region 3 January Summary that Karl VK6XW has been awarded a 1995 Merit Certificate for his dedicated observations of VRQ and partial removal of same. My congratulations, Karl. I hope others will follow your example. We must defend our exclusive amateur radio frequencies.

The IARU Monitoring System — Part 4

(See previous issues of *Amateur Radio* magazine for parts 1, 2 and 3 of this continuing series about the IARU Monitoring System.)

I think it is about time to get into the "nitty-gritty" of the system. It should be obvious to those following the series why we need many observations and observers. Many reports on the same intruders are needed to convince the Authorities, that we want ACTION taken, not lip service, to have them removed from our bands.

Now some general information.

Log sheets are obtainable from your State Intruder Watch Co-ordinator, or direct from the Federal Co-ordinator, VK4KAL, QTHR. Information on the filling in of log sheets is also available from the same sources.

A question often asked is what happens to the completed log sheet? The answer is that it finds its way back to the Federal Co-ordinator where, on receipt, it is recorded in the SMA/WIA data base. From this data base, which at present time holds details on 188 separate intruders, a summary is compiled. This summary is available to any amateur on request. Its main purpose, though, is to notify the other regions what is happening in our region intruder wise. The IARU Region 3 co-ordinator sees to this.

In VK, a copy is faxed to the SMA in Tasmania and in Canberra, to WIA Federal, and to each State co-ordinator on a rotational basis. I must stress that the Monitoring Service is NOT interested in local issues, which must be taken up with the state offices of the SMA, nor do "we" deal with foul or abusive language.

As this series covers only the basics, many more questions are bound to be asked, so let me hear them. Some may be answered in *Amateur Radio*. The subject can be simple or complex. It is up to you, the amateur, to decide "how much you want to enjoy the hobby", and as to what you do about it.

Don't be frightened to submit an intruder report because you are unsure of the mode. Just describe it as best you can or send a tape with your log. Try and observe if any intruders are coming up on a regular basis. Some are as regular as clockwork; these are the ones worth watching and reporting.

Please note that I accept log sheets from ALL amateurs, whether they be members of the WIA or not.

**Federal Intruder Watch Co-Ordinator, Freepost No 4 Rubyvale QLD 4702 or VK4KAL@VK4UN-I*

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Over to You — Members' Opinions

All letters from members will be considered for publication, but should be less than 300 words. The WIA accepts no responsibility for opinions expressed by correspondents.

Nerves

Having been present at a number of examinations being sat by amateurs and prospective amateurs, I have noticed one of the main problems with the CW sending exam is nerves.

Sure enough, a lot of people sit for exams ill-prepared and do not pass for that reason. But a fair number of candidates sit time and time again, only to fail when the tape recorder is turned on.

Listening to these candidates during their practice sessions, it is obvious that they are very capable with the Morse key and deserve to get through.

Maybe the WIA could perhaps select a couple of examiners who are proficient CW operators to listen to these people under less stringent conditions and assess whether they deserve, after a number of exams, to be given a pass on their abilities. I am sure our hobby would benefit and a few more well deserved full calls would be the result.

John Bedwell VK3EHZ
49 Winyard Drive
Mooroolbark VIC 3138

Jargon

In the February 1996 issue of *Amateur Radio*, John Martin VK3KWA discussed the new Technical Licence Specifications, the fact that they were difficult to understand, and the uncertainty concerning which modes were permitted.

I must confess that my thoughts were not so kind. I thought the regulations were written in jargon — officialdom gone mad!

What is the merit of writing regulations in code such that the people

who are expected to abide by them have to spend hours trying to decipher what they are allowed to do? Why should it have even been necessary for John to write an article to try and further enlighten us on what the jargon means? What was wrong with writing the regulations in plain English, a language hopefully most of us understand?

Lloyd Butler VK5BR
18 Ottawa Avenue
Panorama SA 5041

Thanks to Federal WIA

It's not often I write, but I felt compelled to put pen to paper to ensure that my positive encouragement got through to you. I consider myself to be what you would probably call an average member of the WIA with my major focus being on local club issues and events. I follow with interest our weekly VK5 Division news broadcasts and often hear news items relating to discussions with the SMA on the various big issues that are currently affecting our hobby.

I just wanted to assure you that your efforts and deliberations in this area are appreciated. I feel confident that there are thousands of amateur radio operators, like myself, who listen with interest to the activities of the Federal WIA and appreciate the volunteer effort being put into this most important aspect of protecting and promoting our hobby.

Feel proud of your achievements over the past 12 months. I am certainly impressed with our pro-active approach to SMA matters and feel confident that our hobby is being represented to the highest standard.

Keep up the great work, and please accept my sincere appreciation for your efforts.

Mark Phillips VK8MA
PO Box 228
Howard Springs NT 0835

Need for CW

Let's be honest with ourselves. There will come a day when the CW requirement for HF occupancy is dropped.

The year is 1996. In the 90s the advances have been remarkable; mobile telephones, and communications to practically anywhere you care to name via the Internet. The youth of today are not interested in our hobby. We are seen as "a mob of old farts, with nothing better to do with our spare time". We can chuckle, but it is so close to the truth.

We are losing WIA members and the number of newcomers is falling. Why? We have, in my opinion, an image problem. Why should the youth of today sit in front of a "black box" and simply talk to someone, when they can connect to the Internet on their computers and have almost a three dimensional "contact" anywhere in the world, for very little cost? (And, probably more to the point, without having to pass an examination!)

The good old days when a home brew SSB transmitter was the "height of technology" are over. The face of amateur radio has changed and will continue to change.

The Spectrum Management Authorities, world wide, see the commercial value of our resource and some of "our" bands are being threatened. The old sayings of "Use it or Lose it", "Populate or Perish" are becoming a reality.

As a Z call, I can use practically any mode I desire, including CW, *without the necessity of proving proficiency in any of them.* I can now use 29 MHz, albeit only in the FM mode. What is so special about our HF Bands?

How many Full Call amateurs now use commercial equipment, rather than

WIA News

International Contestants Line Up for Direction Finding Championships

Contestants from six, or possibly seven, overseas countries will arrive for the Second Region 3 Amateur Radio Direction Finding (ARDF) Championships, to be held in Townsville over July 15-20 this year.

The Chinese Radio Sports Association, the Japan Amateur Radio League, the Korean Amateur Radio League, and the New Zealand Association of Radio Transmitters will all field teams. From Region 1, there will be a small team from Bulgaria and a team of five from the East Kazakstan Radio Engineering and Radio Sports School. A single entry from the USA is also expected. A local team will contest the Championships on behalf of the WIA. There will be society officials accompanying the teams from overseas. The new Secretary General of the Chinese Radio Sports Association, Chen Ping BA1HAM, who is also Chairman of the International Amateur Radio Union (IARU) Region 3 ARDF Committee, will be guest of the Townsville Amateur Radio Club, who are hosting the Championships.

ARDF is a cross between a cross-country run and the old familiar amateur radio fox hunt. A number of transmitters are placed at intervals along a course. They turn on and off in a timed sequence. Contestants travel on foot and have to find the transmitters and complete the course in a given time. ARDF is an activity for young and old alike. Only simple, handheld equipment is required. Bands used are 80 m and 2 m.

According to the Championships organiser, Wally Watkins VK4DO, production of the necessary transmitters is almost complete and long term testing should already be under way by the time this is published. Special timers are being tested.

The Federal WIA has provided financial assistance to the Championships. Anyone interested in taking part, either as a contestant, a referee or general helper, should contact: The Secretariat, 2nd IARU region 3 ARDF Contest, W. A Watkins VK4DO, PO Box 432, Proserpine Qld 4800.

The European ARDF Championships are being held in Bulgaria in the first week of September this year and Wally VK4DO, has accepted an invitation to take part as an international referee.

homebrew? How many have touched a key since their examination? On the other hand, how many do use this mode? CW certainly won't go away.

Could someone please put forward an argument for the necessity of retaining CW as a prerequisite for occupation of the HF Bands?

Not an argument based on:

"We had to do it" (that argument is petty and banal; a bit like telling trainee pilots that they must train in Tiger Moths!);

"CW is the only mode allowing error free communications during poor conditions" (Are we at war? Are our communications that important?);

or

"We will end up having the HF Bands populated by unskilled operators — the CBers — who have little or no skills" (I seem to recall a similar argument when the Novice Licence was first mooted.);

but an argument based on fact.

Many Government agencies, world wide, no longer have the need or the requirement for CW. A Command Instrument Rated Pilot no longer has to show proficiency in CW at 10 wpm, as they did only a few years ago. The Marine Authorities in Australia, and many other countries, no longer use CW even for emergency communications.

As Godfrey VK5BGW wrote in December 1995 *Over to You,* CW is not dead. It never will die because we have the enthusiasts who enjoy that mode. It could be a fact, though, that *our hobby dies,* because our bands will simply be taken away from us.

The simple answer to the "Use it or Lose it" principle is to attract more and younger people to our hobby.

Where do we start? In my youth the simple thrill of making a crystal set was something special. Now, the youth of today have personal mobile telephones and miniature colour TV receivers. Home computers and communications are taken totally for granted. What on earth will they have tomorrow? I can tell you now that the CW requirement for HF band occupancy certainly does nothing towards attracting bright young men and women to our hobby.

If we don't use our bits of the spectrum, we **will** lose them. It is a case of populate or perish.

Peter Whellum VK5ZPG
PO Box 317
Willunga SA 5172
ar

Packet World

*Grant Willis VK5ZWI**

Introduction

Hello everyone. This month I am going to continue with the article, by John VK1ZAO from the Canberra Packet Radio Group Technical Symposium, on the AX.25 protocol, taking people through the structure of the packet frames that they transmit and on to describe a typical packet connect sequence.

AX.25 Amateur Packet Radio Link-Layer Protocol

AX.25 has been the standard link layer protocol for use by amateurs since 1982. It was originally defined in the paper *"Amateur Packet Radio Link Layer Protocol — ARRL 1982"* and since revised with version 2.0 in 1984 and *"AX.25 Link Access Protocol — Amateur Packet Radio Version 2.2"* in 1993. I am not aware as to whether any of the changes in this last paper have been implemented.

AX.25 was designed to be able to establish a data link independent of any other level (it can function as all levels from Presentation to Data-Link), to work in a full or half duplex environment, to allow connections between independent individual stations and between individual stations and a multi-port station all on a shared channel, to allow multiple link layer protocols and link layer connections, to allow that the link is balanced (ie neither station is a controlling or master station, therefore any station can establish communication with any other station, assuming a physical path exists).

AX.25 transmissions are sent as small packets of data called packets or, more correctly, frames. The basic frame is synchronous (no start or stop bits) and conforms to HLDC (high level data link control). Each frame is constructed as follows.

For U (unnumbered) and S (supervisory) frames, see Fig 1.

Flag	Address	Control	FCS	Flag
01111110	112/560 bits	8 bits	16 bits	01111110

Fig 1.

For I (information) and UI (unnumbered information) frames, see Fig. 2

Flag	Address	Control	PID	Information	FCS	Flag
01111110	112/560 bits	8 bits	8 bits	N*8 bits	16 bits	01111110

Fig 2.

The **Flag Field** contains a unique bit pattern (six Is in a row). This can never happen within the frame, as HLDC requires "bit stuffing" to ensure clock integrity at the receiving end; if five Is occur in a row, a zero is inserted into the data stream. At the receiving end, if five Is are received, the next zero is deleted. Therefore, if six Is are received it can only be a flag. The only other time that more then five Is can appear in a row is in a frame abort, which is a minimum of 15 Is with no intervening 0s.

The **Address Field** contains the destination address, the source address and up to eight digipeater addresses to facilitate user defined routing. All addresses are seven bytes long — six uppercase/numeral ASCII, plus one SSID, all shifted one bit left to accommodate address termination bit in the least significant bit.

The **Control Field** identifies the type of frame and to control level two (data-link) functions. Is the frame an Information, Supervisory or Unnumbered Frame?, Send and Receive sequence numbers, and bits classifying what type of S or U frame it is in those cases.

The **PID Field** (Protocol Identifier field UI frames only) indicates the type of layer 3 protocol (if any) — see Fig 3.

L3 Type	Binary	Hex
Escape	11111111	FF
No L3	11110000	F0
AX.25 L3	xx10xxxx	
AX.25 L3	xx01xxxx	
NET/ROM	11001111	CF
ARP	11001101	CD
IP	11001100	CC

Fig 3.

The **Information Field** (1 to 256 (AX.25 v2.0)/default of 256 (AX.25 v2.2) bytes of information) contains the actual data to be communicated to the other end. This field exists only for I, UI and FRMR frames. The I field may contain control information for other protocols but, as far as AX.25 is concerned, this is all data (FRMR frames being a special case).

The **FCS Field** (Frame Check Sequence) — the last sixteen bits before flag are a HLDC conformant CRC check used to ensure validity of the frame.

The **Flag Field** — see above.

Frame Types

"rrr" is the receive sequence number, and "sss" is the send sequence number. The bit marked P/F/E is used to indicate that a command requires an immediate response (poll) or that this response is to a poll (final). 0s and Is identify the frames.

Numbered Information Frames

rrrPsss0

I — Information Frames are used to transfer user information (data). Send and receive sequence numbers are used to detect missing frames.

Unnumbered Information Frames

000E0011

UI — Unnumbered Information are used to transfer information outside of the normal flow control. These frames are not acknowledged by the AX.25 protocol, and may either be unimportant (beacons) or part of a higher protocol that supports its own control (TCP/IP in datagram mode).

100F0111

FRMR — Frame Reject. If an invalid frame is received, ie a frame received out of sequence, an invalid command, or an invalid information length, basically an error has occurred that cannot be corrected by resending the offending frame. An I field is included to give more detail of the error encountered.

Numbered Supervisory Frames

rrrE0001

RR — Receiver Ready and is able to receive more I frames, acknowledge correctly received I frames to N(r-1), clear a previous RNR condition.

rrrE0101

RNR — Receiver Not Ready — no more I frames can be accepted at present. Will acknowledge I frames received correctly to date to N(r-1).

rrrE1001

REJ — Reject is used to request retransmission from frame N(r). Frames to N(r-1) are acknowledged.

Unnumbered Supervisory Frames

001P1111

SABM — Set Asynchronous Balanced Mode (Connect) — establishes a LAPB (Link Access Protocol — Balanced) connection between the parties and will be acknowledged by a UA or DM.

010P0011

DISC — Disconnect. Closes the link, should be acknowledged by a UA.

011F0011

UA — Unnumbered Acknowledge. Used to acknowledge a SABM or DISC.

000F1111

DM — Disconnect Mode. Used to indicate that the station is in a disconnected mode. When disconnected this is sent in response to any frame other than a SABM or UI frame. It is also sent in response to a SABM if a connection cannot be accepted a present.

Mention was made above of both numbered and unnumbered frames. You will recall that one function of the Network layer of the model is to detect the loss of an information packet. AX.25 handles this by keeping track of the frame number of the last sent and last received frames and updating these counters accordingly. The system used is a modulo 8 (0-7 or three bits) counter for each of the send and receive numbers — these bits form part of the control field. This allows up to seven frames to be outstanding (sent but not yet acknowledged); the actual number permitted is controlled by the MAXFRAME parameter. I frames contain both a send and receive number; S frames contain a receive number only; and U frames contain neither.

Typical AX.25 Contact Scenario

Fig 4 shows a sample of a contact established between two adjacent (no digipeaters involved) stations, A — VK1ABC and B — VK1DEF. Callsigns are for example only.

Here is an explanation of the contact.

1. Station A requests a link establishment with Station B.
2. Station B acknowledges and accepts the connection (it would have replied with a DM if the connection was refused).
3. Station A sends an information frame to B (0).
4. B sends back an information frame, and also acknowledges the one from A (0).
5. A sends another information frame to B (1).
6. B acknowledges that frame.
7. A sends another I frame to B (2).
8. B sends a receiver not ready which acknowledges the last received frame.
9. After a timeout, A asks if B is ready yet.
10. B says still not available.
11. After another timeout, A asks if B is ready yet.
12. B say OK this time.
13. A sends an Information frame (2).
14. B returns an Information frame which also acknowledges the last received frame.

	VK1ABC				VK1DEF	
Frame	Address	Info		Frame	Address	Info
SABM	VK1ABC/VK1DEF		-->			
			<--	UA	VK1DEF/VK1ABC	
I(0/0)	VK1ABC/VK1DEF	Hello	-->			
			<--	I(1/0)	VK1DEF/VK1ABC	Hello to you too
I(1/1)	VK1ABC/VK1DEF	More text	-->			
			<--	RR(2)	VK1DEF/VK1ABC	
I(1/2)	VK1ABC/VK1DEF	Still more txt	-->			
			<--	RNR(2)	VK1DEF/VK1ABC	
RR(1)	VK1ABC/VK1DEF		-->			
			<--	RNR(2)	VK1DEF/VK1ABC	
RR(1)	VK1ABC/VK1DEF		-->			
			<--	RR(2)	VK1DEF/VK1ABC	
I(1/2)	VK1ABC/VK1DEF	Still more text	-->			
			<--	I(3/1)	VK1DEF/VK1ABC	Goodbye then
I(2/3)	VK1ABC/VK1DEF	before you go	-->			
I(2/4)	VK1ABC/VK1DEF	I have some	-->			
			<--	RR(5)	VK1DEF/VK1ABC	
I(2/5)	VK1ABC/VK1DEF	more info that	-->			
I(2/6)	VK1ABC/VK1DEF	I want you to	-->			
			<--	REJ(6)	VK1DEF/VK1ABC	
I(2/6)	VK1ABC/VK1DEF	I want you to	-->			
			<--	RR(7)	VK1DEF/VK1ABC	
I(2/7)	VK1ABC/VK1DEF	hear. that's all	-->			
			<--	I(0/2)	VK1DEF/VK1ABC	Thanks and toorah
I(3/0)	VK1ABC/VK1DEF	Bye then	-->			
			<--	RR(1)	VK1DEF/VK1ABC	
RR(3)	VK1ABC/VK1DEF		-->			
			<--	RR(1)	VK1DEF/VK1ABC	
			<--	DISC	VK1DEF/VK1ABC	
UA	VK1ABC/VK1DEF		-->			

Fig 4.

15. A sends an information frame that acknowledges the last received frame (3).
16. A sends another frame straight away (4).
17. Having received 2 I frames from A, B acknowledges the last one which, in fact, acknowledges both.
18. A sends an I frame (5).
19. A sends an additional I frame (6).
20. B rejects frame 6 (acknowledging frame 5).
21. A resends requested I frame (6).
22. B acknowledges the frame with an I frame of his own.
23. A sends yet another I frame (7), also acknowledging B's last frame.
24. B acknowledges — note the wrap around to 0 (modulo 8).
25. The next I frame that A sends is numbered (0).
26. B acknowledges.
27. After a timeout, A checks to see if B is alive.
28. B acknowledges.
29. B initiates a disconnect sequence.
30. A acknowledges the disconnect.

Conclusion

Next month, John takes a look at channel access protocols and how packet stations decide when they can transmit, as we continue this series on the basics of AX.25 Amateur Packet Radio.

*C/o GPO Box 1234, Adelaide SA 5001
Packet: VK5ZWI@ VK5TTY.#ADL.#SA.AUS.OC
Internet: gwillis@eleceng.adelaide.edu.au

ar

Repeater Link

*Will McGhie VK6UU**

Feedback

There has been some feedback on the February comments in *Repeater Link* about communications within the WIA. These comments have all been in favour of some e-mail system between WIA committee people. Communications between WIA committee people in my opinion, and in the opinion of several others, needs improving. With such a wide-spread bureaucracy within the WIA, keeping informed, in order to do the job you volunteered for, is difficult.

I would like to see an e-mail system for the WIA committee people, and a separate one for members, so as to forward their thoughts easily to their WIA. If you agree, then discuss the idea with your Divisional Council and find out their views on the idea. If your Division supports the idea, then it becomes your Division's policy. Your Divisional Councillor then forwards this to the Federal WIA. If enough Divisions support the idea, then it is adopted as WIA Federal policy. From there progress can be made.

You may wonder what this topic has to do with voice repeaters? For many years I have been involved in repeater development and have found that the biggest problem repeater development has in Australia, is the multiplicity of regulations. Bringing about changes to these regulations is very time consuming and frustrating. After all this time I now have some ideas where some of the problems are. They are within the WIA and our poor communications. Until this problem is fixed, change will require dedicated people to spend a great deal of time, effort, and some of their own money, to struggle to bring about better regulation. Being connected effectively can result in efficient progress.

Link Timer

Here in VK6 we have a couple of repeaters that are on major highways, but have few or no amateurs living in the service area. These repeaters are mainly for amateurs travelling through the service area. The problem is that, unless there is another amateur in the service area, few contacts are made on these repeaters. One such repeater is at Cataby, some 160 km north of Perth on the Brand Highway. This area is sparsely populated, with wheat and sheep farming being the main activity. However, many amateurs travel through this area on their way north to Geraldton and places further on. This highway is the main road north from Perth.

Linking this repeater has long been on the list of things to do. The equipment is now nearing completion and will be an off-air link to a Perth repeater on 70 cm. However, the site is solar powered and linking this repeater at Cataby to Perth will see greatly increased activity. Much of this activity will be in the Perth area and linked to Cataby when there are no amateurs in the Cataby area. The Cataby repeater will be transmitting for many hours each week, using limited solar power, for no purpose.

The circuit shows a way around the problem. When activity from Perth is fed up the link, Cataby only transmits the first few seconds. An amateur in Perth calling is heard on the Cataby repeater. If another amateur in Perth replies, this will also be heard on the Cataby repeater. Once the contact is under way between these two amateurs, only the first few seconds of each over is heard on the Cataby repeater. Most of the contact will not be re-broadcast. The start of each over in Perth is heard if you are listening on the Cataby repeater, but after, say, 10 seconds the rest of that over is timed out. The result is a large saving in solar power when no amateurs are listening on the Cataby repeater. I hope you followed that description.

What happens if there is an amateur in the Cataby service area? This amateur hears the amateur in Perth via the link being re-broadcast on the Cataby repeater. This amateur normally has three options. To reply, not to reply or listen to any resulting QSO between the amateur who called and any amateur in the Perth area who responded to the original call.

Operation

Let's look at the first option, to reply. When the amateur responds to a call that originated in Perth, a five minute timer is set that now allows re-broadcast of the Perth traffic. The Cataby repeater is now configured to re-broadcast any link traffic for five minutes. This timer is reset every time a signal is received on Cataby's repeater receiver. Normal operation in the Cataby area would keep resetting the five minute timer. All that is required is an input signal direct to the repeater's receiver every five minutes or less to add another five minutes. The amateur in the Cataby service area does this resetting of the five minute timer simply by being part of a normal contact. Once the contact has ended, the five minute timer times out and the Cataby repeater goes back to the 10 second timer.

The second option of not responding to a linked call from Perth results in normal operation as the station calling is heard, and with no reply from any amateur, all is as would be expected.

The third option of not responding to a call but another station in the Perth area responding, results in the 10 second window timing out the link once the contact is under way. The original call and response is heard but once the contact is under way, only 10 seconds at the start of each over is heard. The normal response of most amateurs on

hearing a signal time out, is to push the PTT button. This now sets the five minute timer in operation and for the next five minutes the contact between the two amateurs in Perth is re-broadcast on the Cataby repeater.

If at any time the amateur in the Cataby service area wants to join the contact, normal operating procedures are all that are required. The Cataby amateur, by joining the contact, now resets the five minute time-out every time he or she has an over.

Contact between two amateurs, both in the Cataby service area, results in normal five minute time-out operation of the Cataby repeater. This contact is linked to Perth with no time restrictions, except the normal repeater time-outs.

The result of all this is almost seamless operation. Most amateurs in the Cataby service area would not be aware of the operating system. No knowledge is required by this amateur of the special linking timers, reducing long transmissions from Perth being re-broadcast on the Cataby repeater, for no purpose when there is no one to listen to the transmission. The end result is a considerable saving in solar power with no limitations on normal operation.

The Circuit

The circuit that does all this is rather simple. Two NE555 timer ICs are used. One is set as a 10 second monostable, T1, and the other is set as a five minute re-setable monostable. The timing can be set to fit best the type of operation. 10 seconds may be a little long and five minutes a little short. Component value changes can be made for your particular requirements. The 5 M resistors are changed to make this adjustment. Make sure that the 100 μF timing capacitor on pin 6 of T2 is a low leakage type.

The inputs to both timers are controlled by the mute logic from the link receiver and the repeater. With the mutes closed, the inputs on pins 2 and 3 are high. Mutes open on either receiver, results in pins 2 or 3 going low. If your mute logic is the other way around, then remove TR1 and TR3.

The outputs of the timers are 'or'ed' together to turn on TR5 and hence operate the relay. The circuit need not drive a relay but simply provide a logic output from the timers. The idea is there; modifications to suit your requirements are easy enough. The logic output, or relay output, controls the repeater transmission.

Values

Are you wondering why resistors doing similar jobs are different in each timer circuit? For example, the input resistors from pin 2 and pin 3 are 330 k and 220 k. It makes for easier identification and fault finding. I learnt my lesson once by making a circuit using mainly 10 k resistors. What a nightmare trying to fault-find. Which 10 k resistor is that?

Spelling

Not being a good speller, and relying heavily on the spell checker, I still have problems with spelling from time to time. I do my best and hope the *Amateur Radio* editor can touch up the spelling when required. Technical writing has many problems, as many of the words are not in the spell checker or dictionary. I had problems with two words this month. When two logic levels are 'or'ed' together, how do you spell it? Is it or'ed or ored or or'd? Another example is re-setable. To re-set a timer. I gather there is no such word, but there it is anyway. *(As you can see, we picked a fourth possibility, 'or'ed!' If "re-setable" is not in the dictionary, it ought to be! Ed)*

**21 Waterloo Crescent, Lesmurdie 6076 VK6UU @ VK6BBR*

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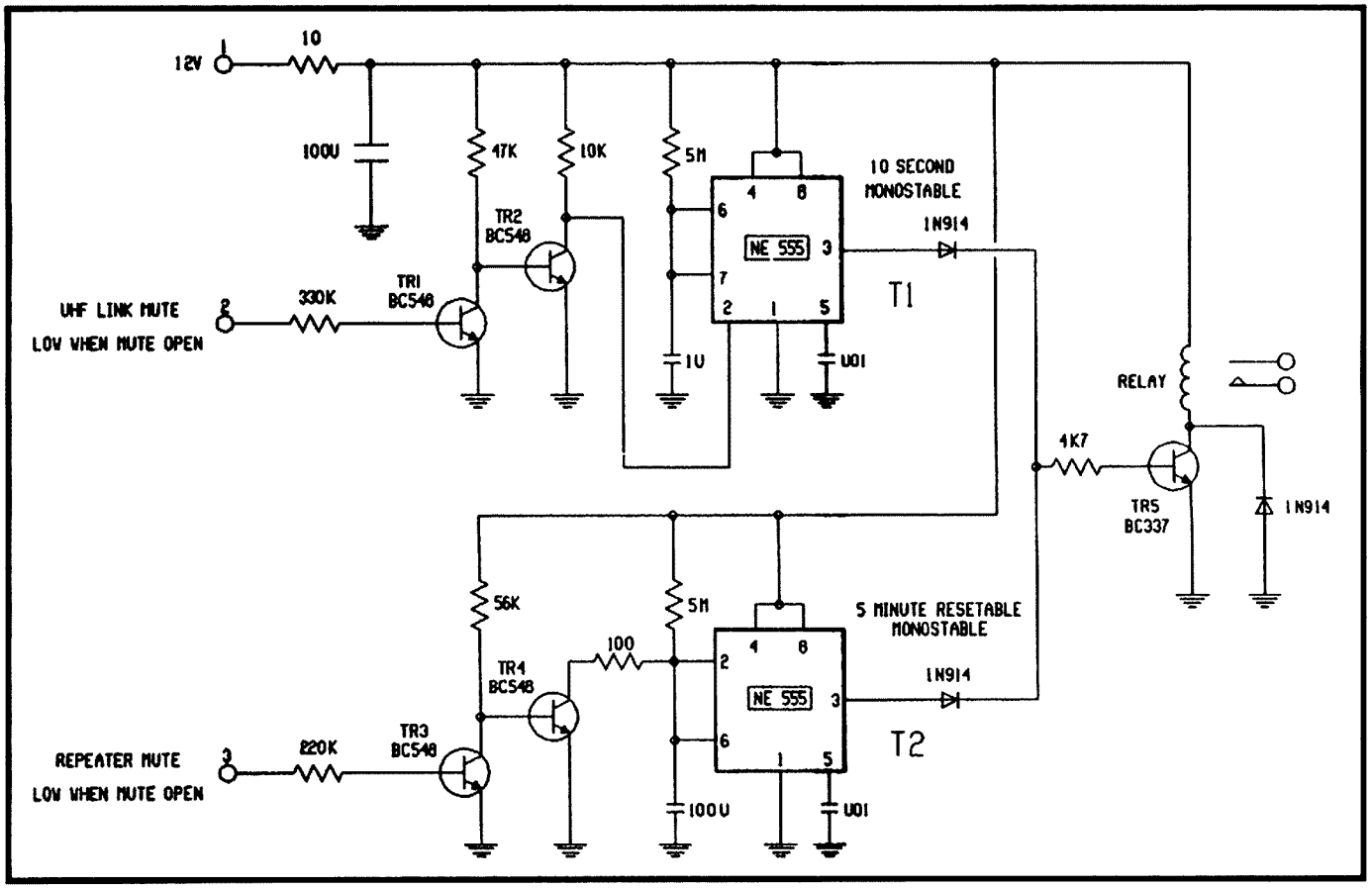

Link timer circuit.

Pounding Brass

*Stephen P Smith VK2SPS**

Every couple of years the IARU Region 1 organises a major Telegraph Competition and designates a particular European country to host this prestigious event.

At the IARU Region 1 championship in Belgium in 1991, some 70 participants from nine different countries competed. The Hungarian Radio Amateur Society (MRASZ) hosted the last Championships which took place only recently in Siofok, Hungary.

Lacy HA3NU, IARU Region 1 coordinator, was in charge for the first High Speed Telegraph World Championship. All major radio societies belonging to the three IARU Regions around the world were invited to participate.

According to the official rules, for the competition to have "World Status" (in this case it was the first time it has been given this title), at least three or more continents must attend, otherwise it will be designated as The European Championships, providing five or more Europeans take part. The recent Championships were well represented with 15 countries from three continents taking part, including Canada, Korea and Japan who were participating for the first time.

The next World Championships will take place in two years time in Bulgaria, the venue being unknown at this time.

Here is a brief summary of the revised rules for the World Championship.

Teams and Categories

Each national team may comprise up to twelve members, representing six categories. There shall be no more than two team members within each category as follows: Seniors (males older than 20 years), Senior YLs (females older than 20 years), Juniors (males up to 20 years), Junior YLs (females up to 20 years), Old Boys (males 45 years or older), and Old Ladies (females 40 years or older).

Each team will have a designated team leader who, if also a competitor, must be at least eighteen years of age. A trainer, interpreter, and HST international class referee, serving as a member of the international jury, may accompany each team.

Tests

The championships comprises seven tests; (a) reception of letter messages, (b) reception of figure messages, (c) transmission of letter messages, (d) transmission of figure messages, (e) reception of mixed messages, (f) transmission of mixed messages, and (g) the radio amateur practising test, based on the RUFZ callsign receiving program devised by DL3DZZ.

During the reception transmission tests, telegraphy speed will be measured by the Paris system. The sample of transmission messages comprises fifty groups, each of five characters.

Speeds

Letter and mixed reception messages are sent at a progressively increased speed, starting with 100 marks/minute (marks mean characters) for letters and 150 marks/minute for figures; competitors withdrawing as the speed becomes too high for them. Messages may be recorded by hand (using any symbols desired) or by typewriter. Messages copied on the contestant's own paper must be re-copied on to the official forms after the test.

For transmission, either straight or electronic keys, single or twin-paddle (adjusted to a dot/dash ratio of 1:3), may be used.

Errors	0	1	1	2	2	3	3	3	3
Corrections	1	2	3	4	5	6	7	8	10
Multipliers	1	0.95	0.9	0.85	0.8	0.75	0.7	0.65	0.6

Radio Amateur Practising Test

The radio amateur practising test shall be established by help of PC computers. The RUFZ callsign copy program requires competitors to make two attempts at receiving 50 callsigns (and typing them back onto the computer keyboard), and the best attempt is taken for scoring.

The overall best performance scores 100 points and other entrants are scored proportionally lower relative to the 100.

Individual Awards

The title of Individual Champion in each of the six categories of the contest is awarded to the competitors with the highest scores calculated as follows: (1) reception (sum of scores for the three reception tests), (2) transmission (sum of scores for the three transmission tests), (3) radio amateur practising test (score gained at the best attempt), and (4) total of the above scores.

In the case of a tie, a result will be judged on the best result for transmission of messages. The winners of each category will be awarded the title "World Champion" or "European Champion" as appropriate and will receive Gold Medals and Certificates. Those gaining second and third places will be awarded Silver and Bronze Medals respectively, and Certificates. Those gaining 4th-6th places will be awarded Certificates.

Team Awards

The position of the national teams in the championships shall be decided by the total points scored by a maximum of six team members (ie those having the best scores in each of the six categories). The team gaining first place will win the title "World Team Champion" or "European Team Champion" as appropriate. The team will be awarded a Cup and a Certificate and all team members will receive Gold Medals and Certificates. Teams gaining second and third places will be awarded Certificates. Members of the teams will receive Silver and Bronze Medals respectively, plus Certificates. Teams gaining 4th-6th places will be awarded Certificates.

Entering the Championships

The organising society of the championships invites all national IARU member societies to participate in the championships.

The rules state that each competitor shall have a radio amateur or SWL

licence, and agreement of his/her national society to take part in the contest. Anyone interested in joining their national team for the HST Championships should therefore contact their national society to find out what arrangements it is making to select a team or send other competitors.

If a national society decides not to send a national team or other competitors, then applications may be made by (for example) representatives of a CW club, with the permission of the national society.

The Wireless Institute of Australia has never entered a team in the HST Championships. Perhaps the society should look into the matter and come up with some ideas which would support this prestigious event.

Being geographically isolated from the rest of the world, I believe, is possibly part of the problem. However, as the event only comes around every two years, I feel there would be ample time to organise a suitable team/teams from interested parties, clubs, etc throughout Australia. If we could organise some form of competition, perhaps an inter-Division challenge with winners from this competition (with the backing of our own Wireless Institute) being selected for the Overseas Championships.

I hope to write shortly to all Divisions and perhaps get the ball rolling.

Next month we will start our Key Construction project series. I have just received the technical drawings from the maker and they can be reproduced much clearer than my previous drawings.

PO Box 361, Mona Vale NSW 2103

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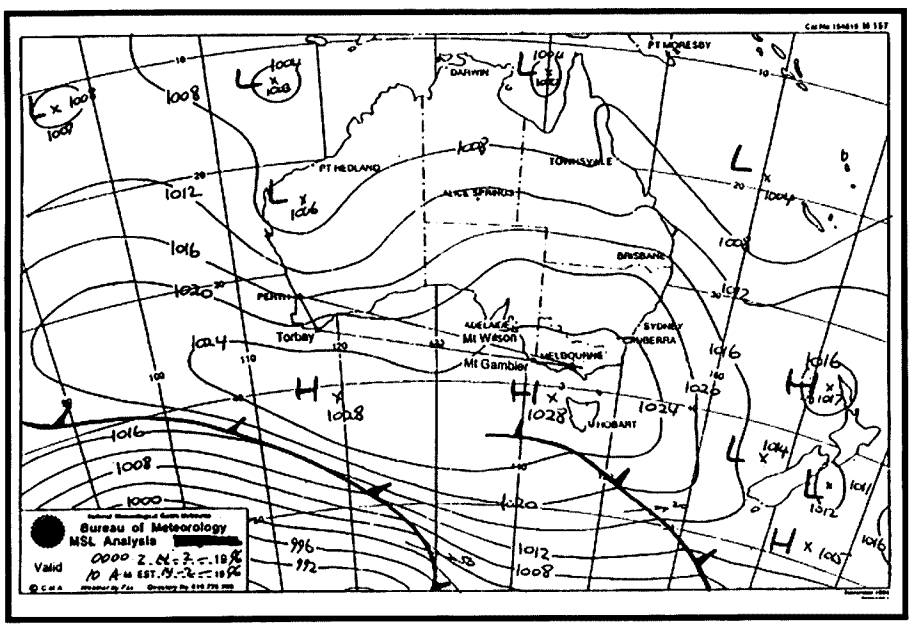
VHF/UHF — An Expanding World

*Eric Jamieson VK5LP**

All times are UTC.

The Great Tropospheric Opening (Part 1)

It was destined to occur. During February, the southern portion of Australia enjoyed a prolonged period of outstanding VHF/UHF propagation. The fact that something may happen, first became evident on 8/2/96 when a high pressure cell moved into the Great Australian Bight at 15 knots and a pressure gradient of 1029 hPa. In addition, a complex series of low pressure cells was stationary over the Tasman Sea, being blocked by a high pressure cell over New Zealand.



The weather map for 14/2/96 showing the elongated high pressure system over the Southern Ocean. The added lines indicate the paths which made contacts possible, firstly between Roger VK5NY at Mount Wilson to Tbrbay and Perth, with a few contacts either side of the line; and secondly, the main path between Perth and Mount Gambier, and on to Melbourne and a little beyond, which received the assistance of an inversion. Very few contacts were made either side of that line. No contacts were made to Tasmania. Secondary contacts were made between Esperance/Albany/Perth.

The first contact, of 1760 km on 144 MHz, was between **Colin VK5DK** at Mount Gambier and **Bill VK6AS** at Esperance at 1255 on 10/2, with 5x9 signals. By 11/2 the high was positioned to permit contacts on 144 MHz between **VK6AS, VK6APZ** and **VK6ATS** at Esperance PF06 and **VK3ZQB** at Port Fairy QF11, a distance of 1890 km. In fact, Russell VK3ZQB spanned that path to work VK6ATS, who used a 1/4 wave whip vertical!

By 12/2 the high had intensified to 1031 hPa and was stationary over the Bight. VK3ZQB worked **VK6KZ/p** at Torbay OF84tw, 2187 km, about 30 km west of Albany on 144 and **VK5NY** on 1296 MHz. By now **Colin VK5DK** and Tim **VK5AV** from Mount Gambier also were working to Esperance and Albany.

This high moved east on 13/2 with a weak front over Perth. However, a second high pressure cell of 1028 hPa was moving east behind the front, and suddenly stations in Perth were being worked on 144 MHz.

On 14/2 the cold front had slipped south east and the two highs, one over Victoria and other south of Perth, had linked to form an elongated area of high pressure extending from Perth to the Tasman Sea. That morning an intense inversion was experienced, situated well down in the ocean from southern Australia. **Trevor VK5NC**, while travelling on the freeway at Crafers near Mount Lofty, said that the inversion was clearly visible in the Southern Ocean. It remained there for several days providing some of the best VHF/UHF conditions ever experienced on that long path up to 3000 km.

By 16/2 the high pressure cell had moved east with the cell centre over the Tasman Sea. A ridge extended across southern Australia to link with a high of 1030 hPa south west of Perth. The pressure of the ridge was about 1016 hPa and, because of this lower pressure, propagation was on the decline. Stations were worked on 17/2 but not to the extent of the previous days.

My thanks to **Russell VK3ZQB** for filling the gaps in my meteorological information and for a series of weather maps. Unfortunately, I could not use these as they suffered lack of definition when faxed. However, **David VK5KK** was able to prepare several good maps, one of which appears in these columns.

As the result of this sustained high pressure system, the following achievements were made:
On 16/2 at 1614, **Trevor VK5NC** in Mount Gambier QF02je worked **VK6AO** in Perth OF78 on 1296 MHz at 5x5 for a new VK5 record, approx 2360 km. This was also the first 1296 MHz interstate contact from Perth and a VK6 record. Cec VK6AO was roused from bed near midnight local time by a phone call from Alan VK6ZWZ who had been in QSO with VK5NC on 144 MHz. Cec runs about 200 watts to a water-cooled 2C39 PA with a long loop-Yagi antenna, and a GaAsFET masthead pre-amp on receive. The exciter is a VK5 type transverter with a M57762 intermediate driver.

On 17/2 at 0200, **VK5NC** in Mount Gambier QF02je worked **VK6HK** in Perth OF78 on 432 MHz at 419 for a new VK5 record, approx 2360 km. **VK5NC** also worked **VK6ZWZ** in Perth on 432 and this may be a slightly greater distance.

John Martin VK3KWA, who keeps the distance records, will need to pore very carefully over the Australian landscape to decide who worked the longest distance as there is little to choose between VK5NC and VK5DK in Mount Gambier and also at the other end for some of the Perth stations!

Comments from the Operators

Wal VK6KZ/p at **Torbay:** *I was thrilled to have so many stations active on 10 GHz looking west! I have a feeling that the higher frequencies did not propagate well to Torbay because of the long narrow high pressure cell with central pressure not particularly high, eg 1024 hPa on Thursday 15/2 compared with 1030 hPa when Roger VK5NY and I bridged the path last year.*

Very grateful to Trevor VK5NC for coming on 10 GHz so soon after returning from Adelaide, and his 1296 MHz contact with Cec VK6AO — he must have had no more than three hours sleep that night! Great to see Cec VK6AO fulfilled his desire to work east on 1296 MHz — he has put a lot of technical excellence in his station with that goal in mind.

I was amazed at the almost continuous absence of the Adelaide beacon VK5VF on 144.450. Also looked for it on 432, 1296, 2403 and 10368 from time to time without success.

Alan VK6ZWZ Perth: *While in contact with Trevor VK5NC on 16/2 at 1535, he mentioned copying the beacon VK6RPH on 432.460. I informed him that on 1296 VK6RPH was low in frequency (about 1296.453 due to a technical problem aggravated by the day's extremely high temperature). Trevor heard the beacon at S2 but we were unable to make contact on 1296. I phoned Cec VK6AO, who is better equipped, and he proceeded to work Trevor VK5NC on 1296, at which point I could hear Trevor on QSB peaks.*

Don VK6HK Perth: *What an incredible week of VHF/UHF propagation from Perth to VK5 and VK3. The Mount Gambier beacon VK5RSE on 144.550 was an outstanding marker for this series of openings. Nothing was heard by me of any of the Adelaide beacons or stations north of VK5NY on any of the five days, although VK6ZWZ reported hearing VK5VF weakly on one occasion.*

Best DX for me was VK3AUU at Drouin QF21, east of Melbourne at 2223 on 15/2. This is a preliminary distance of 2816 km and is thought to be a new VK6 two metre tropospheric propagation record.

VK3ZQB at 2206 on 15/2 was also a great QSO for me, being my first VK3 on 432 MHz. This week saw the first ever 432 MHz QSOs from Perth to VK3. Not sure who made the first, probably VK6AO at 2158 on 14/2. (VK6KRC worked VK3ZQB at 2132 on 14/2 ... de VK5LP)

Russell VK3ZQB said: *VK3ZQB/p at Port Fairy and Allen VK3XPD/p at Mount Dandenong attempted to contact VK6KZ/p at Torbay, west of Albany on 3 cm, on the morning and evening of 13/2 and the morning of 14/2 until 2100, without success.*

Portable stations were set up by **VK5NY/p** at South End QF02, **VK5KK/p** Robe PF92, **VK3XPD/p** Mt Dandenong QF21, and **VK3ZQB/p** Cape Bridgewater QF01, in an effort to communicate with **VK6KZ/p** at Torbay OF84tw. From 1050 to 2130 (except 1630 to 1730 — they had to sleep sometime!), on each half hour attempts were made for contacts on 3 cm without success, although a number of contacts ensured on 144, 432 and 1296 MHz.

Notwithstanding the large number of contacts associated with this period of enhanced propagation, it is interesting to note that the area covered was relatively narrow at both ends, with Perth to Mount Gambier being the optimum for sustained contacts.

The Adelaide beacon VK5VF on two metres was rarely heard in the west and, as far as is known, no one from Adelaide worked Perth, although **VK5KK** and **VK5RO** worked **VK6KZ/p** on 144 on 12/2 but only at 5x2. **VK5NY** from his mountain-top site near Mount Wilson worked **VK6ZWZ** at 5x5 and **VK6HK** 5x6 on 14/2 and **VK6HK** on 15/2 at 2x1! Here at Meningie I heard no signals from Albany/Torbay or Perth or their beacons. **VK6AS** at Esperance was heard weakly and briefly for a few moments on 14/2.

Here are details of those involved in the tropo opening, with the stations progressing from the most easterly to other intermediate positions to the most westerly at Perth. Distances shown are approximate due to lack of detailed latitude and longitude information or locator squares to six places not being available; nevertheless, they are a fair indication of the extent of long distance contacts.

David VK3AUU Drouin QF31
Adam VK3ALM North Dandenong QF22
Jim VK3II Melbourne QF22
Alan VK3AL Melbourne QF22
VK3ZUC
Allan VK3XPD Burwood QF22
Ross VK3ACX QF22
Ron VK3AKJ Melbourne QF22
Ken VK3DQW Geelong QF21
Charlie VK3BRZ Geelong QF21
Mike VK3RZ Melbourne QF22
Ron VK3AFW Melbourne QF22
Russell VK3ZQB Port Fairy QF11
VK3ZQB/p Cape Bridgewater QF01
Trevor VK5NC Mt Gambier QF02
VK5NC/p Cape Northumberland QF01
Colin VK5DK Mt Gambier QF02
Tim VK5AV Mt Gambier QF02
Roger VK5NY Mt Wilson PF94
Roger VK5NY/p South End QF02
Phil VK5AKK Stirling PF95
Colin VK5RO Adelaide PF95
David VK5KK Adelaide PF95
David VK5KK/p Robe PF92
Tom VK5EE Mt Gambier QF02
Bill VK6AS Esperance PF06
Peter VK6APZ Esperance PF06
Graeme VK6ATS Esperance PF06
Bob VK6BE Albany OF84
Frank VK6DM Albany OF84
Wally VK6WG Albany OF84
Wal VK6KZ/p Torbay OF84tw
Darryl VK6KDC Manjimup OF85
Cec VK6AO Perth OF78
Don VK6HK Perth OF78
John VK6JJ Perth OF78
Ross VK6KAT Perth OF78
Bob VK6KRC Perth OF78
Al VK6ZAY Perth OF78
Alan VK6ZWZ Perth OF78
Brad VK6AH Perth OF78
Steve VK6SQ Perth OF78

10/2/96					
1255	VK5DK	— VK6AS	144	5x9	1760
11/2/96					
1310	VK5DK	— VK6AS	144	5x9	1760
1325	VK5DK	— VK6BE	144	5x5	2036
1333	VK5AV	— VK6BE	144	5x1	2036
1345	VK5AV	— VK6AS	144	5x1	1760
1500	VK3ZQB	— VK6AS	144	5x9	1890
1505	VK3ZQB	— VK6APZ	144	5x9	1890
1506	VK3ZQB	— VK6ATS	144	4x1	1890
12/2/96					
0952	VK5AKK	— VK6KZ/p	144	1907	
	VK5AKK	— VK6KZ/p	432	1907	
1031	VK5KK	— VK6KZ/p	144	5x2	1923
1052	VK3ZQB	— VK6KZ/p	144	5x1	2187
1059	VK3ZUC	— VK6KZ/p	144	5x1	
1103	VK3AUU	— VK6KZ/p	144	5x5	2540
1115	VK3ZQB	— VK6KZ/p	144	4x1	2187
1200	VK5DK	— VK6AS	144	5x9	1760
1202	VK5RO	— VK6KZ/p	144	5x2	1907
1208	VK5DK	— VK6HK	144	2360	
1222	VK3ZQB	— VK6KZ/p	144	2187	
1230	VK3XPD	— VK6KZ/p	144	2440	
1245	VK5DK	— VK6KZ/p	144	5x7	2066
1250	VK5DK	— VK6KZ/p	432	5x1	2066
2328	VK6AS	— VK6HK	144	600	
2335	VK3ZQB	— VK5NY	1296	5x9	380
2343	VK6KZ/p	— VK6HK	144	400	
13/2/96					
0145	VK5DK	— VK6AS	144	5x9	1760
0803	VK3ZQB	— VK6KZ/p	144	2187	
0905	VK5DK	— VK6KZ/p	144	5x3	2066
1130	VK3ZQB	— VK6KZ/p	144	5x5	2187
1145	VK5DK	— VK6AO	144	5x6	2360
1205	VK3ZQB	— VK6AO	144	5x1	2490
1210	VK5DK	— VK6ZWZ	144	5x2	2360
1215	VK5DK	— VK6KZ/p	144	2066	
1215	VK6AS	— VK6ZWZ	144	600	
1232	VK5DK	— VK5NY	144	5x9	318
1238	VK5DK	— VK5NY	432	5x9	318
1310	VK5DK	— VK3RZ	144	5x9	375
2328	VK6KZ/p	— VK6ZWZ	144	400	
2343	VK6KZ/p	— VK6ZWZ	432	400	

14/2/96					
0002	VK3ZQB	— VK3XPD/p	1296	5x3	
0610	VK3ZQB	— VK6APZ	144	5x9	1890
0611	VK3ZQB	— VK6AS	144	5x6	1890
1000	VK3ZQB	— VK6KZ/p	144	2187	
1030	VK3ZQB	— VK6APZ	432	5x9	1890
1035	VK3ZQB	— VK6KZ/p	432	5x2	2187
1100	VK5AV	— VK6KZ/p	144	5x1	2066
1101	VK5AV	— VK6APZ	144	5x3	1760
1145	VK5DK	— VK6DM	144	5x6	1760
1148	VK5DK	— VK6APZ	144	5x9	1760
1149	VK5DK	— VK6ATS	144	5x6	1760
1150	VK5DK	— VK6APZ	432	5x6	1760
1155	VK3ZQB	— VK6WG	144	5x7	2157
1155	VK5DK	— VK6WG	432	5x7	2036
1235	VK3ZQB	— VK3ACX	1296	5x9	
1236	VK3ZQB	— VK3XPD/p	1296	5x2	
1253	VK3AKJ	— VK6KZ/p	144	2440	
1306	VK5NY	— VK6KZ/p	144	5x1	1912
1322	VK5AV	— VK6APZ	144	5x3	1760
1400	VK5AV	— VK6AS	144	5x1	1760
1410	VK5DK	— VK6KZ/p	144	2066	
1415	VK5DK	— VK6ZWZ	144	5x1	2360
1515	VK6APZ	— VK6ZWZ	144	600	
2100	VK3AUU	— VK6ZWZ	144	2816	
2110	VK5AV	— VK6ZWZ	144	5x3	2360
2113	VK3ZQB	— VK6ZWZ	144	2490	
2115	VK3ZQB	— VK6KZ/p	144	2187	
2116	VK5NY	— VK6KZ/p	144	5x7	1912
2130	VK3ZQB	— VK6AS	432	5x9	1890
2131	VK3XPD	— VK6KZ/p	144	2440	
2132	VK3ZQB	— VK6KRC	432	5x2	2490
2133	VK5NY	— VK6ZWZ	144	5x5	2180
2135	VK3ZQB	— VK6KRC	144	5x9	2490
2137	VK6APZ	— VK6ZWZ	144	600	
2150	VK5DK	— VK6APZ	432	5x9	1760
2158	VK5DK	— VK6AO	432	5x8	2360
2201	VK3AUU	— VK6KZ/p	144	2540	
2202	VK3ZQB	— VK6ZWZ	432	5x3	2490
2205	VK3ZQB	— VK6HK	432	5x2	2490
2206	VK3ZQB	— VK6AO	144	5x7	2490
2210	VK3ZQB	— VK6HK	144	5x8	2490
2220	VK5DK	— VK6HK	144	5x7	2360
2229	VK5NY	— VK6HK	144	5x6	2180
2314	VK6AS	— VK6HK	144	5x7	600

Thanks to VK3ZQB, VK5AV, VK5DK, VK5KK, VK5NC, VK6AO, VK6KZ, VK6HK and VK6ZWZ for the supply of appropriate information. Part 2, covering 15/2, 16/2 and 17/2 will appear next month.

New Zealand to Australia

Last month's report from **Cliff ZL1MQ** covered known 50 MHz contacts to 5/1/96. Since then, Cliff reports that the band has been open between the two countries on 27 occasions between 6/1/96 and 3/2/96, the only days not open being 31/1 and 1/2! Stations worked were VKs 1MJ, 2APG, 2DVC, 2EMA, 2FZ/4, 2IBT, 2MZ, 2YLO, 2ZJR, 3ALZ, 3AMJ, 3AMQ, 3AMS, 3AYO, 3AZY, 3DEM, 3DUQ, 3DUT, 3OT, 3OW, 4ABW, 4AFL, 4ALM, 4APG, 4AR, 4ARN, 4BKM, 4FNQ, 4GPN, 4JH, 4KK, 4KMA, 4PU, 4RC/5, 4UGC, 4XG, 5AKK, 5AYD, 5BC, 5KTZ, 5LP, 5NA, 5ZNC, 6AKT, 6BE, 6JJ, 6KRC, 6KZ, 6RO, 6YU, 6ZWZ, 7AF, 7JG, 7LZ, 7RR, 7XR, 7ZUF and 8RH by ZLs 1ADP, 1HI, 1MQ, 1TMF, 2AAA, 2AGI, 2AQR/3, 2KT, 2TPY, 3AAV, 3ADT, 3ADT, 3NE, 3TIC, 3TLG, 4LV, 4NV, 4TBB and 4TBN.

FK8EB was worked by ZL2AGI and ZL2KT on 10/1. On 12/1 and 15/1 **VK9YQS** Lord Howe Island QF98 was worked by ZL2KT and ZL2AGI. Doug VK9YQS may go to Macquarie Island late in 1996. **ZL2TPY** worked **JE2DWZ** on 14/1 and **ZL1MQ, ZL2AGI** and **ZL3NE** worked **JH6VXP** on 8/2.

A new six metre beacon is operating from Christchurch RE66 with the call of ZL3SIX on 50.020 MHz.

On two metres the band was open on 9/1, 11/1, 13/1, 15/1, 20/1, 21/1, 24/1 and 27/1, or eight occasions. VKs worked were 1VP, 2APG, 2BA, 2DVZ, 2DXV, 2FZ/4, 2XKE, 2ZAB, 2ZXC, 3DEM, 3DUT, 3TMP, 3XRS, 4ABW/2, 4APG and 7XR, the first VK7 on two metres. They were worked by ZLs 1TWR, 3AIC, 3NE, 3TIB, 3TIC, 3TY and 4BTN. In addition, eleven VK2s and two VK1s were worked by ZL3TY on 20/1 but no further details. The ZLs are as elusive as ever into VK5!

Ross Hull Contest

Looking over advance information sent to me by **John Martin VK3KWA**, I note the Contest was won by **VK2FZ/4** with 14048 points, followed by VK2ZAB 10931, VK3XRS 10495 and VK2DVZ 10345. Next was **VK6KZ** with 6943 and Wal was the only station to operate on 50, 144, 432, 1296, 2304, 3456 MHz and

10 GHz, scoring 1216 points on the latter band. Good work gentlemen. Full results will be in the May issue of *Amateur Radio.*

From G4UPS

Ted G4UPS sent an analysis of his 1995 QSOs. He writes: *I was very surprised to find that 50% of all six metre QSOs were made on CW. I did realise, however, that all the real DX contacts into W.land were made on CW, as were nearly all the rare contacts such as 3V8BB, 4K6D, 4N5, FP5, etc.*

Total QSOs were 1883 during 1995 with 936 on CW. These figures represent 65 different countries, 265 grid squares and 22 fields. The busiest months were May with 240 contacts, June 486 and July 305.

I think this proves that, despite having only a few rungs of the current solar cycle ladder to go to reach the trough, I feel sure that a newcomer to the band would be extremely pleased to have notched up well over 50% of his or her DXCC for the six metre band. I have only a 4 element Yagi, because of my location, and I am sure that many others will also be most pleasantly surprised when they analyse their 1995 six metre logs.

Most certainly 1995 was a much better year on six metres than many would have believed, and certainly better than many predicted. Perhaps we can entice back to the band those who think that six metres is closed until the peak of the next cycle! January 1996 started well with 16 countries, 9A, DL, G, GW, I, OE, OH, OK, OM, ON, OZ, S5, SM, SP, YL and YU.

Closure

Part of February was very busy as attested by the above reports. It was frustrating that I could not be part of the contacts to Perth, but the signals simply travelled either side of me, at the same time largely bypassing Adelaide. This is shown by reference to the map. But, there is always next time!

Closing with two thoughts for the month:

1. Effective knowledge is that which includes knowledge of the limitations of one's knowledge, and
2. I do beseech you to direct your efforts more to preparing youth for the path and less to preparing the path for the youth .... Judge Ben Lindsey.

73 from The Voice by the Lake.

*PO Box 169, Meningie SA 5264
Fax: (085) 751 043
Packet: VK5LP@VK5WI.#ADL.#SA.AUS.OC*

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Stolen Equipment

The following equipment has been reported stolen. If you have any information that may lead to the recovery of the equipment, please get in touch with the advised contact as soon as practicable.

Make:	ICOM
Model:	ICW2A
Serial Number:	05048
Type:	Handheld transceiver
Accessories:	Soft case and speaker/mic
Stolen from:	Tea Tree Gully, SA
Date:	13 January 1996
Owner:	Rob Janoska
Callsign:	VK5CS
Contact details:	PO Box 204, Birdwood, SA 5234; or via packet: VK5CS@VK5HB

Make:	ICOM
Model:	IC-725
Serial Number:	9511
Type:	HF Transceiver
Stolen from:	Greenacre, NSW
Date:	29 February 1996
Owner:	John Blunn
Callsign:	VK2TAT
Contact details:	(02) 707 9505

Make:	ICOM
Model:	IC-24AT
Serial Number:	5430
Type:	Dual Band Handheld
Accessories:	Speaker Mic
Stolen from:	Greenacre, NSW
Date:	29 February 1996
Owner:	John Blunn
Callsign:	VK2TAT
Contact details:	(02) 707 9505

Make:	GME
Serial Number:	PSA1225
Type:	35 Amp Power Supply
Stolen from:	Greenacre, NSW
Date:	29 February 1996
Owner:	John Blunn
Callsign:	VK2TAT
Contact details:	(02) 707 9505

Make:	MFJ
Model:	Deluxe Versa Tuna II 949E
Type:	HF Antenna Tuner
Stolen from:	Greenacre, NSW
Date:	29 February 1996
Owner:	John Blunn
Callsign:	VK2TAT
Contact details:	(02) 707 9505

Make:	Mirage
Serial Number:	3660-1080
Type:	2 Metre Amplifier
Stolen from:	Greenacre, NSW
Date:	29 February 1996
Owner:	John Blunn
Callsign:	VK2TAT
Contact details:	(02) 707 9505

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HF Predictions

Evan Jarman VK3ANI

These charts were prepared using one of the IPS stand-alone prediction systems. They show the diurnal variation in ionospheric conditions. The legend below indicates how each of the frequencies is plotted.

Those frequencies are:-

ALF Absorption limiting frequency
MUF Maximum useable frequency
OWF Optimum working frequency

The T index used is shown in the legend.

Also included is the path bearing for the Australian station of each circuit. The short path is displayed unless indicated.

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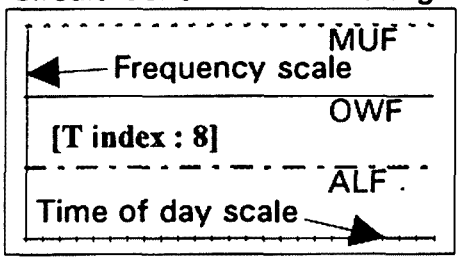
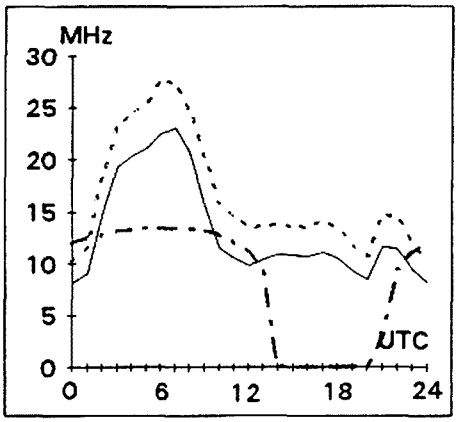
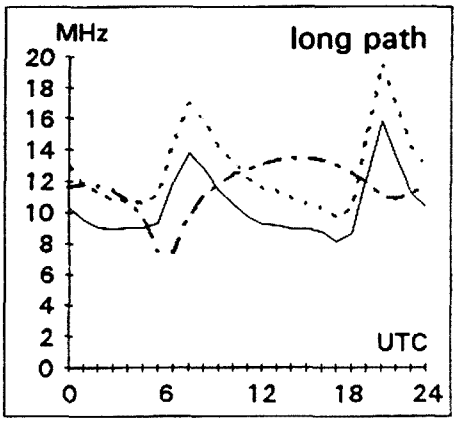
Circuit identifier Bearing



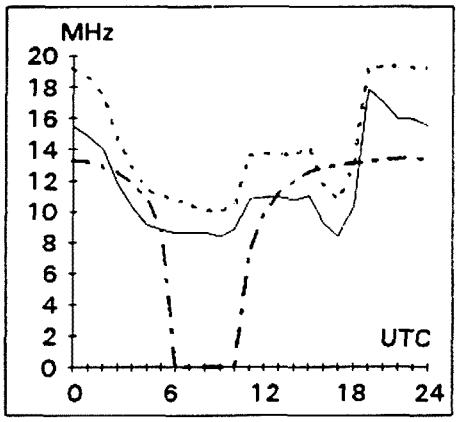
Brisbane-Bahrain 289



Canberra-London 136



Brisbane-New York 58



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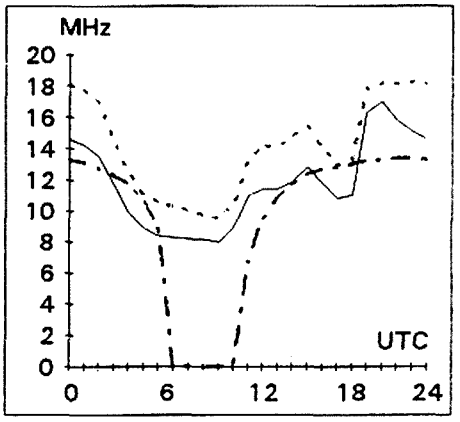
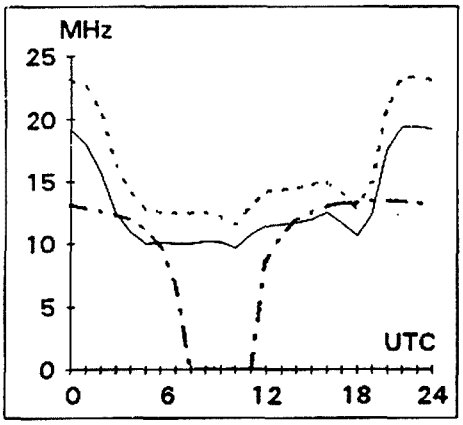
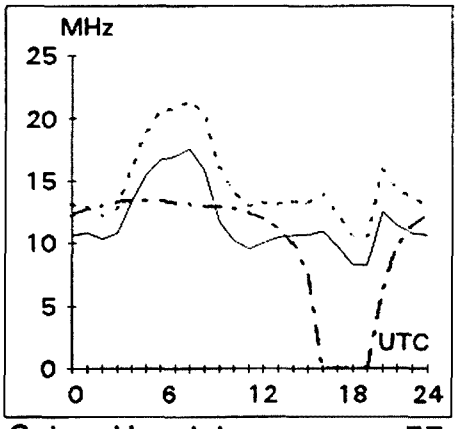


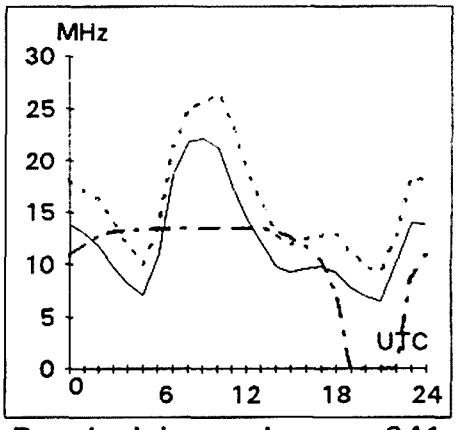
Adelaide -Atlanta 79



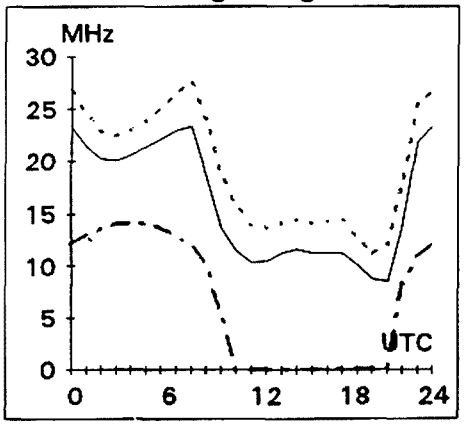
Brisbane-Rome 305



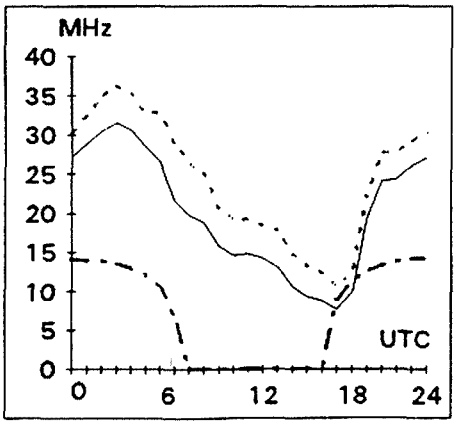
Darwin-Dakar 278



Adelaide-Hong Kong 334



Cairns-Honolulu 57



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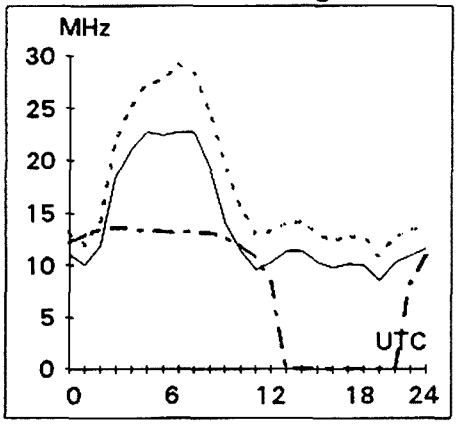
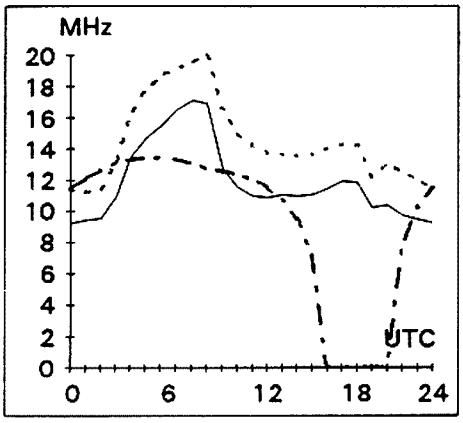
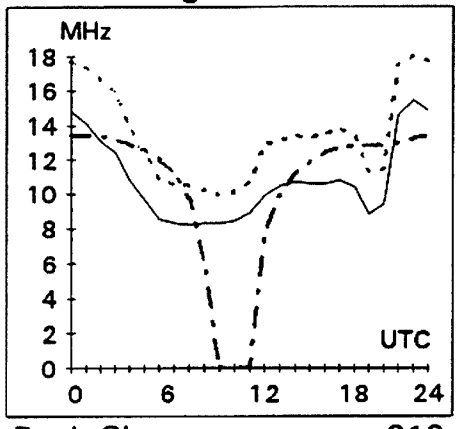


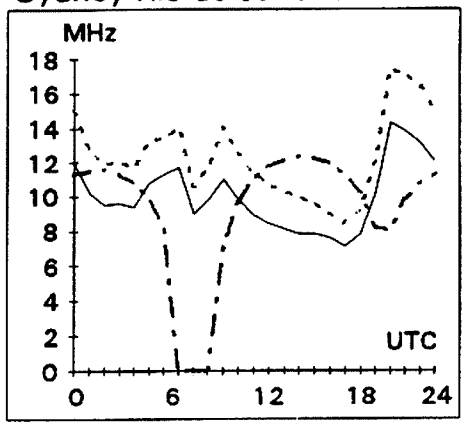
Melbourne-Berlin 310



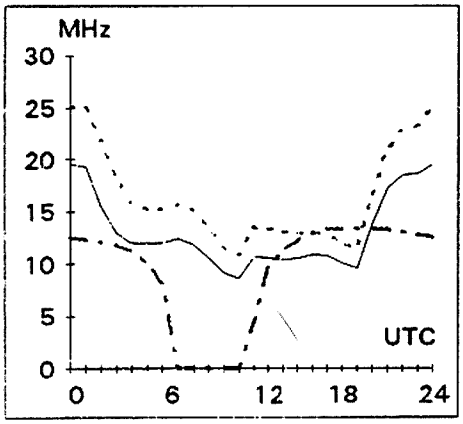
Perth-Chicago 55



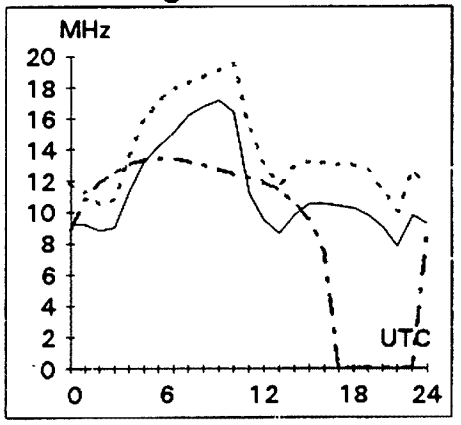
Sydney-Rio de Janeiro 164



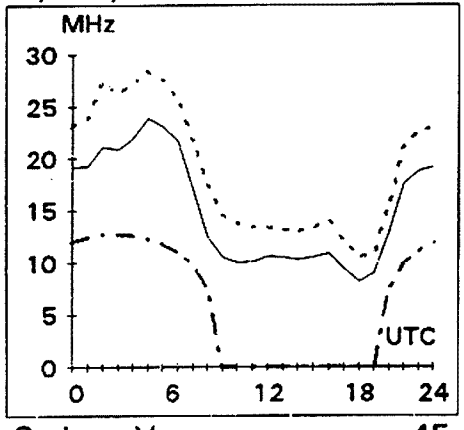
Melbourne-Miami 94



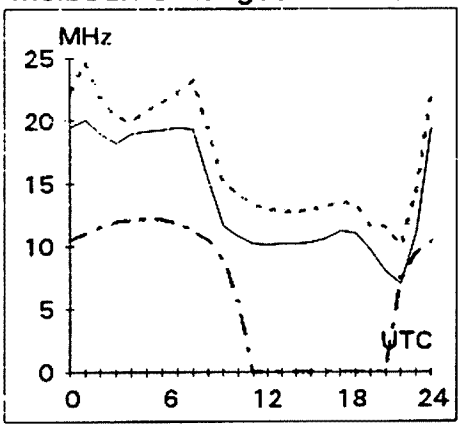
Perth-Glasgow 319



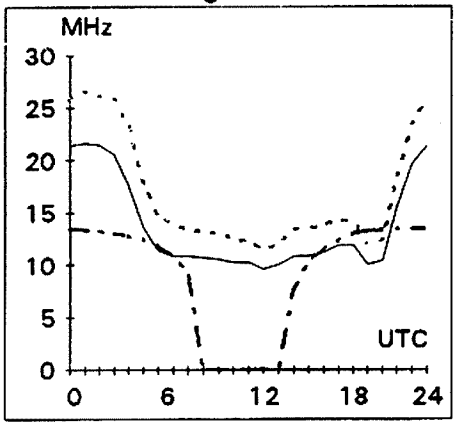
Sydney-Seoul 340



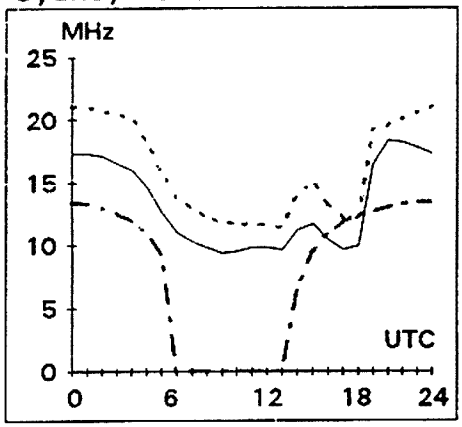
Melbourne-Rangoon 310



Perth-Los Angeles 72



Sydney-Vancouver 45



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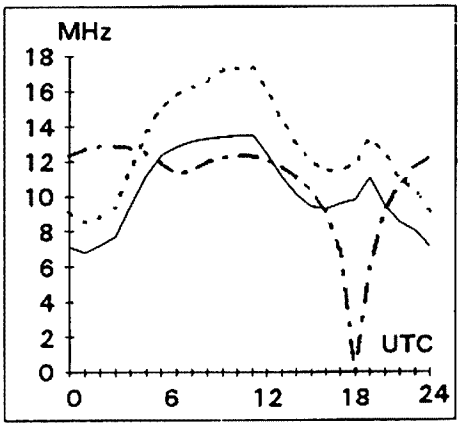

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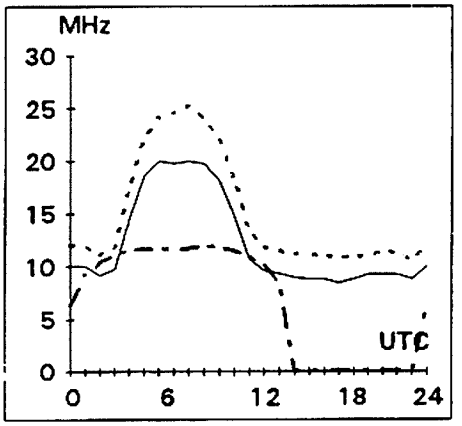

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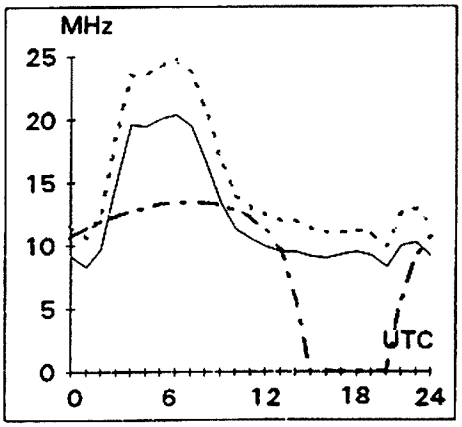

HAMADS

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FOR SALE NSW

* **Callbooks** International and US, 1995, excellent condition, both together, $70. Steve VK2PS QTHR (02) 654 1809.
* **Yaesu FT107** 100 W transceiver SSB/CW/AM 160-10 m with **FV107** external VFO and microphone. Complete with power leads, instruction manual and parts list. Works well and in good condition, $475. Ric VK2PH (02) 817 0337.
* **TS940S HF** tcvr, inbuilt PSU and ATU, s/n 5700664, vgc with mic and manual, original packaging, all band, all mode, forced sale, $2,500 ono. Paul VK2NPH (049) 33 5995 after 6 pm.
* **Shack Clearance**, going overseas. **TH6DXX** beam, **Daiwa rotator**, 60ft winch up **Hills tower** with Kevlar guys, $950, all working, will separate; **FT690R** 50 MHz transceiver (sister to FT290R) nicads, carry case, fully functional except display clouding, hence $295; **Power Supplies** 12v 15a heavy stuff, $90 each; **Printers Oki microline 80 & 84**, A4 width and 15", $35 each; **2 Metre cross Yagi** 10 element, $75; **Z80 based home computer**, disk drives, can be machine code programmed, runs CPM, Wordstar free to a good home. Household items, workshop tools, eg 10" sawbench & plainer, bandsaw, pillar drill, sailboard. Cables, plugpacks, battery charger, bits and pieces at give away prices, arrange a visit, upper Sydney northshore. Ted VK2EZQ (02) 477 7834.
* **ICOM IC-R7100** comms receiver, 25 — 2000 MHz, EC, with TV adapt, manuals, $2,000. Phil L21001 (02)871 1060, 019 904 724.
* **Philips FM92** synthesised 2 m FM, 99 channels, 25 W, packet or phone, VGC, $200. **Yaesu FL2050** 2 m Linear amplifier, 50 W, all modes, VGC, $150. 2 m **Ringo** and **DSE base vertical**, $25 each. Keith VK2GXB (02) 669 2329.
* **Collins PRC-47** can be converted to LSB easily with **WB0NVE kit**, available with all documentation, for $50 posted to any VK address. Brian VK2GCE QTHR (02) 545 2650 AH.
* **Deceased estate, Kenwood TS-530S** HF tcvr, s/n 1112046, $650. Immaculate condition, boxed, with manuals. John VK2EJP (02) 872 5043.

FOR SALE VIC

* **Hustler 5BTV** HF trap vertical, vgc, $180; **VRK-1 radial kit** (unused), $30. Damien VK3CDI (054) 27 3121.
* **Yaesu FT101ZD** transceiver, s/n 9F060403, vgc, includes service manual, hand mike, spare finals, $500; **Katsumi electronic keyer** EK150, $100 negotiable. John VK3BAS QTHR (057) 52 2056.
* **FT101E**, receives OK, desensitises receiver on transmit. Electrically fine but full of nicotine and CRC, ex-smoker so contacts yuk, $250. Plus spare new finals $300, or finals $60. Jim VK3YJ QTHR (03) 9315 9387.

FOR SALE QLD

* **JPS ANC-4 antenna noise canceller**, as new in carton, $275. Hans L40370 (074) 79 4561.
* **Valves** for restorers of vintage radios. Valve TV's. Amateur transceivers, QRP rigs, octals, novals, rectifiers, regulators, phenolic and ceramic sockets. **Kenwood MB100** 130S rack. High wattage wirewound resistors. Send SASE for list. Ted VK4YG QTHR (070) 97 6387.
* **Yaesu FT101ZD, FT102, Wilson SY2 tribander**, chassis punches, magnifying desk lamp, mantel radios, books, valves transmit receive collectables. Catalogue, .85c stamp. Peter Hadgraft, 17 Paxton St, Holland Park Qld 4121, (07) 3397 3751 ah.
* **Icom IC720A** txcvr, gen coverage RX, 100 W all HF bands, purchased Daycom Dec 1994, $600, in vgc. "Doc" VK4CMY (076) 85 2167 before 8.30 pm please.
* **Yaesu FT-77**, s/n 2N010271, with **Turner** model 751 desk mic, and power supply, good cond, $350. Henry VK4CQH QTHR (07) 92 1994.
* **Kenwood TS140S, HF** xcvr, s/n 21200298, in good condition, manual, $850. Les VK4EM1 (070) 65 4764 ah.
* **UHFs!!** 2 of **Willis Aulophone**, $50 each; **Willis Autophone**, incl two 70 cm xtals tuned, $70; **AWA M1200** h/held, $30; **Philips FM828**, $230; **Philips FM828**, incl two 70 cm xtals, $250; **Sawiron 880**, incl four 70 cm xtals, $80. The lot, $690 shipped. Will VK4XP QTHR (079) 79 3101.
* **Kenwood TS-850S** HF tcvr, built-in auto ATU, 160 — 10 m, digital recording unit (DRU-2), YK-88SN-1 SSB filter and remote control unit 11 functions. complete with box and manuals, VGC, $2595. **AWA** 2 m, 64 channel, remote head radio, programmed for packet, simplex and repeater frequencies, 25/5 W, complete with circuit diags, works very well, $175. Eric VK4NEF QTHR (07) 3395 5327.

FOR SALE WA

* **Icom IC745**, HF trans, 100 W, gc, receiver excellent, noise blanker, PBT, IF shift, variable AGC, serial 05879, $870. Graham VK6RO QTHR (09) 451 3561.
* **TET model DS-32S** 2 el delta loop tribander antenna, brand new, never used, $350. Gerry VK6GW (09) 298 8489.

FOR SALE TAS

* **Yaesu FL2100Z** and **572B** tubes, one pair, both new; **Hustler 5BTV** 80-10 trap vert, as new; Service manual for FT901DM, TS940, TS430, TS930, TS830, TS811/711, TW4100, TS600, all new. Offers for above. YK-88SN-1, FL102, filters. Allen VK7AN (003) 271171.

WANTED NSW

* Spy radio **Type A Mark 3**, including spares and vibrator power supply if possible. Ric VK2PH (02) 817 0337.
* **Yaesu FC757AT** automatic antenna coupler. H Bolton VK2BOL (02) 477 2624.
* **Mecograph**, or the **McDonald Pendograph**, or any unusual Australian keys or jiggers. Pay top dollar for any of the above. Steve VK2SPS (02) 99992933 after 6.00 pm.

WANTED VIC

* Antenna **Hy-gain triband** or similar, good condition, only Bendigo area. Bob VK3MRG (054) 39 6314.
* Operator's **service manual** for Marconi signal generator model TF144H/(4S) (RAAF CT452A), or circuit diagram. All costs refunded. Drew VK3XU QTHR (03) 9253 6199 BH or (03) 9722 1620 AH.
* **JRC NVA-88 Speaker; JRC-97** antenna tuner. Tony VK3PTV (03) 9729 1513 AH or (03) 9794 4546 BH.

WANTED QLD

* **Racal** (Airmec) signal generator, 200 kHz to 80 MHz, in any condition, for purchase, or repair and return in working order. A Hinkler VK4AO 41 Spenser St, Iluka NSW 2466.
* **TB4/1250** Super Giant RF power triode in good working order; **6 m RF amplifier**, valve or solid state, homebrew ok, also **Heathkit 6 m amplifier** for collection and **6 m/2 m VSWR power meter**, good home given to unwanted Heathkit equipment, any condition. For collection, details to "Doc" VK4CMY (076) 85 2167 before 8 pm please.
* **Heathkit 6 m amplifier, Heathkit 2 m all-mode tranceiver, Heathkit SB200** amplifier, **Heathkit VHF SWR-power meter, Heathkit HF SWR-power meter, Heathkit rotary coax switch, Heathkit HW16, HW101, DX40, DX60** transmitters/transceiver for operational Heathkit Museum. Contact "Doc" VK4CMY, PO Box 24, Dalveen Qld 4374 or phone (076) 85 2167 before 8 pm please. Vietnam Veterans Wireless Group.

MISCELLANEOUS

* THE WIA QSL Collection (now Federal) requires QSLs. All types welcome especially rare DX, pictorial cards, special issue. Please contact Hon. Curator, Ken Matchett VK3TL, 4 Sunrise Hill Road, Montrose Vic 3765, Tel (03) 728 5350.
* Wanted for WW2 No 11 set, valves type **1C7G, 1M5G, 1K7G.** Will pay your price. Alan Morriss G4GEN, Pippingford Park, Nutley, Sussex TN22 3HW UK. ar

Spotlight on SWLing

*Robin L Harwood VK7RH**

April has come and propagation conditions are making their seasonal alterations. Most of the International stations now make their major frequency alterations on the last Sunday in March, to take account of the introduction of daylight saving in Europe. This means that programs primarily directed to European audiences are aired one hour earlier than previously. This usually continues until the last Sunday in September.

However, all the European Union countries will now be extending this to the last Sunday in October, which will, therefore, conform with North America reverting to Standard Time. The last Sunday in October also happens to be the time for some Australian states to change to Daylight Saving. So it appears to be a conscious trend by international broadcasters to cut down the number of frequency changes from four to two.

The future of Radio Canada International seems assured after a recent Cabinet reshuffle, which saw a new Communications Minister appointed in Ottawa. The protests seem to have had some impact and RCI will continue, but the extent of the programming has yet to be worked out. I also think several international broadcasters who use the Sackville site to rebroadcast their programming in North America, were concerned at the possible closure.

Yet another country has been lost to shortwave radio. For about 20 years, Deutsche Welle has been broadcasting from a site at Cyclops, Malta, using 250 kilowatt transmitters. These closed in January and shortwave broadcasting ceased. I believe that the senders have already been dismantled and the site is to be utilised for other purposes. The closure of the site also meant that a joint Maltese/Libyan shortwave station, "Radio Mediterranean", which was using these senders, closed down. It used to be on 9765 kHz at 0600z in English, followed by Arabic. "Radio Mediterranean" is looking for some other senders to broadcast from, but is having some hassles because of the Libyan connection.

I have also heard strong rumours that the Carnarvon site of Radio Australia is going to close in June. The senders would be packed up to Darwin and Shepparton. The Carnarvon site is on the former NASA Space tracking station, which became famous during the early American manned space flights. Placing the senders at Shepparton and Darwin makes economic and strategic sense, although Carnarvon is less susceptible to cyclones than Darwin.

Recently I managed to hear another nation broadcasting on shortwave. Radio Almmaaty in Kazakhstan is easily heard on 9560 kHz at 0630 UTC in English. It is located near Alma Ata, close to the Chinese border. The Kazakh Republic is the largest Central Asian republic, stretching across two time zones from the Caspian sea to the Chinese border. It has the Baikonur Cosmodrome, where the Russian Space launches are held. The Semipalatinsk region in the northwest of the republic is where the majority of Soviet nuclear explosions were conducted until the breakup of the USSR.

"Waveguide", the weekly ten minute program on the BBC World Service, went

Continued page 56

Hamads

Please Note: If you are advertising items For Sale and Wanted please use a separate form for each. Include all details: eg Name, Address, Telephone Number (and STD code), on both form. Please print copy lor your Hamad as clearly as possible.

* Eight lines per issue free to all WIA members, ninth line for name and address Commercial rales apply for non-members. Please enclose a mailing label from this magazine with your Hamad.

* Deceased Estates: The full Hamad will appear in AR, even if the ad is not fully radio equipment.

* Copy typed or in block letters to PO Box 2175, Caulfield Junction, Vic 3161, by the deadlines as indicated on page 1 of each issue.

* QTHR means address is correct as set out in the WIA current Call Book.

* WIA policy recommends that Hamads include the serial numb,er of all equipment offered for sale.

* Please enclose a self addressed stamped envelope if an acknowledgement is required that the Hamad has been received.

Ordinary Hamads submitted from members who are deemed to be in general electronics retail and wholesale distribulive trades should be certified as referring only to private articles not being re-sold for merchandising purposes.

Conditions for commercial advertising are as follows: $25.00 for four lines, plus $2.25 per line (or part thereof) Minimum charge – $25.00 pre-payable.

Stale: .....

Not for pubfication: ❑ Miscellaneous ❑ For Sale ❑ Wanted

Name: ..... Call Sign: ..... Address: .....

WIA Divisions

The WIA consists of seven autonomous State Divisions. Each member of the WIA is a member of a Division, usually in their residential State or Territory, and each Division looks after amateur radio affairs within its area.

Division	Address	Officers			Weekly News Broadcasts		1996 Fees
VK1	ACT Division GPO Box 600 Canberra ACT 2601	President Secretary Treasurer	Philip Rayner John Woolner Bernie Copier	VK1PJ VK1ZAO VK1KOX	3.570 MHz LSB, 146.900 MHz FM each Wednesday evening commencing at 8.00 pm local time. The broadcast text is available on packet, on Internet aus.radio.amateur.misc newsgroups, and on the VK1 Home Page http://email.nla.gov.au/ cmakln/wiaact.html	(F) (G) (S) (X)	$70.00 $56.00 $42.00
VK2	NSW Division 109 Wigram Street Parramatta NSW (PO Box 1066 Parramatta 2124) Phone (02) 689 2417 Freecall 1600 817 644 Fax (02) 633 1525	President Secretary Treasurer (Office hours Web: http://sydney.dialix.oz.au/~wiansw e-mail address: wainsw@sydney.dialix.oz.au	Michael Corbin Eric Fossey Eric Van De Weyer Mon-Sat 11.00-14.00 Mon 1900-2100)	VK2YC VK2EFY VK2KUR	From VK2WI 1.845, 3.595, 7.146*, 10.125, 24,950, 28.320, 29.120, 52.120, 52.525, 144.150, 147.000, 438.525, 1281.750 (*morning only) with relays to some of 14.160, 18.120, 21.170, 584.750 ATV sound. Many country regions relay on 2 m or 70 cm repeaters. Sunday 1000 and 1930. Highlights included in VK2AWX Newcastle news, Monday 1930 on 3.593 plus 10 m, 2m, 70 cm, 23 cm. The broadcast text is available on the Inernet newsgroup *aus.radio.amatuer.misc*, and on packet radio.	(F) (G) (S) (X)	$66.75 $53.40 $38.75
VK3	Victorian Division 40G Victory Boulevard Ashburton Vic 3147 Phone (03) 9885 9261 Fax (03) 9885 9298	President Secretary Treasurer (Office hours	Jim Linton Barry Wilton Rob Hailey Tue & Thur 0830-1530)	VK3PC VK3XV VK3NC	VK3BWI broadcasts on the 1st and 3rd Sunday of the month, starts 10.30 am. Primary frequencies 1.840 AM, 3.615 LSB, 7.085 LSB, and FM(R)s 146.700 Mt Dandenong, 147.250 Mt Macedon, 147.225 Mt Baw Baw, and 2 m FM(R)s VK3RMA, VK3RSH, VK3ROW. 70 cm FM(R)s VK3ROU and VK3RGL. Major news under call VK3WI on Victorian packet BBS.	(F) (G) (S) (X)	$72.00 $58.00 $44.00
VK4	Queensland Division GPO Box 638 Brisbane OLD 4001 Phone (074) 96 4714	President Secretary Treasurer	Geoff Sanders John Stevens John Presotto	VK4KEL VK4AFS VK4WX	1.825 MHz SSB, 3.605 MHz SSB, 7.118 MHz SSB, 14.342 MHz SSB, 28.400 MHz SSB, 29.220 MHz FM, 52.525 MHz FM, 146.700 MHz FM, 147.000 MHz FM, 438.525 MHz (Brisbane only), regional VHF/UHF repeaters at 0900 hrs Sunday. Repeated on 3.605 MHz SSB & 147.000 MHz FM, regional VHF/UHF repeaters at 1930 hrs EAST Monday. Broadcast news in text form on packet under WIAQ@VKNET.	(F) (G) (S) (X)	$72.00 $58.00 $44.00
VK5	South Australian Division 34 West Thebarton Road Thebarton SA 5031 (GPO Box 1234 Adelaide SA 5001) Phone (08) 352 3428	President Secretary Treasurer	Garry Harden Maurie Hooper Charles McEachem	VK5ZK VK5EA VK5KDK	1827 kHz AM, 3.550 MHz LSB, 7.095 AM, 14.175 USB, 28.470 USB, 53.100 FM, 147.000 FM Adelaide, 146.700 FM Mid North, 146.800 FM Mildura, 146.825 FM Barossa Valley, 146.900 FM South East, 146.925 FM Central North, 147.825 FM Gawler, 438.425 FM Barossa Valley, 438.475 FM Adelaide North, ATV Ch 35 579.250 Adelaide. (NT) 3.555 USB, 7.065 USB, 10.125 USB, 146.700 FM, 0900 hrs Sunday	(F) (G) (S) (X)	$72.00 $58.00 $44.00
VK6	West Australian Division PO Box 10 West Perth WA 6872 Phone (09) 351 8873	President Secretary Treasurer	Cliff Bastin Mark Bastin Bruce Hedland-Thomas	VK6LZ VK6OO	146.700 FM(R) Perth, at 0930 hrs Sunday, relayed on 1.825, 3.560, 7.075, 14.116, 14.175, 21.185, 29.680 FM, 50.150 and 438.525 MHz. Country relays 3.582, 147.350(R) Busselton and 146.900(R) Mt William (Bunbury). Broadcast repeated on 146.700 at 1900 hrs Sunday, relayed on 1.865, 3.563 and 438.525 MHz; country relays on 146.350 and 146.900 MHz.	(F) (G) (S) (X)	$60.75 $48.60 $32.75
VK7	Tasmanian Division 52 Connaught Crescent West Launceston TAS 7250 Phone (003) 31 9608	President Secretary Treasurer	Andrew Dixon Robin Harwood Terry Ives	VK7GL VK7RH VK7ZTI	146.700 MHz FM (VK7RHT) at 0930 hrs Sunday relayed on 147.000 (VK7RAA), 146.725 (VK7RNE), 146.625 (VK7RMD), 3.570, 7.090, 14.130, 52.100, 144.150 (Hobart) Repeated Tues 3.590 at 1930 hrs.	(F) (G) (S) (X)	$72.00 $58.00 $44.00
VK8	(Northern Territory is part of the VK5 Division and relays broadcasts from VK5 as shown received on 14 or 28 MHz).						

Note: All times are local. All frequencies MHz.

Membership Grades
Full (F) Pension (G)
Needy (G) Student (S)
Non receipt of AR (X)

Three-year membership available to (F) (G) (X) grades at fee x 3 times.

Continued from page 55

into recess at the end of last month and could be re-activated in October. There are question marks whether it will be re-activated, judging by comments on the Usenet "rec.radio.shortwave" forum on Internet. This program was a successor to the "World Radio Club" and helped BBC World Service listeners to understand shortwave. It is hoped that it will continue after its hiatus and not go the way of "Swiss Merry-Go Round".

Well, that is all for April. Until next time, the very best of monitoring and 73.

**52 Connaught Crescent, West Launceston TAS 7250*
VK7RH@VK7BBS LTN.TAS.AUS.OC
Internet: robroy@tamarcom.com.au
fidonet: 3:670/301
ar

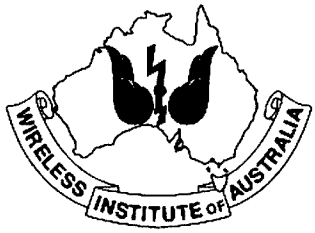
Exposure Draft

Submission
to the
38th Parliament
on
Amateur Radio Service Licensing

Towards a New Licensing System

February 1996

from the
Wireless **I**nstitute of **A**ustralia



National Society representing
Radio Amateurs - Founded 1910

PREAMBLE

This "Exposure Draft" is *not* the final submission. That will come later and is planned to include further argument and considerably more detail evidencing the value of amateur radio to the community. The purpose of publishing this draft is to stimulate further discussion within the amateur radio fraternity, and provide time for the Institute to advocate the objectives of the proposals and the refine the details and supporting material in response to feedback.

In the final event, the WIA will be dealing with the 38th Parliament on this issue, negotiating for the benefit of all Australian radio amateurs. In order to successfully pass through the committee systems of the Lower House and the Senate, we need to gain the interest and support, not only of the Government, but the Opposition and minority party members of Parliament.

Foreword

The Amateur Radio Service is a voluntary, non-commercial service made up of people with an interest in radio communications. Radio amateurs are individually licensed by the Spectrum Management Agency, under the Radiocommunications Act 1992.

Each radio amateur pays a licence fee determined by the Spectrum Management Agency. In late-1994, the SMA proposed to raise the fee more than 190%, from $36 at that time to $69, for the Unrestricted licence.

The Australian amateur radio fraternity raised a storm of protest with their Parliamentarians during early 1995, resulting in the Government announcing a new fee of $51 in March 1995.

The Wireless Institute of Australia was invited to put a submission proposing how the Australian Amateur Radio Service could be better licensed.

This *Exposure Draft* is the "first working" of that submission. It is being circulated to all candidates of the Government and Opposition parties standing for this 1996 election, together with candidates from other major parties. It is also being widely distributed among the amateur radio community in Australia. Once this Exposure Draft has been circulated and feedback received, a final submission will be drafted for consideration by the 38th Parliament.

This document has been researched and compiled by our organisation's Media Liaison Officer, Roger Harrison, call sign VK2ZRH, a communications engineer by training and a journalist by profession, and is the culmination of nearly 12 months of research and discussion within the Wireless Institute of Australia and the amateur radio community, with input being received from many radio amateurs around Australia.

On behalf of the Wireless Institute of Australia, I commend you read and digest the information and arguments presented for a better amateur radio licensing system, distilled from the thoughts and ideas of the radio amateurs of Australia.

Neil Penfold VK6NE
Federal President, Wireless Institute of Australia
25 February 1996

1.0 Radio Amateurs Protest Fees Rise

Radio amateurs are licensed by the Spectrum Management Agency (SMA) after passing a publicly conducted examination in electrical, electronics and radiocommunications theory and practice, and radiocommunications regulations, and for some licence grades, a practical test in sending and receiving Morse code. Upon receiving a pass mark of 70% or more in theory and regulations, and demonstrating the required competency in Morse code (where required), candidates apply to the SMA for an Amateur Operators Certificate of Proficiency and a licence. The SMA issues an **Apparatus Licence**, with the 'type' designated **Amateur**, and a call sign which is unique to the individual. This licence provides the holder with access to all allocated amateur radio bands designated in the relevant Technical Licence Specifications (TLS) issued by the SMA.

The Amateur licence is for people interested in any and every aspect of radio communications. It allows them to conduct experiments and all manner of other activities, and to learn for themselves about communications technology, using bands of frequencies spread throughout the radiofrequency spectrum.

There are some 18,000 licensed radio amateurs in Australia. This community of radio amateurs has a representative association called the **Wireless Institute of Australia**, (WIA) founded in 1910. It is the amateur radio community's "peak body" and actively represents radio amateurs' interests to the SMA, on Standards Australia's committees, the Radiocommunications Consultative Council, the International Radiocommunications Advisory Council, and other community bodies.

In 1994, the Amateur licence fee under the then existing Apparatus Licence fees schedule was $36.

In December 1993, the SMA commenced a public inquiry into the Apparatus Licence system, a system which had evolved over many decades. The SMA published a Discussion Paper, titled *Inquiry into the Apparatus Licence System*. This paper set out a proposed new framework of the Apparatus Licence system and a new method of determining licence fees. The SMA said:

> Apparatus licence fees provide a means of obtaining a monetary return from the private use of a community resource.
>
> The SMA is proposing a licence fee structure which does not depend upon licence categories but is in accordance with government policies. It involves:
> - charging for SMA services . . .
> - imposing a licence fee that has two components:
> - a charge to recover ongoing SMA spectrum management costs; and
> - a tax for access to a valuable community resource.

In December 1994, at a meeting between the SMA and the WIA, the SMA set out a proposed schedule of fees under the new Apparatus Licence fees schedule that was to be introduced in March 1995. The proposed fee for the majority of amateurs, holding an Unrestricted licence, was set at $69. This was made up of three components:

1/ $25 *Administrative Charge* to issue a licence/call sign, and to renew;

2/ $9 *Spectrum Maintenance* fee;

3/ $35 *Spectrum Access Tax*.

The SMA's new licence pricing policy was released to the amateur radio community, via the amateur radio digital packet radio network and WIA amateur band broadcasts in mid-December 1994. A circular explaining it was inserted in the WIA's journal *Amateur Radio* magazine for January 1996.

Opposition to the proposed fee structure began to be expressed among radio amateurs immediately. After monitoring radio amateurs' initial reactions, the WIA issued a press

release at the end of December 1994, to bring the issue to the attention of as many radio amateurs as possible, and to the Australian community. *The Age* newspaper ran a story on Tuesday, 3 January 1995, "Ham radio users attack fee." The national television networks carried news stories about the issue on the evening news programs the same day. Many metropolitan and regional newspapers subsequently ran stories on the issue.

In January 1995, the then Amateur licence fee rose from $36 to $37, and the proposed new licence fee to apply from March 1995, rose to $71.

Following suggestions arising from WIA members, the WIA encouraged radio amateurs to write to parliamentarians, expressing their opposition to the fee. Many, many amateurs from around Australia contacted their members of Parliament. The WIA also wrote to parliamentarians. Subsequently, the Amateur licence fees issue was debated in Federal Parliament in February, 1995.

The WIA had contact with the office of the Minister for Communications and the Arts, Michael Lee, in February 1995, with a view to negotiating on the issue. Subsequently, an appointment was made for WIA representatives Roger Harrison (Vice President, and Media Liaison Officer, call sign VK2ZRH) and David Wardlaw (ITU Conference and Study Group Coordinator, call sign VK3ADW) to meet the Minister's Parliamentary Secretary, Paul Elliott, on 6 March 1995. Amongst the information the WIA put to Paul Elliott was:

- the many ways the Amateur Radio Service was of value to the community, particularly the self-training aspect,
- the lack of information from the SMA until December 1994 on how Amateur licence fees would be affected by the price-based spectrum allocation system,
- the range of views expressed by the amateur radio fraternity since the December 1994 announcement of the proposed fee structure,
- the issue of amateur radio access to the spectrum,
- how WIA representatives had provided expert assistance on non-amateur matters on behalf of the Australian Government's delegations at international radio conferences (at WIA members' expense),
- and the WIA's objections that the Amateur Radio Service was unsuited to being included under the Apparatus Licence System, dating from the 1990-91 House of Representatives Standing Committee on Transport and Communications Infrastructure (HORSCOTCI) hearings on spectrum management.

On March 8, Paul Elliott announced to the Parliament that the proposed Amateur licence fee of $71 would instead be $51. In a press release dated 9 March 1995, Paul Elliott said:

> "After further consultation and in recognition of the valuable services provided by Amateurs to the community in maintaining communications links, and in training young people to be proficient in communications technology, the SMA has decided to reduce the tax component of Amateur fees to the minimum level.
>
> The new fee is based on the administration and maintenance services provided to Amateurs by the SMA, including the costs of issuing the licences, managing interference; issuing and registering call signs; arranging and accrediting examinations; and international coordination."

In the 6 March meeting between Paul Elliott and the WIA representatives, Paul Elliott asked the WIA to put a submission to the Government on how the Amateur Radio Service might be better licensed. This submission has been developed as a result of that invitation.

2.0 About Amateur Radio

Definition

Radio amateurs appeared with the advent of wireless technology in the late 19th century. With the proving of the usefulness of the technology came government regulation in developed nations of the time, and eventually international agreements on the regulation of the radiofrequency spectrum.

Out of the parallel burgeoning of telegraph and telephone technology and the development of international communications by these means, came the establishment of the International Telecommunications Union (ITU) which determines international regulatory issues by means of international treaty agreements.

The international Radio Regulations, developed at international conferences held under the auspices of the ITU, define the **Amateur Service** as follows:

> "A *radiocommunication service* for the purpose of self-training, intercommunication and technical investigations carried out by amateurs, that is, by duly authorized persons interested in radio technique solely with a personal aim and without pecuniary interest."
>
> [ITU Radio Regulations, S1.56]

With the advent of earth satellites in the late 1950s, it was but a few short years before a satellite designed and constructed by radio amateurs orbited the earth, launched in December 1961 and dubbed OSCAR, for Orbital Satellite Carrying Amateur Radio. Almost 40 amateur radio satellites have been launched in the intervening 30 years. This development in amateur radio was later recognised by the ITU and a definition for the **Amateur-Satellite Service** was subsequently incorporated in the international Radio Regulations.

> "A *radiocommunication service* using *space stations* on earth *satellites* for the same purpose as those of the *amateur service*."
>
> [ITU Radio Regulations, S1.57]

For the purposes of licensing Australian radio amateurs, the Spectrum Management Agency (SMA) defines the Amateur licence type as:

> "A station that:
> - is operated for the purposes of self training in, intercommunication and technical investigation into, radiocommunications by individuals who:
>   - do so solely with a personal aim; and
>   - do not have a pecuniary interest in doing so; and
> - is operated on amateur frequencies or frequency bands specified in the licence or in a technical licence specification referred to in the licence; and
> - may participate in the Amateur Satellite service."
>
> [*Inquiry Into the Apparatus Licence System - A New Outlook*, SMA, February 1995]

Radio amateurs pursue their interests in the true meaning of the Latin root of the word *amateur*, that is, for the *love* of it.

Radio Amateurs' Activities

There are three "foundation stones" to radio amateurs' activities, which are enshrined in the ITU definition of the Amateur

Service: *self-training*, *intercommunication* and *technical investigations*.

SELF-TRAINING. In order to obtain the Amateur Operators Certificate of Proficiency and gain a licence, prospective radio amateurs must sit for a publicly conducted examination, comprising modules of theory, regulations and/or Morse code operation, depending on the licence sub-type desired.The system is illustrated in Appendix LS1, *The Amateur Licensing System*.

The Australian amateur licensing system provides for seven licence sub-types, so there are multiple "entry points" to the licensing system to accommodate candidates' interests and level of knowledge.

The licence sub-types are as follows:

Unrestricted	Intermediate	Limited
Novice	Novice Limited	
Amateur Beacon	Amateur Repeater	

The last two sub-types are unattended stations operated by licensed individuals or special interest groups for the benefit of other radio amateurs. These licenses are not obtained by examination.

Candidates for the first five licence sub-types all sit for multiple choice theory and regulations papers, while candidates for the Unrestricted, Intermediate and Novice licences sit for additional practical sending and receiving tests in Morse code. The pass mark in the theory and regulations papers is 70%.

The syllabuses for these examinations is published by the SMA (*Information for Prospective Amateur Operators*, RIB70 Revised, August 1994). The syllabuses cover basic electrical and electronics theory and technology, radiocommunications principles and technology, interference and safety. A level of knowledge is required such that licensees can assemble and operate their stations with sufficient competence such that they can carry on their pursuits and technical experiments or investigations without being a danger to themselves or others, and without causing harmful interference to other spectrum users.

Right from the outset, even before a licence can be obtained, amateur radio necessarily involves self-training.

Having obtained a licence, radio amateurs will *learn for themselves*, in a practical way, about the techniques and technologies involved in radiocommunications. They have the comparative freedom and the flexibility to pursue an enormous range of radiocommunication techniques and technologies, ranging from: medium frequency transmission, propagation and reception, through high frequency (shortwave) transmission, propagation and reception, earth satellite communications techniques and digital communications technologies, television transmission and reception to microwave technologies and communications techniques, to name but a few among the vast scope of pursuits available.

People who have an interest in technology and gain an understanding of it through self-training are better equipped to adapt to and benefit from an increasingly technological world which is undergoing continuous and rapid change. This is particular so for young people. The Australian amateur radio community particularly encourages young people's interest in radiocommunications technology.

INTERCOMMUNICATION. The purpose of assembling and operating a radiocommunication station is to make contact with other people having a like interest. Radio amateurs use their radio frequency band allocations, which are spread throughout the spectrum from the medium frequencies (MF) through to the microwave extra high frequencies (EHF), to communicate with one another.

The intercommunication may be by means of the international Morse code, which operates as a "universal language" irrespective of the amateurs' country of origin, culture or language, by voice communication, by the exchange of digital text-data transmissions, or by the exchange of images.

The content of the intercommunication may be related to technical issues or it may be personal exchanges between the operators, similar in nature to having a conversation face-to-face with another person. That is, it is normal human interaction. When radio amateurs become involved in providing communications assistance during emergencies, the intercommunication comprises important messages related to the emergency event.

It is through all the varieties of intercommunication between amateur radio operators that radio amateurs learn the pertinent procedures necessary to establish radiocommunication contact in all the spheres available to them.

On the international scale, intercommunication between radio amateurs helps to break down not only barriers of distance, but barriers of understanding about culture and life among other communities around the world. Radio amateurs belong to an international fraternity bound together by their mutual interest in amateur radio activities.

Radio amateurs come from all walks of life, are found among the ordinary citizens of large cities and rural communities, in prominent businesses and scientific institutions, in schools and universities, in government authorities, in politics and among the world's royalty.

TECHNICAL INVESTIGATIONS. As outlined above, radio amateurs have the freedom and the flexibility to pursue an enormous range of radiocommunication techniques and technologies within the bounds of the regulations attached to the Radiocommunications Act and the Technical Licence Specifications issued by the SMA. This freedom to conduct technical investigations is fundamental to many of the contributions Australian radio amateurs have made to the Australian community and indeed, to the Australian economy.

In order to pursue technical investigations and self-training in as many spheres of radiocommunications as possible, the Amateur Service has access to small bands of frequencies spread throughout the radiofrequency spectrum, ranging from the medium frequencies (MF), through the high frequency (HF, or "shortwave") range, right through to the upper microwave extra high frequencies (EHF). A proportion are exclusive to the Amateur Radio Service, but radio amateurs share a considerable amount of spectrum on bands allocated to primary users from other services (e.g. defence, industrial equipment and broadcasting). On bands where radio amateurs are secondary users, they must avoid interference to and accept the possibility of interference from, the primary users. The availability of such a wide variety of frequency bands throughout the radiofrequency spectrum provides and encourages the flexibility and freedom for radio amateurs to undertake technical investigations of an enormous variety, unfettered by limitations on access to spectrum.

Radio amateurs have gained this access to spectrum through representations at many World Administrative Radio Conferences over the years, effectively recognising the intrinsic value of the Amateur Radio Service to the world community.

When someone is able to conduct a practical technical investigation for themselves, they gain a better understanding and a deeper knowledge of the subject than by any other means. When that is driven by a strong personal interest, as it is with amateur radio activities, then that understanding is immeasurably strengthened. This principle applies regardless of the technical level of the participant and the investigation.

Knowledge and understanding gained in this way can never be trivialised. Such people become an important community asset.

When it motivates young people to take up a tertiary course in engineering or science, and/or to enter a career in electronics or telecommunications technologies, then the nation is the richer for it.

The Wireless Institute of Australia

As outlined earlier, the amateur radio community in Australia has a representative association called the Wireless Institute of Australia (WIA), founded in 1910. It is acknowledged as being the first amateur radio society in the world.

The WIA is a federation of seven state and territory Divisions, each of which is an autonomous body. They are known as: WIA A.C.T. Division, WIA NSW Division, WIA Victorian Division, etc. The WIA is the Australian amateur radio community's peak body, and participates in a range of relevant community affairs, actively representing radio amateurs' interests to the SMA, on Standards Australia's committees, the Radiocommunications Consultative Council, the International Radiocommunications Advisory Council, and other community bodies.

The WIA is a member of the Region 3 Association of the International Amateur Radio Union (IARU), a representative body recognised by the ITU. The IARU is an active participant in ITU radiocommunications affairs.

The WIA has participated in the Australian Preparatory Groups for the ITU-organised World Administrative Radio Conferences, held at intervals over the decades up to 1992. The WIA has also provided members for the Australian delegations to these conferences. Now that World Radio Conferences are held at two-year intervals, the WIA is continuously involved, with a representative, Dr David Wardlaw (call sign VK3ADW), participating in the relevant groups. Dr Wardlaw was a member of the Australian delegation to the World Radio Conference, WRC-95, held in Geneva during October-November last year.

Over the years, the WIA has had regular liaison with the regulatory authorities, including the Post Master General's department (PMG), the Post & Telecommunications department (P&T), the Department of Transport and Communications (DoTAC) and now maintains regular liaison with the Spectrum Management Agency (SMA).

The WIA has taken an active interest in the processes which led to reform of the Radiocommunications Act 1983, leading to the introduction of the new Act in 1992. When the House of Representatives Standing Committee on Transport, Communications and Infrastructure (HORSCOTCI) held its *Inquiry Into Management of the Radio Frequency Spectrum* in 1990, the WIA made a submission to the committee in September that year. In 1991, when HORSCOTCI issued its *Discussion Paper on Issues and Options in Radio Frequency Spectrum Management*, the WIA again made a submission to the committee, in July that year.

Following the establishment of the SMA in 1993, they held a public *Inquiry Into the Apparatus Licence System*, from December 1993 through February 1995. The WIA, some WIA Divisions, and many individual radio amateurs made submissions to this SMA inquiry. Similarly, when the SMA issued its February 1995 Discussion Paper, *Implementing Spectrum Licensing*, the WIA, some WIA Divisions, many individual radio amateurs and amateur radio interest groups made submissions.

An off-shoot affiliate of the WIA is the Wireless Institute Civil Emergency Network (WICEN), with operating organisations in each state and territory of Australia. WICEN serves to prepare radio amateurs for service to the community in an emergency. Radio amateurs use their own equipment and expertise, without reward, to provide the authorities with an invaluable communications resource that is not otherwise immediately available in a community emergency.

With the ability to use a wide range of frequency bands across the radiofrequency spectrum and portable equipment suited to this type of operation, the flexibility afforded is not usually available to other services when communications problems occur. The WICEN organisations around Australia have formal links with the various emergency services and authorities.

The Senate Standing Committee on Industry, Science, Technology, Transport, Communications and Infrastructure, has recognised the importance of volunteer assistance during emergencies:

> "Volunteer organisations provide a focus for community-minded individuals, ensuring that a large amount of work is carried out in an effective way, and a wide range of voluntary organisations become involved in emergency situations. Some specialise in response and immediate first aid, such as St John Ambulance Australia and the Red Cross . . . and others specialise in the provision of emergency communications, such as . . . WICEN."
>
> [*Disaster Management*, published by the Senate Standing Committee on Industry, Science, Technology, Transport, Communications and Infrastructure, June 1994]

Additionally, the Senate Committee gave particular recognition to WICEN:

> "WICEN is a volunteer group of radio amateurs with communications and information transfer skills and equipment. The organisation can be called upon by response and recovery agencies and the general community in times of emergency. WICEN's major role is the coordination of the response of the general amateur radio service in times of need.
>
> Inspector Mackey of the Victoria Police acknowledged that WICEN performs a major role in the provision of back-up communication in the event of disasters in that state:
>
> WICEN is our main back-up for communications within this State. If we are to lose telecommunications, our normal radio frequencies become overloaded. WICEN basically becomes our one and only back-up frequency until we perhaps get assistance from Defence, but still they would stay as our number one back-up."
>
> [*Disaster Management*, published by the Senate Standing Committee on Industry, Science, Technology, Transport, Communications and Infrastructure, June 1994]

The Senate Committee went on to recommend that WICEN be included in the National Communications Advisory Group in reviewing emergency communications throughout Australia.

> "The Committee recommends that the National Emergency Management Committee request the National Communications Advisory Group to review emergency communications throughout Australia with a view to finding ways of achieving standardisation and compatibility among and between state emergency services. The Committee further recommends that a representative of WICEN be included in the Group."
>
> [*Disaster Management*, published by the Senate Standing Committee on Industry, Science, Technology, Transport, Communications and Infrastructure, June 1994]

The WIA, as the peak body of the amateur radio fraternity in Australia, is an active participant in, and contributor to, community affairs which affect radio amateurs and where the Amateur Radio Service can be of value to the community.

3.0 The Value of the Amateur Radio Service to the Community

"The Amateur Service world-wide, uses or experiments with, virtually every aspect ot the art of radio communication, from the very simple to the most sophisticated.

It is the urge of the amateur to experiment and to communicate that is expressed in many countries in different ways. The self-education of individuals or the establishment of classes to be attended by those who wish to qualify as radio amateurs provides a basic education for many who would not otherwise acquire that knowledge.

Whether it is the construction of a simple telegraphy transmitter for the novice, or a satellite earth station for the advanced amateur, both are learning. The amateur is restricted by regulation in the matters that may be the subject of his communication. His common interest with all other amateurs in the world is his interest in the radio art, and by that intercommunication knowledge is exchanged and expanded.

The knowledge and the experience of communications, and the existence of the equipment that the amateur uses, provide a valuable resource that in many countries cannot be found in any other service.

The most important features of the Amateur Service are:

(1) it makes unique provision for advancing an individual's skills in both the technical and operating phases of the art, thus helping to provide a reservoir of trained operators, technicians and electronics experts. It also provides an avenue for further investigation for those already involved in this field;

(2) it has a unique ability to enhance international goodwill;

(3) it is a voluntary, non-commercial service.

The interests of radio amateurs are as diverse as the number of countries and regions in which they are located.

The basic desire to study radio communications techniques with the opportunity for practical applications leads to:

(1) the acquisition of experience and skill in communications techniques and operating;

(2) contact and interchange of information with others having similar interests;

(3) furtherance of the unique ability of the radio amateur to promote international goodwill;

(4) contribution to scientific research by participation in programs organised on a national or international basis, and

(5) participation in communications systems including emergency communications by both training and assistance when required.

Reference has been made to the urge to conquer the ether and communicate. The Amateur Service provides a trained, regulated and disciplined outlet for that desire. Otherwise that urge, and the desire to experiment with communications might find its outlet in undisciplined, illegal and perhaps potentially dangerous transmissions.

An important aspect of the Amateur Service is that, because the amateur must be qualified and then licensed by his administration, he is known and recognised. The amateur zealously guards his spectrum allocations and rejects the improper use of the frequencies allocated for his use. Such improper use cannot go unnoticed, nor can unauthorised users hope to remain undetected. It would be a foolish act to operate a clandestine transmitter in an amateur service allocation.

Many administrations rely heavily on the fact that the Amateur Service is a safeguard against unauthorised use of radio communications."

The above text is the preamble from a paper entitled *The Amateur and Amateur Satellite Service - A Microcosm of Radio Communications*, presented at the Australian "Communications '92 Conference", by Dr David Wardlaw (call sign VK3ADW). It is an effective, succinct summary of the Amateur Radio Service's reason-for-being, its place within, and broad impact on the community.

Apart from the broad aspects introduced above, there are a number of specific areas where the Amateur Radio Service is of demonstrable value to the community, many of which could be said to *return* value to the community. Under the following headings are presented summaries and pertinent examples of this thesis. It is by no means exhaustive, because the information is voluminous indeed. But the information presented, while showing "the tip of the iceberg", should demonstrate the breadth, depth and variety of ways in which the Amateur Radio Service is of value to the community.

Education and Self-training

Apart from the WIA state and territory Division organisations, there are some 150 local community amateur radio clubs and groups around Australia. Membership in these radio clubs ranges from 10-20, up to more than 400-500. Some 100 of these clubs conduct amateur licence classes for prospective radio amateurs.

The Wireless Institute of Australia (WIA), has conducted a nationwide amateur examination service on behalf of the Spectrum Management Agency (SMA), operating under a Memorandum of Agreement, since 1992 when the SMA devolved the examination routine to the WIA. This service is formally known as the **WIA Exam Service.** Invigilators accredited by the WIA Exam Service supervise candidates sitting for amateur licence examinations. The WIA Exam Service provides examination papers and Morse code materials for invigilators. The WIA has drafted examination syllabuses and questions banks and negotiated approval with the SMA. So, all the routine aspects of administering the amateur exam system are conducted by the WIA. There are some 500 accredited invigilators.

During 1995, a total of 450 examination events were held around Australia. Each year, between 300 and 400 new radio amateurs are licensed.

A number of Australian radio amateurs who are school teachers by profession have incorporated amateur radio activities as part of their school's curriculum, with beneficial results.

"In any class there are students who do not cope well outside their own small group of friends. There are the loner types who do not like team sports and who often lack confidence, although they have the capacity, they are low achievers in school.

It has been clearly shown through a number of school programs that when this kind of child participates in the hobby of amateur radio he/she gains confidence and personal esteem. This translates into higher achievement with other school work.

The sense of achievement in contacting and talking to someone in a foreign country can be a catalyst for a turn-around in their classroom performance.

This practical kind of experience often motivates children who can easily be turned off the study of physics and electronics by a dry textbook approach. For instance, the basics of electricity and magnetism can be picked up more quickly and with enthusiasm.

Studying for an passing the exams to qualify for their own amateur licence has at times resulted in students progressing with their school work beyond their teacher's expectations."

[*Amateur Radio Benefits School Children*, Jim Linton VK3PC, Electronics Today International, Oct. 1989]

- a list of eight school teacher/radio amateurs who'd involved amateur radio in their schools, and were willing to provide teachers' assistance, was included at the end of this article, one from each state and the A.C.T. (two from Victoria).

Victorian school teacher and radio amateur, **Maggie Iaquinto** (call sign **VK3CFI**), regularly uses amateur radio to demonstrate space science to her physics students.

"Science students at three Victorian schools were over the moon last week after interviewing crew members on board the orbiting Russian MIR space station.

'The students were astounded by being able to chat with space travelling scientists,' said their schoolteacher and amateur radio enthusiast, Maggie Iaquinto, who organised the hook-ups.

The Year 12 students put a series of physics questions to Flight Commander Anatolij Solovyov, 43, and Flight Engineer Sergej Avdeev, 35, on board the space station.

Mrs Iaquinto said the value of the hook-up in education and personal terms was enormous.

'It gives them the rare opportunity not only to do research, gather data and analyse it, but also to obtain it direct from a primary source,' she said."

[*Students over the moon after chat to spacemen*, The Australian, 31 August 1992]

Similarly, more than 10 schools across Australia have had contact with the US Space Shuttle during the last five years, arranged and conducted via amateur radio. Some 2000-3000 students have been involved nationwide.

Some 100 secondary schools have used satellite telemetry provided by radio amateurs in the study of physics and related subjects at school. **Radio amateurs who assisted include:** Graham Ratcliff, call sign VK5AGR, Peter Ormerod VK3CPO, Joe Ellis VK4AGL, Maggie Iaquinto VK3CFI, Barry Abley VK3YBX, John Mahoney VK4JON, and Bill Magnusson VK3JT.

A Western Australian radio amateur and teacher of electronics, **Ralph Bradstreet**, call sign **VK6KRB**, was appointed a Member of the Order of Australia for his contribution to the community, which stemmed from his amateur radio activities.

"Lt Col Ralph Bradstreet AM RFD became interested in amateur radio during his teenage years and joined the CMF and became a radio operator. After completing a commissioning course he was appointed as an officer in The Royal Australian Signal Corps.

His knowledge of radio matters enabled him to make considerable contribution to both the Signal Corps and the Army.

As a Major he commanded two reserve units and was appointed a Member of the Order of Australia in 1988 and invested by Her Majesty The Queen.

Lt Col Bradstreet has trained hundreds of young men and women soldiers in radio communication skills over the past thirty years. In his civilian career he teaches electronics.

An interest in Amateur Radio not only influenced Lt Col Bradstreet's career but as an active amateur radio operator it continues to provide skills which enhance his military and civil occupations."

Perth radio amateurs have provided training and assistance to the Paraplegic and Quadriplegic Centre at Shenton Park, Western Australia. **John Morgan**, call sign **VK6NT**, conducted an amateur radio training course for the Para-Quad Centre residents in 1995. One of the residents to successfully gain his licence was 'Shane', who now proudly uses the call sign VK6HAM, signifying he has obtained one of the new Novice Limited licences, introduced in 1995 and designed to encourage young people into amateur radio.

The Centre has an active amateur radio club, call sign VK6QC, established with the assistance of Diane Cousins VK6BC, Glenn Cousins VK6AUZ, Ray Spargo VK6RR, Bob Philips VK6THB and Rob Lamb VK6VP.

In the early 1960s, a scheme to involve young people in amateur radio was advocated by a NSW radio amateur and school teacher, **Rex Black VK2YA**. The Youth Radio Scheme (YRS) was adopted as WIA policy in 1962. An entirely volunteer-run scheme, it trained thousands of young people in the following decade and was a major force behind the introduction of the Novice Amateur licence in the mid-1970s.

"Founded by Rex Black VK2YA, it aimed to encourage young people to become radio amateurs by providing practical instruction in radio and electronics at clubs attached to schools and youth groups; some of these had been operating in the 1930s, but the YRS triggered a renewed interest. By 1967, 48 clubs and groups were operating in NSW alone, and the Scheme had spread to all states.

"The YRS was based on a series of syllabuses, examinations and constructional projects. Those who satisfied the requirements were awarded certificates, several grades of which were available. The standards of the YRS were high. The level demanded of those who achieved the Advanced YRS certificate was more rigorous than the standard of current AOCP theory examinations. The first two levels of certification are still in use by schools today in some states."

[*Novice Notes*, Peter Parker VK1PK, Amateur Radio, journal of the WIA, February 1996]

When community amateur radio clubs and groups burgeoned rapidly during the early 1970s, these clubs began to gradually take on the role established by the YRS. The core of the Youth Radio Scheme depended on the syllabuses and published teaching and self-study materials. Over the late 1970s a group of volunteer radio amateurs and teachers produced a coordinated set of publications for self-study at low cost. **This work was carried out by Rex Black, Ken Hargreaves, Ian Hook, Derek Lark, Geoff Pages, Br Cyril Quinlan, Athol Tilley, Tom Scott, Kurt Welzel and Dave Wilson,** among others, all radio amateurs.

The publications produced at that time are now produced and distributed by the WIA NSW Education Service, and are regularly updated. It is run by two radio amateur volunteers, **Ian Hook and Kurt Welzel.**

"The Service has been responsible for the education of a whole generation of radio amateurs. The material produced was popular, not only amongst aspiring amateurs. It has found ready acceptance amongst high schools, Scouts, the Armed Services, technical colleges, PMG/Telecom as well as private training colleges. Electronics became an accredited examinable subject in NSW high schools due to the influence of the WIA Education Service. The Service ran some 20 holiday camps for students with an interest in electronics. These were very popular, with 40-50 children normally attending."

[*Novice Notes*, Peter Parker VK1PK, Amateur Radio, journal of the WIA, February 1996]

From the early 1980s, the **Gladesville Amateur Radio Club** in Sydney has provided video tape self-study courses, comprising a series of structured lectures presented in an entertaining and absorbing way. They supply them by mail order and many hundreds of radio amateurs have gained their licence through this service. This club has a well-equipped television studio and provides regular thrice-weekly transmissions of lectures and other material.

The way in which amateur radio clubs have taken on the education and self-training role is exemplified by the **Westlakes Amateur Radio Club**, located at Teralba near Newcastle in NSW. The club owns a spacious, well-equipped building with a class room and technical library. It conducts regular amateur radio licence classes and opens on weekday evenings and weekends to welcome enthusiasts, and they particularly encourage young people. Westlakes ARC has one of the largest club memberships in Australia.

Motivating Young People to Take Up Scientific or Technological Careers

An interest in amateur radio has served as a catalyst and motivation for thousands of young people over the years to enter scientific or technological careers. It is these careers which go towards making Australia a "clever country", acknowledged widely by academic, business, community and political leaders as an essential component for Australia's future growth and prosperity.

"Our future will, to some extent, be dependent on our ability to not only generate and master new ideas, but also to turn these ideas into national wealth.

In other words, our future will be dependent upon our ability to innovate - to combine the notion of newness with the notion of creating commercial value.

To sustain economic growth, rising living standards and continual jobs growth we will need to ensure that Australia is technologically literate and information rich.

We will need to ensure that Australians are employed in interesting, well paid jobs that add value to our economy.

I understand that Electronics has now passed Automotive as the world's largest sector.

And by the 2000, electronic components will make up 25 per cent of all manufactured products.

Looking specifically at the telecommunications industry, local equipment suppliers compete for over $3 billion worth of sales.

Telecommunications exports are now over $1 billion per annum and growing . . . activity in the telecommunications industry indicates that sales are expected to rise by over 26 per cent, new investment in capital in the industry will rise by 22 per cent, employment by just over 10 per cent and exports by a remarkable 38 per cent.

This Government has recognised that a key part of a viable, innovative telecommunications infrastructure is the capacity to design and build state of the art equipment."

[Extracts from an Address by *Senator Peter Cook, Minister for Industry, Science and Technology*, at a seminar sponsored by the Australian Electrical and Electronics Manufacturers Association and the Australian Telecommunications Industry Association, Sydney, 12 February 1996]

An exhaustive list of radio amateurs who found motivation to enter a scientific or technological career stemming from their interest in amateur radio is too voluminous to reproduce here. Following are just a few pertinent examples which serve to demonstrate the thesis that amateur radio is not only of value to the community, but returns value to the community.

One of the recipients of the 1995 Australia Prize, our country's top science award, was Dr Ken McCracken VK2CAX. The Australia Prize is awarded to researchers who have made outstanding contributions to science and technology promoting human welfare. Gaining his amateur licence as a student, Dr McCracken went on to become the founding chief of the CSIRO's Division of Mineral Physics and the founder of the CSIRO's Office of Space Science Applications (COSSA). Dr McCracken shared the $300,000 prize with Dr Andrew Green and Dr Jonathan Huntington of the CSIRO Division of Exploration and Mining, and Dr Richard Moore Emeritus Professor of Electrical and Computer Engineering at the University of Kansas, USA. In awarding the prize, Senator Peter Cook said Dr McCracken, Dr Green and Dr Huntington were an outstanding research team which had pioneered satellite-based remote sensing in Australia.

John Morgan BSc DipEd VK6NT is director of his own research and development company, J R Morgan and Associates Pty Ltd, of Perth. He and his company have been involved in designing computer control technology into airconditioning systems, manufactured in Perth by Cool Breeze Manufacturing and exported to South Africa and other countries. John Morgan has invented numerous innovative techniques and processes which made the products concerned superior to their competitors.

Grant Willis VK5ZWI, of Adelaide, began his interest in electronics through amateur television experiments, gaining his amateur radio licence aged 13. This interest continued through high school and tertiary education, leading to a Batchelor of Electronic and Electrical Engineering degree. He now works as a Radio System Engineer in the communications industry.

Dick Smith VK2DIK of Sydney. An interest in electronics as a youngster led to an amateur licence in his teens. He later opened a car radio service store and then a store in Atcheson St, St Leonards, selling electronic components and products. This he built into a vigorous, multi-million dollar chain of stores which, since the early 1980s, has been owned and operated by Woolworths. Dick Smith went on to head the *Civil Aviation Authority* and started the highly successful *Australian Geographic* magazine, recently sold to Fairfax. He is a noted adventurer, having circumnavigated the globe in his helicopter (now in the Power House Museum in Sydney) and flown across the Australian continent in a balloon (communications backup was amateur radio).

Mrs Florence (Violet) MacKenzie VK2GA/2FV of Sydney, was the first woman in Australia to take out an experimental wireless licence, in 1921, and to pass the amateur licence examination in 1925. She became an electrician by trade, and was the first woman in Australia to hold a Diploma in Electrical Engineering. At the outbreak of World War 2, she foresaw the importance communications would play and set up a school in Clarence St, Sydney, to teach men and women the Morse code, training thousands during that time. She was subsequently responsible for the foundation of the WRANS and was awarded an OBE for her service to Australia. There is a commemorative stained glass window to her in the RAN Chapel at Garden Island.

Literally, thousands of like examples can be quoted. It has been the same since amateur radio's "birth" at the turn of the century, and has continued through to the present era.

During 1995, attention was drawn by the media to an alarming decline of interest in science among school students. This attention resulted from a study published in January 1995 by Woolcott Research. The Woolcott Report highlighted not only this decline of interest in science among students, but also painted a gloomy picture about ignorance among middle managers about how to initiate and organise science and technology research projects. Public spending on scientific research in Australia is around the $1 billion level, but spending in the private sector is well behind. Out of 24 OECD and Asian nations, Australia ranks 18th for investment in research and development. In January 1995, the Editor of *The Australian* warned:

"There has to be a change in attitude inculcated at an early age so that science is seen as being as attractive as the law or medicine, subjects which many of our most capable

students favour because of the greater financial rewards. Bringing about this change will be an immense challenge for educators. It is something that needs to be woven into the fabric of the education system before any results will become apparent. It is also becoming an imperative for business."

From the foregoing evidence, the Amateur Radio Service in Australia has had a role to play in motivating young people to take up an interest in science and technology and continues to contribute to the community in this area, well recognised now as being important to Australia's future.

Contribution to the Advancement of Scientific Knowledge

In many ways over the decades, some small and some significant, Australian radio amateurs have contributed to the advancement of scientific knowledge. While many instances could be cited, presented here are a couple which exemplify this contribution by Australian radio amateurs.

During the mid-1960s, the Defence Science Research establishment in South Australia instituted a research project into anomalous high frequency (HF) and very high frequency (VHF) radio propagation across the equator (transequatorial propagation) between Japan and Australia. It was US and Australian amateurs who discovered and exploited this type of radio propagation just after World War 2. Many radio amateurs from around Australia contributed propagation reports to the project, following a public request from the project director. A number of research papers were published as a result and the amateur radio community's help acknowledged.

On 23 January 1970, the fifth amateur radio satellite, OSCAR 5, was launched. This satellite, weighing 17.7 kg, was of considerable significance to Australia as it was entirely designed and constructed by a small group of radio amateurs at the University of Melbourne. The electronics aboard this satellite included two telemetry transmitters, an encoder and a telecommand system, enabling it to be controlled by amateur radio stations sending commands from the ground. One of the on-board experiments measured the satellite's temperature, to get a measure of the changes experienced during its orbit, the data being sent to ground stations via telemetry through an on-board amateur band transmitter. Significantly, this experiment revealed that the engineering formula previously used by space engineers to predict an orbiting satellite's temperature was in error.

Another transequatorial radio propagation research project was conducted in the early 1970s by the Ionospheric Prediction Service (IPS), then a Division of the Bureau of Meteorology (now IPS Radio and Space Services, a division of DAS). Following a public call for assistance with radio propagation reports from the amateur radio community, many radio amateurs provided information and the IPS subsequently published a research report, which has been cited in later research papers. The radio amateurs who contributed were acknowledged by the IPS.

Contribution to the Development of Technology

As a result of an interest in amateur radio, many Australian radio amateurs have made recognisable contributions to the development of electronics and radiocommunications technology.

It should be recognised, at this point, that radio amateurs were the first community broadcasters, realising and exploiting the demand during the 1920s and 1930s, for entertainment which could be broadcast into the home. Point to point radio communications wasn't the only interest among radio amateurs of the era. These early amateur radio broadcaster paved the way for Australia's vigorous broadcast industry and the local manufacturing which fed the demand (in which many early radio amateurs were also prominent).

■ One of Australia's first radio amateurs, Henry Sutton, licensed by the Commonwealth circa 1900, was a prolific inventor. Apparently a quick learner, he read science and engineering texts as a teenager and experimented with flying machines and an electric dynamo and motor. Apart from being credited with building a portable radio transceiver in 1900, he published in 1885 a method for transmitting pictures over a distance by wire, called the "Telephane" - a precursor to television. Sutton was also credited with having built Australia's first motor car.

■ A Melbourne radio amateur, the late Alan H Reid VK3AHR, took a degree in electrical engineering following an interest in amateur radio as a young man. He later devised a design for an instrument to detect the location of faults in overhead electricity transmission lines, saving electricity authorities a great deal of money in having repair teams patrol hundreds of kilometres of overhead lines to investigate faults. Called Fault Locator for Overhead Systems (affectionately referred to as "flossies"), its success rested on an electronic circuit which Alan Reid designed and patented. He manufactured the FLOSs in his Melbourne factory through the 1950s and 60s, and exported them all over the world, particularly to the USA, South Africa and the Middle East. Today, his business would be referred to as one of Australia's high-tech, "born global" small-medium enterprises, seen as heroes of our manufacturing industry.

■ The group of Victorian radio amateurs and Melbourne University students who designed and constructed the OSCAR 5 satellite mentioned earlier, made a significant contribution to the technology of low earth orbiting (LEO) satellites which are now coming into prominence in global telecommunications. They devised a simple satellite stabilisation scheme involving on-board permanent magnets which reacted with the earth's magnetic field to stabilise and orient the satellite during orbit.

■ The renowned Australian pedal wireless was invented by a radio amateur, Alf Traeger VK5AX. The pedal wireless became the backbone of John Flynn's Royal Flying Doctor Service, another Australian icon. Starting in amateur radio as a young man, Alf Traeger became an electrical engineer. George Towns and Harry Kauper attempted to build an experimental radio transceiver for John Flynn, meeting with limited success. Kauper introduced Flynn to Traeger in 1926 who set up successful experiments, the work undoubtedly being based on his amateur radio experience. His ingenuity led to the pedal generator to power the sets, which he improved and began manufacturing in late 1928. Further improvements followed and an outback radio network grew up with remote homestead stations around Australia. Out of this grew the "School of the Air" for children in isolated regions. Traeger's company became a well-known and respected name in the Australian communications manufacturing industry.

■ In the 1930s in NSW, a young man combined his trade in the fledgling photographic industry with his interest in electronics and amateur radio to develop a product which has become a cornerstone of the Australian racing industry. That young man was the late Reg Brook VK2AI, who devised the "photo finish" camera. A firm now operated by his son, still installs and services photo-finish cameras to this day.

■ Australia's first television broadcasts were made in Brisbane by Thomas M B Elliott VK4CM. Conducting experiments from 1927 until 1935, Elliott began regular daily broadcasts on 8 October 1935. The system employed a

mechanical scanning unit similar to that developed by TV pioneer John Logie Baird. The technology provided comparatively low definition pictures with an image rate of 12.5 pictures per second (half the rate of modern TV). The broadcasts were on a long range amateur band, and pictures were received in Melbourne, 1500 km away. A plaque on the Old Windmill Tower at Wickham Terrace in Brisbane, commemorates Elliott's achievements.

Providing Communications During Emergencies and Supporting Community Events

Post-WW2, the radio amateur fraternity has amassed a remarkable record of community assistance during disasters. Ranging from the mid-1950s floods in NSW, for example, through the devastating 1965 Victorian bushfires, to the Darwin Cyclone Tracy tragedy in 1974, the 1989 Newcastle Earthquake, Victorian floods in 1993 and NSW bushfires in 1994. These are but a few distinct examples among dozens of others all round the country, over the past 50 years. It should be noted, however, that the record extends back to the 1920s.

The United Nations has given formal recognition of the role and value amateur radio can have in emergency communications. In 1995, the Working Group on Emergency Telecommunications (WGET) of the UN Department of Humanitarian Affairs, in drafting recommendations for overcoming barriers to improving disaster communications, proposed one of the ways to overcome such barriers is to:

> ". . . encourage the development of the amateur radio services and their application to disaster communications."

Considering war as a community emergency, it is notable that more than 2000 radio amateurs served in the defence forces in World War 2, many entering signals and radar units during their service.

■ Official recognition of community assistance has often been generous in its praise. The then WIA NSW Division president, the late Jim Corbin then-VK2YC, received an MBE for his part in organising radio amateurs' communications support during the **1950s floods**, although he always said it rightfully belonged to the WIA.

■ Radio amateurs' role in the 1975 **Cyclone Tracy** disaster at Darwin was praised in 1992 by the then Federal Minister for Communications, Mr Bedall, in a speech given on his behalf by MP Warren Snowden, broadcast nation-wide from Darwin in October that year. He said:

> "The work carried out by Amateurs when Darwin was ravaged by a cyclone on Christmas Day in 1974 was outstanding.
>
> There was virtually a loss of total communications with the outside world. When telecommunications links were cut, nothing was heard from Darwin for a number of hours until the lone voice of a Darwin amateur made contact with other amateur operators.
>
> The call was the first in a series of communications established by amateur operators throughout Australia and it wasn't long before a network of amateur stations was established (who) relayed traffic of a health and welfare nature while the rest of the country tried to re-establish communications and provide relief to the people of Darwin."

■ Following the "Ash **Wednesday**" bushfires which ripped through many communities in Victoria early in 1983, the then Federal Minister for Communications, Neil Brown, praised the work of WICEN and amateur radio operators:

> "Amateur radio operators had shown complete dedication to the best interests of the community in providing an emergency communications network in the fight against the Victorian bushfires.
>
> The operators gave generously of their expertise and without thought to the cost to themselves."

In that event, 160 members of WICEN swung into action with Victoria's SES using their own radio equipment and vehicles, and 150 extra members were on standby.

The Minister, Mr Brown, said the Red Cross and St John's Ambulance had relied on the radio amateurs of WICEN for their communications.

■ Ten years later, the Victoria Police were fulsome in their praise of assistance from radio amateurs during the 1993 **floods**. Acting Chief Commissioner, Robert Falconer, said:

> "The effort by WICEN volunteers and the fact that they are volunteers who provide their own time and resources, is to be highly commended as in such circumstances it would have been extremely difficult to complete the registration of evacuees by any other method."

■ During the ferocious **1994 bushfires in many regions of** NSW, hundreds of radio amateurs played critical roles in providing key communications links, particularly on the Central Coast, the Blue Mountains and around the northern suburbs of Sydney.

■ The state WICEN organisations provide communications support for community events around Australia. This provides valuable regular "exercise" in communication skills as well as experience with portable equipment.

- in NSW, some 30-plus events are supported each year, including cave rescue exercises, horse enduros, canoeing events, bicycle rides etc.
- in Victoria, WICEN supported three major community events in 1995, involving more than 50 members.
- in Western Australia, WICEN supported 13 events in 1995, involving 60 members who travelled a total 6088 km, contributing 6696 man-hours.

■ A popular, and well supported community event involving amateur radio is the annual world **Jamboree of the Air** (JOTA) for Scouts and Guides. Held over a weekend on October each year for almost 40 years now, more than 100 countries now participate, representing 98% of members of the World Organisation of Scout Movements.

In recent years, the number of Scouts and Guides participating around the world has reached 500,000, involving more than 33,000 radio amateurs.

In Australia, in recent years the number of radio amateurs participating is around 1400, operating nearly 700 individual stations. Some 16,000 Scouts and 8000 Guides, with about 2500 Scout Leaders and 1400 Guide Leaders participating. Scout and Guide participation has been increasing at the healthy rate of 9% in recent years. These young people are introduced to modern radio communications and the excitement of international amateur radio.

JOTA acts as a spark for many to attempt the various Scout and Guide technical badges in electricity and electronics, and some of these young people go on to get their amateur radio licence.

4.0 Radiocommunications Licensing Systems under the Radiocommunications Act 1992

The Radio Communications Act 1992 creates three licence systems for the purpose of managing access to, and the use of, the radiofrequency spectrum.

These are:

Apparatus Licensing,
Class Licensing, and
Spectrum Licensing.

Apparatus Licensing

This was the predominant form of radiocommunications licensing before the enactment of the Radiocommunications Act 1992. Previously, there were 94 transmitter and 10 receiver licence categories. Following the SMA's 1993-95 review of Apparatus Licensing, there are now 16 transmitter licence types and three receiver licence types.

Transmitter Types	Receiver Types
Aeronautical	Major Coast Receive
Aircraft	Earth Receive
Amateur	Fixed receive
Broadcasting	
Defence	
Earth	
Fixed	
Land Mobile	
Maritime Coast	
Maritime Ship	
Multipoint Distribution Station (MDS)	
Outpost	
Public Telecommunications Service	
Radiodetermination	
Scientific	
Space	

A clear definition of an Apparatus Licence is hard to come by. The Act, Part 3.3, Division 1 - Types of apparatus licences, says:

> (2) A transmitter licence authorises:
> (a) the person specified in the licence as the licensee; and
> (b) subject to Division 4, any person authorised by that person under section 114; to operate specified radiocommunications transmitters, or radiocommunications transmitters of a specified kind.

Section 114 concerns authorisation of third party users to operate the equipment in the licensee's absence. In the case of radio amateurs, this is not permitted except to other licensed amateurs. The Act also provides for transfers of licences between parties, so that equipment may continue to be used under the licence when ownership passes from one party to another, for example.

The SMA explains the role and purpose of Apparatus Licensing as follows:

> "Apparatus Licensing . . . authorises the operation of radiocommunications equipment for a particular frequency, geographic location and use."
>
> [*Implementing Spectrum Licensing*, SMA Discussion Paper, February 1995]

From the list of Apparatus Licence types, it is clear that this licence system is principally suited to private sector and public sector business operations, as it focuses on equipment and its uses in terms of radiofrequency spectrum locations and geographic locations. It is widely used by commercial, military, academic and government services.

The radiofrequency spectrum is divided, by international and national agreement, into bands allocated for given uses. For Australia, this is set out in the Australian Radiofrequency Spectrum Plan (published by the SMA), based on general spectrum usage allocations determined by the International Telecommunications Union (ITU) for this region of the world (ITU Region 3). The specific use of these allocations for Australian radiocommunications services is determined by the SMA.

The Apparatus Licence fee framework instituted in 1995 reflects the above precepts. This framework was instituted following a public inquiry process conducted by the SMA over 1993-95. The radio amateurs' representative association, the Wireless Institute of Australia (WIA), some WIA state Divisions, and individual radio amateurs made submissions to the SMA during this inquiry. The SMA explains the new Apparatus Licence fee framework as follows:

> "The objectives in reforming apparatus licence fees were to provide for an efficient, equitable and transparent system of charging for the use of spectrum and SMA services. This is to be effected by a new pricing framework based on three components:
> i. a spectrum access tax, based on the location and amount of spectrum access;
> ii. a spectrum maintenance component; and
> iii. an administrative component.
> The spectrum access tax is a fee which generally applies to each access to the radiofrequency spectrum, a community resource. The tax is derived from a formula that takes account of the licensee's spectrum access, in terms of four parameters:
> i. spectrum location;
> ii. geographic location;
> iii. channel bandwidth; and
> iv. area of coverage.
> The tax varies according to these parameters: as the demand for the location (geographic and spectrum) increases, the tax increases; and as the amount of spectrum access increases, the tax increases."
>
> [RB 68A, *Apparatus Licence Fee Schedule*, SMA June 1995]

The Spectrum Access tax is calculated according to a formula which incorporates these five components. In economic terms, this formula values 'scarcity' and 'demand', and acts as "a rationing device". It is thus based on fundamental commercial concepts. In introducing the formula, the SMA said:

> "The concept of using spectrum access as the basis for licence fees exists, to some extent, in the current fee schedule and is applied in a number of other countries.
>
> "The same formula will be applied to all users. Weightings will be used to distinguish between different spectrum locations and geographic locations, and to take account of channel width and area covered. The weightings will be derived from the current demand patterns for spectrum so that fees will be higher for users in larger cities and for users of more popular spectrum bands. Also, the fees will increase as the amount of spectrum accessed increases."
>
> [*Inquiry Into the Apparatus Licence System - A New Outlook*, SMA, February 1995]

The Spectrum Maintenance component is related to the Spectrum Access Tax, as follows:

> The spectrum maintenance component is designed to recover the indirect costs of SMA spectrum management activities such as international coordination, domestic planning, interference investigation and policy development. It is a fixed percentage of the spectrum access tax, at 30%.
>
> [RB 68A, *Apparatus Licence Fee Schedule*, SMA June 1995]

This fee framework for the Apparatus Licensing system has been severely distorted in the SMA's application of it to the Amateur Type licence.

This distortion arises because:

- the amateur radio frequency allocations are spread throughout the spectrum from the medium frequencies (MF) through to the microwave extra high frequencies (EHF);
- a proportion of the bands are "secondary" allocations in which radio amateurs share occupancy with primary users;
- radio amateurs have the freedom and flexibility to move around the spectrum, from band to band and within their allocated bands;
- radio amateurs are free to use their band allocations and vary their equipment as they see fit, constrained in technical operation only by the relevant Technical Licence Specifications (TLS) issued by the SMA covering specified bands, transmission modes, bandwidths and powers, etc;
- and radio amateurs are spread throughout Australia, in cities, in rural and remote regions, and they have the freedom and flexibility to move their stations from location to location.

These factors render the application of geographic location, channel bandwidth and area of coverage in the application of the Spectrum Access Tax formula to Amateur licences quite meaningless.

The Amateur Radio Service in Australia has a total of 38 blocks of spectrum between the medium frequencies and the extra high frequencies. Some blocks are contiguous, which results in a total of 23 Amateur bands through the spectrum. In the Australian Radiofrequency Spectrum Plan, the Amateur allocations are generally coincident with the ITU Amateur spectrum allocations for Region 3, which are also largely coincident with Amateur band allocations throughout the spectrum across the rest of the world (ITU Regions 1 and 2).

Total access for the Amateur Radio Service in Australia is just over 8% of allocated spectrum. This may seem a comparatively enormous amount, but a great deal of it is shared because many Amateur bands are allocated on a "secondary user" basis; that is, radio amateurs must avoid interference to and accept the possibility of interference from, primary users in that part of the spectrum. A number of the Amateur band allocations in the ultra high frequency (UHF) and super high frequency (SHF) portions of the spectrum are allocated by ITU agreement to the Amateur-Satellite service, and are thus shared on an international basis. Of the bands allocated to Australian radio amateurs, primary user status applies to only 1.75% of the allocated spectrum.

The Amateur Radio Service has access to so many segments of the spectrum so that the nature of radio amateurs' activities, according to the ITU definition of the service, is not fettered by constraints on access to spectrum. This arises from international recognition of the value of the Amateur Radio Service to the world community, affirmed and reaffirmed at ITU World Radio Conferences over decades.

When the SMA originally determined fees for Amateur licences, which they released in December 1994, the Spectrum Access Tax component was $35 of the $69 fee (for an Unrestricted licence). They said that the figure was arrived at by taking into account all the primary Amateur bands and applied nation-wide, divided by the total number of amateurs.

The distortion of the Apparatus Licence fee framework was further compounded when the eventual fee of $51 was struck in March 1995.

Further, the Act allows for transfer of Apparatus Licences between parties by a simple administrative means. Amateur Radio licences are prohibited from being transferred in this way because the individual radio amateur is licensed according to a qualification held (the Amateur Operators Certificate of Proficiency).

A radio amateur's licence is identified by the call sign allocated by the SMA. Call signs cannot be transferred between amateurs without it being relinquished by the holder. A radio amateur cannot give or assign their licence to another person to use. A complication arises also, in that an amateur may apply to hold more than one licence-and-call sign. Some amateurs do hold multiple licences. Amateurs exchange transmitting and receiving equipment with each other, but the licence does not go with it.

Clearly this factor in the Apparatus Licensing model has distinct limitations for the Amateur Radio Service. Radio amateurs do not want the ability to transfer licences in the way conferred by the Act. It has chaotic implications for the orderly regulation of the Amateur Radio Service.

The actual model for amateur radio operations is distinctly at variance with the core precepts of the Apparatus Licensing system. As a consequence, the Apparatus Licensing system does not suit the Amateur Radio Service in Australia.

Class Licensing

This licensing system was introduced with the new Act in 1992. The SMA defines Class Licensing as follows:

> "A class license authorises any person to operate radiocommunications devices of specified kinds and/or for a specified purpose, provided the operation is in accordance with the conditions of the licence. They are used where individual frequency assignments are not required.
>
> "The SMA does not issue class licences to individual users."
>
> [*Inquiry into the Apparatus Licence System*, SMA Discussion Paper, December 1993]

It is quite clear from this definition that Class Licensing is not a suitable licensing system for the Amateur Radio Service in Australia.

Radio amateurs require the freedom to operate equipment of their own choosing and/or their own manufacture.

Radio amateurs require individual licences. This is a fundamental consequence of the ITU definition of the Amateur Radio Service. Australian radio amateurs would likely not be recognised by the members of the International Amateur Radio Union if the Amateur Radio Service in Australia oper-

ated under a Class Licence and Australian radio amateurs did not have individual licences.

Spectrum Licensing

This is also a new licensing system, introduced with the new Act in 1992. The SMA defines Spectrum Licensing as follows:

> "A spectrum licence authorises the licensee to operate radiocommunications equipment within core conditions (frequency and geographic boundaries, and emission limits beyond those boundaries), subject to certain other conditions. A spectrum licensee can vary the use and technical operating arrangements within the emission limits, and assign the licence in whole or in part to a third part through trading or subleasing. Spectrum licences may be issued only in spectrum bands designated by the Minister."
>
> [*Inquiry into the Apparatus Licence System*, SMA Discussion Paper, December 1993]

A Spectrum Licence confers considerable flexibility of operation on the licence holder.

> "Spectrum licensing, instead of focusing on *equipment* and its uses (which in turn defines the area covered and the frequency bandwidth used), authorises the use of *spectrum* within specified limits of frequency bandwidth and coverage area. Under spectrum licensing, licensees will have the flexibility to change their equipment, antenna, siting, in fact any aspect of their use of spectrum, provided they comply with the core technical conditions of their licence, and any coordination requirements."
>
> [*Implementing Spectrum Licensing*, SMA Discussion Paper, February 1995]

This sounds like almost an ideal prescription for amateur radio operations, because it allows the flexibility required by the Amateur Radio Service, but the difficulty arises as to who would be the licensee. Would there be one licensee, who would then have responsibility to regulate operations within the allocated spectrum, or would all Australian radio amateurs hold the spectrum licence jointly and severally? Radio amateurs require individual licences. As noted previously, this is a fundamental consequence of the ITU definition of the Amateur Radio Service.

Because some Amateur frequency bands are allocated on a primary use basis and others are shared by radio amateurs with primary users from other radiocommunications services (e.g. defence, broadcasting), this mixed primary/secondary status creates administrative difficulties if radio amateurs were Spectrum Licensed.

In addition, a clear purpose of Spectrum Licensing is the ability to assign, trade or sublease the licensed spectrum, in whole or in part, granting rights analogous to property rights in the radiofrequency spectrum.

> "A spectrum licence provides the licensee something like a property right, where the licensee can trade and subdivide the spectrum to other users."
>
> [Speech to the *Wireless Technology Forum*, Sydney, 15 February 1996, by the Spectrum Manager, Christine Goode]

Spectrum Licensing has a clear commercial purpose. This is borne out by the fact that Spectrum Licences for bands of frequencies designated for Spectrum Licensing will be auctioned by the SMA.

The Government's policy framework relating to charges to be levied for Spectrum Licences provides that:

> "• new spectrum licences will generally be allocated by a price-based allocation system which recovers the scarcity value of the spectrum;
> • all spectrum licensees will also be required to pay a separate annual fee related to the costs of administration of spectrum management; and
> • the SMA will be able to reserve spectrum licences for direct sale to public and community service providers, in some cases at concessional rates."
>
> [*Implementing Spectrum Licensing*, SMA Discussion Paper, February 1995]

Clearly, Spectrum Licensing is a framework for "spectrum for sale" in a like manner to real estate. However, a Spectrum Licence is more akin to a leasehold rather than a freehold title, because it has a limited tenure without presumption of renewal.

> "The Act provides that a spectrum licence may be issued for a period of up to 10 years, but there will be no automatic right for a person to be issued a second spectrum licence after the expiration of their first."
>
> [*Implementing Spectrum Licensing*, SMA Discussion Paper, February 1995]

However, the Act provides a mechanism for renewal, but with a "public interest" test.

> "The Act provides that the SMA may re-issue a spectrum licence to the original licensee without following the reallocation procedures which would normally apply *if that would be in the public interest.*
>
> "The "public interest" in this case is able to be determined by the Minister, but any determination by the Minister is a disallowable instrument, able to be disallowed by either the House of Representatives or the Senate during the 15 sitting days after tabling.
>
> "The SMA expects that only very few situations will actually meet public interest criteria, for example, volunteer community or public services."
>
> [*Implementing Spectrum Licensing*, SMA Discussion Paper, February 1995]

Clearly, this mechanism has a deal of uncertainty associated with it. Radio amateurs want the certainty of continued access to their allocated spectrum and the renewal of their licences from period to period, so this aspect of the Spectrum Licensing system is anathema to radio amateurs.

It is clear the role of Spectrum Licensing and the requirements of the Amateur Radio Service, while having some congruence, have fundamental differences and Spectrum Licensing is not a suitable licensing system for the Amateur Radio Service in Australia.

5.0 Towards a New Amateur Radio Licensing System

Amateur Radio Activities and the Licensing Systems

Radio amateurs *operate* radiocommunications *stations* comprising equipment which may be:

- designed and constructed by themselves,
- assembled from units of commercially manufactured equipment originally designed for civilian, government or military applications, and adapted or modified for amateur radio pursuits;
- assembled from commercially manufactured equipment designed for the world amateur radio market; or
- a variety of combinations and permutations of the above.

Radio amateurs operate their stations on bands allocated under the Australian Radiofrequency Spectrum Plan (published by the SMA). These bands range from the medium frequencies (MF) through to the microwave extra high frequencies (EHF). Radio amateurs operate within the specified limits of these bands and are only constrained in technical operation by the relevant Technical Licence Specifications (TLS) covering specified bands, transmission modes, bandwidths and powers, etc. Radio amateurs have total flexibility to change their equipment, transmission modes, location and antennas, provided they comply with the core technical conditions of their licence, and any coordination requirements. This flexibility is essential to maintaining technical experimentation as one of the core activities and attractions of amateur radio.

By the very nature of radio amateurs' activities, the equipment used changes as the interests, pursuits and goals of the individual amateur changes.

Among all the defined radiocommunications services, amateur station operation is *unique*.

As has been demonstrated earlier, Apparatus Licensing is a poor licensing model for amateur radio activities because it is prescriptive, as it

> "authorises the operation of radiocommunications equipment for a particular frequency, geographic location and use."
>
> [*Implementing Spectrum Licensing*, SMA Discussion Paper, February 1995]

Apparatus Licensing is particularly suited to, and widely used by, commercial, military, academic and government services.

Likewise, it has been demonstrated that Class Licensing is not suitable for general licensing of amateur radio operators as it authorises the operation of

> ". . . radiocommunications devices of specified kinds and/or for a specified purpose . . . The SMA does not issue class licences to individual users."
>
> [*Inquiry into the Apparatus Licence System*, SMA Discussion Paper, December 1993]

Similarly, Spectrum Licensing has limitations for general licensing of radio amateurs, as many amateur radio frequency bands are shared with primary users, while radio amateurs have primary occupancy on many other bands. In addition, the 10-year tenure of a Spectrum Licence, without presumption of renewal, does not suit the reason-for-being and activities of the Amateur Radio Service.

Radio amateurs have always been licensed as *individuals*.

The Present Amateur Licensing System

Amateur radio operators are presently licensed under the Apparatus Licensing system. The licence type is categorised as **Amateur**, under which there are seven sub-types, as follows:

Unrestricted	Intermediate	Limited
Novice	Novice Limited	
Amateur Beacon	Amateur Repeater	

The last two sub-types are unattended stations operated by licensed individuals or special interest groups for the benefit of other radio amateurs.

A person wishing to gain an amateur radio licence has to sit for a publicly conducted examination, comprising modules of theory, regulations and/or Morse code operation, depending on the licence sub-type desired. The system is illustrated in Appendix LS1, *The Amateur Licensing System*. Candidates sit for multiple choice theory and regulations papers, and for practical sending and receiving tests in Morse code. The pass mark in the theory and regulations papers is 70%.

The amateur radio community's peak body, the Wireless Institute of Australia (WIA), has conducted the nationwide amateur examination service on behalf of the Spectrum Management Agency (SMA), operating under a Memorandum of Agreement, since 1992 when the SMA devolved the examination routine to the WIA. This service is formally known as the *WIA Exam Service*. Accredited invigilators supervise candidates sitting for the amateur licence examinations. The WIA has drafted examination syllabuses and questions banks and negotiated approval with the SMA. So, all the routine aspects of administering the amateur exam system are conducted by the WIA.

Upon receiving notification of the necessary pass mark in the required examination modules, a candidate applies to the Spectrum Management Agency for them to issue the necessary Certificate of Proficiency. This Certificate is issued to the individual and is unique to that person, just as is a Higher School Certificate. The SMA assigns the candidate a Customer Number. Again, this is unique to the individual.

Upon receipt of an Amateur Certificate of Proficiency, the candidate applies for a licence and call sign. The licence is renewable at annual or 5-yearly intervals. The original call sign may be held by the individual for many years, or changed because they move interstate, or for other reasons.

When a licensee holding other than an Unrestricted (full) licence passes the necessary additional examinations, they apply afresh for the appropriate Certificate of Proficiency, and a new licence and call sign – the call sign suffix identifies what licence grade is held by the licensee.

When licensees move from one state to another, they change their call sign to coincide with the new state or territory as the third character in the call sign is a number which identifies the geographic region of the licensee (1 = ACT, 2 = NSW, 3 = Victoria, etc). More than one call sign may be held by an individual licensee. Some licensees retain previously-held call signs. Some licensees will hold the same call sign all their life, some may have only two or three call signs throughout their life, while some may hold a series of perhaps five or more over a period.

A radio amateur's Certificate of Proficiency is held for life (even if their licence lapses through non-renewal, is relinquished, is suspended or revoked by the SMA), but a call sign may be taken up and relinquished or changed as the licensee sees fit.

Amateur Licence Fees

Under Apparatus Licensing, amateur radio operators are currently charged a fee comprised of three components,

identified on the licence and "Offer to Renew" as:

1/ A *Spectrum Access Tax* of $10;

2/ A *Spectrum Management* (previously, 'maintenance') *Component* of $3; and

3/ An *Administrative Charge* of $38.

At a meeting between the Spectrum Management Agency and the Wireless Institute of Australia on 5 December 1994, the SMA told the WIA that, on average, licensees retain a call sign for 10 years and that it cost the SMA $140 to issue an original licence (which presumably includes the cost of issuing the Certificate of Proficiency), and $11 for each renewal. The SMA said that amortising the costs over the average 10 years amateurs hold a call sign, yielded an administrative cost of $25 per annual renewal, which was set as the proposed Administrative Charge.

In early 1995, the amateur licence fee was $37, and the SMA proposed to raise it to $71 under the new Apparatus Licence fees regime.

Following protest from the amateur radio community, the Parliamentary Secretary to the Minister for Communications and the Arts, Paul Elliott, announced in March 1995, a reduction of the proposed $71 fee to $51.

The Administrative Charge component of the newly-struck fee rose from the previously determined $25 to $38; the rest of the $51 fee being made up of a $10 Spectrum Maintenance charge and a $3 Spectrum Access tax.

The $13 rise in the Administrative Charge, between December 1994 and March 1995, has never been explained.

As part of the 1993-94 review of Apparatus Licensing, the SMA determined a formula by which it could charge licensees for access to the radio spectrum.

> "The spectrum access tax is a fee which generally applies to each access to the radiofrequency spectrum, a community resource. The tax is derived from a formula that takes account of the licensee's spectrum access, in terms of four parameters:
> i. spectrum location;
> ii. geographic location;
> iii. channel bandwidth; and
> iv. area of coverage.
> The tax varies according to these parameters: as the demand for the location (geographic and spectrum) increases, the tax increases; and as the amount of spectrum access increases, the tax increases."
>
> [RB 68A, *Apparatus Licence Fee Schedule*, SMA June 1995]

It is obvious therefore, that in arriving at the $51 Amateur Licence fee, the SMA abandoned application of this formula in respect of the Spectrum Access tax component. Radio amateurs operate in defined frequency bands and have the flexibility to, at will, use transmissions of differing bandwidth, transmit on different frequencies within their assigned bands (many of which are shared with other primary users or shared internationally), and to change their location.

Hence, it is a practical impossibility to apply the Apparatus Licensing system's Spectrum Access Tax formula to amateur operations.

It can only be concluded that the originally proposed fee and the eventual fee of $51 were arrived at on the basis of "what the market could bear" and took no account of the substantial differences between the circumstances which pertain to private sector licensees, where licence fees are supported out of commercial income and the cost is passed on to business customers, and the circumstances of public sector licensees where licence fees are supported by public revenue.

In the case of radio amateurs, their licence fees are paid out of private income, and is a recurrent expenditure. As a consequence of the ITU definition of the Amateur Radio Service, radio amateurs cannot have a pecuniary interest in their pursuits and thus licence fees must be paid from their private income. From WIA membership statistics, it is estimated that between one-fifth and one-quarter of Australia's radio amateurs are either students, retirees or pensioners, on restricted incomes. The WIA scale of membership fees reflects this fact, with reduced payments available to members in these circumstances. But it must be acknowledged that radio amateurs who are students or pensioners also make their collective contribution in being of value to the community.

The Amateur Radio Service in Australia would be better served by a new licensing system which arrived at a licence fee regime that was truly transparent, equitable for all licensees and reflected the value to the community of the Amateur Radio Service.

Proposal for a New Licence - the Amateur Operator Licence

It is proposed that a fourth licence system be created under the Radiocommunications Act, to be called the Amateur Operator Licence.

The Amateur Operator Licence would recognise the complete flexibility amateur radio operators have in pursuing their activities, within the framework of the allocated amateur frequency bands, the Technical Licence Specifications and the Radiocommunications Act. The present seven licence sub-types would be retained.

It is proposed that a licence fee be retained, because some 'engagement' between the amateur radio community and the SMA must necessarily remain to meet obligations under the ITU Radio Regulations and the Radiocommunications Act.

The new Amateur licence fee would be made up of two components: a *Spectrum Management* component, and an *Administrative Charge*.

Access to radio spectrum for radio amateurs is defined by the allocated bands according to the Australian Radiofrequency Spectrum Plan (published by the SMA).

The fee would not include a *Spectrum Access Tax* component, for all sub-types of Amateur licence, in recognition of the value of amateur radio to the community, and the value amateur radio operators and their activities return to the community.

The nett cost in loss of revenue would amount to less than $200,000 in 1996 terms.

The *Spectrum Management* charge is proposed to be retained at the present level of $3 as it is clear that the SMA determined in 1995 that this satisfies their administrative requirements.

The *Administrative Charge* would be reduced by reducing amateur radio operators' engagement with the Spectrum Management Agency.

The cost of public administration of the Amateur Radio Service in Australia has previously been reduced through devolvement of the amateur licence examination system to the WIA. This is the key part of licensing amateur radio operators: establishing candidates' competency in technical and regulatory matters to meet agreed standards.

The principle of devolvement of administrative routines could also be applied to the issuing of call signs, reducing individual amateur radio operators' engagement with the SMA, thus achieving further savings in administrative burden and cost.

It is envisaged that, eventually, the issuing of Certificates of Proficiency could also be devolved to the WIA Exam Service with a consequent reduction in administrative cost.

It is recognised that the Spectrum Management Agency has statutory obligations under the Radiocommunications Act in respect of regulating the Amateur Radio Service in Australia.

It is also recognised that the Government has determined that:

> "The SMA will operate on a full cost recovery basis. It will charge users for services and facilities provided to them."
>
> [*Inquiry into the Apparatus Licence System*, SMA Discussion Paper, December 1993]

With the above in mind, it is proposed that new administrative arrangements be instituted which would reduce the administrative burden and thus the cost.

Amateur radio operators' contact with the Spectrum Management Agency is labour intensive for the SMA in the initial phase of licensing – the issuing of a Certificate of Proficiency, licence-and-call sign.

After that initial phase, contact between amateur radio operators and the SMA involves:

(i) licence renewal (annually, 5-yearly, or annual instalments of 5-year renewal);
(ii) licence upgrade with new Certificate of Proficiency and new licence-and-call sign;
(iii) change of call sign/additional call sign(s).

Item (i) is predominantly an automated operation and comparatively low in cost. Item (ii) is as labour intensive as the initial phase of licensing. Item (iii) is intermediate in labour and cost.

In principle, the amateur licence and the call sign are separate entities and the issuing of each could be administratively separated. The amateur licence could still be issued by the SMA, while the issuing and administration of amateur call signs would be devolved to the WIA.

It is proposed that the Administrative Charge for an Amateur Operator Licence could be reduced in the following way:

- Candidates who have met the necessary examination requirements be issued with an Amateur Operator Licence by the SMA for a 5-year term; the existing arrangements under the Radiocommunications Act and Regulations in respect to licence renewal, and regarding licence suspension or revocation following a breach, would be retained.
- At the time of licensing, the SMA issues a candidate with an individual Client Number, as is the present case. Licensed radio amateurs, as clients of the SMA, would still have the responsibility of notifying change of station, etc, address to the SMA.
- Candidates are not issued a call sign by the SMA at the time of licensing; this would be devolved to the amateur radio community's peak body, the Wireless Institute of Australia, under a Memorandum of Agreement between the SMA and the WIA.
- The WIA would administer all aspects of issuing call signs. New call signs issued to, and call signs relinquished by licensees would be recorded by the WIA and supplied to the SMA at agreed intervals (e.g. quarterly) so that Amateur Operator details for the SMA database are recorded as whole groups (*en bloc*), rather than one after another (in *seriatim*) "on demand", as is the present case. This affords efficiencies not otherwise available in the recording of call signs and maintenance of the licensee and call sign database, which is intensive in terms of staff labour and computer resources.

The Amateur Operator Licence Proposal in Summary

That a new licence system be created, in addition to the current three systems, to be called the Amateur Operator Licence system. The present seven licence sub-types would remain.

That persons wanting to be amateur radio operators obtain the relevant qualification for an Amateur Operators Certificate of Proficiency through the present amateur examination system.

That no Spectrum Access Tax be levied, in recognition of the value of amateur radio to the community, and the value amateur radio operators and their activities return to the community.

That the Amateur licence fee comprise just two components:
- a Spectrum Management charge, and
- an Administrative Charge;

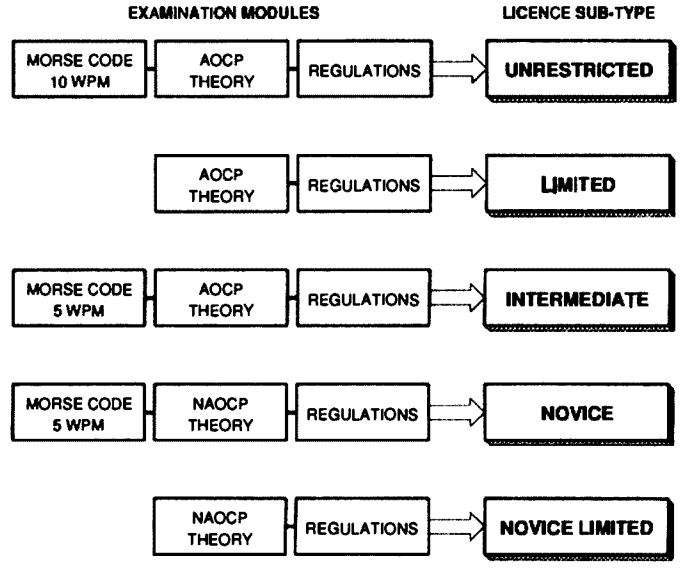
the Spectrum Management Charge to be maintained at the present level of $3, and that SMA administrative costs be reduced by devolving the routine administration of amateur call signs to the WIA.

A framework for introducing the Amateur Operator Licence might proceed as follows:

1/ The SMA to make immediate arrangements to devolve the administration of amateur call signs to the WIA;
2/ Concurrently, the SMA develops the necessary new administrative procedures;
3/ Concurrently, the SMA institutes recommendations for pertinent changes to the Radiocommunications Act.
4/ The proposed amendments are introduced to the 38th Parliament.

oooOOOooo

THE AMATEUR LICENSING SYSTEM **APPENDIX LS1**



AOCP = Amateur Operators Certificate of Proficiency
NAOCP = Novice Amateur Operators Certificate of Proficiency
WPM = words per minute

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May 1996
Volume 64 No 5

Amateur Radio

Journal of the Wireless Institute of Australia

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Cover

Formally offering the Icom IC-706 transceiver prize in the WIA's 1995-96 Membership Recruitment and Retention Campaign is Icom (Australia) managing director, Kiyoshi Fukushima VK3BZX (left), followed by (l-r) Icom staffer, Duncan Baxter VK3LZ, WIA Federal Media Liaison Officer, Roger Harrison VK2ZRH, and Federal President, Neil Penfold VK6NE. The picture was taken by NSW Division Federal Councillor, Michael Corbin VK2YC, at the October 1995 Federal Council meeting at the Ibis Hotel in Melbourne. The Federal Council was fortunate to get Yoshi and Duncan along – they were cajoled into coming the day before, by Val Bergman-Harrison.

BACK ISSUES

Available, only until stocks are exhausted, at $4.00 each (including postage within Australia) to members.

PHOTOSTAT COPIES

When back issues are no longer available, photocopies of articles are available to members at $2.50 each (plus $2.00 for each additional issue in which the article appears).

The opinions expressed in this publication do not necessarily reflect the official view of the WIA, and the WIA cannot be held responsible for incorrect information published.

Amateur Radio Service

A radiocommunication service for the purpose of self-training,intercommunication and technical investigation carried out by amateurs, that is, by duly authorised persons interested in radio technique solely with a personal aim and without pecuniary interest.

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Editor's Comment

Deregulation

Deregulation is a popular buzz-word these days. What does it mean?

To answer the question we need to go back over 100 years to the period when governments, parliaments and people were beginning to discuss who should have the right to own, or at least control, "the means of production, distribution and exchange".

There are two extremes of opinion on this, one which considers the State should control everything and one which considers the State should control nothing. There is a continuous spectrum in between in which the mixture varies through most of the possible combinations.

The State-owned extreme was most closely approached until 1991 by the USSR, and the free-enterprise extreme by the USA. Australia fell somewhere into the "mixed economy" part of the spectrum, with the Labor Party a little nearer the State-control end than the Liberal-National coalition.

While we have had a Labor Government from 1983 to March 1996, there has, nevertheless, been a steady process of reducing the areas of government control and leaving more and more of the management of enterprise to those actually involved in it. This is deregulation; and it may be expected to accelerate under a Coalition Government.

Once, when the government not only controlled all Australian communications systems, but owned and operated the largest player in the game (PMG's Department, Telecom, now Telstra), it made all the rules and thereby restricted any possible competition. Now Telstra has been set up as a limited company and provided with ready-made competition from Optus! Once, the PMG regulations applying to amateur radio prevented amateurs from discussing matters more appropriately the topic of a telephone call. In fact, in the UK, only the licensed amateur could speak into the microphone; and this may still be the case.

Continued on page 55

CONTRIBUTIONS TO *AMATEUR RADIO*

Amateur Radio is a forum for WIA members' amateur radio technical experiments, experiences, opinions and news. Manuscripts with drawings and/or photos are always welcome and will be considered for possible publication. Articles on computer disk are especially welcome. The WIA cannot assume responsibility for loss or damage to any material. *"How to Write for Amateur Radio"* was published in the August 1992 issue of *Amateur Radio*. A photocopy is available on receipt of a stamped, self addressed envelope.

■ WIA News

Roger Harrison VK2ZRH, Federal Media Liaison Officer

Spectrum Manager Responds to Licensing Submission, Federal Council Plans Final Draft Deadline

In March, the WIA sent to the spectrum manager, Ms Christine Goode, two courtesy copies of the "Exposure Draft" of the Wireless Institute of Australia's Submission to the 38th Parliament on Amateur Radio Service Licensing, which was released in February.

The spectrum manager has acknowledged receipt, writing to the WIA Federal President, Neil Penfold VK6NE, on 29 March. In her letter, she said, *"I have read the draft with some interest and I look forward to discussion with the WIA on these issues at some stage in the future."*

She concluded with, *"I note that you are currently seeking comments from within your own membership on the draft before you consider submitting it to the Minister. I would prefer at this stage to reserve any comments we may have until you have finalised your proposals."*

Neil Penfold has replied to Christine Goode, thanking her for the letter, and welcoming her comments in the future.

In March, the Federal President also wrote to the new Minister for Communications and the Arts, Senator Richard Alston, seeking a meeting at the earliest available opportunity, to establish a relationship, to determine the Government's position and to outline the main thrust of the submission and how the Amateur Radio Service in Australia would be better licensed at lower cost to the Government.

He reminded the minister that a copy of the exposure draft had been sent to him in February and that last year he wrote to the then WIA Vice President, Roger Harrison VK2ZRH, and had issued a press release supporting objections to the proposed licence fees increase and acknowledging that radio amateurs were of value to the community.

In his letter to the minister, Neil Penfold concluded with, *"Once the consultative process within the amateur radio community concludes and our final submission is completed, we will be seeking a further meeting to present it, later in the year."*

As the WIA has identified that the Senate is likely to play a key role if the submission is to achieve its objectives, Neil Penfold has also written to the Shadow Minister for Communications and the Arts, Senator Chris Schacht, and the Democrats' spokesperson on Communications, Senator Vicki Bourne.

The WIA Federal Council is currently considering a proposal on a time frame for evaluating feedback on the Exposure Draft, developing a second draft for further consideration, completing the final draft and timing of submitting it to the Minister for Communications and members of the 38th Parliament.

Having been published as a 16-page supplement in the April issue of *Amateur Radio*, a 2000-word summary and explanation of the Exposure Draft Submission's proposals appears in the May issue of *Radio and Communications* magazine, arranged with Editor Len Shaw VK3ALS by WIA Federal Media Liaison Officer, Roger Harrison VK2ZRH.

Production Editor, Chris Edmondson VK3CE, told *WIA News* that the May issue of *Radio and Communications* includes an Editorial strongly supporting the WIA's submission, urging all amateurs – particularly non-WIA members – to support the Institute and its efforts to achieve reform in the administration of amateur radio in Australia.

Run-on prints of the Exposure Draft Submission supplement from April's Amateur Radio magazine have been provided to all WIA Divisions for circulation to affiliated clubs and groups, and non-members who request copies. Meanwhile, the exposure draft of the submission was placed on the World Wide Web over Easter, courtesy of South Australian Division Federal Councillor, Grant Willis VK5ZWI. It can be located at http://www.vk5wia.ampr.org/federal/subintro.htm.

It is proposed that the deadline for feedback on the submission be the end of June this year, and that a second draft be available for circulation to all WIA Division councils by late August or early September, allowing time for responses to be analysed and any necessary further research arising from that to be written into the second draft. There would then be time for Division councils to discuss the second draft and formulate points for discussion or any formal motions for the October meeting of the WIA Federal Council. Publication and circulation of the final submission is also to be considered.

It is proposed that the final submission be submitted to the parliament in late October or early November, during the spring sitting.

Amateur Radio Issues on World Radio Conferences Agenda

The report of Australia's International Radiocommunications Advisory Committee (IRAC) on the first preparatory meeting for the World Radio Conferences to be held in 1997 and 1999, highlights several items of interest to radio amateurs: wind profiler radars operating near 50 MHz, 400 MHz and 1000 MHz, and simplification of Article S25 of the international Radio Regulations covering amateur radio.

Three delegates from Australia attended the Conference Preparatory Meeting, CPM-96, held in Geneva during February, led by Roger Smith of the Spectrum Management Agency.

Wind profiler radars that detect rapidly rising and falling wind draughts in the vicinity of airports, blamed for many aircraft crashes around the world, operate on three key frequency ranges which detect air turbulence structures in these hazardous "wind shears". Consideration of these radars is on the agenda for the 1997 World radio Conference, WRC-97.

The IRAC report said a special technical group, TG8/2, is to continue studies ". . . of the characteristics and requirements of wind profiler radars, to make recommendations as to the technically suitable frequency bands, associated standards and frequency sharing criteria necessary for compatibility with the services that may be affected."

As they need to operate near 50 MHz and 400 MHz, they have the potential to interfere with operations in the six metre and 70 centimetre bands, as has been reported in the American Radio Relay League (ARRL) journal, *QST*, and European amateur magazines. Wind profiler radars operating near 1000 MHz are not known to affect any amateur bands.

A wind profiler radar was installed near Darwin some six years ago and operates just below 50 MHz. Interference to the six metre DX window, between 50.0 and 50.2 MHz, was minimised following action taken by local Darwin operator, Rex Pearson VK8RH, who worked with the cooperative radar manufacturer and operators to set the carrier frequency and pulse repetition rate so that a minima in the radar's sidebands fell around 50.1 MHz.

The 1999 World Radio Conference, WRC-99, will review Article S25 of the Radio Regulations, which concerns the amateur and amateur-satellite services. A specialist study group, known as SG 8, will consider the issue over the next few years. International Amateur Radio Union Vice President, Michael Owen VK3KI, addressed the WIA Federal Council on this issue at its February meeting, this year.

The next Conference Preparatory Meeting, CPM-97, will be held some time early next year, according to the IRAC report. The WIA's delegate on IRAC is Dr David Wardlaw VK3ADW.

Last Chance to Win An All-modes, HF-VHF Rig!

This month provides the last chance to renew your membership, or for non-members to join the WIA, and join in the draw to win a fabulous Icom IC-706 transceiver.

Those who join or renew their membership before 31 May 1996 are eligible to go into the draw for the Icom IC-706 transceiver, worth almost $2500, which was generously donated by Icom (Australia). Those members who had the foresight to join or renew their membership since 1 June 1995 are already in the running to win the magnificent Icom rig. All grades of membership are eligible and members on a three-year subscription, and life members, are included automatically.

Tell the advertiser you saw it in the WIA *Amateur Radio* magazine!

The IC-706 rig, one of the latest releases from Icom (Australia), covers all nine HF amateur bands from 1.8 MHz through 28 MHz, plus 50-54 MHz and 144-148 MHz. Delivering 100 watts on all HF bands and 50 MHz, and 10 watts on 144 MHz, the IC-706 features continuous receiver coverage between 30 kHz and 200 MHz and all-modes operation: SSB, CW, RTTY, FM and even AM. The IC-706 can thus be used by all amateur licence grades. The rig was very favourably reviewed in the November 1995 issue of *Amateur Radio* magazine.

The winner will be determined by a draw, to be held in June, and the lucky recipient will be notified by mail. The result will be published in *Amateur Radio* magazine. Of course, should the winner not have a licence – yet – or not have a licence which allows them to use the transceiver's full features, the WIA trusts that they will make responsible use of the equipment. And what an incentive to get that Unrestricted ("full call") licence!

Have You Got a Licence Renewal Asking For More Than $51?

Isolated examples of amateurs receiving licence renewals which give a "total fee due" of more than $51 are still occurring, according to information received by the WIA.

If you receive an "Offer to Renew", as the notices are now titled, which lists a total fee due which does not come to $51.00, then you are advised to write immediately to your nearest Area Office of the Spectrum Management Agency and bring the error to their attention. Better still, to be on the safe side and ensure your licence doesn't lapse, include a payment of $51.

The same goes for repeater and beacon licence renewals, which should be $24 per individual transmitter (links excluded). Apparently, some incorrect amounts have appeared on repeater renewal notices, which clubs have inadvertently accepted and paid.

Make sure you keep a record when you send your licence renewal payment as delays of up to eight weeks between licence renewal date and actual receipt of the renewed licence have been noted.

For official licence fees, get the SMA booklet RB68A, Apparatus Licence Fee Schedule, June 1995, available from SMA area offices.

Electronics Conference and Exhibition in June

For those amateurs working in the electronics, communications or telecommunications industries, a conference and exhibition to be held in Sydney in June should be of particular interest.

The "Electronics at Work" Expo is being staged at the Sydney Olympics site, the State Sports Centre at Homebush Bay, over 5 and 6 June.

The Expo is being supported by the Spectrum Management Agency (SMA), the Australian Electronics Development Centre (AEDC) and the Australian Electrical and Electronic Manufacturers Association (AEEMA).

The AEDC and SMA (who is responsible for implementing the EMC framework) are supporting practical workshops and an international conference on electromagnetic compatibility (EMC), to be held at the Gazebo Hotel in Parramatta. The series of conference sessions will be complemented by a continuous series of EMC workshops at the Homebush Bay exhibition site. A commuter bus will run between the exhibition and the Parramatta conference sites.

Of particular interest will be a presentation from a world authority on EMC, Don White, the author of 13 books on the subject, as well as a joint presentation on mobile phone interference and medical devices from Dr Ken Joyner, head of the EMC section at Telstra Research Laboratories, and Mike Flood of the Therapeutic Goods Administration.

The manager of the SMA's EMC Standards group, Ian McAlister, said the event will provide an opportunity for attendees to learn, via the associated conference and workshops, of the new arrangements introduced by the Government to contain electromagnetic interference (EMI).

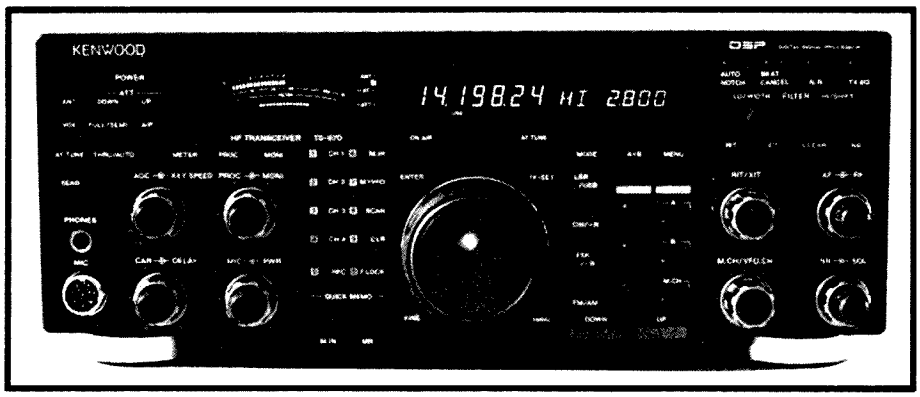
AEEMA will conduct a special seminar session on export opportunities for the electronics industry.

The exhibition will showcase products and services, with industry names such as Alcatel, GEC, Hewlett Packard, Mitsubishi, Motorola, National Semiconductor and Philips Electronics Australia, according to the Expo organisers, The Practical Marketing Group, based in Sydney.

■ Equipment Review

Kenwood TS-870 All Mode HF Transceiver

*Reviewed by Ron Fisher VK3OM**



The Kenwood TS-870 All Mode HF DSP Transceiver.

According to the advertising brochure, this is not a transceiver. It is an *Intelligent Digital Enhanced Communications System.* Further, *"You can talk to someone half way round the world and it'll feel like they're in the room with you".*

That's quite a claim to make. Of course, you might need a good antenna connected to achieve the above claim, but they don't mention that. Assuming that a good antenna is connected, will the equipment do as they say? Maybe yes, and maybe no!

So let's see what happens in the real world, particularly as we are now at the bottom of the sun spot cycle. By the way, from here on I am going to call the TS-870 a transceiver. The editor allocates just so much space for these reviews so if I used the full title each time, that would fill the article. Anyhow, with such an exalted title, the 870 must have something going for it, and indeed it does. Let's take a close look at just what the TS-870 has to offer.

TS-870 Features and Facilities

In a nut-shell, the TS-870 is a transceiver with digital signal processing and a "Bay Window" appearance. No, there is more to it than that; but that was my first thought when we first met.

The TS-870 is a mid-sized transceiver and is, in fact, exactly the same size as the TS-850S. I am not sure if the 870 will replace the 850 or if they will run side by side. However, for all practical purposes, it is an updated TS-850. Where the original Kenwood "8" series, the 820 and 830, had built in AC power supplies, the 850 and 870 do not. They both require external DC supplies. The nearest rival to these is the Yaesu FT-990 and this does come with a built-in AC power supply which, in my opinion, does give it a decided edge (it is also available without the built-in power supply if you prefer it that way).

For some unknown reason the TS-870 was available overseas several months before its release in Australia. *Amateur Radio* magazine was the first Australian publication to announce the TS-870 in our *"What's New"* column for December 1995. It was available in the UK at least three months earlier than that. Let's now see just what you get for your money.

As we might expect these days, the TS-870 produces 100 watts RF output, or thereabouts, on all the HF amateur bands. For some reason this doesn't include six metres which is included in many HF rigs these days.

The receiver has full general coverage capabilities from 100 kHz to 30 MHz. All current modes are available on both transmit and receive. From here on, things become somewhat different. The big feature of the TS-870 is the digital signal processing. This operates on both transmit and receive. It allows the operator to set the transmit and receive bandwidths independently, and to boost or cut the top or bottom audio frequencies when transmitting SSB. The big difference between the DSP system used with the TS-870 and other transceivers is that the 870 uses it at IF.

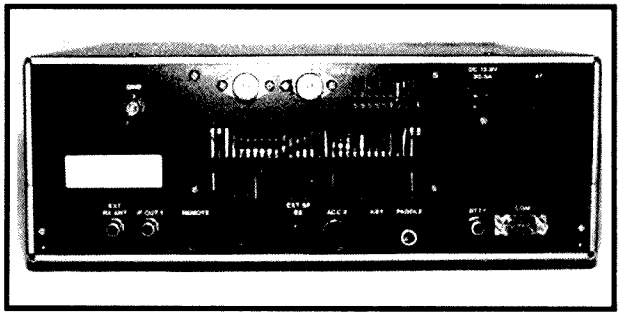
The TS-870 is multiple conversion with IFs at 73.05 MHz, 8.83 MHz, 455 kHz and a new one at 11.3 kHz. This is where the DSP all happens. The feature that first attracted my attention was the controls for the filter on the top right hand side of the panel. To those familiar with Kenwood transceivers, these act like the old SSB slope tuning on say the TS-850 or 940. As soon as an adjustment is made to either of these controls, the display instantly changes from the previous setting (RIT, etc) to show the bandwidth setting.

The bandwidth is also graphically displayed on the meter although there are no calibration points so this acts as an approximate indicator only. The meter is a coloured bar-graph type, similar to the one used on the TS-850 and 450. It has scales for S meter, power output, ALC, SWR, processor compression and the filter width as mentioned above.

The frequency display reads to the nearest 10 Hz and there are something like thirty status indicators built into the overall display. It provides all the information you will need, but I feel it is a bit on the dull side.

The menu system allows you to dim it even further but not to brighten it up. With bright external lighting it could be hard to see. Sunlight shining on it makes it impossible to see. However, I guess no one will be using the TS-870 mobile.

The menu system on the 870 is really something. There is a total of 68 functions that can be set up and all are



The uncluttered rear panel of the TS-870. Note the absence of the usual jutting heatsink on a rig of this size.

displayed on the multi-function display panel. This really enables you to get into the radio and customise it to suit your own requirements. It might take a little time to get used to it as the alpha-numeric display looks a bit strange at first sight; but the handbook explains things very well.

Just to finish off this section of the review, let's look at some of the other functions that the 870 has. There are two VFOs, 100 memories, an automatic antenna tuner, two antenna input connectors switchable from the front panel, selectable tuning rates down to one Hz steps for extra slow tuning, and split frequency operation with both frequencies displayed at the same time.

However, it does not have dual receive capability like its more expensive brothers. In addition to the normal 100 memories, there is a quick memory feature which stores five frequencies in succession. When the sixth frequency is entered the first frequency drops off. This is a useful feature for contests, DXing or just keeping interesting channels on tap.

Computer Control

The TS-870 is all set up for external computer control. According to some overseas information, Kenwood supplies Radio Control Program software with the TS-870 but there was none with our review transceiver. There is an RS232 port built into the transceiver so it's all ready to go. Contact your dealer for more information. It sounds like a great idea.

Rear Panel

Have you ever tried to plug in an external speaker or something at the back of a transceiver and found a large heat sink in the way? Well, no such trouble with the TS-870. There are no projections and all connectors and sockets are easy to get at. There is only one problem, a thirteen pin DIN socket used to connect a TNC or MCP. You will need good eyesight and a steady hand to solder connections to the plug.

General Appearance

I mentioned the Bay Window appearance before. I must admit, it takes time to get used to the look of the front panel. Nothing wrong with it, just different.

But the front feet are a different matter. They look as if they were left over from a job lot of old CD players. When I first spotted them I thought that by rotating them they would screw up or down to adjust the height. But no. If you want the front higher you have to unscrew the feet and add spacers. Really not appropriate for a transceiver in this price class.

On The Air

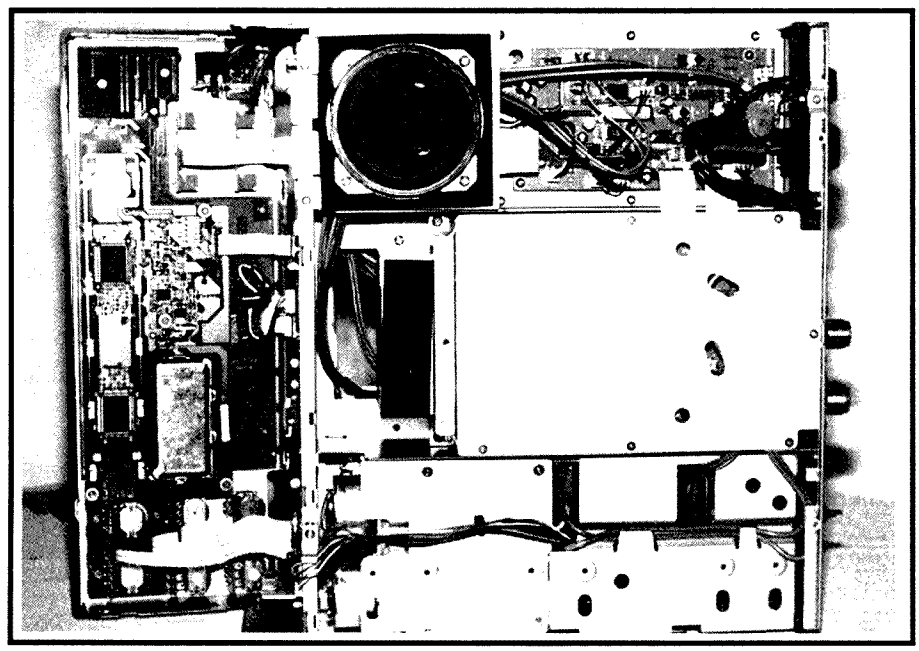
First connect your power supply. The DC connector is a now standard six pin plastic connector. Standard, that is, until you try to buy a spare and you will soon find there are plenty of six pin connectors available that look right but which won't plug in. Strange, isn't it?

You will also note that the specifications call for a power supply with a 20.5 amp rating. I am not sure where that extra 0.5 amp goes, but my ordinary 20 amp (peak) supplies seem to work fine.

One of the first things noted after connecting up is that Kenwood have at long last put a finger hole back in the tuning knob. I think the last Kenwood to have one was the old TS-430S. Let's hope it becomes a standard feature.

This was one time when reading the book came second. Most of the normal controls are very straightforward. Received audio was excellent through the internal speaker and superb through a good external one.

The Lo/width Hi/shift controls work in different ways for different modes. For SSB the "Lo" shifts the low frequency cut off usually in 100 Hz steps where the "Hi" control shifts in 200 Hz steps. The widest bandwidth obtainable on SSB receive is 0 Hz to 6 kHz. I am not sure if the response actually goes down to 0 Hz or not; I didn't make any measurements quite that low!



Top view of the TS-870 with the case removed and the front panel hinged down. Note the cooling fan in the centre, and the auto antenna tuner on the left. The cooling fan was very quiet in operation.

With CW selected, the controls take up their second function, that is width and shift. The width control selects the width of the bandpass and the shift control places that bandpass in the required portion of the audio spectrum. The effect can be followed on the visual bandwidth section of the meter and on the display which indicates the two frequencies selected.

Now to the anti-QRM features of the TS-870. To start with, the controls discussed above play a big part in reducing off-channel interference. The DSP filtering has vertical sided selectivity that can lop off interference with minimal effect on the audio response. The DSP noise and notch controls do the rest.

Of the three controls (auto notch, beat cancel and noise reduction) only one can be selected at a time. The auto notch can take out a single heterodyne with amazing ability. The beat cancel can reduce multiple heterodynes. Note, I said reduce! While very useful, it hasn't the effect of the auto notch. That leaves the noise reduction. Without doubt its main use is for CW and digital modes where it works like magic. For SSB I found that the normal noise blanker was as good and some times better. Of course, you can use the two together for possible improvements.

Note, too, that the auto notch can only be used on SSB while the beat cancel can be used on SSB and AM. The noise reduction can be used on all modes. One slight problem with the noise reduction is that there is no panel control to adjust the degree of reduction.

The fourth DSP button is for SSB transmit audio equalisation which I will discuss in the transmit section. The receiver AGC deserves a mention because of its extreme versatility. Firstly, through the menu system, you can customise each mode to have any desired characteristics of AGC decay time or even switched off all together. In addition, there is a front panel control which allows the decay time to be set from fast to very slow or to switch the AGC off completely.

The RIT on the 870 has been upgraded compared to the TS-850. It is now the +/- 9.99 kHz type as used on the TS-930/940/950 instead of a simple potentiometer with a centre detent. A great improvement.

Now let's start talking. The TS-870 is supplied with an MC-42S microphone so it's just a matter of plugging it in and away we go on SSB.

There are two key sockets, unfortunately both on the back panel. The one for a straight key, a bug or an electronic keyer is a 3.5 mm socket while the one for a paddle is a 6 mm or standard $^1/_4$ inch socket. The straight key socket is a two circuit while the paddle is a three circuit. The in-built keyer has a number of features that will keep the CW enthusiast happy for a very long time. I will run through just a few of its amazing facilities.

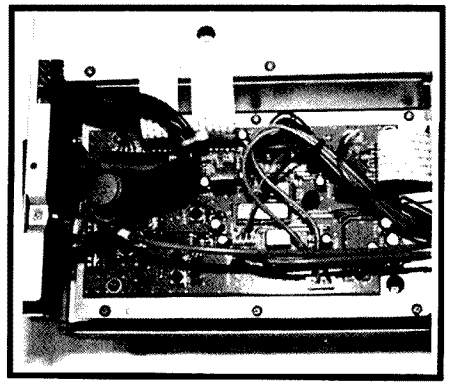
Selectable automatic character spacing, message loop capability for continuous replay, automatic contest serial number generation, and it is programmable via commands sent from the key. Even if you are not a CW enthusiast, try this out. You will be amazed.

There are just as many options available for the phone operator. You can select your transmitted bandwidth, speech processor plus response equalisation. Reports on the transmitted voice quality indicated it was good, but not outstanding. I tried several other microphones with much the same result. Some of the overseas reviews have given rave reports on the transmitted audio. I couldn't duplicate them. In all, a competent performer with more bells and whistles than we have ever seen before.

Kenwood MC-42S Microphone

It seems that this microphone has been around for a long time. Kenwood brought it out when they released their first synthesised transceivers around 1982. During the intervening years they have had both eight and six pin connectors fitted, although the six pin type has disappeared over the last few years. It is still one of the best hand-held microphones supplied with Japanese transceivers. The microphone element is a 600 ohm dynamic unit of better-than-normal quality.

The only thing that goes wrong is that the up/down buttons lose their "click" after a few years of use. Fortunately, the fix is easy. Under each button is a thin layer of rubber (about 1 mm thick) which goes hard. With a thin, sharp, pointed knife cut this rubber away and back comes the "click". There is no doubt this microphone has stood the test of time. It has also been used in slightly modified form with the TS-50S. There seems to be no reason why the MC-42 should not continue for a long time yet.



A close-up of the extensive filtering on the DC input lead to the TS-870.

Kenwood TS-870 On Test

I carried out the usual series of tests including two SSB transmit frequency response tests to check the action of the DSP variable transmit bandwidth control.

However, as usual, the transmit power output and current drain were measured on all bands.

Band	Power Out	Current Drain
1.8	120 watts	18.0 amps
3.6	120 watts	18.0 amps
7.1	115 watts	17.5 amps
10.1	115 watts	17.5 amps
14.2	110 watts	17.0 amps
18.1	110 watts	17.0 amps
21.1	107 watts	17.2 amps
24.9	105 watts	17.5 amps
28.5	108 watts	17.8 amps
29.5	108 watts	18.0 amps

With the power control set to minimum, the power output was 10 watts on all bands.

I then carried out tests to estimate the transmitter intermodulation distortion. As usual, this was done by comparing the test transceiver with a transceiver with known distortion figures. It is interesting to note that intermod tests reported in overseas magazines seem to

vary over wide parameters for the same type of transceiver. As I presume that these testers have access to professional spectrum analysers, I cannot give an answer as to why this occurs.

However, the TS-870 produced the best result of any transceiver so far tested with my standard method. My normal transceiver produces distortion of about -35 dB, but the TS-870 was at least a couple of dB better. It was so good that my reporter had trouble getting a figure because it was so far down.

The transmitter power output was also checked with the automatic antenna tuner in circuit. The loss through this averaged about five watts, although this was very dependent on the degree of mismatch and, in some cases, went as high as ten watts with a 5:1 mismatch on 29.5 MHz.

I decided to carry out two frequency runs on the transmitted SSB response. The first one was at a normal setting that would possibly be chosen by many operators, that is 300 to 2600 Hz. Maximum power was set at 15 watts output and the speech processor was turned off. As can be seen from Graph 1, the result was very smooth with a 3 dB peak at 2 kHz and a gentle drop-off at the low end. At 300 Hz the response was down 11 dB.

The next run was taken with the response set to 100 to 3000 Hz. Note from Graph 2 how the low frequency now extends well down with 100 Hz being -16 dB (referenced to 1 kHz), and how the top end is extended out to 3.5 kHz at -6 dB. The strange thing is that these tests did not show up any reason why the transmitted audio was generally not liked. Being able to set the response virtually to anything you want should produce superb quality.

Again, the few overseas reports I have been able to read about the TS-870 have all commented on the "excellent" transmit audio. No doubt time will tell who is right. By the way, I did try the rig out on the Travellers' Net control stations and they didn't like it either. I used several microphones in my on-air tests, including a Shure 444, Kenwood MC-60, Kenwood MC-50 and, of course, the supplied Kenwood hand microphone. Some were preferred to others but no one found the quality as good as my old Kenwood TS-940.

Carrier and sideband suppression were better than anything measured in the past. My estimate is that they were both in excess of -70 dB which, with the superb intermod distortion figure, all adds up to an extremely clean signal.

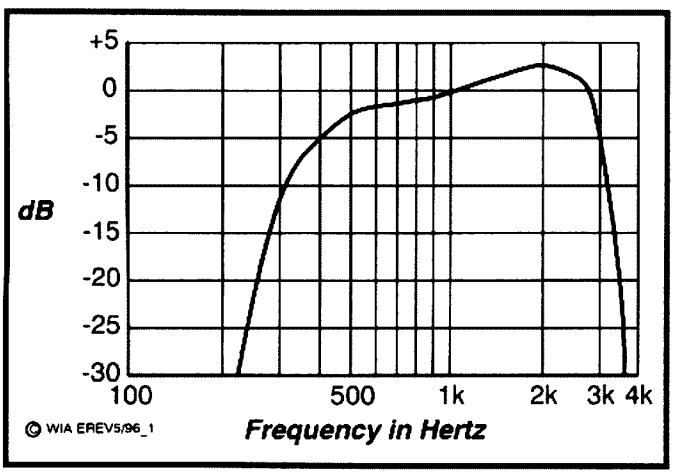
Receiver Tests

The first receiver test was to check the S meter calibration. The meter on the 870 is similar to the type used on the TS-850 and TS-450 and also on a few other Japanese transceivers. It is a fluorescent display with thirty segments between S0 and S9+60 dB. Calibration points are at S 1, 3, 5, 7, 9 and +20, 40 and 60 dB. My figures were taken with the AIP and attenuator off; in other words with full receiver gain and with the receiver tuned to 14.2 MHz.

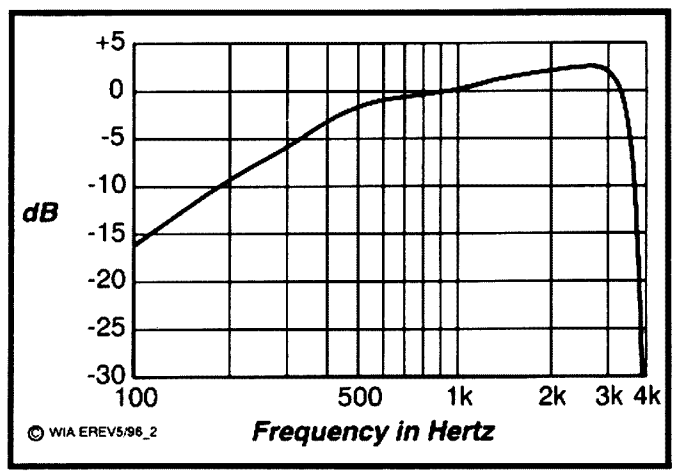
Reading	Voltage
S1	1.0 µV
S3	1.5 µV
S5	3.0 µV
S7	7.0 µV
S9	30.0 µV
S9+20 dB	200.0 µV
S9+40 dB	1200.0 µV
S9+60 dB	.02 volt

The receiver attenuator is switched for -6, -12 and -18 dB. These all measured spot-on, but again I would like to see the addition of at least a -24 dB position. For instance, -18 dB isn't enough attenuation to give meaningful reports on antenna front-to-back measurements.

The AIP gives a gain reduction of about 10 dB. I didn't carry out any receiver frequency response checks for SSB, but a few interesting observations might be in order. The bandwidth, like the transmitter, can be set for any requirement. I found that the best AM reception was obtained in the SSB position with the bandwidth set for 7 kHz. The received audio was flat to nearly 7 kHz and sounded very much better than using the AM mode with 6 kHz bandwidth which only gives a top response of about 3 kHz. However, with the widest bandwidth selected, the AM receive quality is almost Hi-Fi. Here are my measurements:



Graph 1 – Transmit audio response of TS-870 on 14.2 MHz, no compression, 15 watts output at 1 kHz, response set to 300 – 2600 Hz.



Graph 2 – Transmit audio response of TS-870 on 14.2 MHz, no compression, 15 watts output at 1 kHz, response set to 100 – 3000 Hz.

Frequency	Response
50 Hz	0 dB
100 Hz	+2.0 dB
400 Hz	+1.5 dB
1 kHz	0 dB
2 kHz	-1.5 dB
3 kHz	-3.0 dB
4 kHz	-6.0 dB
5 kHz	-12.0 dB

Just try your favourite AM broadcast receiver and see how it compares with that.

Receiver audio output was measured with an eight ohm load connected to the external speaker output. Maximum power was 2.35 watts at 25% distortion. At 2.1 watts the distortion had dropped to 10%, thus exceeding the specified 1.5 watts at 10% by a wide margin. At a normal listening level of 300 milliwatts, the distortion was down to 0.4% which makes it one of the best that I have measured.

The final check was for receiver sensitivity. At 14.2 MHz this measured 0.2 µV with a signal-to-noise ratio of 14 dB, which is slightly better than the specified S/N of 10 dB. The sensitivity actually improves at higher frequencies, going to better than 0.1 µV for 10 dB S/N at 29 MHz. These figures were taken with the AIP and attenuator off.

Of course the technical tests only tell half the story. The ability of the DSP to set the transceiver to suit any conditions or preference of the operator is quite amazing and really sets the TS-870 apart from other rigs.

TS-870 Instruction Manual

Kenwood have gone to a lot of trouble to put this book together. Its 100 plus pages cover subjects you might not expect to find. There is information on short wave listening, a list of the NCDX beacon network, and a full list of HF beacons. Operating instructions cover fourteen chapters and cover such subjects as installation, getting acquainted, operating basics, menu setup and communicating. A full circuit diagram and block diagram are included. I rate the TS-870 instruction 8 1/2 out of 10.

Conclusion

I guess the main feature of the 870 is the fact that you really don't need to buy any extras apart from a power supply. The DSP gives you an almost infinite array of filters that would cost a small fortune in a standard transceiver. In fact, it would be impossible to duplicate the 870 filtering in a normal transceiver. If you are a CW operator then you will find everything here you will need. The Logikey K-1 memory keyer would please the most ardent CW operator. On receive, the DSP noise reduction and selectivity options bring new heights to CW operating.

During my on-air tests with the TS-870, I was asked by two TS-850 owners if they should or should not trade up to a TS-870. As both were SSB operators and only spend a minimal time with CW, I was hard put to give them an answer. In the end, my advice was to stick with what they already had unless they were able to arrange a side-by-side test with a TS-870 to determine if the latest model provided the improvement that they hoped for. I guess this applies to all purchases.

Our review TS-870 was supplied to us by Daycom Communications of 44 Stafford Street, Huntingdale 3166. Current price for the TS-870 is $4,400; the matching SP31 speaker/filter unit is $209; a matching power supply is $720; and the DSP compatible desk microphone is $470. You can phone Daycom for further information on (03) 9543 6444.

* *24 Sugarloaf Road, Beaconsfield Upper, VIC 3808*

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WIA News

EMC Standards and the Homebrewer

Many amateurs are keen on making electronic and communications equipment for themselves, either from kits provided by electronics suppliers, clubs or Divisions, or entirely from their own resources, from design to finished assembly.

This activity is an important aspect of self-training, which is fundamental to the Amateur Radio Service, and which the WIA actively supports.

However, some concerns have arisen within the amateur radio community as to how the new electromagnetic compatibility (EMC) standards might affect this aspect of amateur radio activities.

From 1 January next year, makers of electrical, electronic and communications equipment, assemblies and systems will have to comply with standards and regulations on EMC. There has been a "voluntary compliance" regime operating in Australia since 1 January, this year.

Basically, EMC is defined as the ability of electronic devices and systems to operate without harmful mutual interference with other electronic devices and systems.

In Australia, the new EMC compliance framework applies to completed products (whether components, subassemblies or self-contained) offered for open sale, according to Standards Australia.

Kits and home-built equipment are excluded. Ardent homebrewers can breathe a collective sigh of relief.

Compliance with EMC standards and regulations comes under the authority of the Spectrum Management Agency. Standards and regulations are developed in conjunction with Standards Australia and the Radiocommunications Consultative Council (RCC).

In Europe, the European Union's legislation on electromagnetic compatibility, known as the "EMC Directive", came into force on 1 January, this year. In the United Kingdom, the Radio Society of Great Britain (RSGB) had concerns that kits for home construction by radio amateurs would be affected by the EMC Directive to the extent of being subject to expensive independent testing and certification.

The RSGB recently obtained advice from the relevant local authority that kits assembled by UK radio amateurs do not have to comply with the European Union's EMC Directive.

■ Antennas

Some Useful Wire Antennas for HF

Part 3

Rob S Gurr VK5RG concludes his series on wire antennas.*

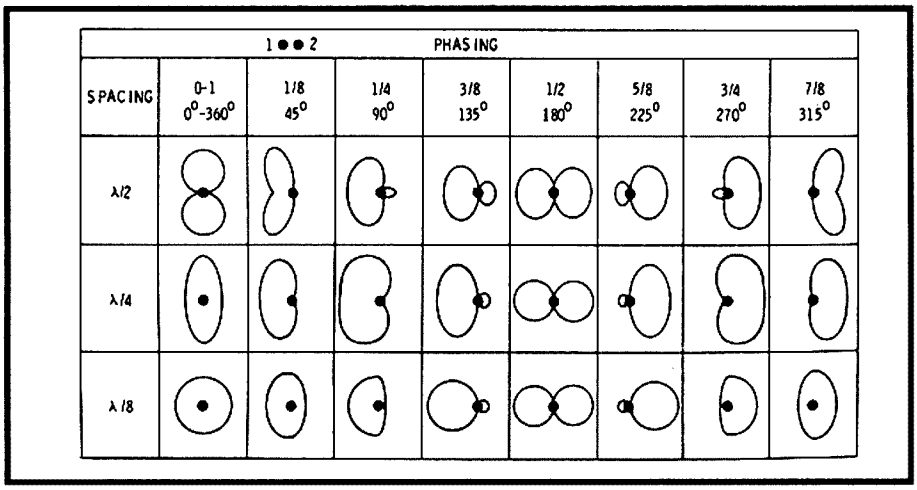

Figure 22 – Radiation patterns for a two element phased array.
(Reprinted from the Radio Handbook, twenty-first edition, page 27-12)

Quarter Wave Sloper

This must be the cheapest effective and useful antenna available. In the simplest form it may be considered a quarter wave vertical, but fed at the top instead of the bottom. The "ground plane" is the support tower and the mass of the other beams and antennas mounted on the tower. I have fabricated a mast clamp that enables me to secure it to the top of a tower, and from this clamp have run a quarter wave wire to a nearby pole or tree. A coaxial cable socket is available to connect the feedline. Tuning is by altering the length of the wire a few inches either way, as guided by an SWR reading, or noise bridge.

The initial SWR should be quite low; however, it may be improved by moving the bottom of the wire from place to place in the yard. Best SWR may sometimes be time consuming to achieve, but it will be worth it. The antenna has a low angle of radiation, and on 7 MHz has provided me with USA contacts that have not been possible on a centre fed dipole. If you have a tower and a spare coax running to its top, this is a "Bonus" antenna.

Full Wave Loop

The use of a full wave horizontal loop at a very low height has become popular throughout the world in recent years. Erection of a large multiband array in a moderate size suburban backyard has been the wish of many hams. Although not large, the full wave loop has a great deal to offer.

In its general configuration, a full wave of wire is suspended (as a square of equal sides), at between three and ten metres above the ground. One corner, or the centre of one side, is fed with open wire line and the array matched at whichever frequency is desired. The radiation is predominantly through the plane of the antenna and, therefore, directly vertical to the ionosphere. This is of great assistance, as reflected power is toward the ground and may spread over up to 1,000 km.

There is a need to consider some aspects of the ionosphere to understand the working of such an antenna:

1. The ionosphere surface is not a clear reflecting plane as is a glass mirror. It is a most uneven surface, with sections so irregular in shape, that reflections may occur at many angles, hence the resultant broad geographic coverage (both on long distance hops or local vertical incidence paths as in this case).

2. There is a frequency above which the radio wave is absorbed by this surface, varying from time to time, season to season, known as the critical frequency.

The overall benefits of such an antenna are, therefore, good low frequency coverage over a local path and at no great expense of supports. Above the critical frequency, at perhaps 14 MHz, random lobes from the horizontal wires, which may have a reasonably low angle of radiation, can give acceptable DX performance.

A number of such low antennas may be used for multiband work. I mention them mainly in the context of their low frequency usefulness. A typical antenna may be erected as a 10 metre-a-side loop on three metre high masts, or on short poles protruding from the top of fruit trees, and give a 7 MHz signal into a nearby state comparable to a full size dipole at 15 metres, used by another ham for DX work. The principle here is never to consider your back yard too small to erect an antenna which will be effective in some way or other! The point at which such a loop is fed is more a matter of convenience than an electrical requirement, although the need to retain symmetry should be observed. I have seen some fed with coaxial cable via a balun; however, the practicality of using it on a number of bands makes the use of open wire line very attractive.

Alternative Forms

I have encountered many of these antennas with a terminating resistor opposite the feedline point, as well as some with an open circuit at this point. These may provide some with an experiment or two to work out the worth of such modifications.

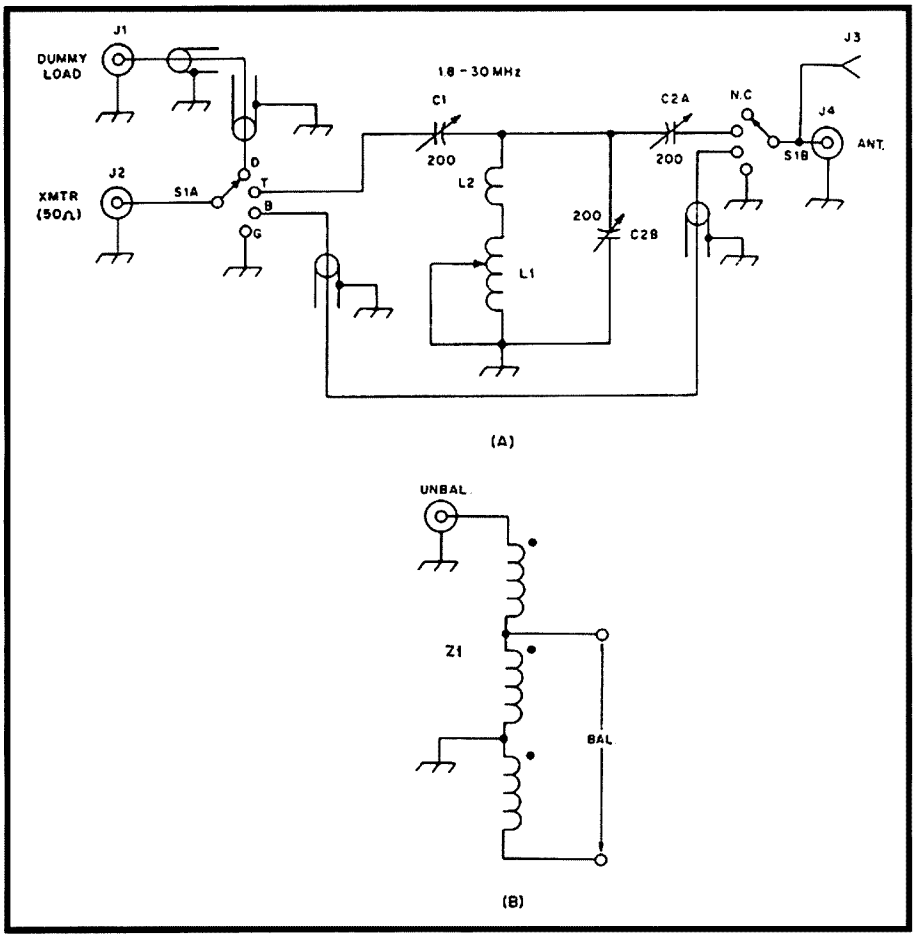

Figure 23 – Schematic diagram of the SPC transmatch. Capacitance is in picofarads.
(Reprinted from the ARRL Handbook, 1988 Edition, page 34-16)

Antenna Tuning Unit

Coupling the feedline of the antenna to a transmitter is arranged through an antenna tuning unit (ATU). This item may be treated as a "black box" that matches the impedance found at the end of our feedline, on the various bands, to the 50 ohm load impedance of our transceivers. The feedline lengths may be chosen to arrange for either a current or voltage node to be present at the ATU terminals, where either a series or parallel resonant tuned circuit would simplify the adjustments.

Modern tuning units of the "SPC" (Fig 23) or "Z Match" (Fig 24) designs are more tolerant to complex impedances and it is not necessary to use "resonant" feedline lengths with these. The components within these ATUs are altered, by the adjustment of the controls, for a reverse power between the transmitter and the ATU of zero. This completes the matching process.

Z Match Antenna Tuning Unit

The Z match antenna coupling unit has been very popular for a number of years, since it was featured in ARRL and RSGB publications, and more recently in *Amateur Radio* magazine. Many units have been described using an assortment of coil dimensions and layouts, including single and two coil set ups, and units to cover from 1.8 to 30 MHz.

I have had success with the RSGB version (Fig 24), which covers 3.5 to 30 MHz only, and have now successfully built a number of these. My modified version has been copied by several VKs, and while the RSGB description gives excellent information on coil construction, the suggested layout gives extremely long leads to the 14-30 MHz range coil, which is overcome in the modified version (Fig 25).

This layout places the higher frequency coil directly between the fixed terminal lugs on the two gang (H gang!) capacitor. On both the RSGB and ARRL circuits, each link is marked for 3.5/7 or 14/21/28 MHz, which has caused difficulties for many constructors, as some feedline lengths present impedances to the coupler which may be matched better by the alternative connection.

I solved this problem by using a 3-position, 2-pole switch which allows the twin feeder to be connected to either link (positions 1 and 2) or to the external terminal mounted on the rear panel of the coupler (position 3). This last terminal allows the twin feeder to be used as a top-loaded vertical antenna on 1.8 MHz through an additional antenna coupler, or as a general coverage receiving antenna.

The coils may be 63 mm and 75 mm in diameter, as shown in the diagrams, and 14 to 16 SWG wire is suitable. The coils should first be wound around a cylindrical former (eg an electrolytic capacitor) of smaller diameter, and then threaded into the holes in the perspex support. A suitable adhesive (eg plastic

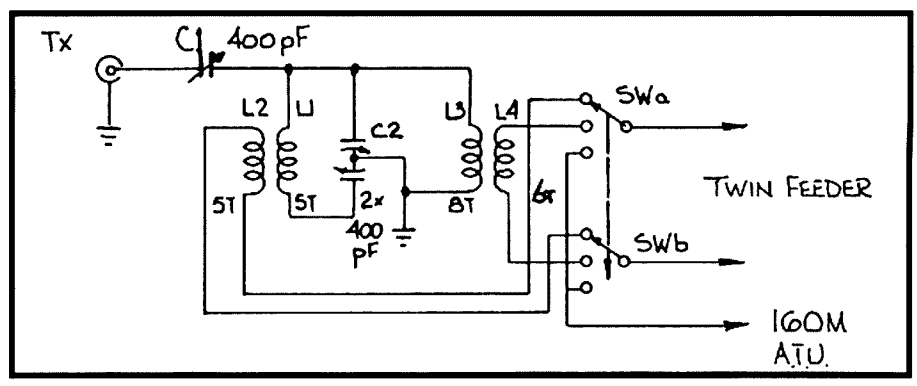

Figure 24 – The Z Match.
(Reprinted from Amateur Radio, September 1984, page 17)

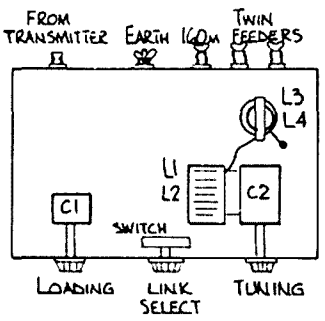

Figure 25 – The Z Match layout.
(Reprinted from Amateur Radio, September 1984, page 17)

cement) may be used to fix the coils in the holes (Fig 26).

For power up to 100 watts, standard single- and two-gang broadcast receiver tuning capacitors are quite suitable, with Stromberg "H" gangs preferred. For higher power, a pair of transmitting variable capacitors, with adequate plate spacing, should be used. Note that C1 needs to be insulated from ground and from the COUPLING control knob. The frame and rotor of C1 should be connected to the transmitter output, while the stationary plates should be connected to L1.

A most essential requirement is the use of vernier dials on the drive shafts of the two capacitors. It is impossible to tune capacitors of these maximum values with the fine accuracy needed to set the match correctly, without such dials.

The "Z" match is constructed on a simple U-shaped chassis, with a second U-shape of perforated metal as a top cover. The front panel controls are LOADING, LINK SELECTION and TUNING.

The unit should be used with a good earthing system. A minimum 1.5 m length of 20 mm galvanised water pipe should be driven into the ground immediately behind the antenna coupler and, from an earth clamp on this pipe, a length of 6 mm² or larger copper wire run to the earth terminal on the ATU. One to two metres of wire should be enough. Additionally, bonding of this earth system to nearby water pipes, galvanised steel carports or other metallic structures will improve efficiency when using unbalanced-feed antennas.

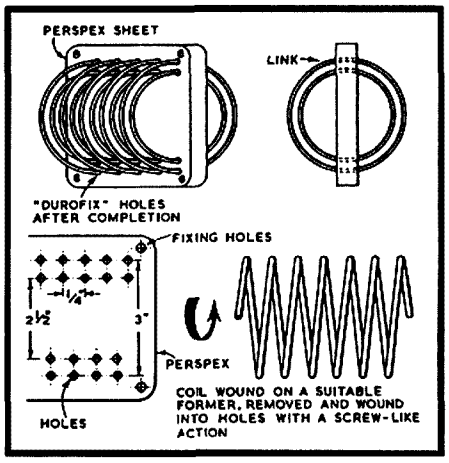

Figure 26 – Coil construction for the Z Match.
(Reprinted from the RSGB Amateur Radio Handbook, third edition, page 369)

Although the Z match will normally be used with balanced lines, I have frequently used it to couple to coaxial cable, and have a standard connector mounted on the rear panel, adjacent to the balanced terminals and suitably insulated from the panel. A small switch or jumper clip may be used to earth the outer of the coaxial socket to the chassis, should this be necessary.

Dipoles

In Fig 27 I have presented 15 ways of feeding a half wave dipole – there are surely more! Few of these may be used with multiband wire antennas; however, all give a great basis for further experimentation with antennas.

It may come as a surprise to a large proportion of readers that there are so many possible methods. I offer them as a starting point for your next antenna matching experiments.

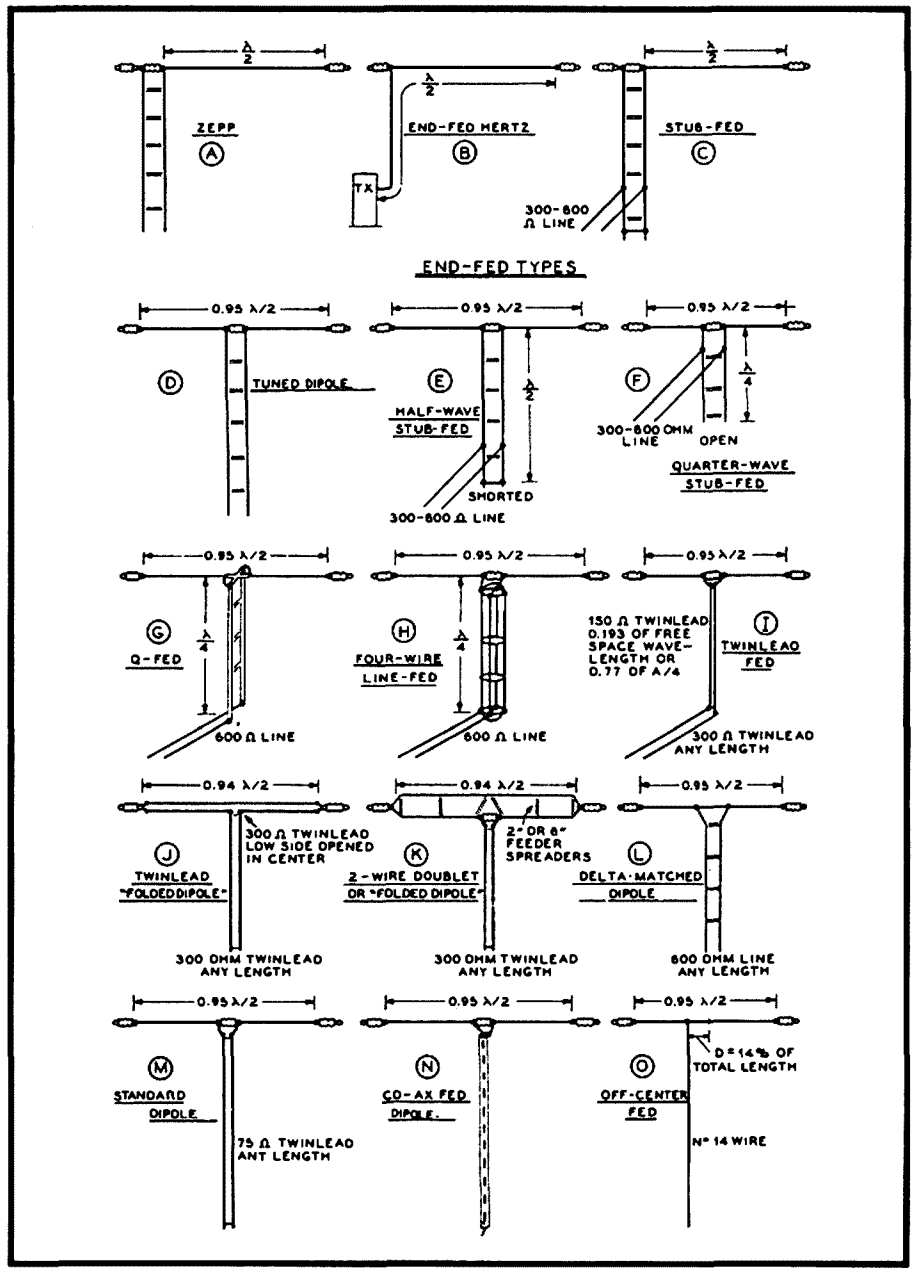

Figure 27 – Feed systems for a half-wave dipole antenna.

Conclusion

I have presented some useful antennas in this article. Some basic details have been supplied and a few hints given on methods of construction. No paper on this very broad subject can be complete in all details; however, I refer you to the list of publications, to read, and conduct experiments with some of my comments in mind.

I am sure you will have plenty of fun, learn a lot about antenna theory, and obtain plenty of contacts with all parts of the world. I cannot help solve the current high frequency propagation problems. However, with a suitable antenna, you should have good contacts when the various bands are open.

Further Reading on High Frequency Wire Antennas

Wire Antennas; Rob Gurr VK5RG, *Amateur Radio* September 1984.

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High Frequency Dipole Antennas; Joe Carr K4IPV, *Ham Radio* June, 1989 (p12).

Non-resonant Delta and V Beam Antennas; Robert Wilson KL7ISA, *Ham Radio* May, 1990.

High Frequency Directive Arrays; William Orr W6SAI, *Radio Handbook 20th Ed*, Ch 24 to 29.

Multiband Antennas; Chip Angle N6CA and others, *The ARRL Antenna Book 15th Edition.*

Antenna Projects: John Bloom KE3Z and others, *The ARRL Handbook 1985,* Ch 33.

Novice Antenna Handbook; Doug DeMaw W1FB, ARRL 1988.

W1FB's Antenna Notebook; Doug DeMaw W1FB, ARRL 1987

ZL Special 2 m Beam; Fred Judd G2BCX, *Out of Thin Air*, Practical Wireless.

Horizontal "Zeppelin" Antenna; page R 38, *Handbook of Wireless Telegraphy, 1938* (Admiralty).

ARRL Antenna Compendium Vol 1, 1985 Edition.

ARRL Antenna Compendium Vol 2, 1989 Edition.

ARRL Antenna Compendium Vol 3, 1992 Edition.

Low Band DXing; John Devoidre ON4UN, ARRL 1987.

Antenna Anthology; ARRL 1978.

Practical Wire Antennas; John D Heys G3BDQ, RSGB 1989.

Acknowledgments

The author acknowledges some drawings and diagrams copied from the following publications:
Radio Handbook, Amateur Radio, ARRL Publications, RSGB Publications, and *Ham Radio.*

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Gain of V Beam

The author would like to make a slight amendment to Part 2 of this series, on page 7 of *Amateur Radio* for April. Referring to V Beams, it is stated that terminating each end remote from the feed-point with a 400 ohm resistor to ground will produce not only a uni-directional pattern but "a benefit of up to 3 dB additional gain".

On energy-conservation grounds it may be argued that absorbing some power in the resistors, which would otherwise be radiated in a particular direction, cannot increase the power radiated in another direction. The front-to-back ratio will become large, but to expect further gain (approaching 3 dB) is rather optimistic.

It may be, because in the terminated case the current distribution along the wires is a travelling wave, not a standing wave, that the energy-conservation concept is an over-simplification and some additional gain may in fact be possible; but it is likely to be much less than 3 dB.

WIA News

Propagation and Ionospheric Data on the World Wide Web

In addition to high frequency radio propagation and ionospheric data provided by Australia's IPS Radio and Space Services at their own Web site, a new service originating in the United States provides five comprehensive global maps of ionospheric and propagation data on the World Wide Web, updated hourly.

For HF band operators, global maximum usable frequency (MUF) maps are accessible at http://solar.uleth.ca/solar/www/realtime.html.

Global maps of the F2 layer's "critical frequency" – the frequency at which a vertically incident signal will penetrate the F2 layer (known as "foF2") – can be found at http://solar.uleth.ca/solar/www/fof2.html. This data is useful for some computer propagation programs.

Enthusiasts of the 160 and 80 metre bands will find the global maps of E layer critical frequencies (foE) of interest, at http://solar.uleth.ca/solar/www/foe.html. This data is also useful for some computer propagation programs.

Information on the likelihood of propagation over non-great circle paths can be determined from global maps of the height maximum of the F2 layer (known as hmF2) accessible at http://solar.uleth.ca/solar/www/hmf2.html. This is the altitude above the Earth's surface where the electron density of the F2 layer is at its maximum, otherwise known as the F2 layer peak.

Global maps showing the elevation angle of the Sun above or below the horizon for any location on Earth – that is, the "solar zenith angles" – can be found at http://solar.uleth.ca/solar/www/zenith.html. The solar zenith is the point on the Earth's surface where the Sun is seen directly overhead. This changes with the seasons, as the Earth moves around its orbit.

Each map shows the plotted sunrise/sunset line, known as the solar terminator, together with the so-called "grey-line corridor" where the Sun is up to 12 degrees below the horizon, and the solar zenith point, along with the location of the auroral ovals in the northern and southern hemispheres. The auroral ovals locate where aurorae are most likely to appear overhead, given a geomagnetic storm induced by solar particles captured by the Earth's magnetic field, often occurring about 40 hours after an intense solar flare, the particles creating intense, field-aligned ionisation in the ionosphere extending down to heights of 100 km. This information is of particular interest to VHF operators looking for opportunities to exploit auroral scatter propagation on the six and two metre bands. The maps of the auroral ovals are based on the latest 24-hour planetary A-index (an index of geomagnetic activity), which is updated three-hourly. The greater the geomagnetic activity, the further from the Earth's magnetic poles the auroral ovals expand.

Sign up a new WIA member today – we need the numbers to protect our frequencies and privileges

■ Antennas

Beer-Can Antennas

Sakari Mattila VK2XIN/OH2AZG describes an interesting and effective antenna which is fun to make.*

Maybe the best part of making a beer-can antenna is acquiring the construction material. The main part of the beer-can antenna is an open can, like a neatly opened fruit-can or something similar. The second essential part is the radiator probe, also called a monopole or sonde. The beer-can antenna looks typically like Fig 1 from Ref 3. One can expect gain to be 8 – 12 dB over a dipole, depending on the length of the can. The best design formulas are in the *RSGB VHF-UHF Manual* (see Ref 3).

Beer-can antennas have been made of various aluminium or steel cans but, for best results, they should be made of copper or brass tube with a copper end plate. The end plate should be press fitted or silver hard-soldered to the tube. The tube can also be made of copper or brass sheet. If high performance is important, no tin or lead solder should be left inside the can because it would increase losses in the electromagnetic field inside the can.

The beer-can antenna is fairly broadband and therefore useful for transmitting, typically for more than 10 percent away from the design frequency. Typical VSWR response for a 3.4 GHz beer-can is in Fig 2 from Ref 5. The radiation pattern stays relatively good over the whole useful frequency range.

The bandwidth depends, in some degree, on the length to diameter ratio of the probe. A beer-can antenna can be tuned by varying the length of the probe, using a dielectric sleeve on the probe and a tuning screw just opposite the probe, or using tuning screws like in other waveguide radiators. Usually it is easiest to vary the length of the probe by putting a small brass screw at the end of the probe. A small hole for adjustment can be opposite the probe. The adjustment tool must be removed from the can before testing it otherwise it will detune the antenna.

Beer-can antennas are known as circular horn feeds and are mainly used as a feed for parabolic dish antennas. Fig 1 shows the vertically polarised version. Polarisation is as if the probe was an ordinary half wave dipole antenna. Turning the can 90 degrees results in horizontal polarisation.

There can be two probes, 90 degrees apart, which can be selected individually for vertical or horizontal polarisation, or fed together through a phasing network for right or left hand rotating polarisation.

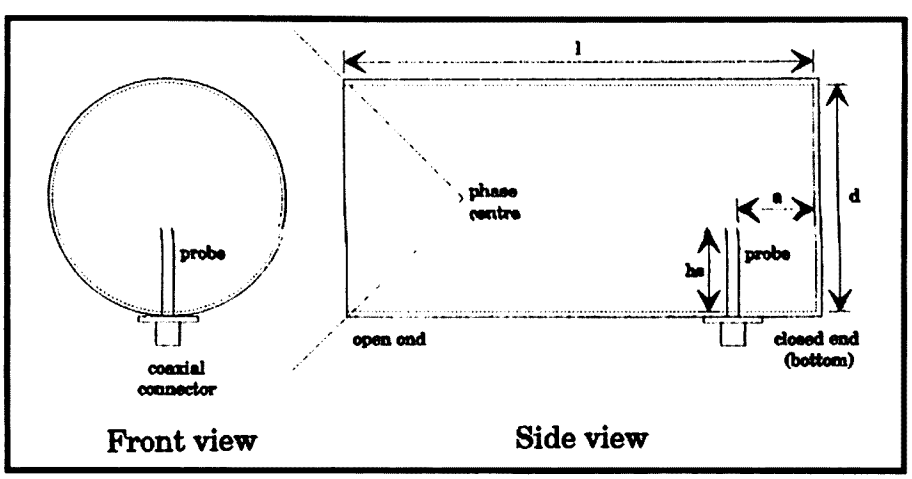

Figure 1 – Basic beer-can.

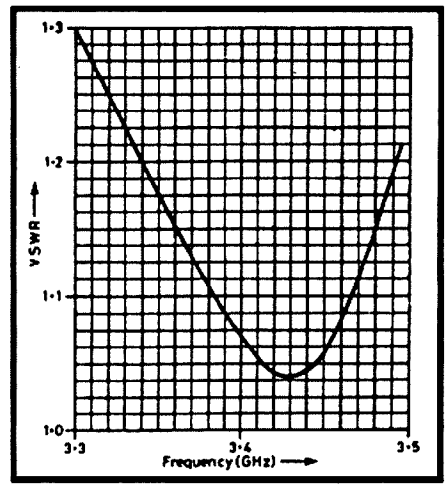

Figure 2 – VSWR versus frequency for a 3.4 GHz beer-can.

Rotating polarisation can also be made using a dielectric (Teflon) vane placed in the front part of the can. Satellite-TV front-ends, also known as LNBs (low noise blocks), use magnetic polarisers (see Ref 17). A magnetic polariser can only give two alternatives, usually horizontal and vertical polarisation.

The beamwidth and gain depend on the length to diameter ratio of the can. A longer can results in a narrower beam and increased gain. There are certain limits for this ratio, but beamwidth can also modified by a scalar ring put on the can near the open end, or a dielectric cone put on the open end like a bullet on a cartridge. The scalar ring, or the dielectric cone, can also improve the radiation pattern of the beer-can radiator by attenuating side-lobes and making the main lobe more suitable to illuminate the parabolic dish.

In Table 1 there are several beer-can designs from 1.2 GHz to 12 GHz. The length is not critical and varies widely with various designs for the same frequency. Beer-cans have been built for the 70 cm band, but are then more like a bucket antenna with a diameter of about a half metre. Some general design rules from various sources are shown in Table 2.

The beer-can antenna has, like all waveguides, a sharp cut-off frequency. Below that frequency it does not radiate at all. The cut-off frequency is when the corresponding free space wavelength is longer than 0.586 times the diameter of the can.

Table 1 – Practical beer-can designs for 50 ohm feed.

l (mm)	d (mm)	a (mm)	hs (mm)	ds (mm)	freq (MHz)	comments
239	165	59	53	3.2	1269	Ref 7
451	152	133	51	3.2	1269	Ref 7 – two sondes (hor/vert)
305	178	102	61	1.6 #14	1269-1296	Ref 10 – FD=0.25-0.5 (Note 1)
231	155	57	45	6	1296	Ref 9 – 130 Deg -10 dB (Note 2)
559	150	140	46	3.2-6.4	1297	Ref 3
175	120	42-48	35	4	1693	Ref 15 – FD=0.4
240	96	33	40		1691	Ref 1 – FD=0.33
160	128	76	36	3-8	1691	Ref 6
107	83	55	29	2	2304	Ref 9 – 130 deg -10 dB (SWR > 2)
312	84	76	25	3.2-6.4	2305	Ref 3
320	100	47	31.5	1.6	2308 #14	Ref 10 – FD=0.25 -0.5 tunable (Note 3)
81	73	29.5	20.4		3430	Ref 5 – FD=0.25 – 0.40
87	58	21	19	2	3456	Ref 9 – 130 deg -10 dB
103	54	21	19	2.6 #10	3456	Ref 4
208	56	51	18	3.2-6.4	3457	Ref 3
175	58	38.5	21.5	5	3800	Ref 11 – FD=0.4 (Note 4)
57	37	13	10	2	5760	Refs 9 & 12 – 130 deg -10 dB
60	38	13	10	2.6 #10	5760	Ref 4
43	25	10	6.6	1	10 GHz	Ref 4 (Note 5)
48	20	9	6	1	10 GHz	Ref 12
77	18	10	x	2	12 GHz	Ref 16 (Note 6) BSB Compact (with Teflon polariser and beam shaper)
105	20	12	7	2.3-2.6	12 GHz	Ref 11 – FD=0.4 (Note 7)

Note 1: This antenna is tunable with a scalar ring; beamwidth can be varied by moving the scalar ring; the probe is made of number 14 copper wire.
Note 2: 10 dB beamwidth is 130 degrees.
Note 3: FD value is the focal distance to dish diameter ratio for suitable reflector.
Note 4: The probe is tunable.
Note 5: The probe is made of the centre conductor of semi-rigid coaxial cable.
Note 6: The probe is part of the LNA printed circuit board, about 2 mm wide extension into the tube.
Note 7: The probe is tunable with a dielectric sleeve.

In the tables, l is the inner length of the can, d is the inner diameter of the can and a is the distance between the probe and the bottom, ie back wall of the antenna. Probe length is hs and probe diameter is ds; f is design frequency; L is the free space wavelength of the design frequency; and G is the waveguide wavelength of the design frequency. FD is the focal distance (F) to dish diameter (D) ratio.

Design rules for a beer-can antenna vary in different books. In the *VHF-UHF Manual* (Ref 3) are the following rules:

1. The diameter of the feed (d), must be more than 0.586 times the wavelength in air (L) at the design frequency.
2. The length of the beer-can (l) preferably should exceed a waveguide wavelength (G), where G = L/sqr(1-(L-43.3*d)*(L-43.3*d)) For d = 0.65L the length should be greater than 2.4 wavelengths; and for d = 0.7L, the length should be greater than 1.8 wavelengths. The thinner the tube, the longer it must be.
3. The radiator probe should be about 3 – 6 millimetres in diameter and have an overall fixed length of about 0.2 L, ie less than a quarter wavelength. It can be tuned as described above.
4. The distance between the probe and the closed end is in the region of a quarter of the waveguide wavelength (G/4); it can be tuned by moving the probe closer to or farther from the closed end.
5. The E-plane (horizontal) 3 dB beam width is 29.4*L/d and the H-plane (vertical) 3 dB beam width is 50.0*L/d. Note that all measurements must be in millimetres. For the d = 0.65L beer-can, the E-plane

Table 2 – General design rules for tubular radiators (beer-can).

Dimensions are in relation to free space wavelength (L) or waveguide wavelength (G); probe diameters are in millimetres.

l	d	a	hs	ds	freq	Comments
1.0-1.5L	0.75L	0.37L	0.25L	–	1/L	Ref 2
>0.8L	0.71L	0.35L	0.23L	–	1/L	Ref 8 (dual-mode)
>2.4L	0.65 – 0.70L	0.25L	0.2-0.25L	3-6 mm	1/L	Ref 3 (d min 0.586L)
0.5G-1.5G	L/1.71-L/1.31	graph	0.20L	3-8 mm	1/L	Ref 6 (graphs & theory)

beamwidth is 46 degrees and the H-plane beamwidth 78 degrees; the mean value corresponds to a focal length to diameter ratio (fd) of 0.56.

A beer-can can be used as a microwave antenna by itself. As a feed radiator it is useful only for a large primary focus dish because the beer-can feed element can shadow the dish too much. With offset feed there is no shadowing, but the dish is more difficult to illuminate evenly. When using it with a dish the focal point of the dish is in the phase centre of the beer-can. The phase centre is inside the beer-can as marked with X in Fig 1.

One of the problems with the beer-can is asymmetry of the horizontal and vertical beam widths. This can be corrected with a scalar ring or a dielectric cone. More about scalar rings is in the DUBUS article (Ref 10), and about polarisers is in *Satellit-TV Handboken* (Ref 11). The Weather Satellite Handbook (Ref 6) contains some theory in addition to 1.7 GHz antenna designs.

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13. VHF Communications 1/1976

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15. VHF Communications, 3/1979, p 135

16. BSB Compact satellite TV LNB for 12 GHz satellites with circular polarisation. This LNB contains polariser and conical beam shaper made of Teflon.

17. Badenhauser, R: Outdoor satellite receiving equipment. Elektor Electronics (UK), July/Aug. 1995, p 22-25 – dual-polarity LNBs – magnetic polarisers and dual probe systems.

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WIA News

New WIA Members

The WIA bids a warm welcome to the following new members who were entered into the WIA Membership Register during the month of March 96.

L21012 MR J W LEE
L21013 MR M MEI
L30929 MR D DEVENEY
L50340 MR R JORDAN
L70134 MR L J BAILY
L70135 MR S M CLARK
L70136 MR A BRADSHAW
VK2CGR MR G S RIGG
VK2CT MR S REEVES
VK2DBL MR B A LINSLEY
VK2EEH MR J F KARAS
VK2EFD MR B D GALL
VK2ESL MR S A LISLE
VK2HEX MS C J TAYLOR
VK2HRG MR R A GREEN
VK2HUZ MR T M HUGHES
VK2JHM MR J H MARTIN
VK2KSI MR M BOGOS
VK2LBK MR R F KENNEDY
VK2LEE MR L T NOONAN
VK2MSD MR S M DRAKE
VK2TCL MR D P HARRIS
VK2TFK MR R E EBELING
VK2XDW MR D WILLIAMS
VK2XIS MR S D PAULEY
VK3AMH MR W SADLER
VK3IIL MR R SLOSIAR
VK3JMB MR D PRICTOR
VK3KVT MR V G TAYLOR
VK3MGH MR G HYNES
VK5KEE MR E J WILLIAMSON
VK5VC MR D H BIRD
VK6KRP MR R D PEDRI
VK6ZGO MR B A G WHEELER
VK7CCC MR J W MCCULLOCH

■ Regulatory

Submission on Licensing: Concerns and Questions Addressed

Roger Harrison VK2ZRH, Federal WIA Media Liaison Officer*

With the exposure draft of the submission now well and truly in circulation, thanks to its publication as a supplement in the April issue, this article expands on a number of issues raised in the submission, and addresses some concerns and questions raised by members.

This article has been prompted by constructive comment from Federal Councillors and some Divisional Councillors, together with immediate feedback to the exposure draft from a number of members. Several Divisions have discussed with the author early feedback to the exposure draft, from which it became clear a number of issues could be clarified by further expansion, and some common concerns and questions needed answering. These are addressed by way of a series of summarised questions, with following answers.

What was the point of releasing the exposure draft just before the election? So that it would not "get swamped" in the round of policy launches and party responses, and would be more likely to be noticed during "the quiet before the storm" of election day, Saturday, 2 March, and subsequently remembered post-election. Given the responses from some politicians already, the strategy achieved its basic purpose.

As the WIA has to deal with the parliament in order to have legislative changes to the Radiocommunications Act, the result of the election was immaterial. Releasing the exposure draft before the election, was done to signal that the subject of amateur licensing would be an issue the WIA would be taking up with the 38th Parliament.

Even if a submission were submitted 6-9 months ago (assuming a capable and comprehensive submission could have been assembled at that time), the legislative process would in all likelihood still have been in progress by the time the election was called this year. Amateur licensing would hardly be a top legislative priority. Reality rules, OK?

Why was the submission kept "under wraps" for so long – why weren't details of different parts released for discussion earlier? The submission, or any parts of the draft were not kept "under wraps" at all. A considered reading of Sections 4 and 5 of the exposure draft (on the existing licensing systems and the proposed new amateur licensing system, respectively) shows that the arguments against applying the existing licensing systems to amateurs and the arguments for a new licensing system are interdependent, and themselves dependent on the factual material presented in sections 2 and 3 ("About Amateur Radio" and "The Value of Amateur Radio to the Community").

Justification for the proposed new licensing system depends on the arguments as to why the present licensing systems fails to meet the unique needs of the Amateur Radio Service. Hence, the different parts of the draft submission do not stand alone and thus have to be read as a whole. This is no mere excuse for the time between planning the submission and producing the exposure draft (10 months), but a matter of fact. Experience with submissions shows that parliamentarians, and especially the Government, will reject rhetoric and quite reasonably demand clear argument well supported by factual documentation, notwithstanding what passes for debate in the House.

The searching out and consideration of a large number and wide variety of sources in the assembly of the material pertinent to sections 2 to 5 of the exposure draft was not a linear, step-by-step process. Submissions such as this are not assembled in the same manner as assembling technical documentation for electronic equipment, or for computer software, which is generally a measured, stage-by-stage production process. A framework for the proposed submission was first discussed among the Federal Council and the Divisions in April 1995, a draft circulated to the Divisions and agreed, then released to the Divisions for broadcast and other publicity. The submission framework is reproduced in the accompanying panel. The principles behind the framework detail, to form the argument and proposal, were identified through Federal Council discussion between December 1994 and April 1995.

After the submission framework was released last year, it was not then a question of sitting back and waiting for material to come in, but of actively seeking out sources and solutions and considering their pertinence. In the process, inevitably, a number of "blind alleys" were explored, but at least that revealed what information would not help, and why. Such matters as the possibilities for Class Licensing or Spectrum Licensing of the Amateur Radio Service were considered and rejected for reasons outlined in Section 4 of the exposure draft.

All WIA Divisions were well aware over April and May last year that input to the submission from all amateurs was required, and the submission framework was circulated to them to publicise in any way they saw fit. The framework and call for input was publicised on

Division broadcasts and published on the packet radio network, and was thus widely circulated. Responses from a number of amateurs were received, along with input from Divisional and Federal Councillors in the following months. The publicity was refreshed in November, at the instigation of the Federal Council following a report and discussion at the October 1995 WIA meeting, via a WIA News item issued on 8 November also published in the December issue of *Amateur Radio*.

As a considerable amount of material had been assembled by year's end, the areas needing further information were then apparent and, as talk of a federal election was increasing, a letter was sent to all Divisions asking for further, specific input on the value of amateur radio to the community, with a deadline of 10-11 February. At the suggestion of the Western Australian Division, this was published on the packet network. This exercise resulted in a considerable amount of useful material being submitted.

The idea that amateurs should have a licensing system quite separate from that applying to the commercial, scientific and military sectors is not new. It was certainly a matter of debate when the author first obtained a licence more than 30 years ago, and has waxed and waned over the decades since. When the House of Representatives Standing Committee on Transport and Communications Infrastructure (HORSCOTCI) considered over 1989-1991 moving to a spectrum management system based on commercial/economic concepts, the WIA saw the looming threats to the Amateur Radio Service and argued, in submissions to the HORSCOTCI inquiries, against the application of such a system to radiocommunications services of a non-commercial nature, in particular amateur radio. The basis of the proposed Operators Licence stems from this background.

Why not ask for a Class Licence – the SMA once offered it? The idea of Class Licensing the Amateur Radio Service surfaced in the "kite flying" phase of the SMA's Inquiry Into the Apparatus Licensing System. The contention circulating within the amateur radio community is that, because individual users are not charged a fee under Class Licensing, then Class Licensing for amateurs would mean we'd have a fee-free licence!

The definition of Class Licensing says that individual frequency assignments are not required, and amateurs don't have this; we have bands allocated according to the ITU allocations and the Australian Radiofrequency Spectrum Plan. However, the definition authorises any person "to operate radiocommunications devices of specified kinds". That means type-approved equipment. Class Licences apply to equipment, and/or the purpose for which it is used. CBers operate under the Class Licence system. Equipment must be type approved to be sold in Australia. Cellular mobile telephones are Class Licensed.

One of the strengths of amateur radio is the fact that we are individually licensed, and thus each licensee is known to the licensing authority. Would it be wise to forgo this strength for a fee-free licence? To retain amateur radio's traditions of freedom to experiment, to have individual call signs and to have a degree of self-regulation and all the other privileges we enjoy, yet to operate under the Class Licensing system would be asking to severely distort that licensing system to our ends in order to achieve a fee-free licence. Clearly, such an argument is self-defeating, apart from the ramifications of the effects on the privileges and freedoms so hard won over the years and jealously guarded.

Class Licensing for the Amateur Radio Service in Australia was not rejected out of hand.

Why not ask for a Spectrum Licence? Likewise, Spectrum Licensing for the Amateur Radio Service in Australia was not rejected out of hand. The concept of Spectrum Licensing is comparatively new, legislated into formal existence with the Radiocommunications Act 1992. It confers a licensee a right to use an allocated block of spectrum which is akin to a property right, like that of Torrens Title to real estate. However, it operates more like a lease as the tenure (or "rights to use") is limited to 10 years and the Act confers no presumption of renewal, except where it can be demonstrated to be in the "public good". The spectrum licensee can sub-let his spectrum in whole or in part, charge fees for usage and set conditions on usage. He is effectively the "landlord" of the block of spectrum licensed to him. While a spectrum licensee might come from a "primary user" group (primary uses of spectrum being defined in the Australian Radiofrequency Spectrum Plan), there is no reason why secondary users could not be issued a spectrum licence. As you know, the Amateur Radio Service in Australia is allocated bands variously on a primary user and secondary user basis.

The management of the frequencies allocated under a spectrum license is primarily the responsibility of the licensee. Except under limited circumstances, the SMA plays no part. However, authorities from the Communications Law Centre caution that the rights and entitlements, and responsibilities, of a spectrum licensee are only likely to be sorted out in the courts as the whole concept is new to the law.

Apart from the complexity of spectrum licensing the Australian amateur bands en bloc, there is the question of just who would be the licensee? What about the HF bands, which are shared internationally, and how would we combat intruders on the HF bands if the responsibility for management of our spectrum was thrown entirely onto the spectrum licensee? What about the amateur-satellite allocations, which are also shared internationally? If intruders appeared on one of our primary user allocations, such as happened recently with hang glider enthusiasts from overseas using the 2 m band, would we have to take the offenders to court ourselves for "trespassing" on our spectrum? Apparently, this is an issue yet to be settled in law.

Spectrum Licensing the Amateur allocations in Australia would offer advantages, in so far as technical freedom to experiment is concerned. It would likely strengthen our position in protecting our primary band allocations.

The biggest single drawback of Spectrum Licensing for amateur radio in

Australia is the 10 year tenure limitation, without presumption of renewal. At least Apparatus Licensing offers regular renewal. Every decade we'd be going to the government of the day and attempting to prove renewal would be in the public good. In some ways, that might influence the amateur radio fraternity to keep on its toes. However, in this instance, too, Communications Law Centre authorities caution that the test of public good is only likely to be resolved in the courts. Would we want to be pioneers, here? You know how to recognise pioneers, don't you? They're the guys lying face down with arrows in their backs!

Section 3 on the value of amateur radio highlights some good examples, but surely there are hundreds more – shouldn't these be included, even if summarised? It might be viewed that Section 3 of the exposure draft is a bit "light on", that more detail is better than less. The opposite view could also be taken, that it's too long – no politician has the time to read it.

As the exposure draft is the "first pass" of the submission, key examples for six areas (identified in Section 7 of the framework) were selected for inclusion. A balance of past and recent examples were chosen. Yes, there are hundreds more.

It was felt necessary to clearly demonstrate through specific, factual examples, that amateur radio is, and has continuously been, of value to the community, and indeed returns value to the community.

It is this volume of material which principally supports the submission's contention that no Spectrum Access Tax be levied on radio amateurs, together with the fact that amateur radio is, by definition and law, a non-commercial service. Of necessity, the case must be as strong as we can possibly make it.

In any event, the final submission will include an Executive Summary (see the accompanying panel), which will summarise the proposal and outline the supporting arguments and evidence detailed in the relevant sections.

One area not covered in the exposure draft, but which deserves serious consideration for inclusion in the final submission, is the ability of the Amateur Radio Service to generate and foster international goodwill.

What about licence fee concessions for pensioners and students? The Operators Licence proposal seeks to remove the $10 Spectrum Access Tax, and to reduce the SMA's administrative costs, to further reduce amateur licence fees – below the resulting $41.

The proposal suggests two means of reducing the SMA's identified licence renewal costs, the principal recurrent cost in amateur licensing. That is: a licence term of five years (doing away with the cost of annual renewal notices and licence re-issue), and devolving call sign administration to the WIA. These measures would result in a significant fall in administrative charges, likely to be well below the previous licence fee, thus providing a cost advantage students and pensioners did not previously enjoy, which would flow equally to all

licensees. Additional arrangements to provide concessions for students and pensioners would likely add some extra cost to the administration of amateur licensing, forcing up the base cost for all. The simpler the system, the better.

Why weren't the IARU and other countries' amateur radio societies asked to write condemning the Australian licence fees and supporting the submission? The Australian Government, as does the government in every country, has sovereignty over the administration of the radiofrequency spectrum within the country's borders and territories. While the amateur bands are allocated by international treaty through the ITU, and the terms of that treaty are, by and large, reflected in the Australian Radiofrequency Spectrum Plan, the ITU treaty does not confer any enforceable obligation on the Government.

A sovereign government has the right to pick and choose how it will allocate and administer spectrum for its country. Countries can and do make frequency allocations differing from the ITU spectrum plans and treaty conditions, but also in derogation of them. Australian Limited licensees having access to the 6 m band is a case in point where, in the past, the Australian authorities acted in derogation of the ITU regulations. New Zealand amateurs having access to a band at 600 MHz, and US amateurs access to a band at 900 MHz, are examples where governments have made allocations differing from the ITU plans.

Given this, expressions of support from the IARU and other countries' amateur radio societies, while possibly providing some "comfort", are not wholly germane to the submission's contentions and arguments. In any case, it would be imprudent to seek expressions of support without the overseas societies knowing what we're seeking and why – which is set out in the exposure draft. Seeking overseas support is a question needing further discussion and evaluation.

Why did the Institute only object to the Spectrum Access Tax in the exposure draft, why not earlier? It was the Institute which identified the Spectrum Access Tax as a key point of objection to the new fees regime proposed by the SMA in December 1994, issuing a press release on 30 December 1994 highlighting this and other issues. That press release was headed "New Tax Hits Community Group". The story was picked up by The Age newspaper and published on 3 January 1995, sparking a run of press stories and comment around the country in the following weeks.

The argument advanced was that the Spectrum Access tax is a tax on knowledge and skill gained through self-training at no cost to the community; the community gains a resource of people having a practical understanding of electronics and communications and related technologies; the knowledge and skills are used to return value to the community through community service in times of emergency and through assisting community events; the knowledge and skills gained through an interest in amateur radio leads young people to take up scientific or technological careers.

The arguments, circulated within the amateur radio community, that the Spectrum Access Tax is for revenue purposes and should not be imposed on amateurs for that reason, that amateurs have never before had to pay a licence tax, that taxes are inevitably increased and amateurs would possibly face massive increases in the future, were

FRAMEWORK for the SUBMISSION

1.0 Introduction

2.0 Scope of this submission

3.0 Executive Summary

4.0 The Nature of the Amateur Radio Service
- ITU definition
- the scope of Radio Amateurs' activities
- the International Amateur Radio Union

5.0 The Wireless Institute of Australia
- structure - the Divisions & Federal WIA
- brief historical background
- role in the Amateur Radio community
- participation in the IARU
- representation role and activities, nationally and internationally

6.0 The Amateur Radio Service and the Radio Frequency Spectrum
- the ITU and Amateur Radio Service allocations
- Amateur Radio Service spectrum allocations in Australia
- Amateur Radio Service spectrum allocations in other countries

7.0 The Value of the Amateur Radio Service to the Community
- self-training in radiocommunications and related technologies
- education of young people in radio and related technologies
- motivating young people to take up scientific/technological careers
- contribution to the advancement of scientific knowledge
- contribution to the development of technology
- providing communications links in community emergencies
- providing communications links for community events

8.0 WIA Representations on Licensing
- prelude to the Radiocommunications Act 1992
- submissions to HORSCOTCI - 1990, 1991
- submissions to the SMA *Inquiry into Apparatus Licensing*
- WIA-SMA consultations during 1994
- WIA meeting with the Parliamentary Secretary to the Minister for Communications, Paul Elliott

9.0 Radiocommunication Licensing Systems under the *Radiocommunications Act 1992*
- Apparatus Licensing
  - purpose
  - advantages
  - possibilities for the Amateur Radio Service
  - limitations for the Amateur Radio Service
- Class Licensing
  - purpose
  - advantages
  - possibilities for the Amateur Radio Service
  - limitations for the Amateur Radio Service
- Spectrum Licensing
  - purpose
  - advantages
  - possibilities for the Amateur Radio Service
  - limitations for the Amateur Radio Service

10.0 A New Licensing System - *The Operators Licence*
- Definition and explanation
- Advantages
- Recommendations
  - administrative arrangements
  - fees regime
  - framework for implementation

found to be flawed and gain little or no sympathy from legislators. All taxes are for revenue purposes (although some taxes are applied for additional purposes, eg regulation of a market, as applies with petrol and tobacco). Taxes don't inevitably increase. An array of various taxes, including personal income and company taxes, were decreased in recent years. The Radiocommunications Act 1983 formally introduced radiocommunications licence fees as a tax. The contentions above, still being advanced, are emotive and easily rebutted by the authorities.

Why not push for removal of the Spectrum Access Tax now, the rest can wait for when the submission's finished? It does our cause more good to have a clearly set out, integrated and self-consistent proposal, eliciting identifiable and well-supported goals seen to benefit both the amateur radio community and the administration of the Amateur Radio Service in Australia, than to take a piecemeal, fragmented approach based on emotive rhetoric which takes no account of the consequences to the whole existing constitution of amateur radio in Australia.

Why wasn't the exposure draft released on packet? The exposure draft consists of almost 100,000 characters (15,000 words). The packet radio network "chokes" on files longer than about 2000 characters; the HF gateways in particular baulk at large files. It would take 50 files of 2000 characters to circulate the exposure draft on the packet radio network.

Alright, some packet operators are in the habit of posting large "documents" as multiple-part bulletins, but the practicality of posting the exposure draft (with some attempt at including the special text highlights) was considered and rejected because it would unnecessarily clog the network to no good purpose when the document was being made available in a more convenient form. It is, however, available on the World Wide Web at http://www.vk5wia.ampr.org/federal/subintro.htm.

LMB 888, Woollahra NSW 2025

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■ People

Australia Day Honour for Amateur

On Australia Day 1996, a Medal in the General Division of the Order of Australia was awarded to Don Hopper VK7NN "For Service to Maritime Safety and Rescue Communications". This award was made to Don in connection with a 12 year involvement with yacht emergencies on amateur radio, and his services as a Volunteer with the Marine Rescue Co-ordination Centre in Canberra.*

Don thinks it may be the first OAM honouring an Amateur Radio Emergency Service. Don's marine communications activities over the years are outlined in the following article, which is a condensed version of a talk he gave in 1995 to Tasmanian amateurs.

I became an amateur in 1981 and was first on air in Madang PNG. I heard Tony's Net, and was shocked to find the flood of illegal stations operating MM (mobile marine).

I discovered that Pacific Island Authorities were issuing licences without examination – Caroline Islands – Solomon Islands – Western Samoa – Cook Islands – Tuvalu (I understand this has now ceased).

Also, unlicensed operators were running MM Nets on amateur radio. For example, Rowdy's Net has been run now for 20 years by TI7RT, Rowdy Taliaferro, an American. First in Hong Kong, then Macao, Singapore and now Phuket. Rowdy will allocate a callsign to any yacht which comes up on his net without a callsign. Usually a TI Costa Rica, EL Liberia or HP Panama.

Many have been the protests I have made to the DoTC (now the SMA) over the years without their efforts producing any results. I suspect that internationally the authorities prefer to have Rowdy operating. Many yachts on Rowdy's Net have been investigated on arrival at their destination.

Emergencies

My first involvement in a MM emergency was when I was in Madang in 1981 and the skipper had malaria. I had the local doctor come to the shack and advise treatment.

My first emergency when I had retired (I had been a marine pilot) was "Big Bear" 5W1DR. This was a call sign issued by Western Samoa without examination. The yacht was in big seas, with strong winds off Moreton Island. He had no charts of the area. I had him take radar bearings and I was able to identify headlands and establish his position. It was too rough to talk him into Moreton Bay so I gave him a course to steer to Mooloolaba.

Another yacht, T2WES, a callsign allocated by Tuvalu without examination, called me from the Coral Sea with the skipper unconscious. A doctor diagnosed cerebral malaria.

The fastest rescue was from the "Windstar", unlicensed for amateur radio. The female crew member, Merin, advised me they were off Suva and the skipper was unconscious. It was nine minutes from the time I advised Canberra until a helicopter was on the way to the yacht.

After handling a few emergencies I was known at the Rescue Co-ordination Centre. The Director asked if I would be a Volunteer with the Centre and handle Marine Emergencies in the Pacific which arose on amateur radio. He explained that, whilst the Coast Radio Stations were their communication medium, they were not permitted on amateur frequencies. I was happy to accept as it was something I understood from my seagoing life, and in retirement I could not have wished for a more interesting project.

Cruising Amateurs

By 1982 practically every yacht cruising the Pacific had amateur radio

on board. They would listen for the excellent weather information on amateur radio and only a minority adopted illegal callsigns. The rest had amateur radio for use in an emergency, which was acceptable under International Regulations.

It was interesting that, during the 12 years I was involved with Marine Emergencies, over half the emergencies were with yachts not licensed for amateur radio. This perhaps indicates the widespread installation of ham radio on yachts for emergency operation.

I asked the DoTC the situation regarding MM Net operation and whether the taking of position reports was taking over the duties of Coast Radio Stations. I also queried the weather information given on amateur radio and whether this conflicted with the duty of the Coast Stations to provide this service. In 1984 I received a reply from the DoTC advising there was no objection to the operation of MM Nets which included the taking of position reports and the passing of weather information. Provided, of course, that radio regulations were observed.

On receipt of this letter I flew to Melbourne and had an afternoon with Mr Gavin Brain in charge of DoTC Regulations. I did this as I had another problem with an anti MM group claiming that the MMs and the nets were involved in breaches of third party regulations and engaging in commercial traffic.

Mr Brain advised me to just keep in mind the financial reward aspect. If, for example, an MM asked someone to phone his stock broker and sell some shares, this was a breach of regulations. The request that mail be redirected to a yacht's next port was not considered a breach.

Pressure

At this time I was a Gold Coast District Councillor with the WIA and we were having considerable pressure from our Federal Councillor and others to push for Morse code to be eliminated or restricted to a small window on 20 metres.

Mr Brain had seen reports of this in minutes of our Annual Meeting of Queensland Clubs. He said he instituted monitoring of 20 metres and was advised that CW was still the most used of all the modes. He commented that if pressure to restrict CW continued he would consider introducing a 60 wpm typing requirement for RTTY mode operation.

Distress

Under International Law and the International Telecommunication Union [ITU] Regulations, a vessel in distress, that is "Mayday", or with emergency traffic where a "Pan" call has to be made, may take any means at its disposal to attract attention, make known its position, and obtain help. As "Hams" our regulations also come under these ITU Regulations.

Distress means the vessel is in imminent danger. A "Pan" call (Urgency) indicates the vessel has a very urgent message to transmit concerning the safety of the vessel or the safety of a person.

On amateur radio, as soon as Distress Traffic commences, amateurs must abide by the International Distress Traffic Regulations. The station in distress, or the station controlling the distress traffic may impose wireless silence on all stations or any station interfering with distress traffic.

When handling distress traffic, I found my biggest problem was the amateurs who kept breaking in with suggestions whilst wireless silence was imposed.

The station in distress is in control of distress traffic but, under ITU Regulation No 3136, he may delegate control to another station. With yachts in distress I always had the yacht delegate control to me. With a merchant ship in distress it was practical for the Radio Officer on board to retain control. However, a yacht distress invariably created a degree of panic with everyone on board involved with the distress. It was, therefore, wiser to delegate control.

At all times I was under the direct instructions of the Marine Rescue Co-ordination Centre in Canberra. If a ham picked up a distress call he immediately phoned MRCC (reverse charge) as required by our Regulations. He would then be told to listen for me on the frequency and I would take over the handling of the traffic. This worked well if the ham knew the Regulations. On many occasions delays occurred when hams, not knowing the regulations, would phone the local police, Coastguard, etc.

With Merchant Ship Distress, strict procedure was followed, with the Coast Radio Stations under the control of the MRCC. However, whilst I operated under the control of the MRCC, strict procedure was not adopted with yacht emergencies. It was often necessary to re-assure those on the yacht and endeavour to be a calming influence.

Emergencies

Often yachts or small vessels in an emergency will call *"Mayday"* and only say *"Am abandoning ship"*. In this instance it is up to the station hearing the distress call immediately to ask him where he is, and obtain other information, if possible, such as the name and callsign of the vessel, the nature of the distress and assistance required, the number of people on board and any other information which may facilitate rescue.

On two occasions I heard *"Mayday, am on fire, abandoning ship"*. I immediately responded with no callsign, *"Where are you, I cannot assist unless you give me your position"*. In both cases they gave their approximate location before abandoning the vessel.

One said *"Michaelous Cay"*, nothing more. It was about 7 pm and dark. I was at sea off Cairns and was unable to raise the local Coastguard or any Coast Radio Station, even when calling *"Mayday relay"*. Finally Auckland Radio answered my CQ call and phoned Townsville Radio for me.

Cairns Coastguard organised a search and one speedboat on the outside of the reef headed for Michaelmas Cay. About six miles nor'east of the Cay they stopped to fill their petrol tank from a four gallon drum. They heard a cry for help and found two men swimming with no life jackets. When their speedboat caught fire, their life jackets were in the bow. As the fire had taken hold they had no alternative but to jump overboard. They sure were two lucky men!

The other instance when I asked where they were, they said *"Off Cape Bedford"*, which is north of Cooktown. My ship was tied up at Weipa at the time. The vessel was a trawler and the two

men were able to get a life raft into the water. They managed to get ashore near Cape Bedford where a freighter saw them next morning and sent a lifeboat in to pick them up.

Complaints

One particular ham on the Gold Coast has an unbelievable hatred of yachties and spent hours every day listening to the MM nets. Whenever he considered there was a breach of regulations he would break in on the net and chastise the alleged offender.

His nose was put out of joint when regulations came into force making it an offence to use a radio to harass a person.

He then collected a group of hams in QLD, NSW and VIC and, between them, they monitored my MM involvement nine hours daily, seven days per week. For six years this group did everything possible to make life miserable for yachties and myself.

However, it was my practice to telephone the DoTC whenever anything arose which I considered might be borderline communications on amateur radio.

For example, I had a call from a yacht off a remote island in the Fiji area. The village water pump broke down and they had no communications with the outside world. The pump engine was an Aussie Southern Cross and a part was required for it. DoTC gave me the OK to order the part. Never once did the DoTC refuse me permission when I had "grey area" communications.

Then the letter writing started, first to the DoTC, then to *Amateur Radio* which published his accusations *(in ignorance of the full story and to show both sides of the argument. Ed).*

Then a letter to me from the Meteorological Bureau advised they could no longer provide me with weather reports for yachts in strong winds and high seas as an amateur had advised them I was breaking third party regulations.

I nominated the ham to the Bureau, denied his accusations and said if I was ever refused weather information for a yacht in strong wind and high seas I would ask the yacht to make the request a Pan call, and the request would go to the MRCC who would have the Met Bureau provide me with the information to pass to the yacht. I continued to receive weather information.

Next came a phone call from Quarantine, asking about third party traffic and whether my advices about yacht arrivals were a breach of regulations. A senior man was sent from Sydney to see me and discuss the matter. I suggested they contact the DoTC for advice. There were no further problems.

The accusations which hurt most were made to Customs. I had been a Volunteer with Customs for 20 years and, when told by Customs that they could no longer accept yacht arrival advices because I was breaking third party regulations, I wrote to the Minister for Customs protesting at this ham's continued vendetta against me and requesting him to seek advice from the DoTC. The Minister wrote to me, clearing me of the accusations and requesting that I continue to support Customs.

Threats

When we moved to VK7, my wife received a letter threatening her and our children if I continued operating amateur radio. I immediately contacted my Federal Police contact in Canberra and gave him the names of the two hams involved with the letter. I do not expect to hear any more from this group.

The DoTC did express concern that yachts were not passing arrival messages via the Coast Radio Stations. At least 90% of the yachts I was in contact with were American who only had to have VHF and, therefore, were unable to use the Coast Radio Stations. Our regulations provide that all foreign vessels advise arrival 48 hours prior to entering an Australian port. Amateur radio was their only means for complying with the regulations. Customs in Brisbane commented on one occasion that they had never received a yacht arrival message from a Coast Radio Station.

(So there it is. Don would certainly seem to have earned his medal several times over! Ed)

*Chalet 43, Leisure Garden Estate, Grindelwald TAS 7277

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ALARA

Sally Grattidge VK4SHE, ALARA Publicity Officer*

Welcome to New Members

Carol ZL1AJL sponsored by Judy VK3AGC; Judith ZL1JDL sponsored by Elizabeth VK3NEP; Claureen VK3LCM; June VK6BNK; Nancy VK2 (no call – yet); Margaret ZL3UD sponsored by June VK4SJ. New YL calls – Joycelin Wright VK4HJW and Tina Clogg VK5TMC.

Special Non-Event Station

The latest news on the special callsign for ALARA's 21st Birthday is that VI21ALARA has been refused. At this stage the plan is to do nothing this year, but plan well ahead for the 25th Birthday.

Monday Night Net

This net is back on its later time of 1030 UTC, now that daylight saving is over for another year, on a frequency of 3.580 MHz +/-. Recently, several YLs who have been absent from the net for a while have been heard again.

Robyn VK3ENX, who was ALARA columnist a couple of years ago, moved house about that time, and has only recently found the time to erect the 80 m vertical. Robyn is also well known to the VK3 Sunday broadcast listeners as one of their regular presenters. Welcome back Robyn.

Marjorie VK2AMJ was on the net infrequently last year being very much involved with the "Australia Remembers" activities. Marjorie cannot always hear all the other stations but always has interesting news to share with us.

Bobbie VK2PXS has been a rare voice on Monday nights, largely due to antenna problems, so it is great to hear her again.

It is good to have regular voices on the Monday nets and really good to welcome new voices and "old" ones returning. The range of subjects discussed is amazing, and it is fascinating to see someone's chance remark produce a dozen different stories from all around Oz.

We know we have a number of "eavesdroppers" so, if you are a YL, please join in (ask the OM to call if you don't have a callsign). If you are an OM you are also welcome once the net has had a couple of rounds. Net Control will call you in or ask the last person on the list to do so. If you turn up late and cannot hear many stations, a good plan is to drop your callsign in the pause as a clearly-heard station hands over.

History Again

Last year many YLs were asked to provide a brief history of their involvement with amateur radio. Thanks go to all those who made the effort to put pen to paper. For the considerable numbers who, for various reasons, did not get around to it, it is never too late, so please think about writing those few words when you can and send them to our Historian, Deb Matthews VK5JDM, at PO Box 61, Moana, SA 5169.

VK3 Lunch

The VK3 girls had their first monthly lunch for the year on Friday, 9 February. Mavis VK3KS, Jessie VK3VAN, Jean (whose daughter Rhyl is a skiing instructor in Soda Springs near Reno USA), Marlene VK3WQ (not on her travels at the moment), Bron VK3DYF, and Elizabeth VK3NEP who attended for the first (but not the last) time. Also present was Gwen VK3DYL who is giving the DX scene a bit of attention at the moment (tell us about it Gwen).

ALARA's president Christine VK5CTY, in VK3 for family reasons, brought her daughter Marion, and word from Raedie that she hoped to attend next month's lunch. An enjoyable time was had by all in spite of wet and windy weather (well, it is Melbourne) and with president and secretary (VK3DYF) at the same table some business was discussed, of course. Itinerant YLs are always welcome to the monthly lunches.

Snap Happy

Christine was in Melbourne for her son's 40th birthday and took her OM's camera to record the event as it had a flash. However, the flash would not work so enterprising Christine used 1/4 second exposure instead, without a tripod! OM had removed the batteries to replace them but, guess what, had not got around to it. There is a moral here somewhere.

Westward Bound

The VK5 YLs have had a meeting to see who is going to Perth and how everyone is travelling. It looks like VK5 is going to be well represented. Contact Christine VK5CTY if you want to find out who is going and maybe share accommodation or travel arrangements.

Fox Hunt

Mary VK5AMD was having fox trouble. The cat and the fox caused a disturbance on the verandah. OM grabbed the gun and fired two shots. One got the fox, and the other hit a tomato bush, two water melons and the hose.

VIP

Christine VK5CTY was visiting the school ship Concordia, when someone on board spotted the callsign she was wearing and invited her to view the radio room. Everyone else was allowed on deck only.

Ouch

Judy VK3AGC was bitten on the foot by a jumping jack ant – they have a nasty bite and can jump high enough to get in your gumboots. While resting the sore foot she is crocheting a huge bedspread in many colours which she hopes to finish before the end of the century.

**C/o PO Woodstock, QLD 4816*

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Awards

*John Kelleher VK3DP - Federal Awards Manager**

"How's DX" columnist, Stephen Pall VK2PS, has supplied the following information on current Hungarian Awards after a request from the President of the Radio Club in the Town of Gyor, to publicise these awards in *Amateur Radio* magazine. There are four awards.

"Gyor is a 725 year old City" Diploma

This award is issued by the MTTOSZ Radio Club of Gyor, for the 725th anniversary of the city's establishment. The award is available to all licensed radio amateurs and SWLs who meet the requirement of one QSO with HG1G special event station, plus three QSOs with amateur stations in Gyor, or stations who are members of the Gyor Radio Club. This is a list of members: HG1S, HG1H, HG1P, HA1AC, HA1AG,, HA1AH, HA1AL, HA1AQ, HA1AR, HA1AS, HA1BA, HA1DAC, HA1DAD, HA1DAQ, HA1DBO, HA1DBV, HA1BN, HA1DCD, HA1DAE, HA1DCY, HA1DDU, HA1KSA, HA1KTK, HA1SC, HA1SD, HA1SF, HA1SN, HA1AV, HA1SW, HA1SX, HA1SZ, HA1TG, HA1TJ, HA1TK, HA1TO, HA1TS, HA1TV, HA1TW, HA1TX, HA1UC, HA1UD, HA1UF, HA1UK, HA1US, HG1DAI, HG1DAM, HG1DAS, HG1DAU, HG1DBB, HG1DBH, HG1DBJ, HG1DBP, HG1DBU, HG1DBX, HG1DBZ, HG1DCA, HG1DCC, HG1DCG, HG1DCH, HG1DCJ, HG1DCK,

HG1DCX, HG1DDG, HG1DDH, HG1DEF, HG1DEH, HG1DEM, HG1DEZ, HG1DFJ, HG1DSP, HG1SJ.

QSOs made between 1 January 1996 and 31 December 1996 are valid for the award. There are no band or mode restrictions. It is not necessary to attach QSL cards with the application, but a copy of your log list has to be validated by two other licensed amateurs.

Applications for this award will be accepted no later than 31 December 1998. The fee is $US5.00 or 10 IRCs. Please send your application to: MTTOSZ Gyor Varosi Radioklub, H-9002 Gyor, Pf79, Hungary.

PANNONIA Award

This award is issued by the Radio Club of Gyor on a worked or heard basis after 1 January 1996.

DX stations have to submit verification of eight contacts from HA1-2-3-4 call areas, comprising two contacts from each call area, on two bands.

The fee for the award is $US5.00 or 10 IRCs. QSL cards are not necessary, but a list verified by two other amateurs is absolutely necessary. Send applications to: The Award Manager, Radioklub Gyor HA1KSA, 9002 Gyor POB 79, Hungary.

Conquest Diploma

This award is issued by the MTTOSZ Radio Club of Gyor, on behalf of, and with the authority of the Hungarian Amateur Radio Society, to celebrate the 1100th anniversary of the establishment of Hungary as a nation.

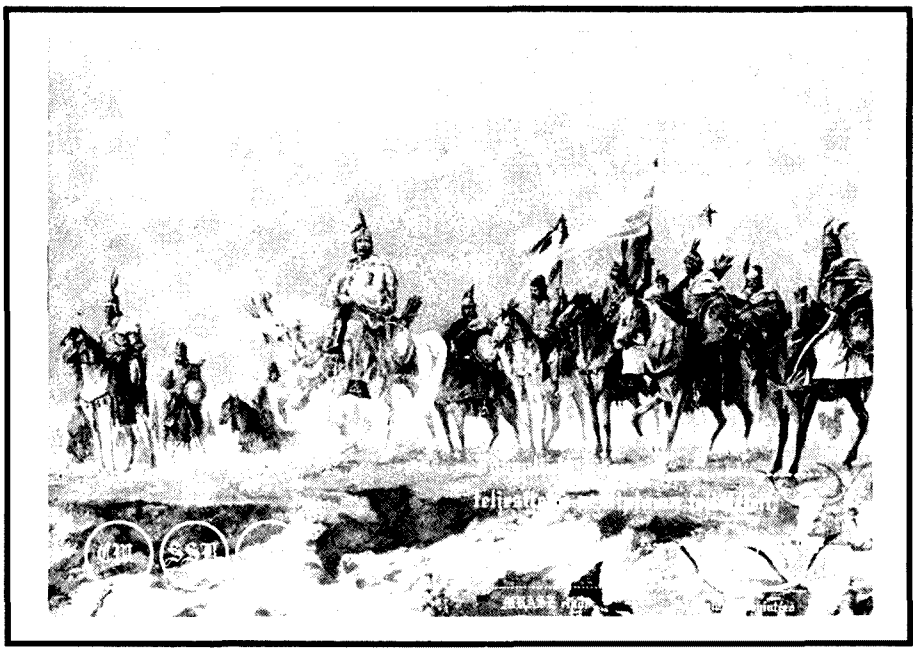
The award is available to all licensed radio amateurs, and SWLs providing they meet the requirement of one QSO with the HG1H special event station, plus one QSO with amateur radio stations in each of Hungary's callsign regions HA/HG 1-0, a total of 11 QSOs.

Any of the callsign regions can be substituted with one of the "Joker" stations HG96HQ, HG1G or HG1P. QSOs made between 1 January 1996 and 31 December 1996 are valid for the award.

There are no band restrictions. The valid modes are CW, SSB, Mixed CW-SSB-RTTY-AM-FM. The basic award can be applied in any category of the above three modes. It is not necessary to attach QSL cards to your application but your list must be verified by two other licensed amateurs.

Applications will be accepted no later than 31 December 1998.

The fee for the award is $US5.00 or 10 IRCs. Please send your application to: MTTOSZ Gyor Varosi Radioklub, H-9002 Gyor, Pf 79, Hungary.



The Conquest Diploma, a colourful A4 size certificate.

PANNONHALMA Diploma

This award is issued by the MTTOSZ Radio Club of Gyor, to celebrate the 1000th anniversary of the establishment of the Abbey of Pannonhalma.

This award is available to all licensed radio amateurs and SWLs if they meet the requirement of one QSO with the HG1P special event station, plus five QSOs with amateur radio stations in the Gyor-Moson-Sopron county. These are HA1 A..B..S..T..U..DAA-DIZ and HG1S, HA1KSA, HA1KTD, HA1KSO, HG1H, HG1G, HG1KSQ, HA1KSS, HA1KTK.

QSOs made between 1 January 1996 and 31 December 1996 are valid for the award. All amateur bands and modes – no band restrictions. It is not necessary to attach QSL cards with the application, but a copy of your log has to be validated by two other licensed amateur operators.

The application may be sent not later than 31 December 1998. The fee for the award is $US5.00 or 10 IRCs. Please send your applications to: MTTOSZ Gyor Varosi Radioklub, H-9002 Gyor, Pf 79, Hungary.

I thank Stephen Pall, and the President of the above Radio Club for this contribution.

For those interested in working US Counties for the USCA award, I have printed out a complete listing of these counties, which can be obtained by sending an oversize SASE and a couple of IRCs to cover printing costs.

**PO Box 2175 Caulfield Junction 3161*

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Dedicated to the memory of JA1MP, the founder of Yaesu Musen, we are proud to announce the release of Yaesu's latest high performance HF base transceiver, the new FT-1000MP.

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The performance of digital processing systems is highly dependent on the quality of software inside the receiver, and here Yaesu's experience with software design really shines through. Yaesu's IF-based EDSP provides 4 random-noise filtering protocols, audio enhancement with 4 equalisation programs for Tx and 3 for Rx, and an automatic notch filter which identifies and eliminates multiple interfering carriers or heterodynes. Front panel selectable EDSP filter contours (Low, Mid, or High-Cut responses; or Bandpass) aid in QRM rejection, providing improved signal-to-noise ratios and razor sharp selectivity. A comprehensive menu system allows you to easily hear the effect of various EDSP settings, so you can choose the best selection for your operating conditions.

In keeping with the improvements that the EDSP facilities provide, the FT-1000MP also provides new features such as selectable flat response or optimised receiver front-ends, 3 antenna connectors (2 main antennas and an Rx-only socket), selectable tuning steps as small as 0.625Hz, and a Shuttle-jog tuning knob for fast QSY operation. For optimised transmit audio, different SSB IF offsets can be set for both normal and RF speech-processed transmissions, and can be used in conjunction with the Tx EDSP functions. Separate bar-graph S-meters are provided for each receiver, and even a synchronous detection system is used for better AM reception on the Shortwave bands.

Standard features include SSB/CW/AM/FM operation, an in-built AC power supply and Automatic antenna tuner, 13.5V DC socket, dual-mode noise blankers, 500Hz CW and 6kHz AM IF filters, full break-in CW, an in-built electronic keyer with memory, a multi-colour high resolution display, an RS-232 computer interface, and a MH-31B8 hand microphone.

With the new FT-1000MP due to arrive soon, now's the time to call us for a copy of Yaesu's 12-page colour booklet explaining more about the FT-1000MP's new level of HF performance and design excellence. We're sure you'll soon agree that the world of HF transceivers has just taken a giant leap forward.

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DICK SMITH ELECTRONICS

AMSAT Australia

*Bill Magnusson VK3JT**

National co-ordinator
Graham Ratcliff VK5AGR
Packet: VK5AGR@VK5WI
AMSAT Australia net:
Control station VK5AGR
Bulletin normally commences at 1000 UTC, or 0900 UTC on Sunday evening depending on daylight saving and propagation. Check-ins commence 15 minutes prior to the bulletin.

Frequencies (again depending on propagation conditions):

Primary 7.064 MHz (usually during summer).

Secondary 3.685 MHz (usually during winter).

Frequencies +/- QRM.

AMSAT Australia newsletter and software service
The newsletter is published monthly by Graham VK5AGR. Subscription is $30 for Australia, $35 for New Zealand and $40 for other countries by AIR MAIL. It is payable to AMSAT Australia addressed as follows:

AMSAT Australia
GPO Box 2141
Adelaide SA 5001

New AMSAT Body Formed in France

The following item appeared recently on CompuServe.
Forum: HamNet <Ham Radio>
Section: Amateur Satellites
Subj : BIRTH OF AMSAT FRANCE
To : Scott W3VS [SysOp], 76703,407
Friday, March 08, 1996 8:25:31 AM
From : MERCIER CHRISTOPHE, 100450,3167 #447355

BIRTH OF AMSAT-F

We are pleased to announce the official birth of AMSAT-France. The president of AMSAT-F is Bernard Pidoux F6BVP.

First aim of AMSAT-F is to support amateur projects like PHASE-3D and MAELLE.

We can also announce that our AMSAT-F homepages are available at: http://ourworld.compuserve.com/homepages/AMSAT_F

It is presently a French "beta" version, but the English translation will be soon published, probably in a couple of weeks. We are also thinking of a German translation!

For more information, please contact:
AMSAT-F
14 bis, rue des gourlis
92500 Rueil Malmaison
France
Email : 100450.3167@compuserve.com

Phase 3D Update

Volumes have been written about the progress of this new bird. With the launch slated for some time this year it's time to summarise the story so far.

With the successful launch of AO-13 in 1988, it was decided to review the future directions of AMSAT. There were preliminary plans afoot for a new generation of geo-synchronous orbit amateur radio satellites, the so-called Phase 4 fleet, to follow the Phase 3 birds. Sadly, the funding analysis revealed that it was beyond the resources of the amateur body to bring this to fruition and it was shelved. It would have required three such satellites to give global coverage and the funds were not available to build and launch even one.

It was then decided to continue with the Phase 3 program but to make the next Phase 3 bird something special. Not just a copy of AO-13 but a very much up-market version with more features, more power and more frequencies. The idea of separate transponders for each mode was abandoned and replaced by a matrix concept. P3D will have a number of receivers and a number of transmitters which can be coupled together in an IF matrix switching arrangement allowing many different combinations to be configured.

Whilst the orbit will be substantially the same as previous Phase 3 birds, the stabilisation will be radically different. Three reaction wheels will control the attitude of P3D so that its antennas will constantly point towards the earth. This will not only give much better communication but will also allow greater flexibility in scheduling the various mode configurations.

Whilst this form of attitude control has many advantages it also creates a rather unique problem. For considerable lengths of time the same surfaces of the spacecraft will be facing the sun and will heat up to dangerously high temperatures. To counteract this, a series of heat pipes have been designed and fitted into the structure. These are thermal linkages of very high conductivity. They consist of closed, evacuated pipes lined with a wick material and partially filled with anhydrous ammonia. The fluid vaporises at the hot end and the vapours move through the hollow core and condense at the cold end. The fluid returns to the hot end through the wick by capillary action. The process requires no power and operates at best efficiency in zero gravity. Very clever!

The funding for P3D has been a constant struggle since its inception. A couple of times it almost had to be shelved. Despite the best efforts of the various AMSAT organisations around the world, the funds are still well short of target. Large donations have been made by various foundations but we must accept that this is an amateur radio satellite. It is up to us to fund it. We cannot expect to free-load on this one. There are many ways of contributing. Your local AMSAT co-ordinator will be pleased to pass the funds on. No doubt there will be many users once P3D is up and running. Don't be tempted to put it off until you see if it's going to meet your expectations; if everyone did that it would never get off the ground.

P3D will have more powerful transmitters than any previous OSCAR. This will allow smaller ground stations but it presents formidable design problems. The solar arrays will need to be larger and deployable since there just isn't enough surface area to have them attached to the frame. Since the available space is limited inside the launch structure, the solar panels will need to be hinged and deployed when in orbit. The array will produce about 620 watts when new and after 10 years will still produce about 350 watts. They cost about 200,000 Deutchmarks and have recently been purchased. The main battery will consist of 20 cells of 40 amp-hour capacity connected to give 22-28 VDC. There will be an auxiliary 10 amp-hour battery.

Since P3D is a secondary payload on the Ariane it must conform to whatever space is available for it to ride into orbit. It was originally hoped that the conical adaptor between the upper stage and the payloads would be large enough to house P3D, and the original design allowed for this method. Not so, unfortunately, and a hasty redesign was made necessary in which we (AMSAT) had to design and produce a cylindrical adaptor of the correct dimensions and tolerances to fit between sections of the assembly and large enough to house P3D. This structure is over 2.6 metres in diameter and had to be machined to a tolerance of 0.05 mm. (two thousandths of an inch)! Easy to see where the money goes, isn't it?

P3D will have receivers on 21, 145, 435, 1268 and 1269 MHz, and 2.4, 2.44 and 5.6 GHz. It will have transmitters on 145 and 435 MHz, 2.4, 10.4 and 24 GHz. It will have a 29 MHz transmitter which will not be part of the matrix but will be used only for broadcasting bulletins.

Components recently arrived at the Florida integration facility are the L band antenna reflectors from France, solar panels from Germany, the X band horns from Finland, the main flight battery and the X band amplifier from Germany.

Next month ...DOHOP... working "double-hop" through RS-10/11 and RS-14.

Bill Magnusson VK3JT, 359 Williamstown Rd, Yarraville VIC 3013*
CompuServe: 100352,3065

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Club Corner

South East Radio Group

1996 Mt Gambier Convention

The SERG's 32nd Mt Gambier Convention will take place on the Queen's Birthday weekend, 8 to 9 June 1996, at the usual place, the very large Mt Gambier Show Grounds Hall.

In addition to a large number of new equipment retailers, the second hand equipment stalls and the book stalls, there will be the usual fox-hunts and homebrew competition.

Drinks and meals will be available and there will be a small entry fee at the door. Accommodation will need to be booked early as Mt Gambier is very busy over this weekend. If you have any troubles, please do not hesitate to contact me.

This annual convention is one of the amateur highlights of the year. Make sure you do not miss out!

Simon Vickery VK5VST
SERG Convention Co-ordinator
PO Box 1103, Mt Gambier SA 5290
(087) 334 435

Summerland Amateur Radio Club

Computer Expo

The Summerland Amateur Radio Club will be hosting a Grand Summerland Computer Expo in the Lismore, NSW City Hall on Saturday, 25 May commencing at 9.30 am.

There will be many commercial displays of the latest in computers and electronic equipment, bring-and-buy tables for pre-loved gear, and an Internet display as well as amateur radio and packet radio demonstrations.

Admission will be $2.00, with lucky door prizes and refreshments available.

For more information, contact Rick VK2EJV on (066) 895 137, or check out the club BBS, VK2SRC-2 v VK2RPL-1 668900, or write to PO Box 524 Lismore, NSW 2480.

Rick VK2EJV

Twin Cities Radio & Electronic Club Inc

Field Day

The Twin Cities Radio & Electronic Club Inc will hold an Amateur Radio Field Day at the Murray High School (corner Kaitlers Road and Kemp Street, North Albury) on 10 to 11 August 1996.

It will commence on Saturday, 10 August around midday with tea, coffee and biscuits on arrival. A live fox-hunt will be held mid-afternoon, and a dinner is planned for Saturday evening with a guest speaker. The doors will open at 0930 hrs on the Sunday.

Items of interest will include commercial dealers stalls, second hand/swap tables, talks and demonstrations on SSTV, packet, Ausat, satellite TV and the Internet. Hot and cold food and drinks will be available.

For further information, please contact Greg Sargeant VK2EXA on (060) 211 741 (BH only!), or Fred Armstrong VK3XLV on (060) 267 350.

Greg Sargeant VK2EXA
Club President

Moorabbin & District Radio Club Inc

Moorabbin HamFest

The Moorabbin HamFest will be held this year, commencing at 10.00 am on Saturday, May 11 at the Brentwood Secondary College, Heath Street, Glen Waverley. Talk-in will be available on VK3RML repeater, or simplex on 146.500 MHz. For further details contact David Armstrong VK3KXJ on (041) 936 8740.

Novice Classes

The Moorabbin Radio Club Novice classes will commence on Wednesday, 15 May and run for a period of 12 weeks between 7.30 and 9.15 pm. For more information, or to enrol, please contact Glenn Moore VK3XXX on (03) 9865 7040 during business hours, or (03) 9531 9301 after hours.

Club Meetings

The Moorabbin & District Radio Club meets on the first and third Friday in each month, the first Friday being a natter night from 7.30 pm and the third a general meeting night commencing at 8.00 pm. Visitors are always welcome. For more information, write to the Secretary, Moorabbin & District Radio Club Inc, PO Box 58, Highett VIC 3190.

Denis Babore VK3BGS

North East Radio Club Inc

Two Metre Morse Code Beacon

The North East Radio Club's two metre Morse code beacon has shifted frequency. It is now operating under the callsign VK5VF on 145.650 MHz with an output of 10 watts from its new location on Mount Lofty.

The cycle has remained the same with 10 minute segments of random generated characters from 5 to 12 wpm, starting at 8.00 am/pm local Adelaide time at 5 wpm.

Mark Evans VK5ZHZ
Secretary, North East Radio Club
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Contests

*Peter Nesbit VK3APN - Federal Contest Coordinator**

Contest Calendar May - July 96

May 4/5	ARI Contest CW/SSB/RTTY	(Apr 96)
May 11/12	CQ-M Contest	(Apr 96)
May 18/19	Sangster Shield (80 m ZL)	(Apr 96)
May 25/26	CQ WPX CW Contest	(Feb 96)
Jun 1/2	RSGB Field Day CW	
Jun 8/9	ANARTS WW RTTY Contest	
Jun 8/9	South American CW DX Contest	
Jun 15	QRP Day Contest (VK)	
Jun 15/16	VK Novice Contest	
Jun 15/16	All Asia CW DX Contest	
Jun 22/23	ARRL Field Day	
Jul 1	Canada Day CW/Phone	
Jul 6	NZART Memorial Contest	
Jul 6/7	CQ WW VHF Contest	
Jul 13/14	IARU HF Championship	
Jul 20	Colombian DX Contest (Phone/CW)	
Jul 27/28	RSGB IOTA Contest	

Please note the revised date for the popular Sangster Shield contest, which is 18/19 May, not 11/12 May as shown in last month's calendar. Whilst on the subject of contest dates, my apologies to those who tuned in for the CQ-WPX contest on 23/24 March (myself included), but found that the contest didn't take place until the following weekend. Despite the most rigorous checking, this sort of thing can occasionally slip through, especially with the CQ contests which are tagged to the last weekend of the month.

Unfortunately, the WPX contest details weren't received until after our publication deadline, so the date was assumed as the fourth full weekend, whereas this year March had five full weekends!

As promised last month, this month's column contains the results of the recent Ross Hull and VHF/UHF Field Day Contests. The manager (John VK3KWA) has put a lot of thought into both contests, and outlined some aspects for possible fine tuning. If you have an interest in VHF/UHF operation, you can help by reading his comments and responding accordingly.

Finally, don't forget I still need your input regarding the proposed new 160 m contest which, incidentally, has been agreed to by NZART. The date is reasonably open, although May/June looks suitable, as QRN should be minimal, and there is a reasonable gap to the RD Contest. Any ideas, no matter how trivial they might seem, will be helpful. You can write c/o this column, or to my home address (QTHR). Assuming a May/June date is selected, the contest would not commence until next year; however, that allows a good amount of time for planning and publicity.

Many thanks this month to the following: VK2BQS, VK2SRM, VK3DID, VK3KWA, ZL1AAS, I2UIY, VE2ZP, LCRA, JARL, *CQ*, *Radio Communications*, and *QST*.

Until next month, good contesting!

73,
Peter VK3APN

RSGB Field Day

1500z Sat to 1500z Sun, 1/2 June

This CW contest stimulates considerable portable activity in the UK and Europe. Overseas stations can participate and submit a log, and certificates will be awarded to those in each continent who work the most portable UK stations. Send logs to: RSGB G3UFY, 77 Bensham Manor Road, Thornton Heath, Surrey CR7 7AF, England, postmarked no later than 16 days after the end of the contest

ANARTS WW DX RTTY

0000z Sat to 2400z Sun, 8/9 June

This contest is organised by the Australian National Amateur Radio Teleprinter Society, and runs on the second full weekend of June each year. The object is to contact as many stations locally and overseas as possible on 80-10 m (no WARC bands), using any digital mode (RTTY, AMTOR, FEC, PKT, PACTOR, etc – no satellite). Categories are single operator, multioperator (one Tx), and SWL. Max operating time is 30 hrs for single operators. Rest periods can be taken at any time during the contest. Mark rest periods in log.

Messages comprise RST, TIME (UTC), and CQ ZONE. For each valid QSO, points are claimed according to zone. Space precludes publishing a complete points table; however, the following extracts show the points claimable by entrants in zones 28, 29, and 30. The numbers show the number of points for QSOs with zones 1 to 40, working left to right, top to bottom (ie the first number shows the points per QSO with zone 1, 2nd with zone 2, etc):

Your Zone = 28:

31 40 40 44 45 49 53 51 55 54
49 48 46 32 30 26 22 20 20 25
20 11 14 10 15 05 07 02 10 17
31 24 34 25 36 30 22 26 19 34

Your Zone = 29:

39 50 43 52 54 47 49 54 52 44
42 37 37 42 39 36 32 30 30 34
28 21 24 20 23 16 15 10 02 09
15 32 42 33 39 31 24 24 20 44

Your Zone = 30:

35 50 35 44 46 38 40 44 45 37
41 33 34 49 47 42 38 35 32 43
37 29 30 24 30 22 18 17 09 02
24 07 51 42 47 40 33 32 29 48

Countries are as per the ARRL DXCC list, except that each call area in mainland VK, VE, JA and W counts as a separate country. Mainland VK, VE, JA and W are not claimable. Call areas outside these mainland areas (eg VK0, JD1, KL7, KC4) count as separate countries. One's own country (as defined herein) can be worked for QSO points, but not for a multiplier.

Points are determined for each band, using the relevant points table, and then added. Countries are similarly tallied. Continents are those worked on all bands (max 6). Total score is points x countries x continents. Non-VKs should add a "VK Bonus" to their points tally, which is 500 points for each VK worked on 80 m, 400 points on 40 m, 100 points on 20 m, 200 points on 15 m, and 300 points on 10 m. Send log and summary sheet to: ANARTS Contest Manager, PO Box 93, Toongabbie, NSW 2146 by 1 September of the year of the contest. If required, a full page scoring table (last revised 1994), and log and summary sheets are available from ANARTS or myself upon receipt of a SASE.

South American World Wide CW

8/9 Jun, 1200z Sat to 1800z Sunday

This contest is sponsored by the Brazilian magazine *Antenna Electronica Popular*, and occurs on each second full weekend in June. The objective is to work as many South American amateurs as possible, plus other areas. Bands are 80-10 m, and categories are single operator, single and all band; multioperator, single and all band; and QRP all band (max 10 W I/P). Exchange RST & continent (Oceania = OC). QRP stations add /QRP. Claim 10 points for each QSO with a South American station (WAC boundaries), and two points for all others. Multipliers are the total number of South American prefixes worked. Calculate the band score (band pts x band mult), and add the band scores together to get the final score. Use separate logs for each band, and send to: WWSA Contest, PO Box 282, ZIP 20001-970 Rio de Janeiro, RJ – Brazil, to arrive by 30 October 1996. A number of special prefixes will be activated during the contest, and various awards are offered.

1996 QRP Day

Saturday, 15 Jun, 0200z – 1400z

Presented by Ian Godsil, VK3DID

Sponsored by the CW Operators' QRP Club, the object is for VK, ZL and P2 amateurs to work as many stations as possible. Use CW in the normally recognised CW sections of 160-10 m (no WARC bands). The recognised QRP calling frequencies are 1815, 3530, 7030, 14060, 21060, and 28060 kHz (then QSY to a working frequency). Exchange RST + serial number starting at 001. Repeat QSOs are allowed between the same stations, on the same band, with at least three hours between subsequent QSOs.

For QSOs between VK/ZL/P2 stations, score five points for each QRP station worked, and one point for each non-QRP station worked. For QSOs between VK/ZL/P2 and those outside VK/ZL/P2, score 20 points for each QRP station worked, and 10 points for each non-QRP station worked. Additional bonuses comprise five points per 10 m QSO, 10 points per 160 m QSO, 10 points per QSO made using a home brew transmitter, and five points per QSO made using a home-brew antenna. QRP stations must not exceed 5 W carrier power to the antenna, and should sign /QRP.

Include full details of the equipment used, and send your logs to: Ron Everingham VK4EV, 30 Hunter Street, Everton Park, Queensland 4053, by 15 July 1996. Certificates will be awarded to the first three placegetters overall, and to the highest scorers in ZL and P2. Those interested in joining the CW Operators' QRP Club should write to Kevin Zeitz VK5AKZ, 41 Tobruk Ave, St Mary's, SA 5042.

Since this contest overlaps the WIA Novice Contest by six hours, contacts made during the overlap period can contribute to either or both contests, and are encouraged. The same set of serial numbers can be used for both.

1996 WIA VK Novice Contest

0800z Sat to 0800z Sun, 15/16 June

Presented by Ray Milliken, VK2SRM (Novice Contest Manager)

The object of this contest is to encourage amateur operation in Australia, New Zealand and Papua New Guinea, and particularly to promote contacts with Novice and radio club stations. Only stations in VK, ZL and P2 call areas are eligible to participate.

All operation must be confined to the Novice frequency allocations in the 10, 15 and 80 m bands, viz 3.525-3.625 MHz, 21.125-21.200 MHz and 28.100-28.600 MHz. No cross-band operation is permitted. Stations in the same call area may contact each other for contest credit.

Sections include (a) Phone-novice/full call; (b) CW-novice/full call; (c) SWL. Except for club stations, no multi-operator operation is allowed.

Phone stations call "CQ Novice Contest", and CW stations call "CQ N". Club stations should call "CQ Novice Contest, Club Station", followed by the callsign. Exchange a serial number comprising RS (or RST) followed by three figures commencing at 001 for the first contact and increasing by one for each subsequent contact.

Any station may be contacted twice per band, provided at least 12 hours has passed since the previous contact with that station. SWLs may log up to 10 sequential contacts made by a station, and then must log no less than another five stations before logging that station again. The five stations so logged need a minimum of one contact only logged.

Score five points for contacts with Novice or Intermediate stations, 10 points for contacts with club stations, and two points for contacts with full call stations. SWLs score five points for Novice to Novice contacts, two points for Novice to full call or full call to full call contacts, and 10 points for contacts made by a radio club.

Logs must show: Date/time UTC, Band, Mode, Station contacted, Report and serial number sent, Report and serial number received, Points. Each log sheet must be headed "VK Novice Contest 1996". The total claimed score for each page must be shown on the bottom of the page.

Logs must be accompanied by a summary sheet showing: callsign, name, mailing address, section entered, number of contacts, and claimed score. The summary sheet must include the following declaration: *"I hereby certify that this station was operated in accordance with the rules and spirit of the contest"*. The sheet must be signed and dated by the operator, or in the case of a club station, by a responsible officer of the committee, or a licensed operator delegated by the committee to do so.

Entrants may submit only one contest log per mode. Logs for entries where an entrant uses more than one callsign whilst operating in the contest will not be accepted. Send entries to: Novice Contest Manager, Westlakes ARC, Box 1, Teralba, NSW 2284, to arrive by Friday, 19 July 1996.

The Keith Howard VK2AKX Trophy will be awarded to the Novice entrant with the highest phone score, and the Clive Burns Memorial Trophy to the Novice entrant with the highest CW score (these are perpetual trophies on permanent display at the WIA Federal Office). In each case, the annual winner will receive a suitably inscribed wall plaque as permanent recognition. Certificates will also be awarded to the top scoring Novice station in each call area, the top scoring station in each section, and to any other entrant where meritorious operation has been carried out. Awards are at the discretion of the contest manager. A Certificate of Participation will be awarded to all operators who submit a log in the contest.

All Asian DX Contest

CW: 0000z Sat to 2400z Sun, 15/16 June
Phone: 0000z Sat to 2400z Sun, 7/8 Sept

The object is to contact as many stations in Asia as possible, on 160-10 m (no WARC bands). Classes are single operator, single and multiband; and multioperator multiband. Call "CQ AA" or "CQ Asia". Exchange RS(T) plus two figures denoting your age (YLs send "00"). For each QSO score three points on 160 m, two points on 80 m, and one point on other bands. The multiplier is the number of different Asian prefixes worked per band, according to CQ WPX rules (refer Feb 95). Example: JS9ABC/7 counts for prefix JS7. Note that JD1 stations on Ogasawara (Bonin & Volcano) Isl belong to Asia, and JD1 stations on Minamitori Shima (Marcus) Isl belong to Oceania. Final score is total QSO pts x total multiplier.

Use standard log and summary sheet format, clearly showing new multipliers when first worked. Send logs postmarked by 30 July (CW) and 30 Sept (SSB) to: JARL, AA DX Contest, Box 377, Tokyo Central, Japan. Indicate phone or CW on envelope. Awards include certificates to the top 1-5 stations in each country on each band (depending on activity), and medals to the continental leaders. For full results please enclose an IRC and SAE with log.

Asian countries are: A4 A5 A6 A7 A9 AP BV BY CR9 EP HL/HM HS HZ/7Z JA-JS JD1 (Ogasawara) JT JY OD S2 TA U/R (CIS) VR2/VS6 VU VU4 VU7 XU XV/3W XW XZ YA YI YK ZC4/5B4 1S 4S 4X/4Z 7O 8Q 9K 9M2 9N 9V.

ARRL Field Day

1800z Sat to 2100z Sun, 22/23 June

As with the RSGB Field Day (see above), overseas stations can participate and submit a log, but otherwise are ineligible to compete. Exchange RS(T)+QTH, W/VE will send operating class + ARRL/CRRL section. Send log postmarked by 26 July to: ARRL Field Day Contest, 225 Main St, Newington, CT 06111, USA.

Results of 1995 ARI DX Contest

(call/category/QSOs/mult/score)
VK2APK SO.CW 317 89 99680

Results of 1995-96 Ross Hull Contest

Presented by John Martin, VK3KWA

Activity

Activity in the 1995-96 contest was more variable than last year. Some days were quiet, but when propagation was good, large numbers of stations appeared out of the woodwork. Activity was more evenly spread around the country than in past years, with increased activity in VK6 and even a log from VK8.

Some interesting things were evident from the logs. One is the large number of stations with multi-mode capability, but which only use SSB for a few weeks over the summer. Another is the large number of new 2 m stations this year, including IC-706 owners trying out their new radios on SSB. Several of them remarked how much further they could work with SSB compared with FM, and how much more interesting it was.

The most notable contacts made during the contest were those on 10 GHz, on 13 January, from VK3XPD to VK5NC and VK5NY. Both QSOs set new state records. The other highlight was a sporadic E opening on 20 January, which resulted in many interstate 2 m contacts, and culminated in an opening to ZL.

Rules and Scoring

The calling frequency problem reared its ugly head again. The rule was toughened for the contest, which helped a lot in keeping DX calling frequencies free of local QRM. However, some people complained that the rule was now too tough, and others that it was still not tough enough! I will keep trying to solve this one, but the problem with rules is that they keep getting bigger and more complicated, just to cover the loopholes. I wish we could get rid of this calling frequency problem for all time, without the need for more rules, but guess this will never happen in practice.

There was some uncertainty about 6 m scoring, in which QSOs exceeding 1000 km deliver fewer points than those at shorter distances. Three logs had to be rescored, but this had no effect on the ranking of the major placegetters.

One entrant felt that the handicap for 6 m contacts over 1000 km is discriminatory. This is true in a sense, but the discrimination is against the band itself, not the operators! The reason is that 6 m differs from all other VHF bands. When it is open, its propagation is similar to an HF band, ie ionospheric. Without the handicap, several good dog-piles could easily produce 6 m scores far greater than anything achievable on the higher bands. If the scoring potential of sporadic E contacts was not reduced, the contest would always be won on 6 m, which would draw too much activity away from the higher bands.

Equalising Opportunities

This brings me to the broader question of how to provide more equal opportunities for as many entrants as possible. Previous rule changes along these lines included the dropping of satellite operation from the contest, and changes to 6 m scoring. More recently, the "Best 100" scoring was introduced to help entrants in less populated areas, and also those who are unable to live in the shack for weeks on end.

For several years it has been obvious that another scoring "gold mine" exists – aircraft enhancement. Use of this mode has increased greatly, and it is now possible to amass very large scores by working the same interstate stations repeatedly. This may not be a problem to stations along the eastern coastal strip, but it makes it much harder for those in less populated areas to win the contest.

Several solutions have been suggested. One is to go back to scoring based on locator squares, so there would be little to gain from making repeat contacts with the same stations. This would reduce the scoring advantage of the eastern states, but would still not guarantee the presence of an amateur station in every square that could be worked from Perth, for example. It could also kill activity, because the incentive would be to work new squares rather than to make contacts with stations in squares which had already been worked.

Another suggestion is to adopt a scoring table in which the current national distance records on each band would be worth 100 points, and the scores for other distances worked out on a pro-rata basis. This would encourage activity on higher bands, but stations in less populated areas would

still have to make some fairly stunning contacts to overcome the advantage of the eastern states.

One entrant argued that it is impossible to provide a totally flat playing field, but it could be smoothed by allowing entrants to use satellites, or 6 m without any scoring handicaps, and so on. I take the point about the playing field, but on the other hand there is a limit to the effort and expense that people should have to put into the contest!

So I would appreciate your thoughts. Are you happy with the contest as it is, or is it time to shake things up? Should there be a minor shakeup or a major upheaval?

This Year's Results

Now to the results (although some of you will have skipped my ramblings to come straight here).

We have a new winner this year. The highest score goes to Adrian Pollock, VK2FZ/4, who has made his first all-band entry in the contest this year. Adrian previously lived in Sydney and could only find space for 1296 MHz antennas; now he has moved to Queensland and grown an antenna farm. The results speak for themselves.

The runner up is Roger Steedman, VK3XRS, who set the current record of six consecutive wins. Roger has changed his place of abode and will be concentrating mainly on portable operation in the future. Congratulations to Roger on his score this year, and also his string of previous successes in the contest.

In third place is Gordon McDonald, VK2ZAB, who gained the second highest scores on 2 m and 70 cm, and a very high score also on 1296 MHz.

I hope you will all be in action again next year. With the top scores increasing steadily, competition is getting fiercer. With possible rule changes next time around, there could be even more surprises in store!

Results of 1996 VHF-UHF Field Day

Presented by John, VK3KWA

This year most entrants reported good weather, but fairly ordinary propagation. Activity was good, and the number of portable stations in the logs was surprisingly high. The number of logs was only slightly higher than last year, but of special interest is the fact that half of this year's entrants were new to the contest.

Activity

The centre of activity was again in the south-east, although there was a large increase in activity in VK4. Above 6 m, most interstate contacts were within the VK1/2/3/5/7 area. No logs were received from VK6, and no VK6 stations were worked above 6 m.

The most notable contact was a new VK4 record (still to be confirmed) for the 13 cm band, between VK4OE and VK2FZ/4. On other bands, the "notable contacts" list includes the following interstate contacts:

2 metres:

VK2BIT – VK4OE;
VK3ATL – VK1BG VK1DO VK2ZAB VK5AV VK5NC VK5AKK;
VK3BBB – VK2TWR VK5AKK VK5DK VK5LP VK5NC VK5ZMC;
VK3XLD – VK1DO VK1VP VK1BG VK5NC VK2TWR VK2XKE VK2ZRE VK7KY;
VK4IF – VK2BRG VK2ZAB VK2EJ;
VK7XR – VK3ATL VK3BBB VK3XLD VK3ER;
VK5BW – VK2EFA VK2YVG

70 cm:

VK3ATL – VK1BG VK5NC VK5DK;
VK7XR – VK3BBB VK3DEM VK3ATL

23 cm:

VK5AV – VK3KWA

Scoring

The scoring system was changed this year to encourage the use of as many bands as possible. The previous system gave an advantage to those bands where the greatest number of grid squares can be worked. Unfortunately, the changes made this year had the same effect! A possible solution seems to be to give locator squares a fixed points value, and to add the QSO and locator points rather than multiplying them. I would appreciate any comments or suggestions on this.

Several other changes are suggested for next year. The scoring difference between home and portable stations should be dropped, as it serves no purpose and just complicates the scoring. The times should be more flexible, and the requirement to start and end on the hour can be dropped.

Another change proposed for next year is to drop 6 m from the contest. Many entrants did not use 6 m; others use it but would prefer to concentrate on the higher bands. There was also a problem again with QRM from Field Day stations around 50.110 MHz; remember that DX must have priority in the 50 MHz DX window.

There should be more incentive for entrants to activate rare grid squares, and to operate from more than one grid square if they wish to. Next year all entrants will be able to claim the square they are operating from, even if they do not work any stations within that square. If a station moves to a new locator square, the three hour time limit should be "reset" and repeat contacts allowed straight away.

I would appreciate any comments or suggestions on the above – the sooner the better please. The Field Day rules have normally been published in December each year, but next time I would like to publish them no later than November.

1995-96 Ross Hull Contest Results

CALL	NAME	6m	2m	70cm	23cm	13cm	9cm	3cm	TOTAL
VK2FZ	A Pollock	460	4552	4795	4030	211	–	–	14048
VK3XRS	R Steedman	476	2986	3437	3440	156	–	–	10495
VK2ZAB	G McDonald	98	3632	4291	2370	–	–	–	10391
VK2DVZ	R Barlin	–	3444	3031	3870	–	–	–	10345
VK6KZ	W Howse	404	1728	1694	1060	377	464	1216	6943
VK5AKK	P Helbig	625	3568	2513	140	–	–	–	6846
VK5NC	T Niven	8	2124	2191	1910	–	–	336	6569
VK7XR	A Hay	510	2468	2744	500	–	–	–	6222
VK3DEM	R Ashlin	308	2180	2681	630	156	–	–	5995
VK2TWR	R Collman	288	2244	3374	–	–	–	–	5906
VK3CY	D Clarke	–	2716	3122	–	–	–	–	5838
VK3TMP	M Pickering	–	2580	2331	–	–	–	–	4911
VK3AFW	R Cook	–	2552	2163	–	–	–	–	4715
VK4KZR	R Preston	26	1524	912	550	–	–	–	3012
VK3XPD	A Devlin	–	–	–	1000	286	–	320	1606
VK6HK	D Graham	48	120	182	270	351	432	–	1403
VK7KAP	A Perkins	–	660	553	130	–	–	–	1343
VK4AR	G Ryan	399	808	126	–	–	–	–	1333
VK6BHT	N Sandford	–	308	–	–	–	–	960	1268
VK3ALZ	I Berwick	–	–	–	790	299	–	–	1089
VK3BRF	R Fincher	–	184	259	190	–	–	–	633
VK4CWJ	G Webster	400	–	–	–	–	–	–	400
VK4EJ	B McIvor	398	–	–	–	–	–	–	398
VK5LP	E Jamieson	85	140	91	20	–	–	–	336
VK3HZ/8	D Burger	22	48	28	–	–	–	–	98
VK4GWC	G Combes								Check Log
VK3DLM	L Mostert								Check Log

Results

Last year I awarded a special certificate to VK5BW for surviving the wild weather that blew his station apart. This year I make another special award, an "Iron Man Certificate". This goes to David Learmonth VK3XLD, who carried his whole station 12 km up a mountain, to his location on Mt Feathertop!

The scores show the QSO points followed by the number of locator squares worked, for each band.

Some Comments from the Logs:

VK4OE: "Much better activity in VK4 this year." VK3ER: "We all agreed that the weekend was most rewarding." VK5BW: "Poor propagation, gale force winds and 45°C temperatures forced early closure of the station." VK7XR: "Only one VK7 contact was made, the rest were from across the water."

PO Box 2175, Caulfield Junction, VIC 3175

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1996 VHF-UHF Field Day Results

CALL	LOC	6 m	2 m	70cm	23cm	13cm	TOTAL
Section A (Portable, Single Operator, 24 Hrs):							
VK3BBB	QF32	82/15	528/14	476/10	470/6	–	70020
VK3DEM	QF32	44/12	484/15	455/8	290/4	–	49647
VK4OE	QG51	19/8	228/11	245/7	280/4	13/1	24335
VK3XLD	QF33	36/7	504/18	28/1	–	–	14664
VK5XY	PF95	34/4	408/4	434/3	150/2	–	13338
VK3AFW	QF32	–	244/14	217 9	–	–	10603
VK4KZR	QG53	–	160/6	175/4	130/3	–	6045
VK3DQW	QF12	–	272/8	–	–	–	2176
VK5ZJP	PF95	–	64/3	–	–	–	192
Section B (Portable, Single Operator, 6 Hrs):							
VK3AFW	QF32	–	244/14	217/9	–	–	10603
VK4OE	QG51	9/6	112/8	98/7	130/4	13/1	9050
VK1DO	QF44	5/2	240/7	266/5	–	–	7154
VK5XY	PF95	13/4	108/4	154/3	20/1	–	3540
VK4KZR	QG53	–	60/6	63/4	70/3	–	2509
VK2BIT	QF55	–	160/15	–	–	–	2400
VK2ANK	QF45	–	112/6	28/1	–	–	980
VK3KTD	QF11	–	132/7	–	–	–	924
VK5AV	QF02	–	36/4	–	30/3	–	462
VK1PK	QF44	–	100/4	–	–	–	400
Section C (Portable, Multi Operator, 24 Hrs):							
VK3ATL[1]	QF22	136/26	652/16	609/11	460/7	–	111240
VK3ER[2]	QF11	125/23	644/11	623/9	130/3	–	70012
VK4IF[3]	QG62	117/20	492/10	588/7	260/5	–	61194
VK5BW[4]	PF96	31/7	392/10	322/6	20/1	–	18360
VK5ARC[5]	PF94	41/5	648/5	525/5	–	–	18210
(1) Geelong Amateur Radio Club: VK3s DFL, XGD, PK, AJF, BRZ, AKK, BCL, HQ, HLS, ASQ							
(2) Eastern & Mountain District Radio Club: VK3s YNG, WWW, WT, ZJH, KCP, KAB.							
(3) Brisbane VHF Group: VK4s AR, ZMM, NEF, JSR.							
(4) VK5s BW, AJQ, ZUC.							
(5) South Coast Amateur Radio Club: VK5s UBJ, ZMC, ZWI, ZIP.							
Section D (Home Station, 24 Hours):							
VK7XR	QE38	47/12	308/8	336/6	60/2	–	21208
VK3CY	QF13	–	332/18	203/7	–	–	13375
VK3TMP	QF21	–	344/13	266/7	–	–	12200
VK3KWA	QF22	17/4	144/6	168/4	270/4	–	10782
VK4EJ	QG62	48/12	92/2	105/1	–	–	3675
VK5LP	PF94	9/2	52/5	70/3	10/1	–	1551

VK QSL BUREAUX

The official list of VK QSL Bureaux. All are Inwards and Outwards unless otherwise stated.

VK1		GPO Box 600 CANBERRA ACT 2601
VK2		PO Box 73 TERALBA NSW 2284
VK3	Inwards	Box 757G, GPO MELBOURNE VIC 3001
	Outwards	40G Victory Blvd ASHBURTON VIC 3147
VK4		GPO Box 638 BRISBANE QLD 4001
VK5		PO Box 10092 Gouger St ADELAIDE SA 5001
VK6		GPO Box F319 PERTH WA 6001
VK7		GPO Box 371D HOBART TAS 7001
VK8		C/o H G Andersson VK8HA Box 619 HUMPTY DOO NT 0836
VK9/VK0		C/o Neil Penfold VK6NE 2 Moss Court KINGSLEY WA 6026

WIA News

More Intruders Appearing on 14, 18 and 21 MHz Bands

Commercial, broadcasting and military intruders can be regularly heard on the three popular DX amateur bands of 14, 18 and 21 MHz, reports the Wireless Institute's Intruder Watch Co-ordinator, Gordon Loveday VK4KAL.

In the CW section of the 20 metre band, a Western Australian amateur, VK6XW in Albany, observed a CW station in January on 14,090.2 kHz at 1000 hours UT, using a previously unrecorded call sign of DKA, bearing 345 degrees.

Two Queensland amateurs observed two frequency-shift keyed stations in January, on 14.125 kHz at 1025 UT and bearing zero degrees (due North), each using 250 Hz shift. Another Queensland amateur logged data transmissions around 0125 UT, on 14,0625 kHz and bearing 340 degrees. Frequency-shift transmissions on 14.211.5 kHz were also logged in January by amateurs in Queensland and Western Australia.

Broadcast stations have been logged on the 18 MHz band. An AM station with an Indian-accent announcer was heard on 18,075 kHz at 1123 UT, bearing 315 degrees from Perth. An FM transmission was logged on 18,120 kHz at 1142 UT, also bearing 315 degrees from Perth, along with an Indian radiotelephone link on 18,155 kHz at 0950 and 1120 UT, with the same bearing. Other broadcast signals have been heard on 18,110 kHz.

Over-the-horizon radar (OTHR) signals, believed to emanate from the RAAF in Darwin (earlier reported in WIA News, in the March issue of *Amateur Radio* magazine), were logged again in January on the 15 metre band, at 21,050 kHz from 1258 UT, and 21,223 kHz at 0530 UT. Signals were observed by amateurs from Queensland, Western Australia, and Darwin.

This intrusion has been reported to the SMA, but further log reports from radio amateurs would be welcomed.

Observation log reports, or requests for more information, should be sent to Gordon Loveday VK4KAL, Freepost Rubyvale 4702 Qld.

Divisional Notes

Forward Bias - VK1 Notes

Peter Parker VK1PK

VK1 Division Establishes Field Day Station

Members of the VK1 Division established a Field station as their contribution towards John Moyle Field Day activity. The multi-band station, operating under the VK1ACA callsign, transmitted from Dairy Farmer's Hill, just west of Canberra.

Chris VK1DO reports that the weather experienced was the worst anyone could remember on a John Moyle weekend; it was wet, windy and cold. Of the three generators used at the site, one failed, and another suffered a faulty core balance relay. Despite the flat conditions, 400 contacts were made; 170 on SSB and 230 on CW, the latter being thanks to an all-night vigil by Jim VK1FF. Despite the abovementioned poor weather, failing generators and indifferent propagation, those who attended enjoyed themselves.

News Moves to Sunday

Due to popular demand, the VK1WI News bulletin has moved from a Wednesday to a Sunday evening. The decision, which came into effect last month, was made at the 25 March General Meeting. It follows a listener survey which showed that over 80 percent of listeners preferred a Sunday evening news bulletin. The change also makes it possible for attendees at Wednesday's Novice and AOCP licence classes to hear Divisional broadcasts.

Nevertheless, there will always be some for whom a Sunday night is unsuitable. However, the VK1WI news service is amongst the most accessible in the nation, with bulletins being available on both packet radio and the Internet.

Amateurs in National Capital Rally

Nearly 20 local amateurs provided communication for the 1996 National Capital Rally, held in forests around Canberra. Hugh Blemings VK1YYZ reports that the event, held on Saturday, 2 March, was a great success, with everything going to plan. Paul VK2CJ and Leonie VK1LB were responsible for much of the organisation.

Pay TV!?

The President of the VK1 Division, Phil VK1PJ, is urging local amateurs who have had problems with nearby satellite pay TV installations to get in contact with him. Apparently there have been cases of pay TV equipment interfering with HF amateur reception, and of amateur transmissions getting into the consumer's installation. At the March Divisional meeting, our Federal Councillor Richard, VK1RJ, told members that Pay TV companies have claimed that no problems have been reported. As well, the SMA have reportedly said that this matter was not within their jurisdiction.

Potential problems involving pay TV can be in both directions; systems have been known to cause severe interference to HF reception, as well as TV reception being affected by nearby HF amateur transmitters. Members heard that it is not unknown for amateurs to be closed down because of such interference, even though their transmitting equipment was not at fault.

Phil VK1PJ can be contacted on 292 3260.

First Meeting of New Committee

The first meeting of the 1996 committee was held on Tuesday, 6 March at the home of Phil VK1PJ. As the first meeting for the new committee, many matters of interest to members were discussed. In fact, some attendees of the meeting did not get home until after midnight.

The following topics were covered:-

* Completing the administrative transition to the new committee.

* A consistent date for committee meetings – the second Monday of the month was agreed upon.

* Consideration to be given to moving the Broadcast to Sunday night;

* The need for guidance to be given to the Repeater Group on future projects.

* Alternative means of passing interstate packet radio traffic, with the closure of the VK1 Packet Wormhole.

* The desirability of holding committee meetings at a central venue, rather than at people's houses.

* The publication of a guide to Divisional services, to be made available to local amateurs.

* The WIA's Exposure Draft on Amateur Radio Licensing.

VI100GM QSL REMINDER

QSL Cards for the VI100GM operation in December 1995 have been printed and are ready to be sent to anyone who worked the station and is interested in a card. Certificates are also available for $5.00. Please send requests for certificates and/or QSLs to the VK1 Division Bureau, GPO Box 600.

Wormhole Closed

News has come to hand that the VK1BUD packet radio wormhole has been closed down permanently. A packet bulletin from our Secretary, John VK1ZAO, reports that the closure was due to a change in network policy by the wormhole's host. The closure means that local packet users will experience delays in sending and receiving mail from interstate.

Other means to pass packet traffic in and out of the ACT are being investigated. If you have any ideas, please send a packet to John VK1ZAO@VK1ZAO, or come along to this month's Canberra Amateur Packet Radio Group meeting.

Meetings Change

The meeting of the Canberra Amateur Packet Radio Group has now changed venue. Instead of being held on the third Tuesday of the month, at the Griffin Centre, the meeting now takes place on the fourth Thursday of the month at the Communications Laboratories, 14 Wales St, Belconnen. In addition, the Repeater Committee now meets at the same address on the second Thursday of the month. Both meetings start at 7.00 pm.

Local Experimenter Gets International Recognition

A local amateur has gained recognition in *RadCom*, the monthly publication of the Radio Society of Great Britain. In an article on computer simulations and antennas in January's issue, Pat Hawker G3VA cites experimental work done by Ralph Holland VK1BRH, whose article on antenna simulation appeared in the October 1995 issue of the WIA's *Amateur Radio* magazine. The Division congratulates Ralph on his achievement.

VK6 Notes

John R Morgan VK6NT

March General Meeting

For some time, it has been difficult to obtain a long-term Secretary for the Division. At the March General Meeting, the President took pleasure in being able to announce to the 28 members present, that

two candidates had now applied for the position, and that Council would shortly decide between them.

Following the resignation of the Bookshop Officer, the Division's stock of books is currently being held by Christine Bastin VK6ZLZ, who may be contacted via PO Box 425, Cannington WA 6107, or telephone (09) 458-6218. It is hoped that a volunteer for the post of Bookshop Officer will be discovered shortly; any volunteers?

Finally, the meeting took pleasure in acknowledging the safe return, after some months overseas, of Gwynne Brockis VK6AJG.

Reminders

This year, the General Meetings are held on the last Tuesday of each month in the Theatrette on the second floor of the Westrail Centre, East Perth, commencing at 8 pm. There is to be no meeting in December. All interested persons (members and non-members, licensed or listener) will be made welcome. Free coffee and biscuits are available at "half time".

The VK6 QSL Bureau is now a by-mail-only service, as is the case with all the other divisions. To receive their inward cards, members should send a few stamped self-addressed envelopes to: VK6 QSL Bureau, PO Box F319, Perth WA 6001. The same address is valid for out-going cards, and for the purchase of their required stickers. The latter are also on sale at the monthly meetings.

News from WARG

Seven members attended the April General Meeting of the West Australian Repeater Group, and discussed a variety of technical topics. Much time had to be devoted to designing possible measures to be taken to combat the current misuse of the East-West Link (VK6RPA), and thereby restore the efficiency with which it can transfer packet-radio data to and from VK2.

Subscriptions for 1996/7 are now due. They remain at $17, and may be paid via the Membership Secretary, PO Box 425, Cannington WA 6107. In addition to knowing that you are helping to support WARG's numerous voice repeaters, you will receive a copy of their eight-page best-yet newsletter.

WARG invites you to take part in its Perth VHF net, held every Sunday morning, commencing at 10.30 am. Listen for VK6RRG on the Lesmurdie repeater (VK6RLM, 146.750 MHz). Meetings are held at the Scout Hall on the corner of Gibbs Street and Welshpool Road, East Cannington, on the first Monday of every month, starting at about 7.30 pm. The odd-numbered months are General Meetings, and the even-numbered months are Technical Meetings.

Amateur radio – helping our community

If You Have Material ...

All material for inclusion in this column must arrive on or before the first day of the month preceding publication. Packet mail may be sent to VK6NT@VK6ZSE.#PER.#WA.AUS.OC, or write to PO Box 169, Kalamunda WA 6076, or telephone (09) 291-8275 any time.

"QRM" News from the Tasmanian Division

Robin L Harwood VK7RH

On 23 March, the Annual General Meeting of the Tasmanian Division was held at the Domain Activity Centre, otherwise known as the Old OTC Radio site. The attendance was disappointing at only 28, with apologies being received from VK7RB (ex VK7JRM) and VK7JK. A minute silence for Silent Keys, who had passed away over the past year, was observed.

After the President's Report and the Financial Report were presented, all the other reports were tabled as read. We then moved on to discussion of a Notice of Motion, to repeal and rescind the Articles of Association and replace them with those supplied in draft form, at Branch meetings and at the AGM. Although it was felt that the Articles needed replacing, there was a move to amend several clauses in the draft. However, upon legal advice, the move to amend the draft clauses was ruled out of order.

There was some discussion over the submitted draft rules and some members felt that there had been insufficient time to study the draft rules and felt they were in need of further revision. However, the motion was put and passed by 18 to 7.

The Ballot for Divisional Council, which had been counted whilst the Annual General Meeting was in progress, had a tie for the eighth position on the ballot. After legal advice, the chairman ruled that, as there had been a tie, he proposed drawing it by lots from a hat. He promptly did that, without opening the ballot. After a few minutes, the two scrutineers returned and announced there had been 95 votes cast with one informal.

The candidates declared elected are John Rogers VK7JK, Robin Harwood VK7RH, Ron Churcher VK7RN, Andrew Dixon VK7GL, Terry Ives VK7ZTI, Barry Hill VK7BE, Mike Jenner VK7FB and David Spicer VK7ZDJ. The Annual General Meeting then concluded, and the elected councillors adjourned to elect the office-bearers for 1996.

At the Council meeting that followed, Barry Hill VK7BE submitted his resignation and was thanked by council for his contribution to the Division. As there was a vacancy, it was decided to approach VK7KJC, as president of the Northern Branch, to see if he was interested in filling the casual vacancy. He has referred it to the April monthly meeting of the Branch for approval.

Ex-officio positions of the Division will be notified in next month's column.

Meetings for the month of May are: Southern Branch, Wednesday, 1 May at 2000 hrs at the Domain Activity Centre; Northern Branch, Wednesday, 8 May at 1930 hrs at St Patrick's College, Westbury Road, Prospect; Northwest Branch, Tuesday, 14 May at 1945 hrs at the Penguin High School, Ironcliff Road, Penguin.

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How's DX

*Stephen Pall VK2PS**

Sunspot Cycles

Recently, I heard two amateurs discussing missed DX opportunities, and blaming the "dreadful conditions" for their misfortune.

Conditions are only part of the problem of missed DX opportunities. The DX is there, but these days it requires a constant, almost uninterrupted, "surfing" of the bands to take advantage of the few opportunities of short, almost unexpected, openings to other parts of the world.

The sun is essentially without sunspots at the moment. The solar flux index numbers are scraping along at the bottom, with values between 68, 71 and 72 for the past two months. Low band propagation is improving slightly and many grey-line and night-time openings are there for those who have the right antennas and the stamina for staying up late or getting up very early.

The most frequently asked question in amateur circles these days is, *"When will we reach the bottom of the cycle? Does anyone know?"*

To get up-to-date information on this question, I again consulted Dr Richard Thompson, a solar scientist with the IPS Radio and Space Services in Sydney (see *How's DX?* in the May 1995 and October 1995 issues of Amateur Radio for more information on this subject). In a ten page fax to me, Dr Thompson discussed the prediction of the solar cycle, the relevant sunspot numbers and other related material.

Here is a very brief summary of his findings. *"The prediction of the solar cycle is a very interesting and important task for the solar-terrestrial forecaster. Its significance arises from the use of predictions in areas such as planning for scientific research, for satellite and spacecraft operations and for communications. The forms of predictions include the estimation of amplitude of the cycle prior to its onset; the variation of sunspot numbers within the cycle; the length of the cycle; and the timing of critical points such as maximum and minimum.*

The reappearance of reverse polarity sunspots for cycle 23, were discussed earlier (see October 1995 Amateur Radio), based on the observations made by John Kennewell, a principal scientist at the West Australian Learmonth Solar observatory. Typically, minimum does not occur until at least 12 months after the appearance of the first sunspot group of the new cycle. This sunspot group has reverse polarity. The time span between the first spots and solar minimum in the past three cycles was as follows: Cycle 20, 13 months; Cycle 21, 19 months; and Cycle 22, 16 months.

The first reverse polarity sunspots for Cycle 23 appeared on 15 May 1995, with two spots; 26 July saw the arrival of three spots; 13 August two spots again; 23 August eight spots; and September 1995 with five spots. Similar reverse polarity regions became quite common in November and December 1995, but still at very low solar latitudes.

From the data on hand the next solar minimum would be expected in mid- to late 1996.

The solar cycle is often regarded as having an 11 year period, but this is true only as an average value. Actual cycles have a period as short as nine years or as long as 14 years. Moreover, there are substantial intervals of time during which the cycle is consistently shorter than 11 years, and other intervals during which the period is consistently longer. From 1775 (Cycle 3) to 1913 (Cycle 15), the minimum period of cycle was mostly longer than 11 years. Since then solar cycles have again been shorter than 11 years.

It appears that Cycle 22 will be a little less than 10 years in length. The fundamental conclusion is that we should presently consider a duration of 10 years as normal for a cycle. A duration of 11 years, or longer, is, in fact, quite atypical.

What about the next solar Cycle 23? According to a new prediction method evolved by Dr Thompson, *"Cycle 23 will have a peak sunspot number of greater than 160 (just slightly over 200 of the 10 cm flux, VK2PS). Cycle 23 will be a large solar cycle and excludes a small or average cycle. It appears likely that Cycle 23 will exceed Cycle 21, making it the second largest cycle on record"*.

Well, that's good news. I think that with the arrival of the next millennium in a few years time, DXers around the world, even with average antennas, will have "a whale of a time" with long distance communications.

Heard Island DXpedition Update

Since reporting on this planned activity in last month's column, there have been some new developments. An Australian amateur participant has been found. David Muller of Sydney found the 40 page *"web information site"* on the Internet about Heard Island. He applied to Cordell Expeditions and was accepted as a participant. David works in the electronic industry, and is a newly licensed amateur radio operator (however, he has been mixing in amateur circles for the past fifteen years). His callsign is VK2TQM.

At present David is studying hard for his Morse examination and hopes to upgrade his callsign soon. We wish him well in the future.

Bob KK6EK, one of the Directors of the expedition, was pleased to announce the other day that the Northern California DX Foundation (NCDXF) has authorised a grant of $US20,000 to support the expedition. The team of 20 accepted operators now represents 11 DXCC countries.

Masa JE1DXC as T30XC in the shack of Father Karl T30NJ.

Myanmar - XZ

After the successful activities of the two special demonstration stations, XY1HT and XZ1Z during the second part of last year, there were high hopes of fairly regular activity from that region. Rumours were rife in January this year that OH1NYP and OH2BH would be active as XZ1A again, concentrating on 160 and 80 metres, but no activity was reported.

In February, it was said again that OH2BH and OH2KNB would travel to Myanmar to conduct further amateur radio training and would also do some operating. This planned activity had to be cancelled because regulatory issues still had to be resolved between the military and the ministries involved.

The members of the Central Arizona DX Association planned a major DXpedition to take place in Myanmar between 2 and 12 April. A CW, SSB and RTTY operation was planned with 10 operators taking part. The proposed callsign was to be XZ1N. On 15 March, Warren KF7AY, a spokesman for the group, announced that the XZ1N DXpedition had been postponed. Warren said, *"For the immediate future, the door to amateur radio in the Union of Myanmar will be closed. There have arisen a number of unsettled regulatory matters between the military and several ministries which must first be sorted out before any further amateur radio activity can proceed. It would seem that the same regulatory issues that resulted in the sudden and unexpected postponement of the XZ1R operation have led to the same action for XZ1N. Those of us who have worked closely with the members of the Myanmar government are confident that the overwhelming success of the XZ1A operation from Yangoon will be the foundation upon which future demonstration projects can be built. With the right input, one day we may even see the establishment of a new and permanent amateur radio service with licensing of Myanmar nationals. However, that day remains some distance off in the future.*

So, those of you with XZ1A cards should treasure them. It may be a while before contacts flow freely once again from the Union of Myanmar. The members of the XZ1N team remain in good spirits and are optimistic that, in the near future, we may be fortunate enough to offer this location to many of the deserving."

Broughton Island - VK2BRT

A group of Japanese amateurs resident in Australia was going to activate Broughton Island during the Easter holiday period for two days starting 6 April. The operators were Atsu VK2BEX, Chris VK2FHY and Ken VK1IAZ with the special call VK2BRT for the IOTA award. This will be a new reference number in the New South Wales State Centre Group.

Broughton Island belongs to the Myall Lake National Park and the permission of the Australian National Parks and Wildlife Service has been obtained.

The participants of the mini-expedition belong to a group called JARA, Japanese Amateur Radio in Australia. QSL to VK2BEX Atsu Asahina, PO Box 195, Killara, NSW 2071.

Marion Island - ZS8

Chris ZS5IR/ZS6RI will take part in the 53rd Marion Island expedition as a medical officer. Marion Island, part of the Prince Edward Group of islands (46° 85′ S – 37° 8′ E) became South African territory on 29 December 1947. The size of the island is 490 sq km, the highest peak is 1230 m, and it has an average rainfall of 2398 mm per year (see more details in *How's DX, Amateur Radio*, October 1994 issue).

This island has an average population of about ten people, each of whom is there on a fourteen month contract. The team usually consists of a diesel generator mechanic, three meteorologists, a radio technician and a medical officer.

The other team members are made up of research scientists who are interested in the island's wildlife of penguins, elephant seals, albatrosses and other birds, and the unique plant life. Chris will be active from the beginning of May 1996 until they leave the island in June or July 1997. He will not use the ZS8MI callsign but a special callsign of ZS8IR.

He intends to be active on all bands, 160 to 6 metres, on SSB, CW and RTTY. Antennas will be the local wire antennas (rhombics and V-beams) because of the very strong wind gusts of up to 200 km/h. QSLs go to Chris Burger ZS6EZ (ex-ZS6BCR). Chris ZS8IR will be sending logs to him every two weeks.

Melville Island - VK8MI

Stuart VK8NSB, assisted by David VK8HZ, activated this IOTA island (OC-173) for four days from 15 to 18 March 1996 using the callsign VK8MI.

Melville Island is situated due north from Darwin in the Northern Territory at a distance of about 50 km across the Clarence Strait. It is a large, generally featureless island, about 105 km long and 65 km wide, and has an area of about 5800 sq km. Considerable tides and currents are experienced around the coast and there are many hidden reefs and shoals.

The island was sighted in 1644 by Abel Tasman who took it to be part of the mainland. It was surveyed by Phillip Parker King in 1818 and named by him in honour of Viscount Melville, First Lord of the Admiralty. The aboriginal name of the island is Yermalner.

In 1824 the British Government made the first attempt to establish a settlement on the north coast of Australia and Captain J J G Bremer, who was in charge of the expedition, chose the site on Apsley Strait which he named Fort Dundas. This settlement was short-lived. Dissension, sickness, and harassment by hostile Aborigines disrupted the settlement's life during the next five years. The supply ships "Lady Nelson" and "Sedcombe" were captured by native pirates in the vicinity of Timor and burnt. The settlement, and another one at Raffles Bay, were finally abandoned in 1829 and the garrison, settlers and the remainder of stock and stores were removed to Sydney. Today, no trace remains of the Fort Dundas settlement, but the wild buffaloes, some of which still exist on Melville Island, are believed to be descended from the strays left behind there.

Stuart and David were located on the northern part of the island at the Milikapiti school in Snake Bay with the permission of the local Aboriginal elders. The four day activity resulted in approximately 1650 QSOs with 66 DXCC countries. They were active on all bands except 10 metres. The main activity was on the 15, 20 and 40 metre bands. QSL direct only to VK4AAR.

Future DX Activity

* Gunter ZK1DI moved to Papeete, French Polynesia and became active as FO0DI. He intends to go to North Cook in November and/or December. QSL to DK1RV.

* Bernhard H44MS has moved to Vanuatu and is now active as YJ0ABS.

* Gerard 5R8EN is still active in Madagascar, usually on 7057 and listening up on 7240 kHz around 1415 UTC.

* Bill Horner VK4FW (formerly VK4CRR) and his Oceania DX Group are planning to activate Cocos-Keeling Islands from 18 May to 1 June 96. Among the planned six to eight operators VK4FW, VK4DHM, VK2IVK and VK4BQL are the confirmed starters. Three complete Yaesu stations will be used for the proposed SSB and CW activity on all bands from 160 to 10 metres. Antennas will be verticals and mini beams. Preferred frequencies will be SSB: 28445, 24945, 21295, 18145, 14195, 7045 and 3799 kHz; CW: 28025, 24895, 21015, 18075, 14025, 10105, 7025, 3705 and 1825 kHz. The callsign is not known as yet. QSL to VK4FW.

* Stuart VK8NSB's next island adventure will be on Croker Island. This island is located in the Arafura Sea Coast Centre Group, north-east of the Coburg Peninsula and about 300 km flying distance from Darwin. It is planned that he will be operating for seven days from 7 to 14 August with the assistance of some full call amateurs. If full calls are present the call VK8CI will be used.

* Try to work Paul 9L1PG or Millie 9L1MG before they leave Sierra Leone on 15 May. Paul can be found working CW on 80 metres, whilst Millie cultivates the 14226 net. QSL to NW8F.

* AX2ITU will be active for 24 hours on 17 May, World Communication Day celebrating ITU Day, the 131st Anniversary of the founding of the International Telegraph Convention which in 1947 became the International Telecommunication Union (ITU). QSL via VK2PS.

* The Ukrainian Antarctic Base, Akademic Vernadskij (EMIKA) was inaugurated on 7 February 1996. There is also a Club station on the base using the call EM1U.

* Malcolm VK6LC will be active from Lacepede Island as VK6ISL from 16 to 21 May. QSL via I1HYW.

* Kermadec Island will be active from 4 to 14 May with the callsign ZL8RI. QSL via ZL2HU.

* Sam FT5WE was heard calling for contacts on 7005 between 1400 and 1700 UTC. He was also active on 30 metres. On 40 metres he only runs 100 watts to a vertical antenna, but on 80 metres he will run approx 500 watts to a dipole. QSL via F5GTW.

* DA4RG will be active on SSB from the Falkland Islands using the call VP8BPZ from May to September. QSL via GW8VHI or via the Bureau to DA4RG. QSLs will not be sent before November. (He says, "no nets, no lists.")

* W1EH is at the US Embassy in Malawi for the next three years and is active as 7Q7EH.

* Per LA7DFA plans to arrive at Jan Mayen Islands late in April and intends to be on the air by 1 May. He will stay there until October 1996. His Jan Mayen callsign is not yet known.

Interesting QSOs and QSL Information

* S21YE – Andrew – 14280 – SSB – 1321 – Feb (E). QSL via G0EHX, via the QSL Bureau.

* V51BO – Basie – 14184 – SSB – 0537 – Feb (E). QSL to the Manager, PO Box 1823, Namibia, Africa.

* TT8FT – Frank – 14255 – SSB – 0703 – Feb (E). QSL to Frank Turek, Box DL7FT, D-14004, Berlin, Germany.

* VP5EE – Ed – 14255 – SSB – 0548 – Feb (E). QSL to Edward S Ewing, Box 316, Providenciales, Turks & Caicos Island, Central Caribbean.

* R1FJZ/FJL – Eugene – 14025 – CW – 1130 – Mar (E). QSL to DF7RX (mail drop only), Bernhardt Steibl, Kehlheim Winxer Str 40, D-93309, Kehlheim, Germany.

* TD9IGI – Jerry – 7195 – SSB – 0739 – Mar (E). QSL to the Manager, PO Box 1690, Guatemala City, Guatemala, Central America.

* 9Y4GLB – Garth – 14222 – SSB – 0626 – Mar (E). QSL to Garth Bushell, 21 Belle Eau Road, Belmont, Port of Spain, Trinidad.

* 4F1UFT – Arie – 14180 – SSB – 0955 – Mar (E). QSL to PA3FWG Arie Pols, Sportlaan 27, NL-3135, GR, Vlaardingen, Netherlands.

* 9M8CC – Peter – 14260 – SSB – 1114 – Mar (E). QSL to PB0ALB Pieter F Borsboom, Coosenhoekstr 36, NL-3237 AE, Vierpoldera, Netherlands.

* 9Q5TR – Tuvio – 14243 – SSB – 0626 – Mar (E). QSL via 4Z5DP, Pia Rosher, 4 Harduf St, Ramat Efal, 52960, Israel.

* A61AM – M'hammed – 14243 – SSB – 0637 – Mar (E). QSL to KA5TQF, David C Zulawski, 2808 Catnip St, El Paso, TX 79925, USA.

* BA4AD – Davy – 14191 – SSB – 0939 – Mar (E). QSL to The Manager, PO Box 085-227, Shanghai, China.

From Here There and Everywhere

* The call DP0EPO was used by a special event station to celebrate the establishment of the European Patent Office in Munich. QSL to DF8KN.

* The private postal address of Frank YJ8AA is now PO Box 667, Port Vila, Vanuatu. The postal address of the Vanuatu Amateur Radio Society is now PO Box 665, Port Vila, Vanuatu.

* Ron VK3CN/DU5 has a new callsign – 4F5CN.

* The well known husband and wife team on Pitcairn Island, Brian Young VR6BX and Kari Young VR6KY, have moved from Pitcairn to New Zealand, in the vicinity of Auckland, to further their children's education. Kari's new call sign is ZL1DXX.

* Warren VK0WH on Macquarie Island reported that the big party of scientists who stayed at the base only during the summer, left the island on 28 March. Warren will depart now for a week long trek across the length of the island on maintenance work. During the winter, only about a dozen or so scientists are at the ANARE base, which would result in lighter workload and hopefully more leisure time for amateur radio.

QSL card of Masa JE1DXC for his activities in the Pacific during January and February 1995.

* Franz 3W6GM went home to Germany on 31 March. QSL via DF5GF.

* The planned activity by Ken AE4EL from Cocos/Keeling Island and Christmas Island was cancelled.

* 3V8AS has been reported as a pirate. Antoine F6FNU says that the TT8AK Chad station is also a pirate. The old callsign has not been re-issued.

* It was reported that Martti OH2BH and his family, Leena OH2BE and Petri OH2KNB, spent five days at the Christmas Island Casino holiday resort. During the Easter period they were active with the callsign VK9XM. The Lainc family has invented a truly portable DX station which fits into an airline briefcase. Overall weight is less than 20 pounds, it can be hand-carried and it will deliver more than 1 kW output using two Motorola MRF-154s and advanced switching power supply technology. QSL via JA1BK

* According to an ARRL QSL Newsrelease, the Pennsylvania DX Association is now the new incoming QSL Bureau for the W3 call area and QSLs should be sent to: Pennsylvania DX Association, PO Box 100, York Haven, PA 17370-0100, USA.

* DXpeditioners are exposed to all sorts of surprises, including possible physical injury. The Norwegian YL group, which planned to activate the Svalbard Islands from 31 March to 7 April as JW6RHA, JW9THA and JW8KT, intends to occupy a small cabin on the island. Unni JW6RHA said that their

biggest fear is polar bears. She said that if a bear wants to break into the cabin, it could. To make sure, she is taking along her pistol and plenty of ammunition.

* Claude F5BTW is the QSL manager for Sam FT5WE who is active on Crozet Island. Claude has now received the first batch of logs with 1000 QSOs for a period of 10 days. The direct QSLs have already been sent.

* Starting from 1 March the post codes of the Slovenian Republic have been changed. The first number of the old codes (Nr 6) has been cancelled and was replaced by the prefix SI. As an example, the old 61000 becomes SI-1000.

* If you worked 4U1SCO, it was a special event station celebrating the 50th anniversary of UNESCO. QSL to F5SNJ.

* The Italian Diamond DX Club has raised about 500 dollars to assist Malcolm VK6LC to Lacepede Island and back. Remember, it is a long journey by land and boat, and fuel costs are very expensive in the outback.

* VI3GP was a special event station celebrating the first Grand Prix in Melbourne. QSL to VK3ER.

* If you are confused with the French prefixes TM and TO, here is the solution. The TM prefix is the special prefix from France (continental stations) and the TO is the special prefix for the French overseas departments (FY, FM, FG, FS, FJ, FP, FR, FH).

* Reinaldo YV5AMH reports that the callsign 4M0I used between 16 and 20 February allegedly from Aves Island appears to be a pirate.

* Carl Ikaheimo OH6XY reports that the mail system in Bosnia-Herzegovina has started to work again, and QSL cards for the Sarajevo amateurs may be sent to PO Box 61, 71000 Sarajevo, Bosnia-Herzegovina.

QSLs Received

XZ1A (2 w – JA1BK), FH5CB (4 w op), EM2I (3 w – NA3O), 9L1PG (2 w NW8F), XT2JF (2 w N5DRV), 9U/EA1FH (2 m EA1FFC).

Thank You

Again, I must thank my many friends in the amateur radio world for their support and assistance. Special thanks go to VK2XH, VK2IAZ, VK2KFU, VK2TJF, VK2TQM, VK4FW, VK4AAR, VK5WO, VK8NSB, VK9NS, YJ8AA, ARRL DX Desk, IPS Radio & Space Services in Sydney (especially Dr R Thompson), The Australian Encyclopaedia, and the publications *QRZ DX, The DX Bulletin, The DX News Sheet, The DX News Magazine, INDEXA, 425 DX News*, and *Go List QSL Managers list.*

PO Box 93, Dural NSW 2158

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Over to You – Members' Opinions

All letters from members will be considered for publication, but should be less than 300 words. The WIA accepts no responsibility for opinions expressed by correspondents.

Catapults/Slingshots

In March of 1990 you published an article under the heading *"Field Day Catapults"*, reporting that a letter sent to the late Ken Gott VK3AJU from the Minister of Police and Emergency Services said, inter alia, *"Sections 4(j) and (k) (which relate to slingshots) do not apply to amateur radio operators"*.

This exemption, by the Governor-in-Council, was made with reference to the **Prescribed Weapons Regulations 1989** which act has subsequently been repealed. The relevant legislation is now the **Control of Weapons Act 1990.**

In view of this change, we contacted Superintendent Murray Adams, Victoria Police, the Emergency Response Officer. Through Mr Adams, we have now received advice from the Assistant Legal Adviser to the Chief Commissioner of Police, Mr Raymond Loh, and his letter concludes:

"It is my view that the exemption order of the Governor-in-Council made on 19 December 1989 is still valid and applicable under the current legislation".

So, those of our fraternity who use catapults or slingshots for the purpose of erecting antennas can continue to do so with a clear conscience.

David H Harris VK3DVW
Honorary Secretary
WICEN (Vic) Inc

Interesting Uses of Morse Code

As part of my son's education at Glenmore State Primary School, this year the Grade 6/7 BB class has learnt about the Titanic. Now, we all know about the sinking of the Titanic, but the interesting thing I saw at school was that the students learnt about **Morse Code** as part of the studies on the Titanic. Enclosed is a copy of the home work sheet entitled Morse Code. *(Space precludes reproducing the four pages here. Ed)*

To make it a little more interesting, I took along my key and keyed out the message sent by the radio operator on that fateful day. The teacher remarked at the end of the transmission, *"...it all took a long time to send..."*. I suppose my sending was at about 12 wpm, but I said that the ship's operator would have probably sent it at 30 wpm or thereabouts.

Those interested in other studies carried out at Glenmore State Primary School will find a Web page, all in the eyes of 11 and 12 year old students.

The Grade 6SR class have participated in packet radio for the last three years and will commence again in the second term this year. The packet address is via my station: VK4CNQ@VK4WIR.#CQ.QLD.AUS.OC and the WWW page is at: http://cq-pan.cqu.edu.au/schools/local-schools/gps/gps.html.

And again we see Morse being used recently by Telstra (advertising mobile phones). I don't know what they hoped to gain. A small number of the public would have deciphered it, the rest didn't worry about it.

Nick Quigley VK4CNQ
PO Box 880
Rockhampton QLD 4700

Irish Naval Service Special Event Station

The year 1996 sees the Irish Naval Service celebrating its "Golden Anniversary", 50 years of service. To highlight this special event, members of the Irish Naval Service, with help from EI7M, will operate a special event station **EI5INS** for the month of July 1996.

The event station will operate from the Irish Naval Base which is located on the Island of Haulbowline in Cork Harbour and from the EI7M Club Station at Poer Head.

To mark this memorable event, a total of seven unique QSL cards will be available. The cards will give a history of the Irish Naval Service with a different card available for each band worked. Operation will be on 160, 80, 40, 20, 15 and 10 metres, using CW and SSB, with local operation on 2 m.

Stephen Nolan EI9HC
1 Millfield Lawn
Lower Dublin Hill
Cork
Ireland
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Have you advised the SMA of your new address?

International Amateur Radio Union Monitoring Service (IARUMS) – Intruder Watch

*Gordon Loveday VK4KAL**

The IARU Monitoring System – Part 5

(Previous issues of *Amateur Radio* magazine contain parts 1 to 4 of this continuing series about the IARU Monitoring System.)

All modulated or keyed signals occupy a finite band width. A C60 blank cassette will get you a copy of the modes tape, which explains the method of measuring the frequencies.

Much of the information I have given in this series in *Amateur Radio* can be found in other publications. However, in the final two parts of the series I will endeavour to give the lesser known paragraphs. Most examples come from the IARUMS manual.

Signal Reporting Codes

Many signal reporting codes have been devised and discarded. It is recognised by all authorities that a quantitatively valid system of signal reporting is impractical because of the many variables present on any radio circuit. Nevertheless, an arbitrary system must be used if a listener is to convey an indication to another person of just how strong or weak the signal referred to was at any given moment at one location. For this reason, it is recommended the use of SINPO code be used.

A fuller version of the SINFEMO code for CW, etc can be supplied by the columnist.

CW Codes

The International Morse code is generally heard on the amateur bands BUT it is not the full Morse code! CW is now Mode A1A.

FSK Morse

This method for sending Morse code often introduces confusion to monitoring stations. It is difficult to receive the code when listening to both the carrier and the shifted carrier. To read correctly, simply switch in a narrow filter and listen to the shifted carrier ONLY.

RTTY (F1B) and F1 Morse

Many intruders on amateur bands use radio teletype. For "privacy" they seldom use the standard 5-bit Baudot/Murray code format. If you have RTTY equipment, try for "hard-copy". If not, log him as usual and try to establish his shift.

How? Wind up to the HF side of the signal and zero beat. Slowly tune DOWN to the low side of the signal and you will hear the second frequency creep in. The DIFFERENCE between the two frequencies is the shift of operation and the point MIDWAY between the two is the frequency of transmission.

Common intruder shifts employed are 250, 500, 1000 and 2000 Hz. The usual shift used by amateurs is 170 Hz. Amateurs can ONLY use shifts up to 850 Hz.

Be sure you are in fact monitoring a RTTY transmission. ASSTV and AMTOR are similar (refer to the modes tape).

Now we have some "odd" appearances with RTTY, REVERSALS. These are used for adjustment purposes or testing machines and appear as a series of fast dits. BLANKS are a series of dits for the mark, and a series of dahs for the space. The machine is actually idling at this stage.

RYs are a series of dits at intervals and are also used to test machines. They usually show a definite rhythm.

A rough rule of thumb is that "if the transmission continues for more than 15 minutes, the station is probably not an amateur".

Mode B9W – Phase Modulated Pulse Multi-Channel Transmission

This one can sound like R7B below, but the classical sound is that of a distant jet aero engine. Usually accompanied by two (sometimes one) guard carriers, about 3 kHz apart. If you can't hear the carriers, it could well be an R7B signal you are hearing.

Mode R7B – Amplitude-Modulated, Reduced Carrier, Multi-Channel, Voice Frequency Telegraphy

This one sounds like a big circular saw, as found in a saw mill. Average bandwidth around 7 kHz. Common on 20 metres.

Mode P0N – The Infamous "Woodpecker"

This one is self explanatory, but measure how wide the transmission is.

Federal Intruder Watch Co-Ordinator, Freepost No 4 Rubyvale QLD 4702 or VK4KAL@VK4UN-1

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SINPO Code

	S	I	N	P	O
Rate	*Signal Strength*	*Interference*	*Noise*	*Propagation Disturbance*	*Overall Rate*
5	Excellent	Nil	Nil	Nil	Excellent
4	Good	Slight	Slight	Slight	Good
3	Fair	Moderate	Moderate	Moderate	Fair
2	Poor	Severe	Severe	Severe	Poor
1	Barely Audible	Extreme	Extreme	Extreme	Unusable

Stolen Equipment

The following equipment has been reported stolen. If you have any information that may lead to the recovery of the equipment, please get in touch with the advised contact as soon as practicable.

The following equipment was stolen recently from the Dandenong West, VIC shack of Clint Jeffrey VK3CSJ. If any of this equipment is located, please contact Clint on (03) 9792 4500 AH, or (03) 9706 888 during business hours.

Yaesu Desk Mic YD-844A
Yaesu HF Transceiver FT757GX (faulty on 20 m)
Yaesu 1.2 GHz FM Transceiver FT2311R s/n 7M021315
Yaesu 2 m Handheld FM Transceiver FT290RH s/n 6G320730
Yaesu FRG7700 Receiver s/n 1H090571
Yaesu VHF Converter FRV7700
Yaesu LF Filter FF-5 s/n 1E010515 (attached to FRG7700)
Oskarblock SWR-200 Power Meter s/n 89439
Electrophone TX470 VHF CB Transceiver
NEC 9B Mobilephone
Desktop Charger for Phone
Desktop Charger NC-15 for FT290RH Handheld
Uniden HR2510 All Mode Transceiver
Trakton 6" Colour TV/Monitor CTV-400 s/n 006650
AWA Fleetmaster UHF Transceiver on 486 MHz

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Packet World

*Grant Willis VK5ZWI**

Introduction

Last month John VK1ZAO, in his Canberra Packet Radio Group Technical Symposium Paper, looked at the basics of how packet frames are constructed and exchanged on a typical amateur packet network.

This month we will take a look at how packet radio stations handle a particularly important part of packet radio, namely how stations determine when it is their turn to transmit. This particular facet of packet radio can have major implications on how much data can be exchanged on a particular channel and what the likelihood of successful communications will be. Consideration is also given on how the channel access aspects of packet radio scale with increasing data-rate, and the results may surprise some people.

CSMA – Carrier Sense Multiple Access

Carrier Sense Multiple Access is the mechanism which we use to determine whether or not we can transmit on the channel. After all, there is no point transmitting if there is already another station transmitting. All we will achieve is to corrupt his data and our data will also be corrupted; both stations then require retries.

The simplest form of CSMA requires that we listen to the channel, and when the channel goes free we start transmitting. Obviously if two stations are waiting for a third to finish, they will both try to transmit at the same time, thereby generating a collision.

The next level of CSMA used in amateur radio gives a small priority to those stations that are acting as digipeaters. If the packet to be sent is being digipeated, it is sent as soon as the channel goes free. All other stations that have normal packets hold them for a small time after the channel goes free before being sent. If the channel gets busy, we go back to waiting until it is free.

Currently, the most often used form of CSMA is the P-Persistence algorithm. For this we define a time called the SLOTTIME and a decision "number" PERSISTENCE. Now when the channel goes free we wait for one slottime. If the channel is still free we generate a random number and compare this to our persistence. If the number is smaller we start transmitting. If the number is larger we wait another slottime and then generate a new random number to test. If the channel goes busy, we go back to waiting until the channel is free. The philosophy here is that not all stations will try to seize the channel at the same time thus lessening the chance of a collision, but that if no other station seizes the channel, we won't wait for an inordinate length of time before commencing our transmission.

Obviously the selection of both SLOTTIME and PERSISTENCE can vastly affect the performance of a channel and it is certainly recommended that ALL users of the channel implement the same values. So I think that some discussion on the selection of these values is in order.

Slottime

This is the time that we wait after having decided not to transmit within a particular slot. If, however, another station starts transmitting within that slot, we should have waited at least long enough to detect his transmission, and probably not much longer! Therefore, slottime should equal the time that elapses between a station deciding to transmit, and another station detecting (carrier detect) that a transmission has commenced.

Transmitter Delay + Propagation Delay + Receiver Delay + TNC Delay. Note – this is the time required to detect carrier, not necessarily to detect valid data; hence transmitter delay above is not TXDELAY.

Although 100 ms is an often used default for slottime, I suspect that a better value may be in the range of 10-20 ms. I hope to do some checks to validate this assumption. Checks with two modern hand-helds showed that 100 ms is a good measure of delay from key-up to TNC carrier detect.

Persistence

This number decides our likelihood of transmitting. If set to zero we will never transmit, if set to 255 we will always immediately transmit and the algorithm degenerates to a basic CSMA. If there are likely to be two stations requiring to transmit at the same time then each should have a 50% (128) chance of seizing the channel. Similarly, if it is likely that four stations are wanting to transmit at the same time they should have a 25% chance of access. Remember that the important number here is the number of concurrent transmitting stations, not the number of packet stations in the cell.

As an example, assuming a SLOTTIME of 100 ms, and a PERSISTENCE of 25% (64), then there is a 90% chance that we will have transmitted our packet on a free channel within 8 slottimes (800 ms) and a 99% chance that we have transmitted it within 16 slottimes (1600 ms). Chance of a collision if two stations wish to transmit at the same time is 25%; the chance if three wish to transmit at the same time is 44%; and the chance if all four wish to transmit at the same time is still only 58%. That is there is still a chance that only one station will start transmitting in a slot, and that the others will detect this and delay their transmissions.

TXdelay

Although not part of CSMA, TXdelay is probably one of the other TNC parameters most likely to be set incorrectly. Again, a quick few notes on what the setting of this parameter is to obtain.

The delay here is from the time we start transmitting until the time that we start transmitting data (in the meantime we transmit only flags or some other synchronising data stream).

Transmitter delay + Propagation delay + Receiver Delay + TNC Delay.

Transmitter Delay – time for the transmitter to actually start emitting radiation after being commanded to transmit and/or the time for this transmission to be stable, whichever is longer.

Propagation Delay – time for the signal to go from transmitter to receiver, usually insignificant in VHF/UHF short path circuits, but may be significant in HF channels.

Receiver Delay – time for the receiver to unsquelch and for it to become stable. NOTE: Some handheld radios used for packet have a power save mode, which means that the radio only listens for about 125 ms out of every one or two seconds, the rest of the time it does not listen at all. If you use a handheld for packet, check that this power save mode is off.

TNC Delay – time for the TNC to synchronise to the data stream.

As the setting of these parameters can both enhance the performance gained on a single CSMA channel and also disastrously trash that performance, please check with your local packet coordination group for recommended settings for your area and select conservative settings until local recommendations can be sought. If your TNC does not support the P-Persistence algorithm please select a DIGIWAIT value equal to the time for a P-Persistence station to have a 50% chance of transmitting in your area. For the example times given above (25% persistence) this would be equal to three slottimes or 300 ms if the slottime was 100 ms.

Channel speed	300 bps	1200 bps	4800 bps	9600 bps	56k bps
eff. bit time	3.3ms	0.83ms	0.208ms	0.104ms	0.018ms
Min AX.25 frame	160 bits	160 bits	160 bits	160 bits	160 bits
Xmit time	528ms	133ms	32ms	16ms	2.9ms
Max AX.25 frame	2208 bits	2208 bits	2208 bits	2208 bits	2208 bits
Xmit time	7286ms	1832ms	459ms	230ms	39.7ms

Table 1 – Comparison of times required to transmit both the smallest possible and largest recommended AX.25 frames at different channel bit rates.

Table 1 compares the time required to transmit both the smallest possible and largest recommended AX.25 frames (256 bytes) at different channel bit rates. Obviously, in a half-duplex situation the time that the radios and TNCs require becomes a more significant part of the data throughput equation.

Conservative Recommendations for 1200 baud working are:

TXDELAY	30 (300 ms)
SLOTTIME	10 (100 ms)
PERSISTENCE	64 (maximum)
DIGIWAIT	30 (300 ms).

Other speeds should use different parameters; however, these should still be in keeping with the capabilities of the equipment being used. It is an obvious disadvantage to use the delay parameters presented for 1200 baud when using 9600 baud because the TXdelay is longer than the time taken to actually send your 9600 baud packet, reducing your efficiency to something less than 50%!

Conclusion

Next month, John VK1ZAO takes a look at how the Internet TCP/IP protocols can be applied to Amateur Packet Radio Operations.

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Repeater Link

*Will McGhie VK6UU**

The FM Receiver

Listening to conversations on repeaters indicates some of us could understand more about how our FM receiver works. There are some considerable differences between FM receivers and AM or SSB receivers. It gets down to the difference between FM and other forms of modulation. It could be argued that FM is a unique form of modulation, a stand-alone, with no other modulation types having similarities.

Unique

So what is so different about FM? To put it simply, FM is not amplitude conscious. The audio level you hear out of the loud speaker is in no way proportional to the received RF signal level. To put it another way, the RF signal can be just moving the S meter, or full scale plus 60 dB, and the resulting audio level is the same.

I hear you say "but SSB and AM are the same". The audio level is the same as you drive around in your car listening to an AM radio station. The same could be said for an SSB signal, the audio varies little between an S1 and a 40 dB over S9 signal. This is not due to the nature of the modulation, but rather the design of the AM or SSB receiver.

Amplitude Modulation

It may be of value to refresh our minds on amplitude modulation, and single sideband modulation. Both are similar in the context of this discussion. The audio level out of the speaker is proportional to the RF signal level. This is a problem with amplitude type of modulation. So much so that a means of automatically changing the RF and IF gain must be built into any receiver that is designed for amplitude modulation. If this was not done, not only would the audio level change greatly from signal strength to signal strength, but at higher RF signal levels, distortion would be the result.

AGC

All amplitude modulation types of receivers must have, as part of their design, an automatic gain control that samples the RF signal level and adjusts the RF and IF gains. The result is a constant audio level out of the speaker regardless of the RF signal level.

No AGC

In contrast, FM receivers don't require AGC in the RF and IF circuits. The RF signal level has no effect on the resulting audio and very strong RF signals do not suffer from audio distortion. The modulation information is contained in the change of frequency of the RF signal and not an amplitude change.

The RF signal is amplified to a point where it is deliberately clipped, to remove any amplitude changes that may have found their way into the transmission process. Noise from power lines and car ignitions that ride in on top of the FM modulated signal are, as a result of the clipping, removed. FM suffers less from this form of interference. However, there are other factors that cause this type of interference still to be present to some degree.

Passband ripple in the IF crystal filter results in some of the pulse type noise being phase modulated. Once this noise is an FM signal, then, as an FM signal, it can not be removed by clipping.

High Gain

The RF and IF gain in an FM receiver is always flat out, as there is no AGC in an FM receiver. The overall gain in an FM receiver is higher than in an AM receiver. The RF level in the IF amplifier is amplified to a level that can be clipped. This is why, if you open the mute in an FM receiver, the noise level in the absence of a signal is so high. AM receivers don't have the same amount of gain to maintain the amplitude characteristics in any incoming signal.

The Mute

Of all the operational differences between AM type receivers and FM receivers, the mute is it. In an AM receiver there is normally no mute, for two reasons. First, AM mutes don't work very well as they have limited ability to handle pulse noise and interference. And secondly, the noise level in an AM receiver, in the absence of a signal, is low.

However, in an FM receiver the noise level coming out of the speaker is high. So high that it is very annoying. This noise, by the way, is not band noise but noise generated in the RF front end. Disconnecting the antenna from an FM receiver results in little or no change in the noise level. The noise is generated in the receiver due to the high RF and IF gain and, combined with the RF clipping, masks any band noise. A mute is essential in an FM receiver.

How it Works

How does the mute in an FM receiver work? Perhaps the most important point, is

that the mute in an FM receiver does not use the S meter signal.

The mute circuitry is not driven from the signal strength of the incoming signal. Rather, the mute looks at the signal to noise on the demodulated audio. The mute circuit measures the audio noise level and, depending on the sensitivity point that it is set to (mute pot), either allows the audio to go to the speaker amplifier or not. This is a most important point. The mute circuit looks at the signal to noise on the demodulated audio and, if the signal to noise is acceptable, allows the audio to go to the speaker amp. This point is worth repeating.

But How?

However, the mute circuit has a problem as described so far. The demodulated audio contains the wanted audio, and this appears to the mute circuit to be noise.

The mute detector is simply an amplitude detector. If the noise level is high, the mute toggles one way, and if the noise level is low, the mute circuit toggles the other way. The wanted audio on the signal is seen by the mute circuit as a changing noise level. Speech would close the mute.

The solution is to only allow the high frequency component of the demodulated audio to go to the mute circuitry. Filter out the speech, which is contained below 4 kHz, and only allow frequencies above 5 kHz to go to the mute detector circuit. It is this audio noise above 5 kHz that is used to determine if the signal to noise level is low enough to switch the speech to the speaker amplifier.

The mute pot is the control that determines the switching point of the mute circuit, and allows the audio to be switched through to the speaker amplifier. With the mute pot wound hard on, a high audio signal to noise ratio is required to switch the audio through. With the mute pot adjusted to just before the point it opens on noise alone, the mute will open on a very poor audio signal to noise ratio.

More Noise

One useful characteristic of the noise mute circuit is its immunity to being falsely triggered by varying noise such as power line noise, car ignition and lightning. The mute sees these increases in noise level as an even poorer signal to noise level, and remains closed. The result is that, with no wanted signal on the frequency you are tuned to, the mute remains closed, even when there is all sorts of unwanted noise about. Mutes for amplitude modulated systems find these types of noises difficult to handle and usually open. FM has it all over AM when it comes to providing a highly effective mute.

Mute Tail

There are so many aspects of the mute in an FM receiver, that it is difficult to know when to stop. The mute described so far is the most common, but there are more sophisticated FM mutes.

The ordinary mute is not perfect. Particularly when mobile, limitations become obvious. Weak fluttery signals cause the mute to close from time to time, reducing the intelligibility of the received signal. For this type of operation the mute should be adjusted for maximum sensitivity. This is the point where the mute just closes on no signal. Even so, fluttery signals are often cut up by the mute. One way around this is to place a delay on the mute closing. This is called the mute tail, and is the short burst of noise you hear when the incoming signal ends.

This burst of noise is even used in movies these days to show how up to date the movie makers are. Pity they also have a burst of mute noise at the start of a transmission as well.

The longer this mute tail the less weak fluttery signals are chopped up when mobile. However, if this mute tail is made too long it becomes annoying, so a compromise is required.

Hysteresis

Yet another characteristic associated with the FM mute is hysteresis. This is the difference between the open and close points of the mute, often quoted in dB. A stronger signal is required to open the mute than is required to close it.

The idea behind this characteristic is considered to be suited to commercial usage. A weak noisy signal can be difficult for the every day commercial user, so it is best not heard. However, once the mute does open on a fairly clean signal, it will remain open if the signal becomes noisy.

I don't agree with this explanation in total, but it is one explanation I have heard for using hysteresis in an FM mute. For amateur operation, hysteresis, in my opinion, is a pain. Amateur transceivers vary from having a modest amount of hysteresis, to almost none. Most commercial radios we convert to amateur bands employ hysteresis and, with most of them, the hysteresis can be modified. Hysteresis cuts up a weak signal in the mobile quite badly. Hysteresis is best avoided in amateur receivers and repeater receivers.

Proportional Mutes

One way around the weak signal performance of the mute when mobile, is to use a proportional mute circuit. This clever circuit adjusts the mute tail to be short on strong signals and proportionally longer on weaker signals.

This idea works very well but, unfortunately, is yet to find its way into amateur FM receivers. The idea is not new, but for reasons unknown, manufacturers of amateur FM transceivers have not included this idea into amateur designs.

Repeaters

This mute circuit is the logic switch in a voice repeater that turns the repeater's transmitter on and off, and is fundamentally important in the performance of the repeater. All in all, the mute circuit in an FM receiver is perhaps the most important part of the FM receiver.

CTCSS Mute

So where does the CTCSS mute fit into all this? I think there has been enough to digest for the moment, so CTCSS mutes will be covered in a future Repeater Link.

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Update

Output Balance on the Z Match

Page 10, April 1996 issue of Amateur Radio

Lloyd Butler VK5BR, author of the above article, advises that in the last sentence of the centre column on page 10, he quoted the test probe used as having a terminal resistance of several kilohms (depending on frequency).

This should have been given as several **hundred** kilohms.

Front Cover Photo, April Issue

Credit to Ron Fisher VK3OM for the photo of the Frank Hine Memorial Trophy was inadvertently omitted.

It might be a good idea to correct your copy of the April 1996 issue of *Amateur Radio* now.

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Silent Keys

Due to space demands obituaries should be no longer than 200 words.

The WIA regrets to announce the recent passing of:-

S C (Stephen)	SCOTT	VK2FVB
J I	BREWSTER	VK2KOJ
P H (Peter)	SYME	VK5KB
R J	MCCORMICK	VK6MQ

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Pounding Brass

*Stephen P Smith VK2SPS**

Interested in CW and homebrewing? Why not combine the two and make a hand key. It's been some time since a project of this calibre has featured in this column. Hopefully, many home-brewers will find it both interesting and challenging. What I intend to do is present you with the parts list and base details first, and conclude with the key details in the coming months.

Firstly, my sincere thanks to Dr Jim Lycett G0MSZ who supplied the technical drawing and for his kind permission to allow me to reproduce it here for you; and to Wes VK2WES who has made two of these magnificent keys which featured in *Morsum Magnificat,* issue No 27. Wes has kindly supplied me with his own construction details which are also presented here for your benefit.

Material List

The following will be required: hacksaw, files, hammer, centre punch, soldering iron, scriber, emery paper, hand reamers, taps, bench drill (0 to 12 mm with drills to suit), centre lathe (small, 120 mm to machine all terminals, bosses, contacts, etc), and a bore trunnion for ball bearings.

While organising the above I paid many visits to the local scrap yards armed with the material list, collecting the nearest sizes of brass bits that I could. In most cases the correct size was not available so I made sure that I got oversize materials that could be machined down.

The base as specified is marble but, owing to the difficulty of accurately drilling this material, I was fortunate in being able to obtain a piece of 20 mm thick phenolic switch board panel which was perfect. Any dense wood is also satisfactory.

I added a piece of 3 mm scrap brass sheet as a cover plate and for additional weight under the base.

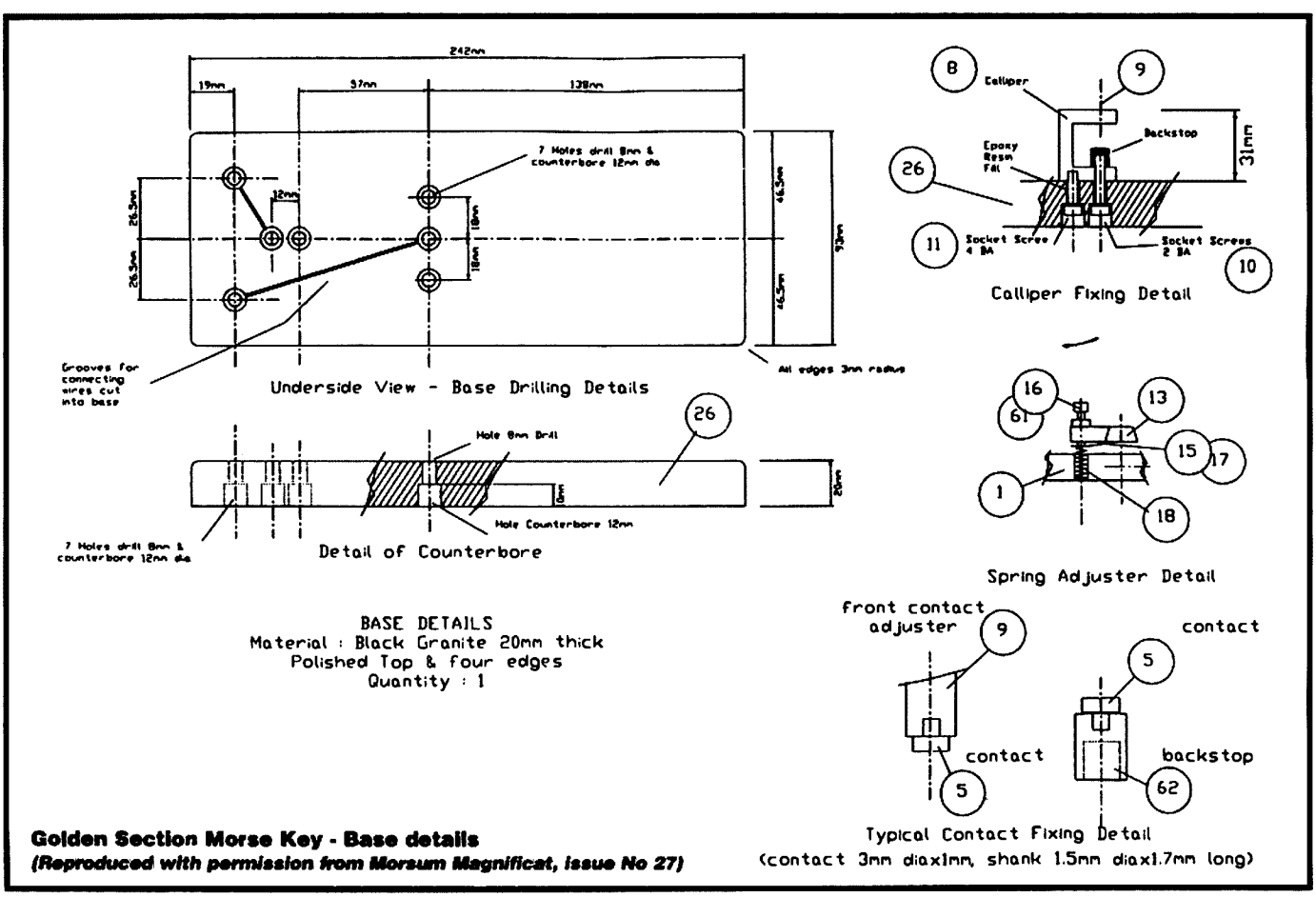
Construction Sequence

1. Terminals, adjusting screws and contacts.
2. Contact caliper.
3. Trunnion.
4. Arm.
5. Spring plate.
6. Knob and finger plate.
7. Base.
8. Assemble, adjust, test action.

The manufacturing time for two keys was approximately 50 hours. I now had a gleaming "Golden Key" and it was time to put it to a transmitter and dummy load. Adjustments were completed and I was very happy with the action and feel. Being, by this time, completely biased about its performance (equal to my beloved Swedish Key), I delivered it to a friend, who was a long time Naval and civilian professional, for evaluation. His comment, *"a lovely piece of gear."*

So there you have it. A very interesting project, the end result of which is very satisfying.

While these comments relate to the cantilever style of key as per the original drawings, they are also pertinent to a conventional arm arrangement, which has now been completed and performs flawlessly.



Golden Section Morse Key - Base details
(Reproduced with permission from Morsum Magnificat, Issue No 27)

Golden Section Morse Key – Parts List

Item	Description	No	Mat	Size	Finish
001	Arm – shaped	1	brass	142x12x7	Ch Pl
002	Boss – turned	2	brass	12 diax9	Ch Pl
003	Keep plate	1	brass	16x7x2	Ch Pl
004	Contact plate	1	ph bronze	34x7x2	Ch Pl
005	Contacts	4	3 diax 1, shank 1.5 diax 1.7		
006	C/Sk socket screw	2	steel	6BAx7	Ch Pl
007	C/Sk socket screw	1	steel	6BAx5	Ch Pl
008	Calliper – shaped	1	brass	31x25x20	Ch Pl
009	Contact adjuster	1	brass	2BAx15	Ch Pl
010	Back-stop sk screw	1	steel	2BAx20	Ch Pl
011	Connector sk screw	1	brass	4BAx20	Ch Pl
012	Terminals (binding)	2	brass	2BAx16d	Ch Pl
013	Springplate-shaped	1	brass	45x28x6	Ch Pl
013a	Springplate(option)	*	brass	91x28x6	Ch Pl
014	Socket screw	2	steel	6BAx11	Ch Pl
015	Leaf spring fixing	1	brass	6BAx4	Ch Pl
016	Spring Adjuster	1	brass	4BAx12	Ch Pl
017	Leaf spring	1	Sp St	28x7x1	Ch Pl
018	Coil spring	1	Sp St	4 diax16	Ch Pl
019	Trunnion – shaped	1	brass	25Hex x25	Ch Pl
020	Socket Screw	3	steel	2BAx20	Ch Pl
021	Ball Race bearings	2	(1/2"OD x 3/16"bore x 5/32"w)		
022	Bearing Pin	1	steel	3/16"diax45	
023	Knob – turned	1	plastic	26 diax25	black
024	Studding	1	brass	2BAx18	Ch Pl
025	Finger plate	1	plastic	40diax2.5	clear
026	Base	1	granite	242x93x20	polish
027	Connecting wire	2	copper	16SWG x 200	
060	Locknut	1	brass	2BA	Ch Pl
060a	Locknut (turned & knurled to suit)			2BA	Ch Pl
061	Locknut	1	brass	4BA	Ch Pl
061a	Locknut (turned & knurled to suit)			4BA	Ch Pl
062	Back stop	1	plastic	15 diax9	black
063	Locknuts	2	brass	2BA	(terminals)
064	Washers	6	brass	2BA	
065	Washers	1	brass	4BA	

Key to abbreviations

Ch Pl = chrome plate
swg = standard wire gauge
ph bronze = phosphor bronze
OD = outside diameter,
sp st = spring steel,
BA = British Association Thread

Miscellaneous Materials

Epoxy Resin for bushing holes in base – Araldite, etc.
Bearing Cement – Locktite, superglue, etc.
Evostick for glueing felt to underside of base.
Felt – size of base.

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Ionospheric Update

*Evan Jarman VK3ANI**

Solar Activity

Solar activity during the last quarter was predominantly at very low levels and continuing to decline. During the first half of February the IPS solar observatory at Culgoora saw no solar region with spots. The sunspot number at this time was 4.4.

Ionospheric Activity

The most significant ionospheric depression occurred around the middle of January and February when values were depressed by 15-30% from the mean. The further south, the greater the depression. Blanketing sporadic E was observed from 0000 hours to 0500 hours UTC on 21 to 23 January. Strong Es (sporadic E) was reported by the Ionospheric Prediction Service throughout February especially in the southern regions of Australia.

T Index

The Ionospheric Prediction Service revised the T index values during the last quarter. Numbers from the beginning of last year up to the end of next year have been amended. A graph of the revised T index appears below. When compared with the graph in the ionospheric update last quarter (*Amateur Radio* February 1996, page 51) the changes have been minimal; just fine tuning. Because changes were made to the figures for last year does not mean that history has been rewritten. The changes are due to the delays in receiving data from some foreign ionosondes. Australian ionosonde data is obtained via the telephone network and is immediately processed. Other data is not so rapid. As the data comes in the T index is revised but the delay gives the impression that history is being rewritten; it's only an impression.

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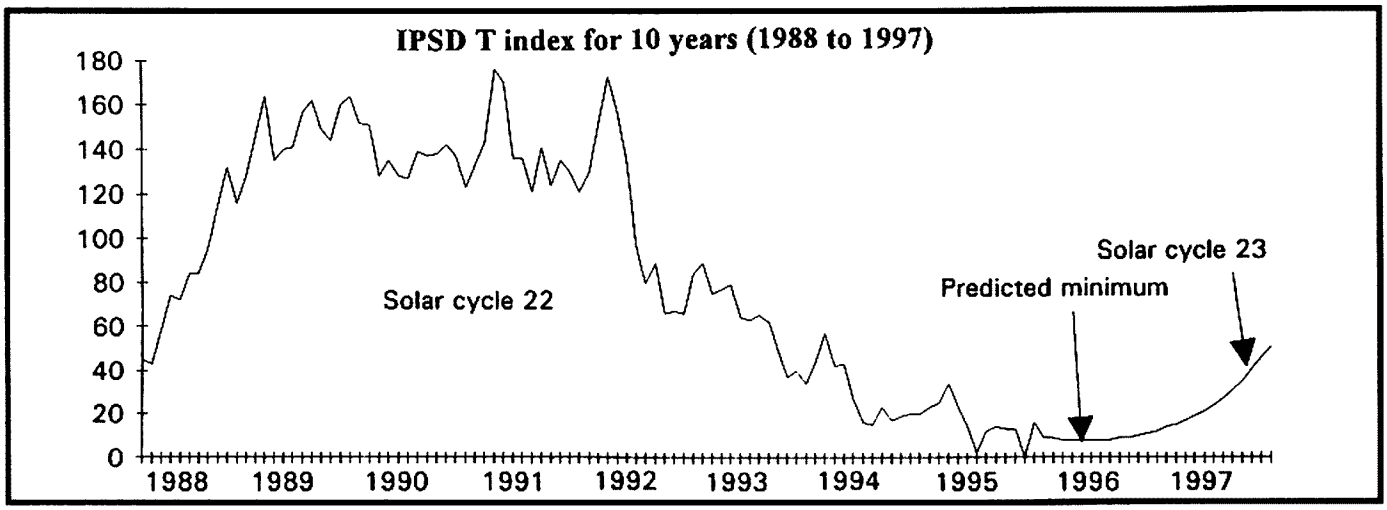

Spotlight on SWLing

*Robin L Harwood VK7RH**

Winter-time conditions have set in on the radio, with more daytime propagation of signals noticeable down here in the south-eastern corner of Australia. I am hearing signals directed to North, Central and South America, Europe and the Middle east between 0200 and 0600 UTC, particularly on the lower frequencies. In the evening hours, I am hearing Asian signals pretty easily but not much else. Signals from Europe are virtually non-existent while the North Americans broadcasting to the western hemisphere in their early morning are well down. All bands above 11 MHz seem to shut down after the local sunset.

Because of the unfavourable propagation conditions, I have been spending more time surfing the Internet than earwigging about the bands. Many of the major international broadcasters have opened pages on the World Wide Web or, as they are commonly referred to nowadays, websites. I have peeked in on several and have picked up quite a deal of information, which has assisted me in the hobby. Electronic mail (e-mail) is certainly a lot faster than via the conventional postal service and this faster medium has had a significant input to the various broadcasters, who find this feedback is beneficial to all concerned.

I would recommend that you obtain the latest Internet guide to International Broadcasters, prepared by Thorsten Koch in West Germany. It can be accessed at http://www.informatik.uni-oldenburg.de/~thkoch or at http://www.cs.cmu.edu/~jblythe/short-wave.html. Both sites also have links to other shortwave related websites.

It looks like I was too hasty paying my Fidonet subscription as the BBS closed mid-April. This means that I don't have a current node. I am somewhat wary of outlaying any more subscriptions as there have been feelers from several interested local "entrepreneurs" wanting to see if I would come aboard. But I think Fidonet has probably passed its use-by date as more are finding that the Internet has faster e-mail facilities than Fido plus a wider information base. The local Fido BBS did have a games area plus extensive files and shareware but, as it was only a part time effort, the sysops did not get sufficient donations to pay for its ongoing costs. The lure of the Internet now is being readily available locally through four providers, whereas 18 months previously the University had only a restricted service.

I received an e-mail at the end of March from Radio Canada International. It informed me that RCI would not be closing as scheduled at the end of March, as funding had been received for another 12 months operation. So it appears as if the public outcry that arose around Christmas time, when the shutdown was mooted, has won a reprieve for RCI.

The Carnarvon site of Radio Australia has permanently closed down. Some of the senders, I believe, will be re-located to Darwin, whilst the 100 kW units will be removed to Shepparton, or scrapped altogether. The Darwin site on the peninsula, to the east of the city, has already gone to 24 hour operation. Previously it closed in the local evening hours.

There are several American domestic broadcasters now in the enlarged medium wave allocation from 1600 to 1700 kHz. One is pretty close to New York and the other is close to San Francisco. The latter one, on 1640 kHz, does have distinct possibilities to be heard here, although it is only permitted 1 kW at night and 10 in daylight hours. The station in New Jersey is on 1660 kHz and is known as "Radio Oz". Don't be fooled by the callsign as it is the name of a children based network and has no relation to us. It, too, runs low power in the night but has been already heard in Europe.

The future of Adelaide's "Southern Cross DX Club" is in the balance. I believe that they were presented with two hefty printing bills, pretty close together and rumour is that the "DX Post" is now a bi-monthly bulletin. The question is whether it is still worth subscribing to as I am now able to download updated daily information from the Internet, rather than rely on a bi-monthly magazine, which has dated material. I have been acting as Tasmanian representative of the club but have not been officially informed and the news on what is happening came down to me via a third party who obtained it via another club.

Well that is all for May. Hope you have good propagation and monitoring.

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Don't buy stolen equipment - check the serial number against the WIA Stolen Equipment Register first

VHF/UHF - An Expanding World

*Eric Jamieson VK5LP**

All times are UTC.

The Great Tropospheric Opening (Part 2)

Following are the contacts made during the latter half of the tropo opening across The Great Australian Bight commencing on 10/2 and continuing through to 17/2 with contacts made which, to most people, have been only a dream. That the Mount Gambier to Perth path should remain open for so long on 144, 432 and 1296 MHz seems unbelievable.

Details of the weather pattern which provided the outstanding conditions were described last month. Usually, each year during January or February, there will be a sustained opening across The Bight to Albany and/or the southern areas of VK6, but never before on the scale exhibited this time, and certainly not encompassing Perth to the degree that occurred.

However, as briefly mentioned last month, the sustained operation was confined to a rather narrow path, from Perth/Torbay/Albany to Mount Gambier and on to Portland/Melbourne/Drouin. The area north of Roger VK5NY, and this was to include Adelaide, and south to include VK5LP at Meningie, was devoid of signals, the major path being confined to a point well down in the Southern Ocean. Perth and Mount Gambier shared the greater proportion of all contacts.

15-2-96

0020	VK6AS	– VK6KZ/p	144	5x9	312
0025	VK6APZ	– VK6KZ/p	144	5x9	312
0049	VK5NY	– VK6KZ/p	144	5x6	1912
0115	VK5NY	– VK6KZ/p	144	cw	1912
0118	VK5NY	– VK6KZ/p	144	cw	1912
0126	VK5DK	– VK6ZWZ	144	5x6	2360
0631	VK3ZQB	– VK6KZ/p	144	5x9	2187
0705	VK5DK	– VK6KZ/p	144	5x9	2066
0754	VK5AKK	– VK6KZ/p	144	5x5	1907
0757	VK5NY	– VK6KZ/p	144	5x5	1907
0809	VK3AUU	– VK6KZ/p	144	5x5	2540
0817	VK5NY	– VK6KZ/p	432	5x1	1912
0824	VK5NY	– VK6KZ/p	1296	5x1	1912
0901	VK3DQW	– VK6KZ/p	144	5x3	2440
0910	VK3II	– VK6KZ/p	144	5x3	2440
0959	VK3AUU	– VK6KZ/p	144	5x8	2540
1000	VK5DK	– VK5LP	144	5x9	268
1011	VK5DK	– VK6KZ/p	432	5x6	2066
1030	VK3RZ	– VK6KZ/p	144	5x3	2440
1042	VK3BRZ	– VK6KZ/p	144	5x6	2340
1046	VK3ALM	– VK6KZ/p	144	5x5	2440
1500	VK5DK	– VK6KZ/p	144		2066
1600	VK5KK/p	– VK6KZ/p	144	4x1	
2025	VK3ZQB	– VK5KK/p	3cm	5x8	250
2125	VK5DK	– VK3AUU	144	5x9	458
2126	VK5DK	– VK6APZ	144	5x9	1760
2129	VK5DK	– VK6AS	144	5x9	1760
2140	VK5DK	– VK6HK	144	5x2	2360
2148	VK3AUU	– VK6AO	144		2816
2203	VK5DK	– VK3AL	144	5x7	368
2206	VK3ZQB	– VK6HK	432	3x3	2490
2207	VK6AS	– VK6HK	432	5x7	600
2210	VK3ZQB	– VK6HK	144	5x6	2490
2219	VK5DK	– VK6HK	144	5x4	2360
2223	VK3AUU	– VK6HK	144	5x3	2816
2224	VK5NY	– VK6HK	144	2x1	2180
2226	VK6AS	– VK6HK	144	5x9	600
2230	VK5NY	– VK6KZ/p	144		1912
2233	VK3AUU	– VK6KZ/p	144	5x5	2540
2244	VK6KZ/p	– VK6HK	144	5x9	400
2248	VK3II	– VK6ZWZ	144		2728
2256	VK6WG	– VK6HK	144	5x7	400
2259	VK3AUU	– VK6HK	144	5x7	2816
2301	VK6APZ	– VK6HK	144	5x6	600
2306	VK6APZ	– VK6ZWZ	432		600
2307	VK6AS	– VK6ZWZ	432		600
2308	VK3ZQB	– VK6HK	144		2490
2350	VK6WG	– VK6ZWZ	144		400
2351	VK6KZ/p	– VK6ZWZ	144		400
2357	VK6WG	– VK6ZWZ	1296		400

16/2/96

0020	VK6KZ/p	– VK6ZWZ	432	5x6	400
0021	VK6WG	– VK6ZWZ	432		400
0835	VK3ZQB	– VK6KZ/p	144		2187
1110	VK5DK	– VK6KDC	144	5x9	2251
1125	VK5DK	– VK6KDC	432	5x1	2251
1126	VK5NC	– VK6KDC	144	5x8	2254
1133	VK5DK	– VK6KZ/p	144	5x7	2066
1137	VK3AFW	– VK6WG	144	5x7	2410
1138	VK5DK	– VK6KZ/p	432	5x2	2066
1143	VK5NC	– VK6KZ/p	144	5x7	2066
1147	VK5DK	– VK6APZ	144	5x9	1760
1149	VK5NC	– VK6APZ	144	5x9	1763
1155	VK5DK	– VK6AS	144	5x9	1760
1200	VK5AV	– VK6AS	144	5x3	1760
1201	VK5AV	– VK6APZ	144	5x3	1760
1212	VK5NC	– VK6KZ/p	1296	3x1	2069
1232	VK5DK	– VK6AS	432	5x2	1760
1233	VK5DK	– VK6APZ	432	5x1	1760
1233	VK5NC	– VK6AS	432	5x2	1763
1234	VK5NC	– VK6APZ	432	5x2	1763
1245	VK5DK	– VK6KZ/p	432	5x1	2066
1303	VK5DK	– VK6KZ/p	144	5x9	2066
1305	VK5DK	– VK6KDC	144	5x9	2251
1327	VK3ZQB	– VK5DK	1296	5x9	160
1350	VK5DK	– VK5NC	1296	5x9	3.3
1415	VK5DK	– VK6AS	144	5x9	1760
1435	VK5DK	– VK6KDC	432	5x5	2251
1437	VK5DK	– VK6DM	432	5x5	1760
1438	VK5DK	– VK6AS	432	5x8	1760
1447	VK5NC	– VK6DM	144	5x2	1763
1448	VK5NC	– VK6KDC	144	5x9	2254
1452	VK5NC	– VK6KDC	432	5x6	2254
1454	VK5NC	– VK6DM	432	5x1	1763
1455	VK5DK	– VK6KRC	144	5x8	2360
1458	VK5NC	– VK6KRC	144	5x6	2363
1508	VK5DK	– VK6KAT	144	5x5	2360
1508	VK5NC	– VK6KAT	144	5x4	2363
1520	VK5NC	– VK6ZWZ	432	5x2	2363
1535	VK5DK	– VK6ZWZ	144	5x4	2360
1535	VK5NC	– VK6ZWZ	144	5x4	2363
1536	VK5NC	– VK6ZWZ	144	5x4	2363
1540	VK5DK	– VK6ZWZ	432	5x2	2360
1558	VK5DK	– VK6KRC	432	5x3	2360
1609	VK5NC	– VK6AO	144	5x6	2363
1614	VK5NC	– VK6AO	1296	5x5	2364*
1620	VK5DK	– VK6AO	432	5x6	2360
1623	VK5DK	– VK6KRC	432	5x7	2360
1634	VK5NC	– VK6AO	432	5x8	2363
2100	VK3AFW	– VK6APZ	144	5x6	2128
2105	VK5NC	– VK6KRC	144	5x9	2363
2106	VK5NC	– VK6KZ/p	144	5x9	2069
2112	VK5NC	– VK6KRC	432	5x7	2363
2123	VK5DK	– VK6AO	144	5x9	2360
2130	VK3AFW	– VK6AS	144	5x8	2128
2132	VK3AFW	– VK5DK	144	5x9	368
2133	VK5DK	– VK6SQ	144	5x7	2360
2133	VK3AFW	– VK6HK	144	5x1	2728
2135	VK5DK	– VK6KDC	144	5x7	2251
2141	VK5DK	– VK6HK	144	2x1	2360
2143	VK6APZ	– VK6HK	144	5x9	600
2147	VK3AUU	– VK6HK	144	4x2	2816
2150	VK3ZQB	– VK6HK	432	5x2	2490
2155	VK6APZ	– VK6HK	432	5x4	600
2157	VK5AV	– VK6AO	144	5x2	2360
2202	VK5DK	– VK6HK	144	5x8	2360
2220	VK3ZQB	– VK6AO	432	2490	
2223	VK5NY/p	– VK6HK	144	3x1	2260
2225	VK3ZQB	– VK6AO	1296	4x1	2490
2230	VK5NC	– VK6KZ/p	144	5x8	2069
2235	VK5AV	– VK6HK	144	4x1	2360
2240	VK3ZQB	– VK3XPD/m	1296	5x2	260*
2243	VK5AV	– VK6KRC	144	5x3	2360
2244	VK3II	– VK6HK	144	4x3	2728
2314	VK3AUU	– VK6HK	144	5x5	2816

17/2/96						0902	VK5NC	– VK6KZ/p	144	5x2	2069
0009	VK5NC	– VK6HK	144	5x2	2363	1027	VK5AV	– VK5LP	144	5x1	268
0014	VK5NC	– VK6ZWZ	144	5x2	2363	1034	VK5AV	– VK5NY/p	144	5x7	100
0030	VK5NC	– VK6ZAY	144	5x1	2363	1042	VK5NC	– VK5NY/p	1296	5x9	100
0134	VK5NC	– VK6JJ	144	5x7	2363	1201	VK3AFW	– VK6APZ	144	5x5	2128
0135	VK5NC	– VK6KRC	144	5x7	2363	1225	VK3AFW	– VK6APZ	432	5x3	2128
0142	VK5NC	– VK6AH	144	5x6	2363	1241	VK3AFW	– VK5NC	144	5x9	365
0200	VK5NC	– VK6HK	432	419	2372*	1654	VK5NC	– VK6ZWZ	144		2363
0646	VK5NC	– VK6APZ	144	5x8	1763	2141	VK5NC	– VK6AS	144	5x1	1763
0710	VK5NC	– VK5NY/p	144	5x9	100	2258	VK5NY/p	– VK6ZWZ	144		2260
0715	VK5AV	– VK6APZ	144	5x1	1760	2302	VK5EE	– VK6ZWZ	144		2360
0715	VK5NC	– VK5NY/p	432	5x9	100	2303	VK6AS	– VK6ZWZ	144		600
0720	VK5NC	– VK5NY/p	1296	5x7	100	2315	VK3ZQB	– VK6ZWZ	144		2490
0726	VK5NC	– VK6APZ	432	5x8	1763	2359	VK5NC	– VK6ZWZ	144		2363

* These are VK5 distance records now held by VK5NC, and the 260 km contact between VK3ZQB and VK3XPD/m constitutes a new 1296 MHz mobile record. Please refer to the April issue of *Amateur Radio* for a statement from John VK3KWA on new State UHF and microwave records – they need not be repeated here.

David VK3AUU from Drouin, east of Melbourne and apparently the most easterly station to work Perth and points between, said: Stations worked were 12/2: VK6AS, VK6KZ/p; 13/2: VK6AS; 14/2: VK6s APZ, DM, ZWZ, KZ/p, AO, HK, KDC, VK5NY, VK5DK; 15/2: VK6s KZ/p, YAU, WG, APZ, AS, HK, AO, KDC, DM, VK5DK, VK7XR; 16/2: VK6s KDC, AO, KRC, AS; 17/2: VK6APZ; 18/2: VK6APZ, VK6AS.

Most of the time, signals from Adelaide were non-existent. VK6AS in Esperance was often there very early in the morning. The contact with VK6HK is a potential VK tropo record at 2816.8 km.

They can be worked!

Ron VK3AFW has been no slouch during the past three months judging by his log. Apart from multiple contacts on 144 and 432 to VK5DK, VK5NC, VK1BG, VK2TWR and 144 to VK7XR, which are not included, the following gives an idea of stations available for working from Melbourne.

Contacts on 144 MHz unless otherwise noted. 23/12/95: 2120 VK1RX, 2154 VK1DO; 30/12: 0653 VK5NC, 2114 VK1BG, 2121 VK2TWR/2, 2152 VK1DO, 2159 VK1RX, 2201 VK2FLR/p, 2253 VK5DK, 2258 VK5AV; 31/12: 2212 VK2ZAB. 1/1/96: 0402 VK5NC, 0403 VK5NC (432), 0421 VK2TWR, 0425 VK2TWR (432); 2/1: 0135 VK5DK, 0136 VK5DK (432); 3/1: 0909 VK1BG (432), 0911 VK1BG; 5/1: VK3DQW/p; 6/1: 1059 VK5AV/p, 1110 VK5PO/p.

While portable at Mount Buller for the Field Day: 13/1: 0542 VK5NC, 0546 VK5NC (432), 0647 VK7XR, 0649 VK7XR (432), 0808 VK2XKE.

Home again: 15/1: 2110 VK7XR, 2146 VK5AKK; 16/1: 0008 VK5AKK, 0011 VK5AKK (432), 1140 VK5DK (432), 1144 VK5DK, 2110 VK7XR, 2135 VK2TWR, 2137 VK2TWR (432), 2208 VK6AS; 17/1: 0917 VK1BG, 0952 VK7KAP, 0955 VK7KAP (432), 1003 VK7XR (432), 1006 VK7XR; 18/1: 2104 VK1DA, 2147 VK1VP.

20/1: Andrew VK7XR phoned Ron to alert him to the Es opening to VK4, and between 0450 and 0530 Ron worked VK4KZR, VK2FZ/4, VK4BOO, VK4APG, VK4JSR, VK4ZBH, VK4AR, VK4BKM, VK4ARN and heard VK4LP. Max VK3TMP worked eleven VK4s. Then the ZLs were noted. Charlie VK3BRZ called ZL1TWR several times without response. The same from Ron who noted that his 150 watts to a 15 element seemed insufficient for a contact! Ron also heard ZL1HI. Norm VK3DUT worked ZL1TWR, also VK3XRS and VK3DBM worked ZLs.

21/1: Open to ZL again and worked by VK3TMP, VK3KMN, VK3XRS, VK3BDM and others. VK3KMN didn't bother to write down his ZL stations as he "thought that sort of thing happened regularly on two metres SSB!"

24/1: 0640 VK2TWR; 27/1: 2239 VK5AKK; 28/1: 2129 VK5NY; 13/2: 2106 VK5AV;

14/2: 1006 VK7XR, 1028 VK7XR (432). 16/2 and 17/2 are included in the general list above, except 2151 VK2CM/p; 24/2: 2100 VK2TWR, 2104 VK1BG, 2106 VK2FZ/4 (this contact was made via a long meteor burst!), 2108 VK1BG, 2110 VK1BG (432). Ron speculates whether the contact with Rod VK2FZ/4 could have been via reflection from the space shuttle, as he is aware of two contacts made by that mode between Melbourne and Adelaide on a high power link above 400 MHz.

John Moyle Field Day

Alan VK5BW said he operated on 144 MHz from a high point at Parawa PF94 on 16/3. Conditions were not good but amongst others, he managed to work at 2039 VK3LK Heywood 5x1, 2102 VK5AKJ Mt Gambier 5x3, 2135 VK3ZGL Mildura 5x5, 2149 VK5AMD Bordertown, 2220 VK3NN Yanac 4x1. Alan said Dale VK5AFO from Mount Barker operated at Binney's Lookout, which is about 20 km to the east of me. However, I was away at the time of the contest so was not subject to strong signals from Dale!

Band Comparisons

Thanks to Neil VK6BHT and Wal VK6KZ, I have received a copy of the Propagation Summary made during the Ross Hull Contest between Neil VK6BHT at Geraldton and Wal VK6KZ at Perth, a distance of 378 km on a north-south path, drawing comparisons between 144 MHz and 10 GHz. First signal report is 144 MHz, the second 10 GHz.

30/12/95: 5x7 – 5x9; 1/1/96: 5x2 – 5x5; 2/1: 5x8 – 5x9; 3/1: 5x8 – 5x9; 4/1: 5x7 – 5x5; 5/1: 5x2 – 5x5; 6/1: 5x2 – 5x8; 7/1: 5x2 – 5x8; 8/1: 5x2 – 5x6; 9/1: 5x3 – 5x6; 10/1: 5x2 – 5x7; 11/1: nil – 5x8; 12/1: nil – 5x5; 14/1: 4x1 – 5x6; 18/1: 5x2 – 5x5; 24/1: nil – 5x5; 25/1: 5x3 – 5x8; 26/1: 5x1 – 5x6; 27/1: nil – 5x5. On 14/1 there was unusual propagation with the 10 GHz signal peaking 5 degrees to the west! On 17/1 there was a strong duct but with Wal portable at Torbay, no tests were attempted.

Summary from Neil: *Ducting was present on 22 out of 30 days or 73% of the time. I monitor Perth TV Ch 9 video carrier on 196.250 MHz with 6 KHz bandwidth receiver and dipole antenna. With no ducting present I can normally just detect the carrier, it is rare for it not to be audible.*

During ducting the level increases up to 60 dB! I can usually hear the Perth two metre beacon when Ch 9 TV is about 40 dB. However, there are occasions when there is little evidence of Ch 9 increase and yet there is a duct at sea level or a few metres ASL.

The above summary is interesting because it confirms the findings of the VK3s and VK5s, that often 10 GHz signals are stronger than two metres, which suggests that two metres is not a good indicator for 10 GHz openings! Perhaps someone, at the same time, will examine the propagation on 432 and 1296 MHz and compare these bands with 10 GHz, and report their findings to me.

New Zealand Report

Cliff ZL1MQ reports that during February, 50 MHz openings tapered off and by mid-month the band was quiet. ZL3NE worked 19 VKs and ZL2AGI had 17. On 1/3 ZL2TPY worked JA0GLM/7 and JL7IWF. During February ZL3NE and ZL2AGI between them worked 6 VK2s, 5 VK3s, 10 VK4s and 3 VK5s. Some stations were worked several times for a total of 47 contacts.

The total contacts reported for the summer with VK stations was 426 and other DX was 15, including VK9 Lord Howe Island and Norfolk Island, plus Japan. Cliff says: *We can only estimate that the number of contacts is about 70% of the total which would make the total about 600 for 1995-6. By the way – correct the beacon frequency of ZL3SIX to 50.040 MHz.*

144 MHz: This band generally opens in February between two and four times but this year remained shut, so the total number for this summer was 144, plus two to Norfolk Island. This compares well for the excellent DX season of 1985, and once again, is not the total worked.

It is interesting to note that while ZL 144 MHz contacts have been made to VK1, 2, 3, 4 and 7 this summer, VK5 seems too far away, not to mention the fate of VK6 and VK8!

UHF: During the National Field Day in December 1995, a number of Down East Microwave Transverters were used on 1296, 2424, 3456 and 5760 MHz. These transverters are obtainable from USA at a reasonable price and consist of a kitset complete with all parts. The inductance is etched in the printed circuit boards, IF 144 MHz, output a few milliwatts.

Europe

The 50 MHz report from Ted Collins G4UPS indicates he has a rather busy life, with daily scheds to SM7AED and G3CCH, usually via CW, reports on weather conditions eg cloudy, snow, sleet, hail, rain, fog, sunny, frosty, clear, dry, windy, aurora, etc, listens for beacons on 50 and 28 MHz, works a few stations on both bands, enters a report into the computer. The rest of the day is his for other tasks!

Ted's February report shows he copied ten beacons, ES6SIX, GB3BUX, GB3LER, GB3MCB, GB3NHQ, HV3SJ, SV1SIX, SV9SIX, S55ZRS, 4N1SIX. The HV3SJ beacon is new and operates from the Vatican City on 50.004.5, grid JN61fv.

On 50 MHz Ted worked CT1AUW, DJ0YS, DL2GBT, DL8EBW, DL8FCL, EH3BDT, EH3BKZ, EH3CCU, EH7KW, ES5MC, G3CCH, G3HBR, G3SKR, I0CUT, I0FHZ, IC8CQF, IK0NOJ, IK0WAC, IK2GSO, IK5RLP, IS0QDV, OEM9DMV (special event callsign), OK2DB, OZ5IQ, OZ7DX, S51TJ, S52R, S57AC, S59F, SM7AED, SP5CCC, SP9BIF, YL2DX. Some of these, particularly to Estonia, Poland, Yugoslavia and Italy, are in the range of 1600 to 2000 km so there is probably an Es component involved. There are 13 countries in the above list.

The VK Scene

Six metres appears quiet. John VK4KK phoned to say that on 24/3 at 0500 JA1 and JA9 were up to 5x9, but no JA beacons. Vladivostok TV on 49.750 was weak. Steve VK3OT has reported many video signals around 48 MHz coming from the north and north west, particularly following the sun-flare on 21/3. No other reports to hand.

Ron VK3AFW at Oakleigh, said that during the Ross Hull Contest he worked Andrew VK7XR almost every day on two metres, over the 440 km mostly water path, CW often required. (John VK3ATQ at Berwick does the same thing on six metres which is interesting, the distance about 420 km.) Other regular two metre contacts for Ron were to VK2TWR 410 km, Mount Gambier 380 km, Canberra 470 km.

From the USA

The April issue of *QST*, will carry in *The World Above 50 MHz* by Emil Pocock W3EP, considerable information in an article headed "DX Records Around the World". I hope to present some of this to readers next month.

It was interesting to read that Al Ward WB5LUA checks claimed distances with BD, the bearing and distance programs written by Michael Owen W9IP. BD is based on a refined mathematical description of the Earth's complex shape published by the US Naval Oceanographic Office in 1970, and has a claimed accuracy of a few metres, dependent upon the accuracy of determining station locations.

More on that later, but several amateurs in Australia are now using the Global Positioning System (GPS) which uses several satellites to give a readout of latitude and longitude accurate to parts of seconds, which then allows an accurate assessment of distance using appropriate computer programs.

Yesterday, 29/3, I was fortunate to have a "state visit" from Wal VK6KZ, joint holder with Roger VK5NY, of the world record on 10 GHz. Using his GPS he plotted my position on the earth's surface with a high degree of accuracy. Previously I had used the latitude and longitude of the local aerodrome, about 2 km distant, thus having a built-in error. At present, Wal is travelling around southern Australia and calculating the positions of known amateurs and their likely operating "good spots" for accurate distance plotting of future possible DX contacts on the microwave bands.

Internet Six News

The "On-line" six metre magazine for 5 March (courtesy Geoff GJ4ICD and Dave VK2KFU), contains a number of items which I must hold for the moment. However, perhaps you should know that Chris de Beer ZS8MI, will accompany the 53rd Marion Island Relief Expedition as Medical Officer, beginning May 1996 and ending June or July 1997.

Marion Island is a small (290 km) island about halfway between Cape Town and Antarctica. Chris will be QRV on all bands 160 to 6 metres on SSB, CW and RTTY, with the callsign ZS8IR, grid locator KE83WC, using an IC-735, Yaesu FL-2100Z amplifier, and an AEA PK-232 MBX multimode data controller for RTTY. Rhombics and V-beams will be used due to wind gusts to 200 km/h. QSL requests via manager, Chris R Burger ZS6EZ (ex ZS6BCR).

I mention the above because the station will be operational during our next summer, and after the ease with which we worked VK0IX in Antarctica, anything is possible. More details later if available.

Closure

A special request. Would correspondents please submit their information using UTC time. It will save me considerable time because I need to make the conversion – these columns are forwarded to several overseas destinations and those readers would be confused if I used local time.

Closing with two thoughts:

1. There are few things more consoling to men than the mere finding that other men have felt as they feel, and,

2. A bore is someone who persists in holding his own views after we have enlightened him with ours.

73 from The Voice by the Lake.

**PO Box 169, Meningie SA 5264*
Fax: (085) 751 043
Packet: VK5LP@VK5WI.#ADL.#SA.AUS.OC

ar

HF PREDICTIONS

Evan Jarman VK3ANI

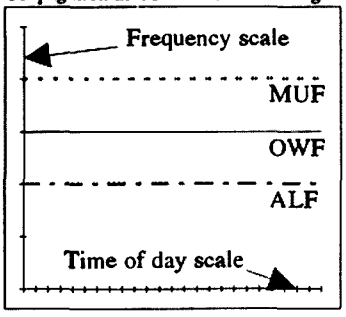
These graphs show the predicted diumal variation in key frequencies for the nominated circuits. This also indicates the possibility of communication.

The frequencies (nominated in the legend) are:-
ALF Absorption Limiting Frequency (lower limit)
MUF Maximum Useable Frequency (50% possibility)
OWF Optimum Working Frequency (90% possibility)
EMUF E-layer MUF (rarely appears)

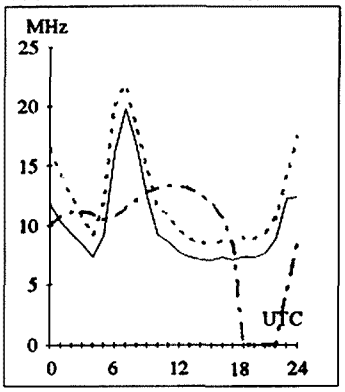
These predictions were made with one of the Ionospheric Prediction Service Stand Alone Prediction Systems. The T index used is shown above the legend. The bearing (Az) in degrees, is for the Australian station. The distance (Dist) in kilometres, is the great circle path length. The path is nominated in all cases. **ar**

T Index : 8
May-96

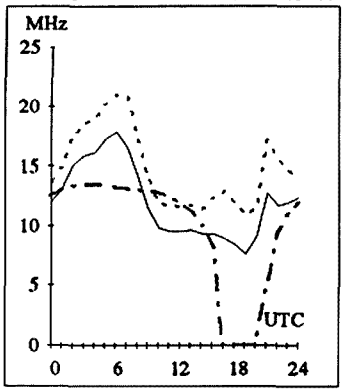
Circuit terminals Az
Propagation mode Path Length



Adelaide-Dakar 233
First 0-5 Short 16725



Brisbane-Budapest 312
First 0-5 Short 15467



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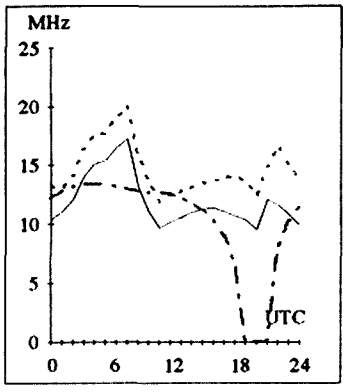
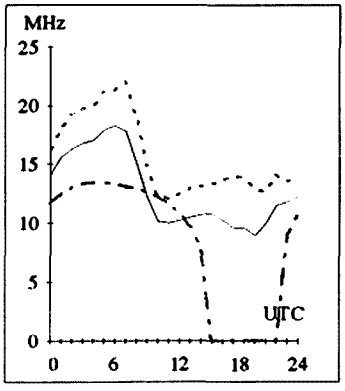
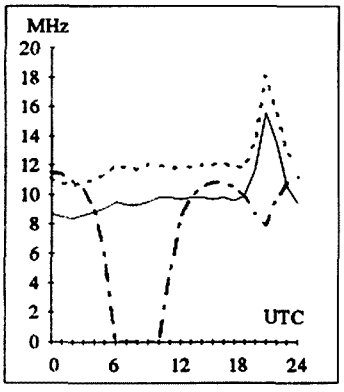


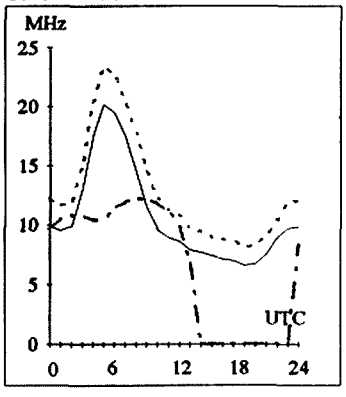
Adelaide-Moscow 318
First 0-5 Short 13807



BrisbaneBuenos Aires 153
First 0-5 Short 12358



Hobart-Pretoria 232
First 3F 0-1 3E 0 Short 10173



Canberra-Tokyo 352
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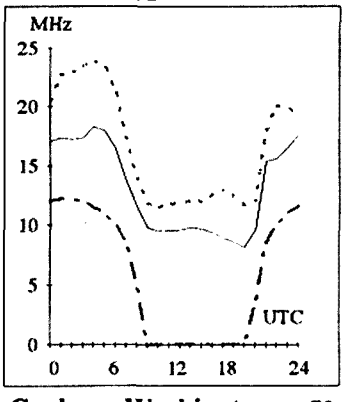
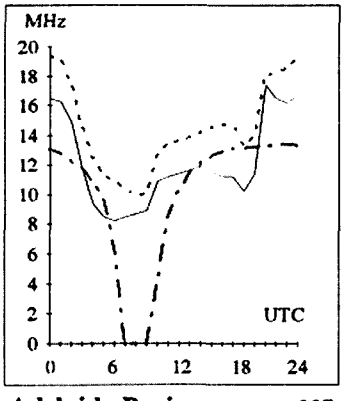
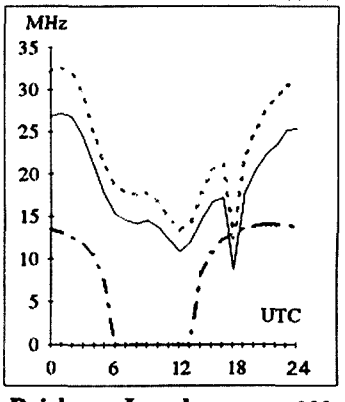


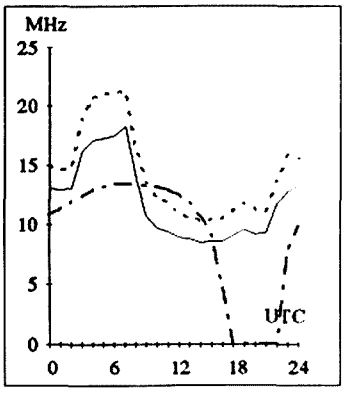
Adelaide-Ottawa 58
First 0-5 Short 16901



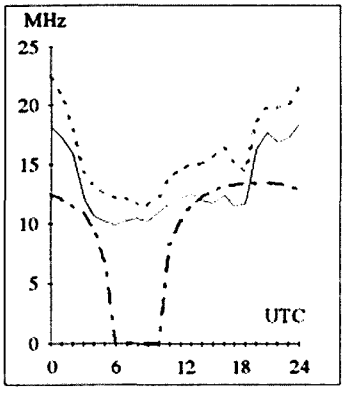
Brisbane-Los Angeles 59
First 3F 0-1 3E 0 Short 11562



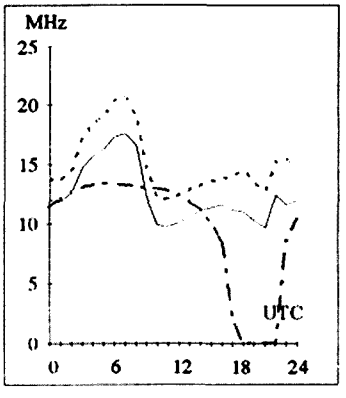
Hobart-Rome 284
First 0-5 Short 16350



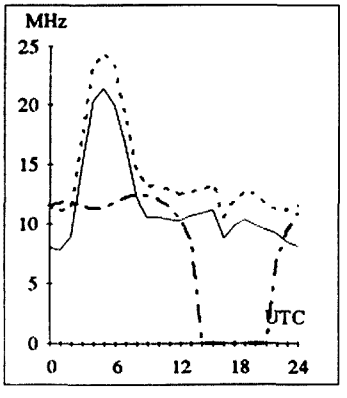
CanberraWashington 70
First 0-5 Short 15938



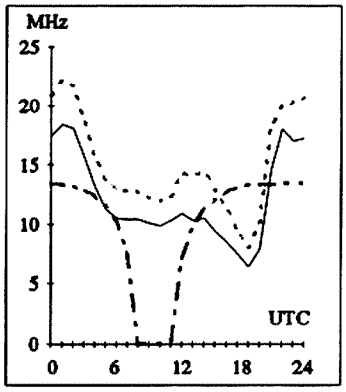
Adelaide-Paris 307
First 0-5 Short 16144



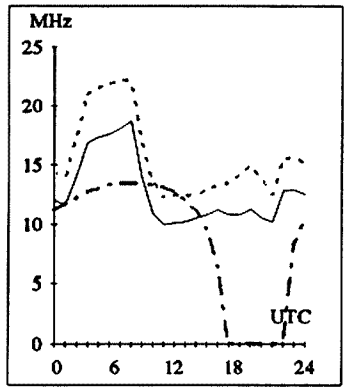
Brisbane-Lusaka 238
First 0-5 Short 12385



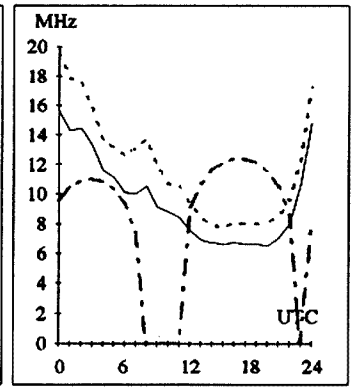
Darwin-Dallas 57
First 0-5 Short 14682



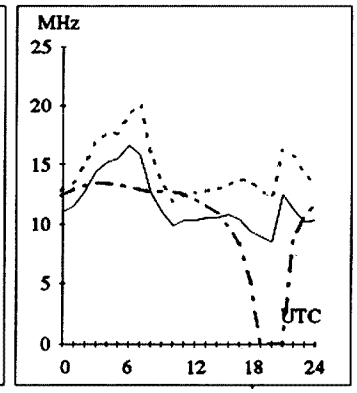
Melbourne-Athens 289
First 0-5 Short 14949



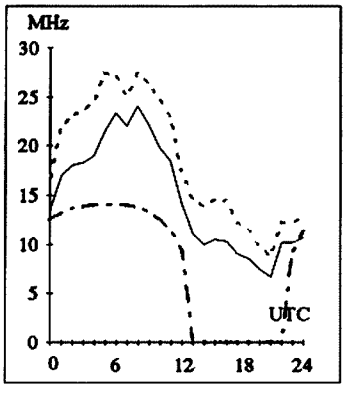
Perth-Lima 162
First 0-5 Short 14931



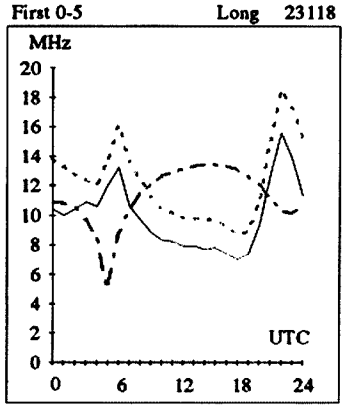
Sydney-Amsterdam 318
First 0-5 Short 16639



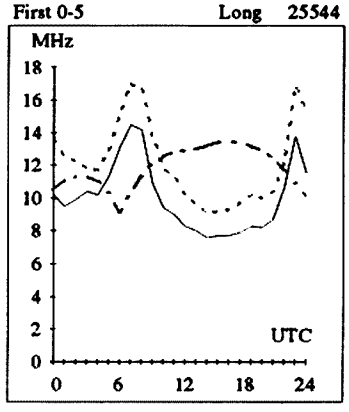
Darwin-Dubai 298
First 3F 2-6 3E 0 Short 9188



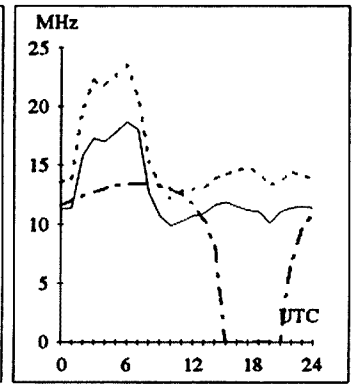
Melbourne-London 131
First 0-5 Long 23118



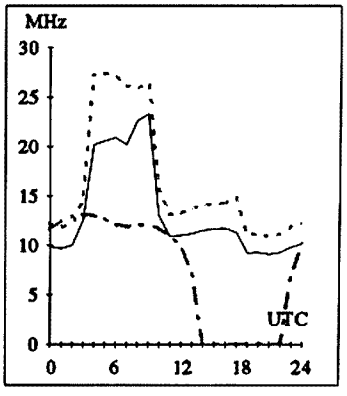
Perth-London 133
First 0-5 Long 25544



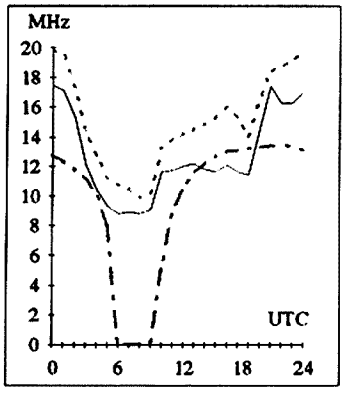
Sydney-Cairo 283
First 0-5 Short 14411



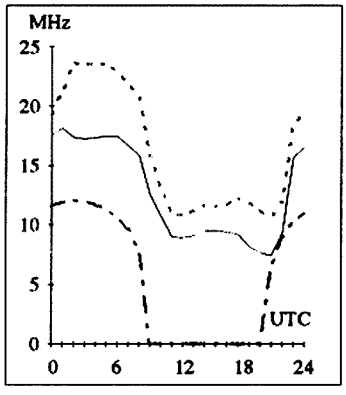
Darwin-Capetown 231
First 3F 0-0 3E 0 Short 11219



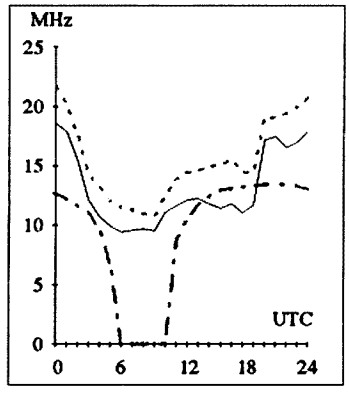
Melbourne-Montreal 62
First 0-5 Short 16733



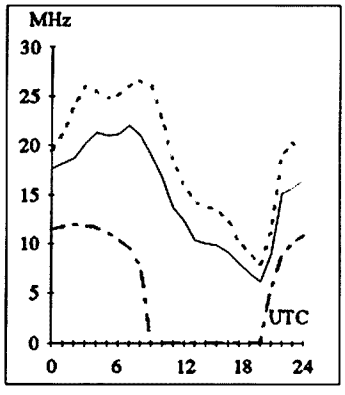
Perth-Osaka 17
Second 3F 4-8 3E 0 Short 7685



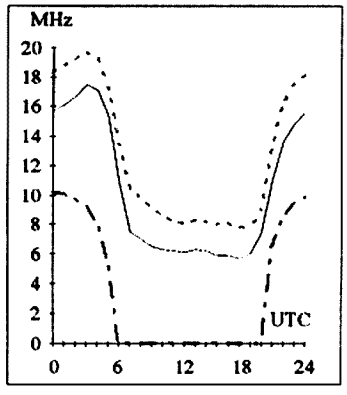
Sydney-New York 66
First 0-5 Short 15988



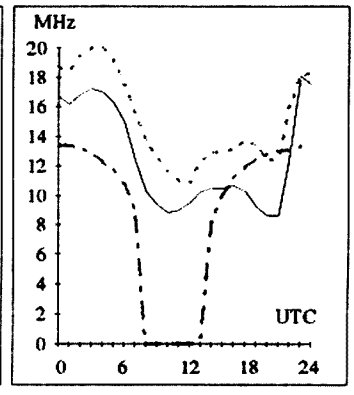
Darwin-Nagasaki 359
First 2F 5-9 2E 0 Short 5056



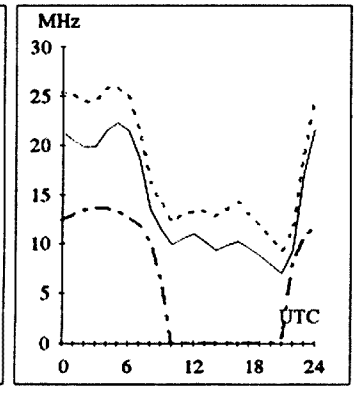
MelbourneWellington 108
First 1F 4-6 1E 0 Short 2569



Perth-Vancouver 50
First 0-5 Short 14824



Sydney-Singapore 298
First 2F 1-3 2E 0 Short 6295



HAMADS

TRADE ADS

• **AMIDON FERROMAGNETIC CORES:** For all RF applications. Send business size SASE for data/price to RJ & US Imports, PO Box 431, Kiama NSW 2533 (no enquiries at office please ... 14 Boanyo Ave Kiama). Agencies at: Geoff Wood Electronics, Sydney: Webb Electronics, Albury: Assoc TV Service, Hobart: Truscotts Electronic World, Melbourne and Mildura: Aplha Tango Products, Perth: Haven Electronics, Nowra: and WIA Equipment Supplies, Adelaide.

• **WEATHER FAX** programs for IBM XT/ATs *** "RADFAX2" $35.00, is a high resolution shortwave weatherfax, Morse and RTTY receiving program. Suitable for CGA, EGA, VGA and Hercules cards (state which). Needs SSB HF radio and RADFAX decoder. *** "SATFAX" $45.00, is a NOAA, Meteor and GMS weather satellite picture receiving program. Needs EGA or VGA & WEATHER FAX PC card, + 137 MHz Receiver. *** "MAXISAT" $75.00 is similar to SATFAX but needs 2 MB of expanded memory (EMS 3.6 or 4.0) and 1024 x 768 SVGA card. All programs are on 5.25" or 3.5" disks (state which) plus documentation, add $3.00 postage. ONLY from M Delahuntly, 42 Villiers St, New Farm QLD 4005. Ph (07) 358 2785.

• **HAM LOG v.3.1** - Acclaimed internationally as the best IBM logging program. Review samples....AR: "Recommend it to anyone"; The Canadian Amateur: "Beyond this reviewer's ability to do it justice. I cannot find anything to improve on. A breakthrough of computer technology". ARA: "Brilliant". Simple to use with full help, the professional HAM LOG is immensely popular (now in its 5th year), with many useful, superb features. Just $59 (+ $5 P & P), with a 90 page manual. Special five hour Internet offer. Demos, brochures available. Robin Gandevia VK2VN (02) 369 2008 BH fax (02) 369 3069.

Internet address rhg@ozemail.com.au.

• **FERRITE SLEEVED BALUN:** Excellent performance when used in G5RV, dipole or beam antennas etc. 50 ohm, 1.5 - 30 MHz. Fitted eyebolts for use as center insulator. SO239 (UHF) socket. Eliminates radiation from coax feedline. Helps reduce TVI, BCI, RFI and noise on receive. Maintains balance in antenna. Only $64 (+ $5 p&p). Alpha Tango Products, Box 441, Kalamunda WA 6076. Ph (09) 294 4725.

FOR SALE ACT

Yaesu FT102 good condition, YD148 mic, spare finals, handbook copy, $650 ono; **Yaesu FT747** exc condition, engraved with licence number, hand mic, AM/FM board fitted, $850. Richard VK1RJ QTHR (06) 258 1228 AH.

FOR SALE NSW

NEC 360 Spinwriter elf computer printer in excellent order, $150 negotiable. John VK2NDR QTHR (048) 71 1343.

Yaesu FT101ZD with mic and service manuals, vgc, new finals, $500 ono. Herb VK2UJ QTHR (068) 65 3213.

Shack Clearance Sat, April, please ring for date. Two element 20 m mono bander, rotator and shack controller, 3 x 3 oregon mast, cabling, purchaser to remove, G5RV, miscel gear, vintage parts. Arthur Brown **VK2IK QTHR** (02) 876 1465.

Kenwood TS600 6 m all mode transceiver, s/n 710099, mic, manuals, $350; **Tokyo Hi Power** 6 m 80 W linear, HL86V, s/n 819604, preamp, $175; **Kenrotor KR400** rotator control unit, cable, $200; **Telegraph key** Hi Mound BK100, $100. All in vgc. Kevin VK2BKG QTHR (049) 82250.

FOR SALE VIC

Hustler 5BTV HF trap vertical, vgc, $180; **VRK-1 radial kit** (unused), $30. Damien VK3CDI (054) 27 3121.

Antenna TH3 with balun and coax, $70; **HAM M** rotator, indicator and cable, $70. Ken VK3TL (03) 9728 5350.

Yaesu FC-757AT auto ant tuner, ex condn, $550 ono. Keith VK3BVK (052) 61 3576.

Naliy crank-up tiit-over tower with engineering and all accs, best offer to $600; **Yaesu** 1.2 kW HF **Lo Pass filter,** 811A GG 600 W all **HF band linear,** $200; **Yaesu** freq counter with 200 MHz prescaler, best offer; **SWR/PWR/FS meter,** brand new, boxed, $15; **Heavy duty variable power supply** 25 A pk, 6- 24 var, $68. Don VK3ADI QTHR (03) 9859 5593.

FOR SALE QLD

Kenwood TS520S, s/n 830738, needs some repairs, spare 6146s, also **DG5 counter** (going), s/n 720321, $250. Charlie VK4BQ QTHR (077) 79 4301 or (077) 78 8786.

Yaesu FT101ZD, $450; **Yaesu FT102**, $550; **Valves** receiving, transmitting, collectable; **ARRL** handbooks, antenna handbooks, chassis punch set, $50; Scope iron and transformer, $40; **Meters**. Catalogue 85c stamp. P Hadgraft, 17 Paxton St, Holland Park Qld 4121 or (07) 3397 3751 AH.

Roger Davies study books and tapes including novice study guide, theory textbook, 1000 Qs and As for NAOCP, Morse tapes 1, 2, 3 and CW exams 5 wpm trial tape, never used, $30. Henry VK4CQH QTHR.

Pocom AFR-1000 Swiss made automatic RTTY-Baudot-ARQ-FEC decoder with Monacor CDM-1002 B&W 10" monitor, $500 ono; **JPS ANC-4** antenna noise canceller, $275. Hans L40370 (074) 79 4561.

FOR SALE SA

EX top of line **Kenwood TS940S** Hi Tec Sy voice frequency plus Auto ATU, condition as new, $1,000 below cost. A Shepard VK5DC (08) 31 4194.

FOR SALE TAS

Kenwood TS850SAT transceiver, **SP31** matching spkr, **PS53** power supply, as new, 4 months old. Boxes, manuals, etc, inc **Icom FL102** AM filter, suit IC760, IC765, offers, new $80. Allen VK7AN (003) 27 1171.

Never been **used** Sangean 45 memory shortwave receiver ATS808, $270 ono; **Matador 105** handscanner new, $100 ono; **Icom** hand held **IC-W21A**, mint cond, VHF/UHF, $380 ono. Phil VK7PU (004) 31 3020.

WANTED NSW

One 8043 Curtis chip, urgent. Dick VK2BKH QTHR (02) 9948 8082.

Help, TS950S/SD owner wishes to discuss operation of IF filter sections with owner similar rig, tnx anyone assisting. Les VK2CLB (02) 9997 1109.

Terlin mobile HF antennas with fittings, good condition only, please. Bruce VK2WWW (063) 31 1188.

Vintage electrical fittings brass, wood, procelain, bakelite, old electrical trade catalogues or brochures. Contact Brian VK2EFD (049) 77 2178 or Box 131, Cooranbong NSW 2265.

WANTED VIC

Ex-Army amplifier RF No 2, with main components and case, the Genemotor is not required. Also any crystals between 2260 kHz and 2335 kHz MC6/U style. Clem VK3CYD QTHR (051) 27 4248.

Ceramic 5-pin valve bases for QB3/300 valves (equiv 4-125), two needed for linear. Arthur VK3ENT QTHR (053) 32 8184.

Circuits, voltage tables, modification info to 6 metres for **Philips FM806.** Also need circuits etc for TCA1674 (hi-band) to modify to 2 metres. Willing to pay any copying costs. Glenn VK3FFX (03) 9531 9301.

WANTED QLD

Garrard 401 turntable, cash or swap Ham gear. John VK4TL (070) 96 8328.

Heathkit 6 m amplifier, Heathkit 2 m all-mode transceiver, Heathkit SB200 amplifier, Heathkit VHF SWR-power meter, Heathkit HF SWR-power meter, Heathkit rotary coax switch, Heathkit HW16, HW101, DX40, DX60 transmitters/transceiver for operational Heathkit Museum. Contact "Doc" VK4CMY PO Box 24, Dalveen Qld 4374 or phone (076) 85 2167 before 8 pm please. Vietnam Veterans Wireless Group.

HV filter capacitors for plate and screen supplies, must be reasonably priced. Ron VK4BL QTHR (070) 55 0230.

Linear Amp suitable for use with Yaesu FT101ZD Tx. John Kaarsberg VK4GY (076) 34 5485.

MISCELLANEOUS

• THE WIA QSL Collection (now Federal) requires QSLs. All types welcome especially rare DX pictorial cards special issue. Please contact Hon. Curator Ken Matchett VK3TL, 4 Sunrise Hill Road, Montrose Vic 3765, Tel (03) 728 5350.

• VK6HC (QTHR) is looking for ex-RAAF signals ops, particularly D/F operators who served in VK6 during WWII. Historical research. Phone (09) 293 2658. **ar**

Editor's Comment

Continued from page 2

In Indonesia, during the Sukarno era from 1945, amateur radio was prohibited; but it is now flourishing since Suharto became president in 1967. American amateurs are surprised to be told that Australian amateurs are still not permitted to discuss a wide range of topics (eg politics, religion, business). The American telephone system has always been privately owned.

Australian CB operators (who outnumber amateurs by 20 to 1) may talk about virtually anything and can, in particular, use their equipment for commercial purposes. Yet, unlike amateurs, they do not now need licences, they pass no examinations and they pay no licence fees. They are well and truly deregulated!

Some deregulation has appeared on the amateur scene. The WIA (not the government) now administers the licence exams. It is possible the WIA may take over the issue of amateur call-signs. The licence regulations now promulgated by the Spectrum Management Agency are much more streamlined and liberal than the old PMG regulations of past decades.

Why is all this happening? Because government administration costs money. In many cases it costs more than the revenue it collects; so obviously there is merit in deregulating, particularly if a competent private body or society is waiting to take over the job. We are, with increasing speed, being carried into a deregulated future!

Bill Rice VK3ABP
Editor
ar

Hamads

Please Note: If you are advertising items For Sale and Wanted please use a separate form for each. Include all details: eg Name, Address, Telephone Number (and STD code), on both form. Please print copy for your Hamad as clearly as possible.
* Eight lines per issue free to all WIA members, ninth line for name and address Commercial rates apply for non-members. Please enclose a mailing label from this magazine with your Hamad.
* Deceased Estates: The full Hamad will appear in AR, even if the ad is not fully radio equipment.
* Copy typed or in block letters to PO Box 2175, Caulfield Junction, Vic 3161, by the deadlines as indicated on page 1 of each issue.
* QTHR means address is correct as set out in the WIA current Call Book.
* WIA policy recommends that Hamads include the serial numb.er of all equipment offered for sale.
* Please enclose a self addressed stamped envelope if an acknowledgement is required that the Hamad has been received.

Ordinary Hamads submitted from members who are deemed to be in 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: $25.00 for four lines, plus $2.25 per line (or part thereof) Minimum charge – $25.00 pre-payable.

State: .....

Not for publication: ❑ Miscellaneous ❑ For Sale ❑ Wanted

Name: ..... Call Sign: ..... Address: .....

WIA Divisions

The WIA consists of seven autonomous State Divisions. Each member of the WIA is a member of a Division, usually in their residential State or Territory, and each Division looks after amateur radio affairs within its area.

	Division Address	Officers			Weekly News Broadcasts		1996 Fees
VK1	ACT Division GPO Box 600 Canberra ACT 2601	President Secretary Treasurer	Philip Rayner John Woolner Bernie Copier	VK1PJ VK1ZAO VK1KOX	3.570 MHz LSB, 146.900 MHz FM each Sunday evening commencing at 8.00 pm local time. The broadcast text is available on packet, on Internet aus.radio.amateur.misc newsgroup, and on the VK1 Home Page http://email.nla.gov.au/~cmakin/wiaact.html	(F) (G) (S) (X)	$70.00 $56.00 $42.00
VK2	NSW Division 109 Wigram St Parramatta NSW (PO Box 1066 Parramatta 2124 Phone (02) 689 2417 Freecall 1800 817 644 Fax (02) 633 1525	President Secretary Treasurer (Office hours Web:http://sydney.dialix.ozau/~wiansw e-mail address: wiansw@sydney.dialix.oz.au	Michael Corbin Eric Fossey Eric Van De Weyer Mon-Sat 11.00-14.00 Mon 1900-2100)	VK2YC VK2EFY VK2KUR	From VK2WI 1.845, 3.595, 7.146*, 10.125, 24.950, 28.320, 29.120, 52.120, 52.525, 144.150, 147.000, 438.525, 1281.750 (* morning only) with relays to some of 14.160, 18.120, 21.170, 584.750 ATV sound. Many country regions relay on 2 m or 70 cm repeaters. Sunday 1000 and 1930. Highlights included in VK2AWX Newcastle news, Monday 1930 on 3.593 plus 10 m, 2 m, 70 cm, 23 cm. The broadcast text is available on the Internet newsgroup *aus.radio.amateur.misc*, and on packet radio.	(F) (G) (S) (X)	$66.75 $53.40 $38.75
VK3	Victorian Division 40G Victory Boulevard Ashburton Vic 3147 Phone (03) 9885 9261 Fax (03) 9885 9298	President Secretary Treasurer (Office hours	Jim Linton Barry Wilton Rob Hailey Tue & Thur 0830-1530)	VK3PC VK3XV VK3NC	VK3BWI broadcasts on the 1st and 3rd Sunday of the month, starts 10.30 am. Primary frequencies 1.840 AM, 3.615 LSB. 7.085 LSB, and FM(R)s 146.700 Mt Dandenong, 147.250 Mt Macedon, 147.225 Mt Baw Baw, and 2 m FM(R)s VK3RMA, VK3RSH and VK3ROW. 70 cm FM(R)s VK3ROU and VK3RGL. Major news under call VK3WI on Victorian packet BBS.	(F) (G) (S) (X)	$72.00 $58.00 $44.00
VK4	Queensland Division GPO Box 638 Brisbane OLD 4001 Phone (074) 96 4714	President Secretary Treasurer	Geoff Sanders John Stevens John Presotto	VK4KEL VK4AFS VK4WX	1.825 MHz SSB, 3.605 MHz SSB, 7.118 MHz SSB, 14.342 MHz SSB, 28.400 MHz SSB, 29.220 MHz FM, 52.525 MHz FM, 146.700 MHz FM, 147.000 MHz FM, 438.525 MHz (Brisbane only), regional VHF/UHF repeaters at 0900 hrs Sunday. Repeated on 3.605 MHz SSB & 147.000 MHz FM, regional VHF/UHF repeaters at 1930 hrs EAST Monday. Broadcast news in text form on packet under WIAQ@VKNET.	(F) (G) (S) (X)	$72.00 $58.00 $44.00
VK5	South Australian Division 34 West Thebarton Rd Thebarton SA 5031 (GPO Box 1234 Adelaide SA 5001) Phone (08) 352 3428	President Secretary Treasurer	Garry Herden Maurie Hooper Charles McEachern	VK5ZK VK5EA VK5KDK	1827 kHz AM, 3.550 MHz LSB, 7.095 AM, 14.175 USB, 28.470 USB, 53.100 FM, 147.000 FM Adelaide, 146.700 FM Mid North, 146.800 FM Mildura, 146.825 FM Barossa Valley, 146.900 FM South East, 146.925 FM Central North, 147.825 FM Gawler, 438.425 FM Barossa Valley, 438.475 FM Adelaide North, ATV Ch 35 579.250 Adelaide. (NT) 3.555 USB, 7.065 USB, 10.125 USB, 146.700 FM, 0900 hrs Sunday	(F) (G) (S) (X)	$72.00 $58.00 $44.00
VK6	West Australian Division PO Box 10 West Perth WA 6872 Phone (09) 351 8873	President Secretary Treasurer	Cliff Bastin Mark Bastin Bruce Hedland-Thomas	VK6LZ VK6OO	146.700 FM(R) Perth, at 0930 hrs Sunday, relayed on 1.825, 3.560, 7.075, 14.116, 14.175, 21.185, 29.680 FM, 50.150 and 438.525 MHz. Country relays 3.582, 147.350(R) Busselton and 146.900(R) Mt William (Bunbury). Broadcast repeated on 146.700 at 1900 hrs Sunday, relayed on 1.865, 3.563 and 438.525 MHz; country relays on 146.350 and 146.900 MHz.	(F) (G) (S) (X)	$60.75 $48.60 $32.75
VK7	Tasmanian Division 5 Helm Street Newstead TAS 7250 Phone (003) 44 2324	President Secretary Treasurer	Andrew Dixon Robin Harwood Terry Ives	VK7GL VK7RH VK7ZTI	146.700 MHz FM (VK7RHT) at 0930 hrs Sunday relayed on 147.000 (VK7RAA), 146.725 (VK7RNE), 146.625 (VK7RMD), 3.570, 7.090, 14.130, 52.100, 144.150 (Hobart) Repeated Tues 3.590 at 1930 hrs.	(F) (G) (S) (X)	$72.00 $58.00 $44.00
VK8	(Northern Territory is part of the VK5 Division and relays broadcasts from VK5 as shown received on 14 or 28 MHz).						

Note: All times are local. All frequencies MHz.

Membership Grades
Full (F) Pension (G)
Needy (G) Student (S)
Non receipt of AR (X)

Three-year membership available to (F) (G) (X) grades at fee x 3 times

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June 1996
Volume 64 No 6

Amateur Radio

Journal of the Wireless Institute of Australia

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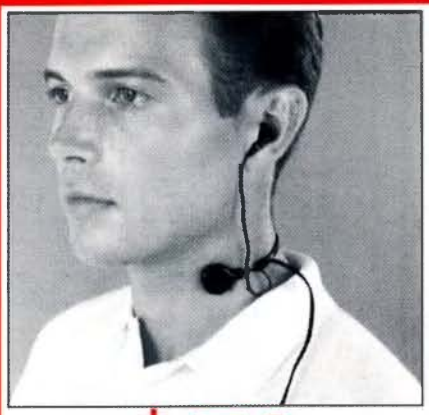

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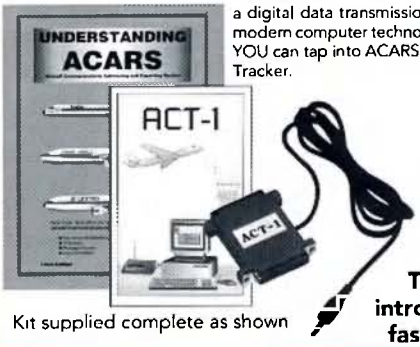

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Amateur Radio

Journal of the Wireless Institute of Australia

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Cover

Present at the 1995 North Queensland Amateur Radio Convention, left to right, were Geoff Sanders VK4KEL, President of the WIA Queensland Division, Christine Goode, Spectrum Manager, SMA, and Bob Mann VK4WJ, President of the Townsville Amateur Radio Club Inc. Christine Goode, assisted by Rick Snow, Area Manager for the SMA, and staff from the Townsville office of the SMA, gave a presentation followed by an informal question and answer session.

(Photo by VK4IGM (VK4KIG))

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Editor's Comment

The Survey Again

The March and April *Editor's Comment* included a general assessment of the results of our readership survey published last December. So far we have commented mainly on the preferences expressed for the work of our regular contributors, with construction and technical articles clearly topping the list. Many would also like to see regular articles on various applications of computers to amateur radio, and we are investigating how best we can cover this tremendous field.

Another popular area for which, at present, we can do very little, is provision of fault-finding and fixing information on popular commercial equipment. As with computers, the problem is to find authors who not only have the necessary knowledge and experience, but also have some spare time! That's the big problem. Such useful people are always busy!

The survey was also very informative in giving us statistics about you, the membership, in general. I mentioned in March that our average age is 59 years. In fact, more than a quarter of the respondents are over 70, and only one claimed to be less than 20 years old. 73% are over 50. But should amateur radio be such an old people's game? It is, and I'm one of them; not 70 yet but getting close! The average respondent has been licensed for 24 years, so the Old Timer's Club (25 years licensed or more) can look forward to a membership boom pretty soon.

To round off the discussion, there were a few questions about the popularity of this, your magazine. Nearly half the respondents claim to read over 80% of the contents each issue. 75% read more than half. We are flattered that you find the magazine so readable, but the compliment also poses a continuing challenge to be sure we deserve your attention. 26% say the contents are not technical enough; 3% think they are too technical; 71% say we have it about right.

Finally, on clarity and readability, over half (60%) think the magazine is excellent or very good, while another 27% rate it as good. Only 2% describe it as poor. Thank you for your praise, people. We hope to continue to deserve it.

Bill Rice VK3ABP
Editor
ar

CONTRIBUTIONS TO *AMATEUR RADIO*

Amateur Radio is a forum for WIA members' amateur radio technical experiments, experiences, opinions and news. Manuscripts with drawings and/or photos are always welcome and will be considered for possible publication. Articles on computer disk are especially welcome. The WIA cannot assume responsibility for loss or damage to any material. *"How to Write for Amateur Radio"* was published in the August 1992 issue of *Amateur Radio*. A photocopy is available on receipt of a stamped, self addressed envelope.

■ WIA News

Roger Harrison VK2ZRH, Federal Media Liaison Officer

Multi-year Licences and Late Payment Penalties Introduced

Following the passage of legislative amendments earlier this year, multi-year licence terms and payment of fees by instalments came into effect on 3 April. At the same time, a "late payment regime" was introduced, with penalty charges for licence renewals not paid within a given period and for expired, unpaid licences.

The new arrangements apply to Apparatus licences, which cover 19 radiocommunications services, including Amateur Radio. The Spectrum Management Agency (SMA) said that licensees now have the option of taking out a multi-year licence, of up to five years, and paying the total cost "up front", and thus paying no further fees during the term of the licence. Alternatively, you can take out a multi-year licence of up to five years and pay the total licence fee by annual instalments over the period of the licence.

The multi-year licence fee comes at a discount, with all but the first year's renewal handling costs subtracted from the total fee. So, a five-year licence, instead of being 5 x $51 = $255, four of the $11/yr renewal handling costs, or $44, is subtracted, making the total 5-year licence fee $211. You could pay this amount at the outset, or pay $42.20 immediately and send $42.20 every year until the end of the 5-year term. This is $5.20 more than the $37 licence fee prevailing in early 1995 before the new fees regime was introduced.

For licences renewed on an annual basis, if the renewal fee is received up to 60 days late, an additional administrative charge of $34.50 will be applied. If the payment is received after 60 days from the renewal date, a new issue charge will be applied, the amount varying depending on the type of apparatus licence. It could be more than $91, according to SMA advice.

In most cases, these additional charges will be recovered from the amount forwarded with the late renewal, and the term of the licence reduced on a pro-rata basis.

When a renewal is not received by 60 days from the due date, the call sign of the licence will become available for re-assignment. However, in the case of deceased amateurs, providing the SMA is notified, their call sign is not available for re-issue until two years from the date of notification.

For multi-year licences paid by annual instalments, late payments will attract an interest penalty, currently set at 11.5 per cent per annum. But if an instalment payment is not received within 60 days of the due date, the remaining term of the multi-year licence will become due, as well as the penalty interest.

The message is: make sure to pay your licence fees on time, whether you get a renewal notice or not!

Have you advised the SMA of your new address?

Tariff to Go Back on Amateur Rigs?

The Minister for Industry, Science and Tourism, John Moore, announced changes to the Tariff Concession System in early April, to be effective from 1 July, which would have seen a 5% tariff added to imported goods previously exempt, but representations from industry lobbies saw the scheme modified in early May.

In a release dated 8 May, the minister said all imports eligible for entry under a Tariff Concession Order will be subject to a 3% duty from 1 July. The system covers both consumer goods and business inputs which continue to be eligible for tariff concession orders.

As this seems to cover amateur transceivers, which have been imported for many years under a Tariff Concession Order (TCO) negotiated by the WIA, the WIA Federal President, Neil Penfold VK6NE, has written to the minister, John Moore, seeking clarification and asking for continuation of the previous Tariff Concession Order.

Should the new tariff of 3% be applied, the WIA intends to lobby for its removal on the basis that the Amateur Radio Service is of value to the Australian Community, that the foregone revenue would have an insignificant impact on government income, but the tariff would impact amateur transceiver sales and deter Australian radio amateurs from keeping abreast of world developments in communications technology and techniques.

Spectrum Sales Rake in Millions

Auction sales of licences for blocks of spectrum in the United States last year brought the American government $US7.7 billion (almost $AUS10 billion) from communications companies such as AT&T and Sprint.

The licences are for digital wireless voice and data networks, otherwise known as Personal Communications Services (PCS), and cover set-down bands and geographic regions.

In the first quarter of this year, the US government has already taken in more than $US9 billion for more spectrum blocks following new laws allowing more competition in the US telecommunications industry, and a new plan introduced by the Federal Communications Commission (FCC) which allows companies to pay licence fees by instalment.

Licences to cover regional markets bought last year have been traded this year at considerable mark-ups. Nextwave, a new communications company, offered $US1 billion for part of a New York regional market sold last year to Sprint for $US442 million. Another new company, Go Telecommunications, is reported to have bid $US1 billion for 11 regional markets.

The Australian radiocommunications industry has expressed concern that the Spectrum Management Agency does not use the US PCS spectrum sales as a benchmark for upcoming spectrum auctions in Australia. The executive director of the Australian Electrical and Electronics Manufacturers Association, Alex Gosman, said there were industry concerns about the runaway bids seen in the US.

SMA to Accredit People to do Beacon and Repeater Frequency Assignments

Before beacons and repeaters can be licensed, or existing ones can change frequency, the proposed frequencies are checked by the Spectrum Management Agency (SMA) for compatibility with other services, to obviate possible interference arising from intermodulation products, for example.

Beacons and repeaters are licensed on an "assigned frequency" basis, similar to Fixed and Land Mobile service Apparatus licences. The local WIA Technical Advisory Committees check beacon and repeater applications for conformance to the relevant amateur bandplans before they're submitted to the SMA.

Where previously the frequency assignment work was carried out by technical officers within the SMA, legislation which came into effect on 1 April now allows the SMA to accredit other parties to undertake assignment work and issue a "Frequency Assignment Certificate". This certificate can then be used by the SMA to "fast track" licence applications.

The SMA indicates that, initially, there will be some vetting of certificates and associated assignments by the SMA to ensure the integrity of the spectrum management system.

This is a scheme which the WIA has advocated for some time, and the Institute welcomes its introduction.

A National Amateur Radio Day – We'd Like to See That!

A proposal to introduce a National Amateur Radio Day as a new way to publicise our hobby has been taken up by the Queensland Division following a suggestion from a member, Bernard Terry VK4KAC.

The Queensland Division plans to put a detailed proposal to the WIA Federal Council at the July Extraordinary Convention.

The basic principle behind it is to have a concerted effort on a single day each year with WIA Divisions and affiliated clubs running open days, displays and coordinated media publicity.

■ Transceivers

"Little Mate" CW Transceiver for 3.5 and 7 MHz

Drew Diamond VK3XU describes how to build a compact, portable two band transceiver*

At a recent hamfest, a radio friend suggested the following project. It went something like this. "What I'd like is a little two-band transceiver, for taking away on trips, not much less than 5 watts, maybe 80 and 40 metres". I asked him, "DC receiver be okay?" He replied, "Oh yes, no problem with that".

That started me thinking that it should not be too difficult to do, particularly with a DC receiver to keep things reasonably simple. The only snag I could see was the band switching arrangement, which is not usually an easy thing to accomplish without complexity.

So, here is my response to the notion. I have borrowed bits and pieces of circuitry from previous projects, and included one or two new ideas. The prototype model has the measured performance shown in Table 1.

Circuit

The variable frequency oscillator and doubler is common to both the receiver and transmitter, and is shown in the top half of the schematic, together with the transmitter amplifier. The receiver is in the lower portion.

A conventional Hartley oscillator is buffered by the two-stage follower amplifier, which supplies a low impedance, frequency adjustable 3.5 to 3.6 MHz signal. For transmission and reception of 7 MHz signals, the frequency is doubled through a push-push amplifier. With a matched pair of transistors, and careful adjustment of the balance trim pot between the emitters, suppression of the (now) unwanted 3.5 MHz component is about 50 dB.

The receiver is similar to that used in the "TCF", except here it is a direct conversion (DC) model. The 500 MHz bandwidth of the NE602 makes it somewhat prone to VHF breakthrough if you are close to such transmitters. Therefore, incoming signals must first negotiate the transmitter's low-pass filter. TV, FM and other unwanted VHF signals are thus effectively prevented from entering the set. A receiver input band-pass filter then selects the wanted band, either 3.5, or 7 MHz.

In an attempt to keep band switching complexity to a minimum, receive frequency range is selected by simply powering the appropriate product detector for the band in use. The need for coil switching is thereby avoided, and the scheme works remarkably well. Product-detected output is applied to the input of a conventional '741 – '386 audio amplifier with HF roll-off. Overall gain is sufficient to provide sensitive, pleasingly clean reception, even where signals are below the microvolt level.

For normal CW working, we should endeavour to be "netted" onto the same frequency as the other station. However, to obtain an audible "beat note" we must tune our receiver off a bit, perhaps by one kHz or so to hear the other station, but only during receive. On transmit it must automatically "snap back" to the same frequency. To achieve this facility, receiver incremental tuning (RIT) is provided on receive mode by making the VFO frequency slightly variable with the use of a diode tune arrangement. The amount of forward bias current through a diode at the source tap of the oscillator tank coil alters the effective capacitance at this point. On transmit, the current level reverts to approximately that of the mid-pot travel value, sourced through the 470 ohm resistor. Type 7805 5 V regulator chips are used for the +5R and +5T supplies. When supplying only a few mA, these chips provide a remarkably stable voltage.

For transmission, a signal of either 3.5, or 7 MHz is presented to the 2N3053 broad band driver stage, which has a gain of about 10 dB, and is again raised to about 3 W with a cheap but rugged IRF511 (or similar) power MOSFET as PA. Any harmonic energy is effectively removed by passing the Tx output signal through an appropriate

Table 1

Receiver

Frequency Range:	Nominally 3.5 to 3.6, and 7.0 to 7.2 MHz.
Sensitivity:	0.5 µV for 10 dB S+N:N.
Reception Modes:	CW, SSB, DSB and AM.
RIT:	Nominally +/-2.5 kHz on 3.5 MHz, 5 kHz on 7 MHz.
Frequency Stability:	Less than 100 Hz drift in any hour after warm-up.

Transmitter

Output Power:	At least 3 W, typically 4 W into 50 ohms.
Frequency Range:	Same as receiver.
Keying Ratio:	80 dB, with no click or chirp.
Harmonics:	"Sub harmonic" and harmonics, at least -46 dBc.
Frequency Stability:	Same as receiver.
Output Load:	Nominally 50 ohms. Can withstand any SWR (including short and open circuit) without damage.
Brag Factor:	During one QRP test weekend, contacts were made with VK1, 2, 3, 4, 5 and 7 using a dipole antenna.

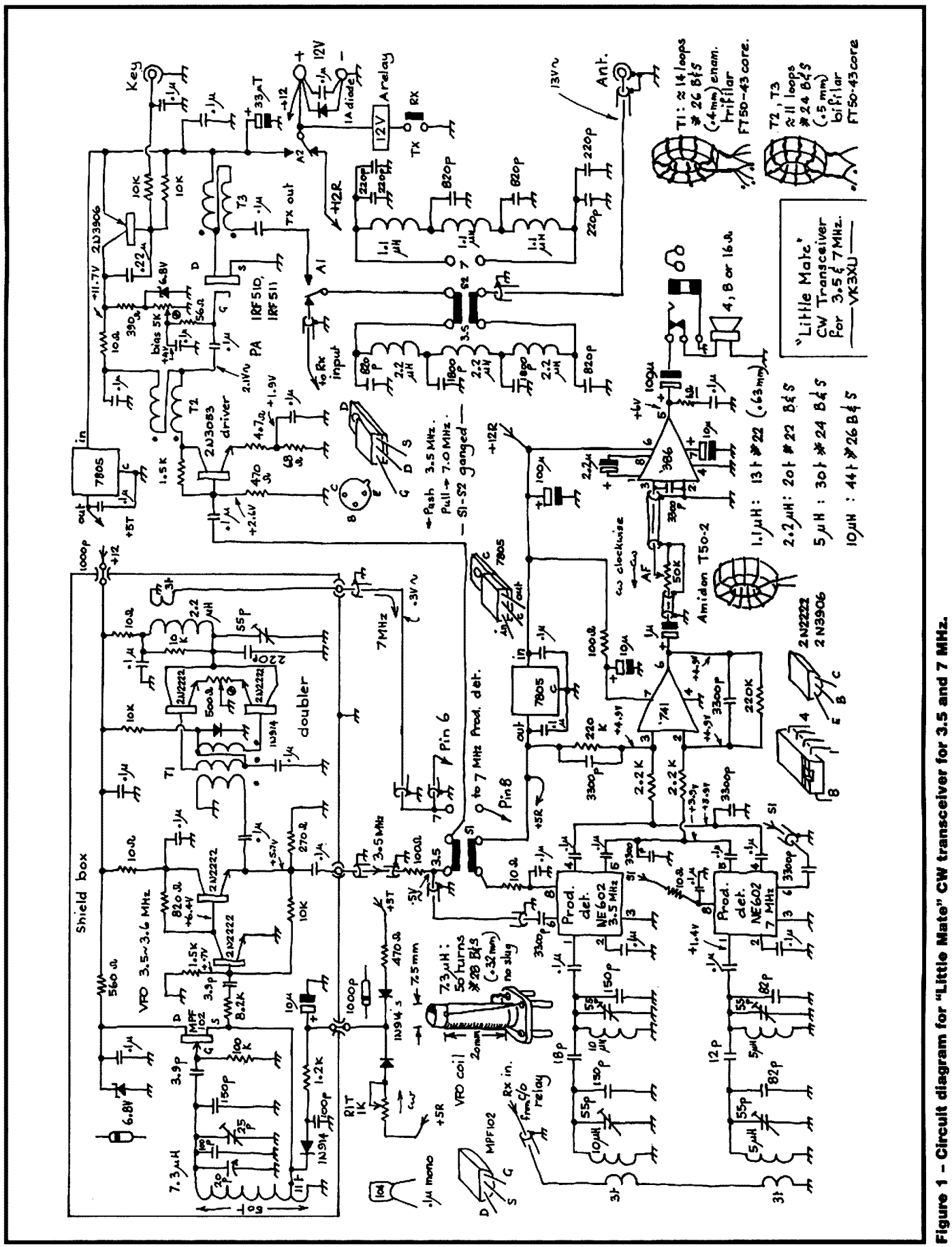


Figure 1 – Circuit diagram for "Little Mate" CW transceiver for 3.5 and 7 MHz.

"Little Mate" transceiver

low-pass filter. For clean, crisp CW keying, the voltage supply to the 2N3053 and PA bias network is ramped on and off in response to the key through a 2N3906 current switch.

Construction

A reasonably compact "travelling mate" radio was the aim. Accordingly, the dimensions of my home made aluminium "shoe-box" is 185 mm long x 165 mm wide x 90 mm high. I'm blessed with good eyesight, yet I would not have wanted to make my own model much smaller than this. If size is not a consideration, larger dimensions would perhaps make construction a bit easier for you.

The chassis is formed by front and back "tray" type panels, with three internal "sub-chassis", which collectively produce a particularly rigid and compact assembly, whilst at the same time giving easy access to all circuitry. Naturally, a ready made box of suitable dimensions would suit. Some sort of slow-motion vernier drive is recommended for the frequency dial. That shown is one from Dick Smith, part number P-7170.

"Paddyboard" style circuit board construction (Reference 7) was used for the three boards, which are VFO/doubler, receiver, and transmitter. However, any of the current popular methods should do, provided plenty of ground plane foil is retained, and connections for signal carrying components are as short as reasonably practicable. Naturally, if only the transmitter, or receiver section is required, it is only necessary to build that part. Indeed, if desired, a single band job is possible.

The VFO/doubler may be tackled first. Good screening, mechanical rigidity and thermal buffering is obtained by mounting these components upon a circuit board fitted inside a metal box, preferably die-cast. Not cheap, but worth the investment.

An aluminium or printed board style box would also serve as second choice, or where reduced weight is a goal. We require (as always) a stable VFO. To that end, fixed capacitors must be polystyrene, NP0 (black spot, or marked

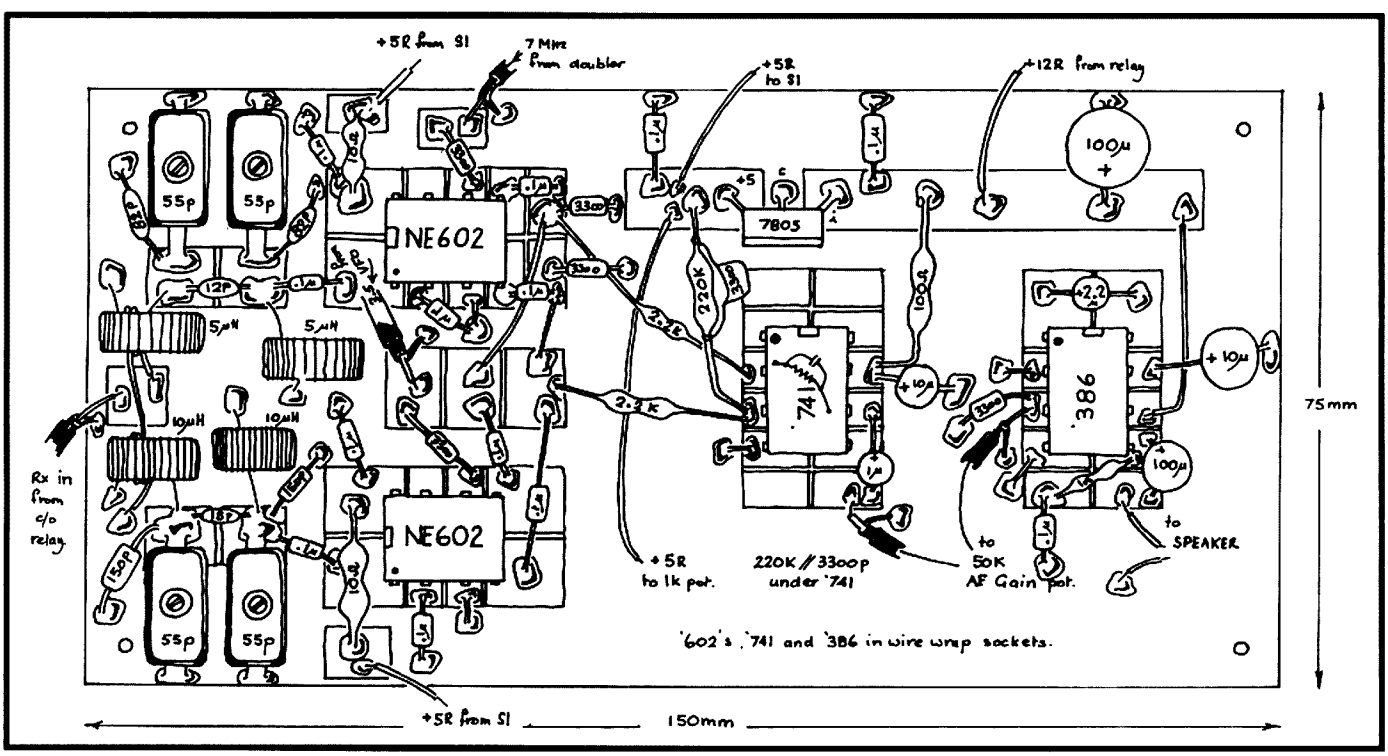
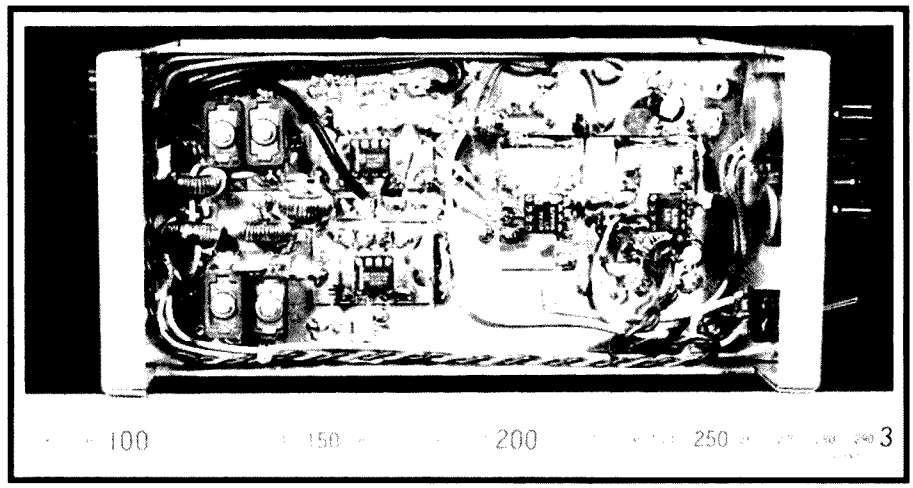


Figure 2 – Receiver board layout

such) or silver mica if available. Employ the best constructed variable capacitor that you can obtain. Mine is one of those fine English Polar types with brass plates and dual ball-bearings, although an ordinary one with aluminium plates should be adequate at these frequencies. Remove plates if necessary to obtain 20 or 30 pF worth at full mesh. Hold it up to the light and look between the plates to see if any particles are trapped there. Clean any grit from between the plates and bearings and re-lubricate if necessary. Finally, check that the spindle rotates easily and smoothly.

The VFO coil may be wound upon a (nominally) 5/16" or 8 or 7.5 mm bakelite former. Bakelised paper tube (perhaps from an old IF transformer) will also serve. We don't need a slug – remove it if there is one. Drill two 1 mm holes spaced 20 mm apart across the diameter of the former if it has no tags. If the former has tags, you will need just one hole spaced 20 mm from the base. Run off about 1.5 m of wire from the spool, then fix the spool in your vice. Solder the bottom "earthy" end to an appropriate tag, otherwise pass the wire through the bottom hole with a bit to spare. Whilst maintaining tension on the wire, walk towards the vice and wind on the wire, always making sure each turn lies right next to the last. When you have wound on 11 turns, pinch out sufficient wire to twist up a little pig-tail for the source tap, then wind on the remaining 39 turns. Take care poking the other end of the winding through the top hole, keep finger and thumb there to stop the coil from springing off. The coil must be sealed by coating the winding with Q-dope, Estapol (TM) or shellac.



Receiver Board

When building the doubler stage, go through your 2N2222s with a transistor gain checker and select two devices which are closely matched.

Check the VFO/doubler upon completion of this assembly. Preset the 500 ohm balance trim-pot for mid-range. Apply +12 V to the supply feed-through. A screwdriver blade inserted into the 3.5 MHz output connector should radiate sufficient signal to be heard on a nearby receiver (BFO on) tuned to that frequency. With the 20 pF variable capacitor at full mesh, adjust the 25 pF beehive trimmer so that exactly 3.500 MHz is generated. The frequency should be about 3.6 MHz at the other end of the variable capacitor's range.

If, for some reason (probably component tolerances), the trimmer cannot bring about the correct frequency, change one of the fixed capacitors, smaller or larger as required. Replace the VFO cover. Some 10 minutes warm-up should have the device settled down and producing a satisfactorily stable frequency. Certainly, by listening you should not detect any significant wobbles or variations in "beat note" in the receiver. The tone should be quite constant (assuming of course that the receiver is stable).

If you have a counter, apply the VFO output to the counter's input and observe the frequency, then adjust as described.

Tune the test receiver to 7 MHz. Insert a screwdriver blade into the 7 MHz output. Adjust the 55 pF trim cap for maximum signal at the receiver. Apply an RF probe/DMM to the 7 MHz output

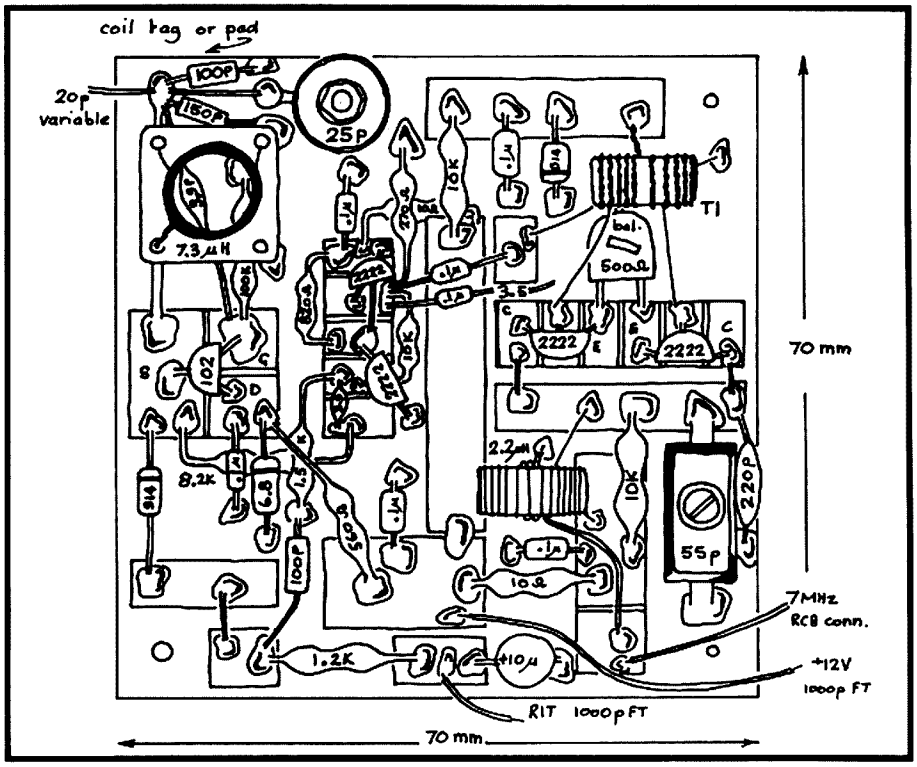
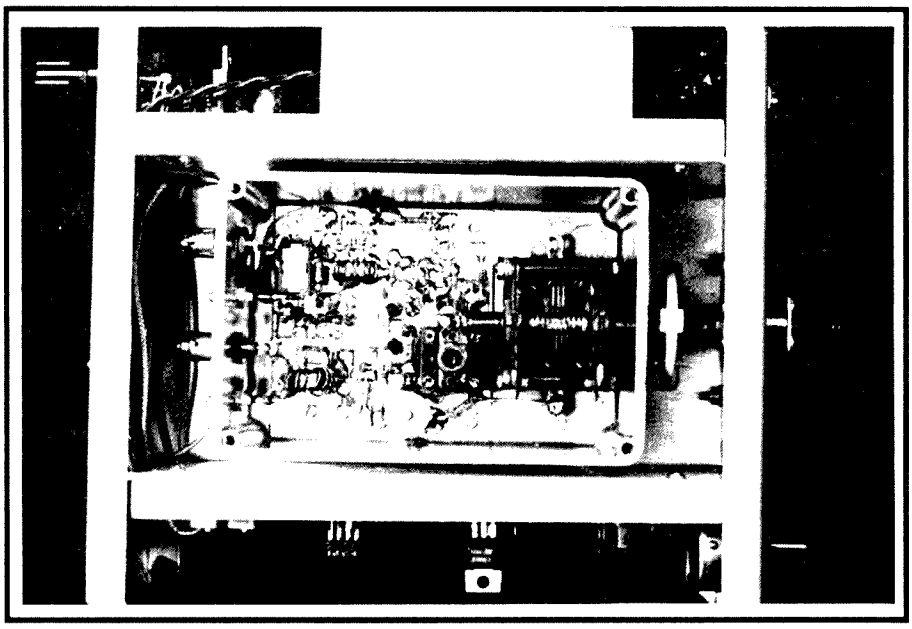


Figure 3 – VFO and doubler board layout



VFO and doubler assembly

and re-tweak the 55 pF for max signal. Now, carefully adjust the 500 ohm trim pot around mid range. You should see a tiny dip as the 3.5 MHz component is balanced out. Can't see it? Leave the blade in the 7 MHz output, and tune your receiver to 3.5 MHz (VFO cover in place). Again adjust the balance pot for a pronounced null in the received signal, which must not be too strong, or the null will be masked.

The receiver board may be tackled next. A board size of 75 mm x 150 mm is suggested. For ease of working, the four ICs should be inserted into wire-wrap sockets which, in turn, are soldered to home-made substrates. A suggested layout plan is shown. Each of the input coils has a link coil of three turns in series, which effectively renders them self-supporting. The other input coils may be fixed to the board with a small blob of non-acid silicone glue. Take care soldering the monolithic capacitors – too much heat for too long may unsolder the lead from the chip.

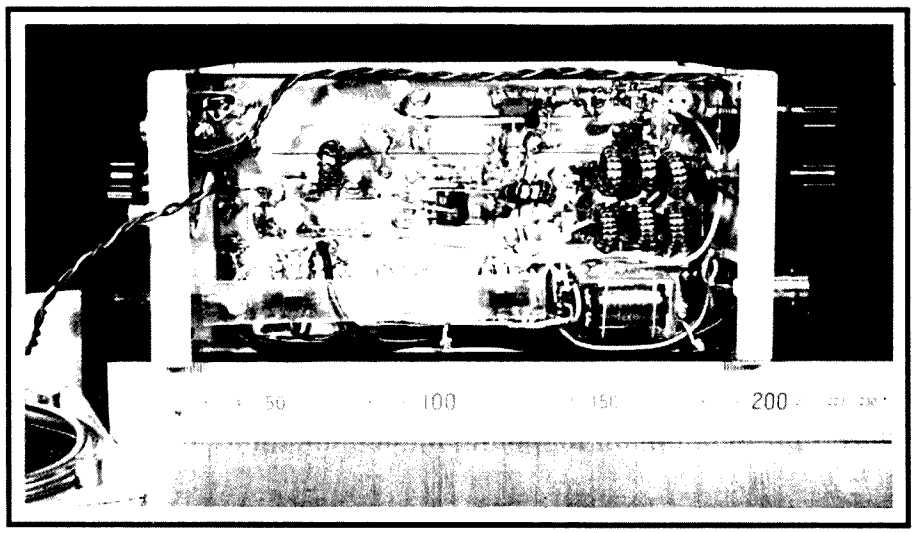
The transmitter board is the same size, and assembly is similar to the receiver. To wind broad-band transformers T2 and T3, take two 300 mm lengths of #24 B&S (0.5 mm) enamelled wire, twist the ends of the pair together, and clamp that end in your vice. Twist the free ends together, then fix in the chuck of a hand-drill. Whilst maintaining tension, turn the drill until you have about three twists per cm. Pull the drill to set the twist, them remove the pair. Carefully wind about 11 loops (not critical) onto the core. Snip the wires leaving about 2 cm for terminating. Remove about 1 cm of enamel from each wire end. With a multimeter on ohms, identify the two "windings". Connect the end of one winding to the start of the other winding to form the tap. Winding starts are shown schematically with a dot.

T1 is made similarly, but this time with three wires. The twist must be even, with no bumps or transpositions. Fix the three wires in your vice jaws, spaced about an inch, or two cm between. Crank up the twist. The drill will tend to be pulled towards the vice, but maintain that tension the whole time. Identify the windings. Connect the start of one winding to the finish of another, and push that group to one side, which leaves the primary as a single winding.

The IRF device may be installed when the Tx board is mounted onto the sub-chassis. A rectangular hole in the board allows the IRF511 to be positioned so that excess heat is sunk directly into the chassis. Fit insulating hardware at the interface. The drain and gate pins must clear the board. A small solder tag under the mounting nut provides the drain connection. Check that there is room for the VFO assembly to be fitted without touching the head of the screw which secures the IRF511.

I wanted to keep the band switching method as simple as reasonably possible. We only need two "positions" for our two bands. The perceived choices include wafer switches (messy, not readily available in some places), relays (bit complex, clunky and costly), diodes (added complexity, bit lossy, may introduce cross-modulation problems), and ordinary slide switches. The slide switches won out. They are cheap, quite reliable, not too lossy (at HF), readily available, and lend themselves to a simplification of the task in hand.

Each of two DPDT slider switches is mounted upon a substrate board in a similar style as for the ICs. The layout shows them mounted in-line. A length of perspex (or similar) has two square or



Transmitter board, with speaker removed

round holes which line up with the slider of each switch. If the holes are made accurately for a good "interference" or "friction" fit, no other keeper will be necessary, although a tiny split pin or wire made to pass through perspex and slider of the rear-most switch would improve mechanical reliability. A small length of metal rod may be attached, which protrudes through the front panel and to which a suitable knob is fitted; or the perspex may simply project through the panel. Push in for 3.5 MHz and pull out for 7 MHz operation.

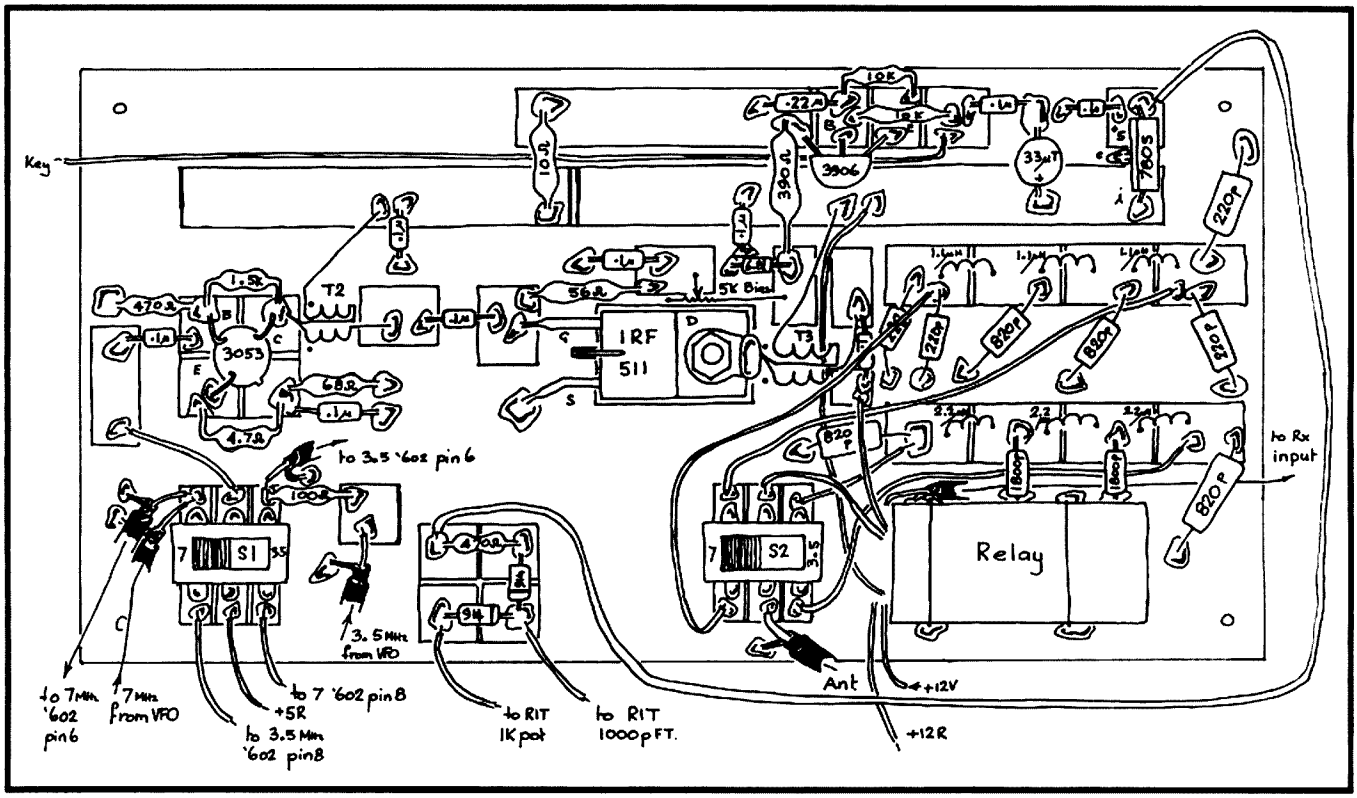
Use ordinary small gauge hook-up wire for connections between the rear slider switch and the output filters. Keep these wires as short as reasonably practicable. The signal connections between the relay and coax antenna connector, and relay to receive input, should be made with miniature 50 ohm coax, or shielded wire as shown. The 3.5 and 7 MHz VFO signals must also be carried via coax.

Adjustment

The following assumes that the VFO/doubler assembly is working correctly as described above. Check your wiring, and that all components are correctly positioned. Set the 5 k bias pot to the minimum voltage point. Set the band switch for 3.5 MHz. For initial testing, apply 12 V from a metered, regulated supply which can deliver at least 1 A. Clockwise rotation of the AF gain pot should cause a perceptible rise in background hiss. Connect an antenna to the input (a few metres of wire will do for now). Adjust the two 55 pF trim caps at the 3.5 MHz input filter for strongest signals (or man-made noise) across the band. Switch to 7 MHz and do the same by adjusting the caps for the 7 MHz filter. The receiver should be responsive. SSB and CW signals should sound clean, without significant distortion or hum. If you do have a little hum (even with the VFO cover in place), it may be due to poor RF earthing. Connection of an additional mains-independent ground should solve this problem. Rotation of the RIT pot should give a smooth plus and minus incremental adjustment of the receive frequency.

Connect a 50 ohm dummy load/power meter (a 12 V/3 W auto dash lamp will do) to the output. Select 3.5 MHz. Switch to Tx. Adjust the bias pot for a standing (key-up) PA drain current of about 100 mA drawn from the supply. Close the Morse key. About 4 W should be indicated, or the lamp brightly lit. Select 7 MHz, then close the key. You should get about 3 W output power. Retweak the 55 pF trim cap at the doubler tank for maximum output. Listen to the signal on another receiver. The keyed CW should have a pure note, with no clicks, chirp or ripple. Current demand should be about 0.8 to 1 A.

On Tx mode, use a DMM to measure the voltage at the junction of the two 1N914s at the VFO RIT input. You should read about 3.5 V. Now switch to receive. Adjust the RIT pot to read exactly the same voltage, then slacken off the knob set-screw and position the knob pointer to a mark at the 12 o'clock position. Transmit and receive frequencies will now be the same when the knob is at 12 o'clock (ie mid pot travel). When first calling another station, tune to "zero-beat", then offset your receive frequency with the RIT pot to obtain a pleasing note above or below zero, depending upon adjacent channel occupancy. When contact has been established, remember to do any receive



Transmitter board layout

frequency adjustments with the RIT, leaving the main VFO control untouched.

More Information

Some DC and RF voltages are shown on the circuit to aid in any necessary trouble shooting. These were measured using a DMM, and diode RF probe. A measured value which differs greatly should indicate the problem area. If, after earnest efforts, you cannot make your model work satisfactorily, or you require more information, please write to me at the address below, and any reasonable amount of assistance will be gladly returned. An SASE would be appreciated.

References and Further Reading

1. Direct Conversion CW Transceivers – Price G4BWE, Rad Comm Jan '86 (excellent).

2. A QRP CW Transceiver for Experimenters – Price, Rad Com Feb, Mar '94.

3. The "Queensbury" 7 MHz CW Transceiver – Ortmayer G4RAW, PW, July '93.

4. A Portable QRP CW Transceiver – Breed K9AY, QST, Dec '90, Jan '91.

5. A Simple Direct Conversion Transceiver – Kreuter WA3ENK, HR (USA) Dec '88.

6. 40 Metres in a Nutshell – Nouel KG5B, 73 Mag, Mar '87.

7. "Paddyboard" Circuit Construction – Diamond, AR, Feb '95

**45 Gatters Road, Wonga Park VIC 3115*

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Parts List

Capacitors	Qty
3.9 pF NP0 ceramic	2
12 pF NP0 ceramic	1
18 pF NP0 ceramic	1
20 pF air variable	1
25 pF "beehive" trim cap	1
55 pF compression mica	5
82 pF NP0 ceramic	2
100 pF polystyrene or NP0 ceramic	2
150 pF polystyrene	3
180 pF ceramic	1
220 pF polystyrene (ceramic 2nd choice)	4
820 pF polystyrene (ceramic 2nd choice)	4
1000 pF feedthrough	2
1800 pF monolithic or greencap	2
3300 pF monolithic or ceramic	7
0.1 µF monolithic	30
0.22 µF monolithic	1
1 µF electrolytic or tantalum	1
2.2 µF electrolytic or tantalum	1
10 µF electrolytic or tantalum	3
33 µF tantalum	1
100 µF electrolytic	2
Resistors	
1 ohm 1/4 W	1
4.7 ohm 1/4 W	1
10 ohm 1/4 W	5
56 ohm 1/4 W	1
68 ohm 1/4 W	1

Parts List

	Qty
100 ohm 1/4 W	2
270 ohm 1/4 W	1
470 ohm 1/4 W	2
500 ohm flat mount trim pot	1
560 ohm 1/4 W	1
820 ohm 1/4 W	1
1 kohm miniature linear pot	1
1.2 kohm 1/4 W	1
1.5 kohm 1/4 W	2
2.2 kohm 1/4 W	2
5 kohm flat mount trim pot	1
8.2 kohm 1/4 W	1
10 kohm 1/4 W	5
50 kohm miniature log pot	1
100 kohm 1/4 W	1
220 kohm 1/4 W	2
Semiconductors	
MPF 102, 2N5457 etc	1
2N2222, 2N3904 etc.	4
2N3053, BFY50 etc	1
2N3906, 2N3638, 2N3645 etc	1
1N914, 1N4148 diode	3
6.8 or 6.2 V 400 mW zener	2
1 A diode	1
NE602AN	2
LM741	1
LM386	1
7805 positive 5 V chip	2

Miscellaneous

Box to suit, or aluminium to make, box for VFO; about 120 mm long x 80 mm wide x 55 mm high, circuit board material and scraps for pads, wire-wrap IC sockets (4), Amidon T50-6 red toroidal cores (11), FT50-43 cores (3), #22, 24, 26 28 B&S winding wire, hook-up wire, miniature coax or shielded wire, 12 V relay with two sets of C/O contacts, DPDT slider switches (2), perspex for push-pull rod, SPST switch, 12 V DC terminal set, coax connector, RCA type sockets (2), RCA plugs (the cheap kind, 2), key jack, phone jack, speaker, insulating hardware for IRF511, vernier dial, knobs, screws, nuts, solder, etc.

WIA News

ARRL to Revamp DXCC

The American Radio Relay League (ARRL) has appointed a committee to review the DX Century Club (DXCC) program and recommend changes to the League.

An ARRL Division Director, John Kanode N4MM, has been appointed chairman, according to an ARRL Letter report. Also appointed were Larry Price W4RA, Rick Roderisk K5UR, Jim Maxwell W6CF, Walt Stinson W0CP, Garth Hamilton VE3HO, Bob Winn W5KNE, Bill Kennamer K5FUV, Wayne Mills N7NG and Chuck Hutchinson K8CH. It is unofficially known as the DXCC 2000 committee, reflecting the goal to have any changes to the program in place by the year 2000.

The ARRL Board of Directors, in setting out the committee's terms of reference, asked the committee to recommend changes necessary to "encourage broader participation by more amateurs, make the program more equitable, create better understood criteria for DXCC countries, improve the process of reviewing requests for additions and deletions to the ARRL DXCC List and increase efficiency in the administration of the program."

There are no plans to scrap the DXCC program, assured the ARRL DXCC manager, Bill Kennamer K5FUV, who is also on the committee. Country credits from the present DXCC program will continue to count regardless of what other changes might occur, he said.

■ Antennas

The VK4FUQ Two Metre "Strip" Yagis

Felix Scerri suggests another method of building Yagi beam antennas.*

For those interested in antenna home-brewing, I would like to present these two somewhat novel small Yagis for the two metre amateur band.

Design

They are novel in that they make use of aluminium strip instead of the usual tubing. This allows very simple construction with rapid assembly and disassembly possible. Thus, they are ideal for portable and emergency use. I designed both Yagis several years ago, and both have been thoroughly tested on air. Yes, they work quite well.

The use of "strip" type elements is interesting electrically, as the length/diameter ratio of this material is quite different from tubing. The "boom effect" necessitates a considerable shortening in individual element lengths. Not being very mathematical, I have not been able to arrive at a length formula but, as a result of heaps of empirical adjustment, I have arrived at the lengths and spacings shown. All the elements show some shortening, except for the reflector, which did not appear to be overly critical in tuning.

The designs were optimised for 146-7 MHz and the SWR bandwidth is quite narrow. The old "quarter of an inch per MHz" rule could be used to shift the coverage range but, I have to admit, I haven't tried it.

Construction

Construction overall is very simple, with the gamma matching unit possibly being the hardest part. I used a mica compression trimmer in conjunction with a gamma wire tapped out at five and a half inches (140 mm) from the boom centre. I soldered this wire to a small bolt and nut mounted through a small hole on the driven element. Follow all the usual rules when matching to a 50 ohm feedline.

The combination of the specified element and boom materials results in a strong and lightweight assembly. A square should be used to ensure that the elements are mounted properly at 90 degrees to the boom (they look terrible otherwise!). There really isn't too much to it. Mounting on a mast is easily done with a few appropriate holes through the boom and U-bolts.

Yagi Design

Finally, a few words on Yagi design. Here, there are many "schools of thought". These antennas were designed through direct field strength measurement at a specific design frequency. It is interesting to note that, when final designs were analysed, I found close agreement with the guidelines published by Carl Greenblum many years ago. Note, also, that both designs are quite short in terms of boom length.

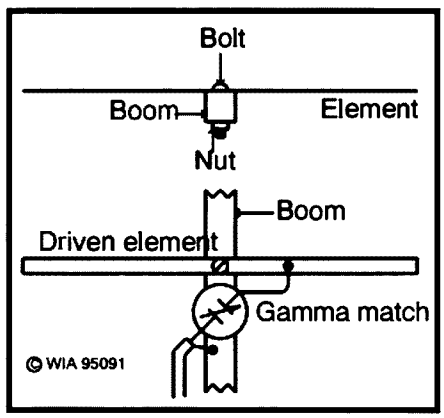

Figure 1 – Upper drawing shows mounting of elements to boom. Lower drawing shows matching feedline to the driven element (drawings not to scale). The co-ax braid is fastened to the boom, the inner to a compression trimmer of about 47 pF. The gamma tap is 5.5 inches (140 mm) from the boom centre. Adjust the gamma capacitor and wire spacing for the lowest SWR. Enclose the trimmer capacitor in a plastic bottle top for protection from rain, etc.

Apart from reasons to do with portability and size, there is another reason, something I call "One Wavelength Uncertainty Principle". It is almost the Yagi version of the "Heisenberg Uncertainty Principle" from the world of quantum mechanics. In my experience, the design optimisation appears to become quite uncertain and difficult to measure as boom length passes one wavelength!

Even the professionals have found this; however, things are getting better. Thanks to the efforts of DL6WU, K1FO, VK3AUU and others, long Yagi design is now much more certain than in the past.

The designs formulated by the then National Bureau of Standards were often touted as "maximum gain" designs. However, having built a few NBS designs in my early days, I found them to be, putting it kindly, incredibly mediocre. But enough of that. I guess others might disagree.

If nothing else, I have found that with Yagis, element (director) tuning is everything. It is my feeling that non-optimum tuning is mainly responsible for lacklustre performance. Yes, it is all very interesting, if rather complex.

Anyway, here are two more designs for you to try.

Design and Construction Data

Element lengths

Reflector	40.25 inches	(1020 mm)
Driven element	38.0 inches	(965 mm)
Directors	35.5 inches	(900 mm)

Element material

20 x 1.6 mm aluminium strip

Boom material

19 mm box tubing

Spacings

3 element		
R to De	16.125 inches	(410 mm)
De to D1	14.5 inches	(370 mm)
5 element		
R to De	12.75 inches	(325 mm)
De to D1	11.25 inches	(285 mm)
D1 to D2	14.0 inches	(355 mm)
D2 to D3	19.25 inches	(490 mm)

Elements mount on boom with 25 mm "roofing bolts" (about 3 mm thick) – see Figure 1. *(Preferably two per element. Tech Ed)*

**9 Garbutt Street, Ingham QLD 4850*

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■ Equipment Review

Yaesu FT-51R Dual Band Handheld Transceiver

*Reviewed by Ron Fisher VK3OM**

It's been quite a while since I have done a VHF/UHF review. This one came along at just the right time; I happened to call in at the Federal Office to drop off some material for the magazine the day before setting off for a three week trip to New Zealand. Would I be interested in looking at a new dual band handheld? Seeing that I was ready to pack two transceivers, one for two metres, the other for 70 cm, how could I refuse the offer of just taking the one, and a new one at that. So, the FT 51R has been tested over many hundreds of kilometres of New Zealand roads.

If you are planning a trip to ZL, it is essential to have 70 cm as well as two metres. On 70 cm, they have an incredible system of linked repeaters that covers the whole country from north to south. From Christchurch in the South Island I could easily talk to my friends in Auckland.

Well, enough of that, what about the FT-51R? The FT-51R is, in fact, the big brother of the diminutive FT-11R two metre handheld transceiver. When I say "big brother", I don't mean big in size but big on features. The FT-51R features both two metre and 70 cm operation with simultaneous dual band receive capability and extended range receive coverage, including the aircraft band with AM detection. All of this in a package only 5.8 cm wide, 12 cm high and 3 cm deep which includes the two watt output battery. The higher power output batteries increase the height a small amount.

The transceiver is supplied with an antenna, nicad battery and an Australian approved charger. The supplied battery gives the transceiver two watts power output. Optional batteries allow up to five watts output.

Perhaps the most interesting feature of the FT-51R is the scrolling instructions built into the larger-than-usual LCD. Yaesu call this feature "windows". Not quite the same as the "Windows" you might find on your

IBM clone computer, but more "windows" into the works of the FT-51R that will help you sort out the very friendly operating options that the rig presents. The amount of information that the display delivers is quite amazing. Let's run through a few of its features.

The spectrum scope gives a visual picture of what is going on on frequencies other than the one you are actually using. If a frequency becomes active, you just have to centre the "pip" in the display using the tuning control and you are there. Of course, the two operating frequencies displayed on the readout are capable of receiving two signals at the same time, either on the same band or on different bands. As well, each frequency has its own "S" meter and if you decide to change either the audio gain or the squelch, this is also displayed by a bar graph. Transmit power output is also displayed as a bar graph. The display will even tell you which battery you have fitted (in case you have forgotten!) and its present state of charge. Both the receive audio gain and squelch settings are set using up/down buttons, with audio being the primary function and the squelch selected via the "F" (function) button. In fact, the only rotary control on the transceiver is the VFO/memory selector on the top panel. Each of the twenty control buttons below the display have dual functions selected via the "F" button.

On the Air

With the rush to get away on our holiday, the first chance I had to read the instruction book was on the plane on the way to Auckland. Unfortunately, I wasn't able to have the FT-51R in front of me while doing this. The Yaesu looks just like a cellular phone and airline staff are paranoid about using these while in the air. However, by arrival time I was sure that I would be able to call my ZL friend on our pre-arranged 70 cm frequency. I did and got through the first time.

The first thing I noted was that the audio output from the speaker was lacking when using the rig in a high ambient noise area. It was really better to treat the transceiver as a mobile phone and hold it up to your ear. Depending on how quiet your car is, an external speaker could be an advantage. But, for normal use around the house, there was plenty of audio.

The received audio quality was very good considering the speaker is only about 25 mm in diameter. Reports on the transmitted audio quality were excellent, indicating a well balanced response and optimum deviation. I also tested the audio with the MH-12 speaker microphone. Transmit quality was identical to the inbuilt microphone with the received audio slightly more restricted than the internal speaker. Acoustic output was slightly less from the external unit.

The MH-12 is now an old model and I note that Yaesu now offer three optional speaker microphones. There is the MH-32A2B which is a miniature size model, the MH-35A2B standard size model which, no doubt, replaces the MH-12, and the super model, the MH-29A2B which has its own inbuilt digital display and control buttons. None of these were supplied with our review transceiver so, unfortunately, I cannot comment on their relative performance. I would be most interested to test these three units, in particular the remote control model with the inbuilt display, some time in the future. Dick Smith Electronics please note.

Transmitter power output was measured at 2.3 watts on 146 MHz and 1.5 watts on 435 MHz. The antenna that Yaesu supply with the FT-51R is a new design which is claimed to give better performance than some of the usual rubber dummy loads. I took along a Diamond RH-77 which, although twice the length of the Yaesu antenna, did not appear to work any better.

There are also three optional battery packs which give the choice of either longer battery life or higher transmit power output. The FNB-38 9.6 volt battery gives the FT-51R a power output of 5 watts. There is no provision to power the FT-51R directly from a standard car battery for mobile operation. The transceiver is rated for a maximum of 11 volts input, not 12, and certainly not 13.8 volts. If you do need to use the rig in your car, you will need the Yaesu E-DC-12 mobile power

adaptor which gives a regulated output of 11 volts to both power the transceiver and also trickle charge the battery. The E-DC-12 terminates in a special fitting that clips onto the battery fitted to the transceiver.

For home use, the FT-51R is supplied with a very neat base charging stand and a wall plug-pack to supply the required charging voltage. This plug-pack has been modified by Dick Smith staff to give the correct charging current. This all works well, with one exception. There is no LED on the charging stand to show that charging is actually taking place. The old CA-2 stand that I use with my FT-23 and FT-411 does have an LED which is very reassuring. Also, both of the adaptors use a 2.5 mm audio plug for the DC connection which can accidentally short the DC supply unless they are pushed in with care. A proper DC connector should have been used.

The Bottom Line

If you are in the market for a dual band handheld transceiver, the Yaesu FT-51R should be near the top of your list. I have always thought that Yaesu handhelds are more user-friendly than many other makes. The wide band receiver has excellent sensitivity right across the range. It is especially good on the aircraft band and actually ran rings around two dedicated air band receivers that I use from home. I note from American advertisements for the FT-51R that Yaesu can supply a software program to operate your transceiver from your PC. If available here, this could be a most interesting addition to your transceiver.

The review FT-51R was supplied by Dick Smith Electronics to whom you should address your enquiries. The FT-51R sells for $899 and this includes a 4.8 volt rechargeable battery, base charging stand and wall plug charger.

24 Sugarloaf Road, Beaconsfield Upper VIC 3808

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WIA News

Antenna Design to Deflect Mobile Telephone Radiation Fears?

Amid speculation and controversy over whether or not radio-frequency radiation from handheld mobile phones causes cancer in some users, engineers from the Queensland Griffith University claim to have successfully designed an antenna for mobile phones that deflects the electromagnetic radiation away from the phone user's head.

Recent media reports have kept alive fears that the radio-frequency radiation from mobile phones may cause brain or other cancers. Recent scientific studies on a possible link between mobile phone use and cancers in users have been inconclusive on the matter of causality, or the likely mechanism if low level radio-frequency radiation is linked to cancer.

After four years of work, the university engineers said their antenna reduces the exposure level to only 0.1% of that currently experienced when using today's mobile phones. In addition, they said the antenna leads to an increase in battery life of more than 70% and the phone's range by 50%.

The Griffith University is seeking a manufacturer to produce the antenna so that it can be sold world-wide.

The Australian Standard AS 2772 presently applies to RF exposure limits from radio-frequency devices, including mobile phones. For those concerned about the health implications of radio-frequency radiation, two very clearly written articles are recommended: "Are Radio Waves Dangerous To Your Health?", and "Does Your Station Comply With RF Field Limit Standards?", written by Andrew Corney ZL2BBJ and published in the NZART journal Break-In, November and December issues 1995, respectively.

■ Technical

Technical Abstracts

*Gil Sones VK3AUI**

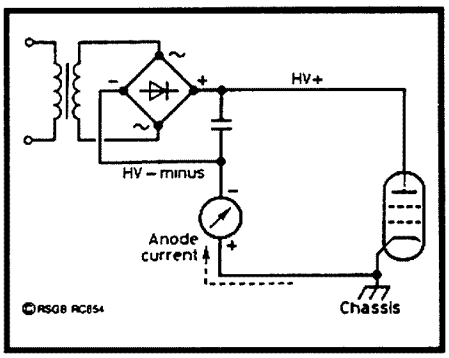


Figure 1 – Skeleton circuit of HV Supply for Grounded Cathode Amplifier.

Flashover Protection

Flashovers in valve linear amplifiers can occur and may result in major and expensive damage. The interlock which grounds the high voltage when you open the high voltage cage may keep you alive but the flash may signal an expensive repair. In *RadCom* January and February 1996 issues, Ian White G3SEK, in his *In Practice* column, explains how the problem can arise and how to avoid major damage.

In Fig 1 and Fig 2 the skeleton circuits of both grounded cathode and grounded grid amplifiers are shown. These are only skeleton circuits and there are many parts omitted, several of which are safety related. The metering is shown in the negative lead as this is standard practice. The use of meters in the HV lead can result in insulation and safety problems and is usually avoided.

The current path in the case of a flashover is shown in Fig 3. This is also the case for the operation of the grounding interlock on the HV cage. The current is quite large as it passes through the delicate meters and it also results in the HV minus rail being forced a long way negative with respect to the chassis ground. This can result in expensive damage to the meters and a potentially dangerous situation with the HV minus rail.

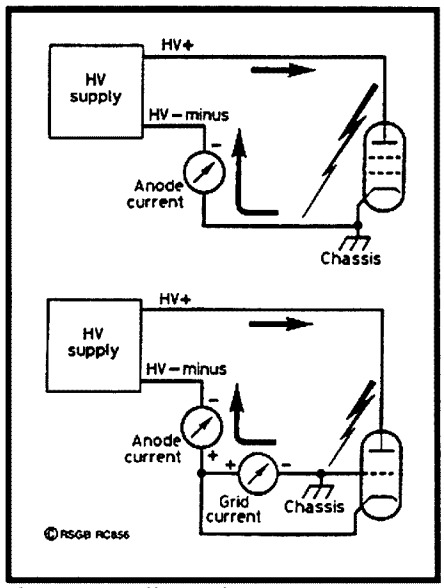


Figure 3 – Effect of Flashover from Anode to Chassis .

The current present in this situation is very large. The usual capacitor block contains a lot of energy which is dissipated very quickly. To limit the current a resistor should be incorporated between the HV capacitor block and the site of potential shorts. This is between the capacitor and the shorting switch and the PA valve circuitry. The shorting switch is normally held open by the lid of the cage and it is intended to keep you alive if you open the cage.

The current limiting resistor should have a relatively small resistance of the order of 50 ohms and should be capable of withstanding the surge. A metal clad wire-wound resistor of 50 to 100 watt rating would be suitable. You can obtain these from a few suppliers. RS or Farnell should be able to help. The resistor won't need a heatsink but should be given a well insulated mounting. This will limit the current in a flashover to a manageable value. The meters still need protection though.

A couple of back-to-back diodes with adequate surge ratings will protect the meters. They can be provided by one of the high current encapsulated bridges cross connected as shown in Fig 4. There are many 25 and 35 amp bridges available which have quite large surge current ratings and they are relatively cheap. The rating may appear excessive, but remember that 2500 volts through 50 ohms gives 50 amps.

The resultant protected circuit is shown in Fig 5 with the flashover current path. The meters are protected and the HV minus rail is kept close to chassis potential. The normal meter operating potential drop is less than the forward diode voltage and so meter operation should not be affected. The

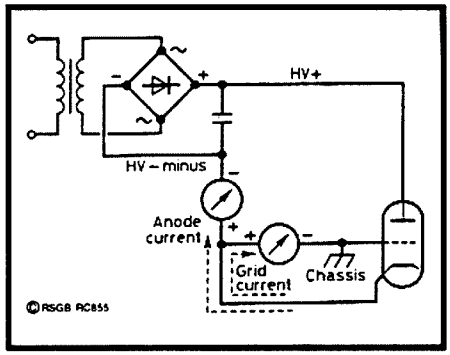


Figure 2 – Skeleton circuit of HV Supply for Grounded Grid Amplifier.

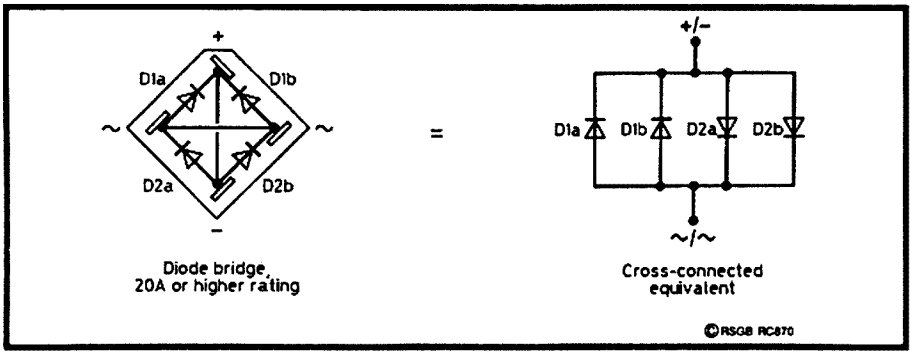
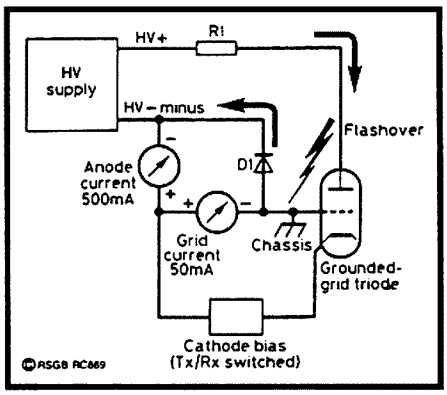


Figure 4 – High Current Bridge cross connected as High Current Protection Diode.



FFigure 5 – Grounded Grid Amplifier with protection diode and resistor showing Flashover Current Path. Meters protected and HV minus rail close to chassis potential.

resistor limits the flashover current to a manageable value. The damage should be minimal in the event of a flashover.

There should also be fuses between the HV transformer secondary and the HV rectifiers. These should be special HV fuses. The glass encapsulated types intended for low voltage use are not recommended as they can shatter sending rather nasty shrapnel into the surroundings. They also produce an arc when they rupture which can last for long enough to do a lot of damage. You need a fuse which can contain and snuff out the HV arc. You can obtain suitable fuses but it does take some work to find them.

Frequency Checking

Most modern transceivers have a very impressive frequency readout but it may differ from the actual frequency of transmission and reception by a significant amount. The readout is usually not a measurement of the actual frequency but represents the frequency setting of the computer controlling the radio. The actual accuracy depends on the accuracy of the oscillators used to generate the signal. These may not be as precise as we may desire. Some radios are fitted with a very accurate TCXO but most have lesser specifications.

The readout may well be 100 or even 200 Hz in error. It is possible to determine the error fairly simply. In *CQDL* for August 1995, Peter Bobeck DJ8WL explained how to check transceiver frequency using an accurate tone source. My thanks to Mike Krochmal VK3KRO/VK3ZIP for providing a translation of the article.

An accurate tone source is needed and this is provided by dividing the frequency of a crystal oscillator. A CMOS divider providing a divide by 4096 is used. A readily available crystal is divided to give a tone of 600, 800, or 900 Hz which is within one Hertz. The crystals are readily and cheaply available as they are used in a variety of common equipment. The circuit is given in Figure 7. The square wave output of the divider is cleaned up by an active filter to provide a sine wave output.

The tone source is used either to determine a transmitted frequency or to check the received frequency. For checking the transmitted frequency a counter with sufficient accuracy is needed. One part per million is an error of one Hertz per MHz.

To check the transmitter frequency, the audio source is fed into the microphone input and the output frequency of the transmitter is measured with a counter. The frequency of the suppressed carrier can be determined by adding or subtracting the tone frequency depending on whether the signal is LSB or USB respectively (see Figure 6). You should, of course, use a dummy load for this test.

For a received frequency test you need a known carrier to tune to. You tune to obtain a beat note which is of the same frequency or pitch as the audio tone source. The ear is very sensitive to pitch and the tone from the generator and the receiver will audibly beat when they are close in frequency. Then, knowing the frequency of the signal and the frequency of your audio tone, you can calculate the suppressed carrier injection frequency and check your dial reading. One of the standard frequency stations will provide a suitable signal. Alternatively, some other known signal can be used.

You can, of course, note the frequency error and, if you are able, you could, of course, adjust the transceiver master oscillator. However, the simplest course is to note the error and bear it in mind when an accurate frequency setting is required.

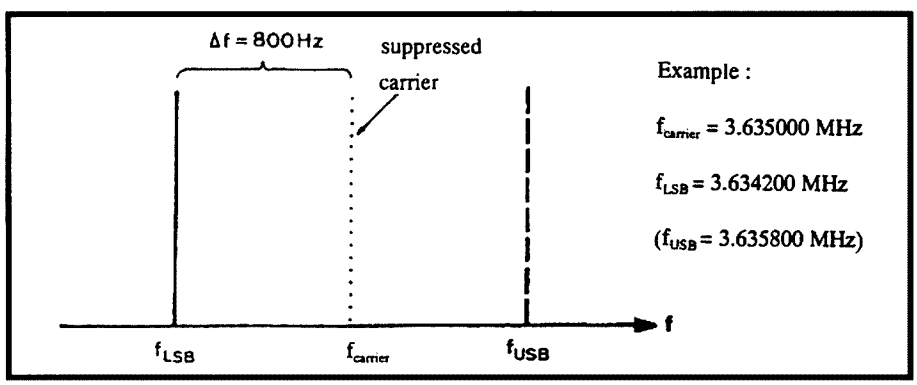


Figure 6 – Frequency scheme.

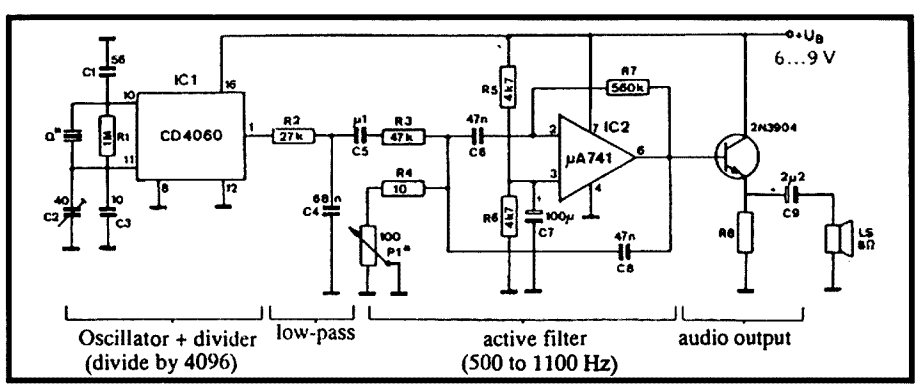


Figure 7 – Reference Tone Generator. Computer crystals Q*, use 2.4576 MHz for 600 Hz; 3.2768 MHz for 800 Hz; and 3.6864 MHz for 900 Hz (frequency adjustable with C2). P1* is a 10 turn pot for adjustment of the filter frequency, depending on the crystal used. R8 = 68 ohms.

*C/o PO Box 2175, Caulfield Junction VIC 3161

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■ Book Review

The ARRL Antenna Compendium

Volumes 1, 2, 3 & 4

Publisher: *ARRL*

Reviewed by: *Evan Jarman VK3ANI*

Paperback 278 mm by 210 mm
Volume 1 (1985) 176 pages
ISBN 0-87259-019-4
Volume 2 (1989) 212 pages
ISBN 0-872259-254-5
Volume 3 (1992) 238 pages
ISBN 0-872259-401-7.
Volume 4 (1995) 216 pages plus 720 K IBM/C disk
ISBN 0-872259-491-2

The perils of being a publisher! What can you do when the articles on antenna construction received for publication grossly exceed the available space in your magazine? One has to balance content among the various facets of the hobby. The problem, if that is what it can be called, is that amateurs love antennas. They are the one area common to all activity. They can be fabricated and modified in the garage; and are the last bastion of home brew. They, more than any other component, determine the effectiveness of a station. Obviously, they are the most popular subject.

Because of the antenna's popularity, the publishers of *QST* have a plethora of antenna articles. The ARRL decided to publish "The ARRL Antenna Compendium: Volume 1" in 1985 to provide the space that the magazine could not. The popularity of articles on antennas has led to subsequent volumes being published, the most recent being volume 4.

Each volume is a collection of articles on antennas. They have been grouped so articles on similar subjects appear together. This approach has been adhered to in all four volumes. Some of the articles are specialised and go into a fair bit of theory, often more than general interest dictates. Others keep the theory to showing how designing is tackled. In this field the growth of PCs as a design aid becomes obvious. In volumes 2 and 3, the programs are published as text (available on disk). With volume 4 a disk is included.

These are not definitive reference books. They are not the books to refer to when a general explanation is required. They are books that show how others have tackled various problems. Most show the progression through theory to construction. The subject range is very diverse, many with very creative solutions. There is even an article on theory that went wrong which includes the "why". The largest I saw was a 9 element beam for 80 metres on a 100 metre boom. The smallest was a 2 metre mobile that you had to struggle to see in the photograph, even when pointed out. Antenna related equipment is also covered, such as rotators, mountings and transmission lines. A few articles on propagation are included as well.

Most frequencies are covered by the articles, diverging from the conventional textbook design. Articles on antennas above UHF are, however, rare. There are some very innovative articles included. Much hard work has obviously gone into these articles and software. Some rare articles have been published elsewhere, but not in *QST*. The classic G5RV article in volume 1 has appeared in many magazines, *Amateur Radio* included.

It is understatement to say that these volumes are a good source of ideas. With over 150 articles within the 4 volumes, there must an idea or ten for even the most knowledgeable.

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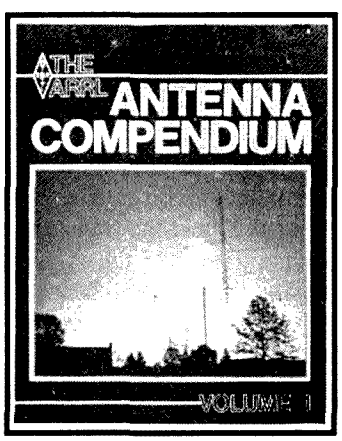

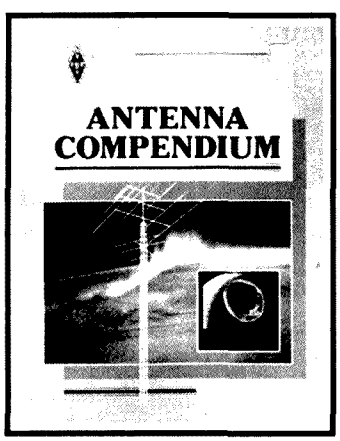

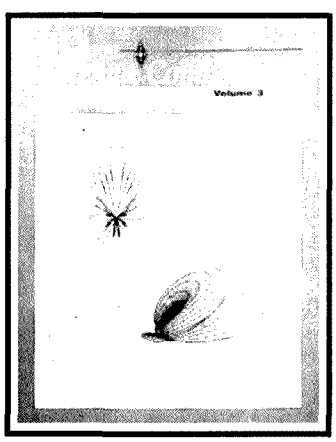

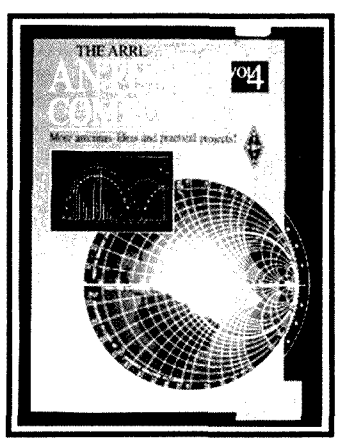

■ Operating

Incident at Tarawa

W A ("Blue") Easterling VK4BBL tells how his regular 20 m sked with a few VK friends suddenly became a focus of international official communications.*

During the second week of October 1995, amateur radio was again to show its usefulness during a telecommunications major failure in mid-Pacific when a severe mishap put the satellite dish out of action at Tarawa.

Tarawa is the capital of the Republic of Kiribati which old timers will remember as the Gilbert and Ellice Islands colony, achieving full independence in 1979. Its land area is comparatively small but spread over 33 coral atolls in an ocean area of five million square kilometres. It extends 3870 km from west to east and 2050 km from north to south. There are three major island groups, the Gilberts in the west and the Phoenix and Line Islands to the east. Tarawa is one of the Gilbert group.

In 1984 communications were upgraded with the installation of a satellite earth station at Tarawa providing fax and telephone links to the outside world. It worked satisfactorily until 8 October 1995 when, after a planned outage, a mechanical failure caused the dish to turn out of control and hit a nearby building. Both the dish and the waveguide were badly damaged.

Help!

Next morning we had a breaker call into our little group on 14130 kHz. He was David T30DW on Tarawa asking if we could relay a rush message to Peter Dalton at Telstra in Sydney. He picked a good group to contact; almost all of us are former OTC staffers.

John VK2ALJ, ex ABC Senior Tech, tried in Sydney but found little information in the telephone book. I took the message, intending to have Brisbane Radio/VIB relay through the internal network; however, it was decided to pass it to Peter direct. Another stroke of luck. Peter is VK1XP, spent some time on Tarawa on secondment, and knew the gear and people so no explanations were needed.

He suggested activating an INMARSET set at the Fisheries Department, but this had been unserviceable for some time. Therefore, David T30DW and I kept skeds during the next few days. David is the General Manager of the Bank of Kiribati, formerly with Westpac and, as I was a "Wales" teller in bygone years, we were on common ground even if most of my working life was in Coastal Radio with OTC.

Next morning he sent a message saying that further checking revealed even worse mechanical damage and again asking for urgent assistance to restore international communications. Tarawa had no spares and no chance for a quick fix.

WICEN

David also had a welfare message and asked if WICEN could handle it and any others that might be offered. Brian Mennis VK4XS, the local WICEN Co-ordinator, responded immediately and lined up some of his members. He advised the local SMA office of the situation only to find that Australia has no third party agreement with Kiribati. After ascertaining the authenticity of the matter, the gentleman at the SMA suggested that if the Republic made an official request, a temporary permit would most likely follow.

So, next morning, Thursday, 12 October, I reported this to David along with the cheering news that an RAAF Hercules aircraft would depart Richmond NSW with a complete new installation and two Telstra technicians on Saturday, 14 October.

It was then found that the Australian High Commission there had a link with Canberra, technical details unknown, but obviously not open for public correspondence. An inter-Governmental message was sent and the third party permit was issued the same day.

Radio conditions the next day were poor. There had been sunspot activity the previous day and no contact on Saturday. On Sunday, David was back with his usual 599 signal, advising that a power blackout had kept him off the air (his home diesel plant gives out too much QRM for radio work).

Relief

The Hercules arrived at 6 pm Saturday and most of Tarawa was there to see the monster aircraft. The Telstra technicians had brought a SATPHONE with them and could dial back to anywhere. They hoped to restore full service by the following Thursday.

David obtained a local permit to open a commercial circuit with Suva on 14365 kHz, outside the amateur band but within the tuning range of his gear and beam. Kiribati is not wealthy, with much of its income deriving from the wages of its young men crewing foreign ships. It was essential that the Bank remain in contact with a bank in Suva acting as an agent during the emergency, so David was a very busy man.

It was fortuitous that T30DW made his contact with a group who knew the ropes of the international aspect and which speeded the process. However, I know that any amateur would have responded to his initial request.

**8 Penguin Waters, Burleigh Heads, QLD 4220*

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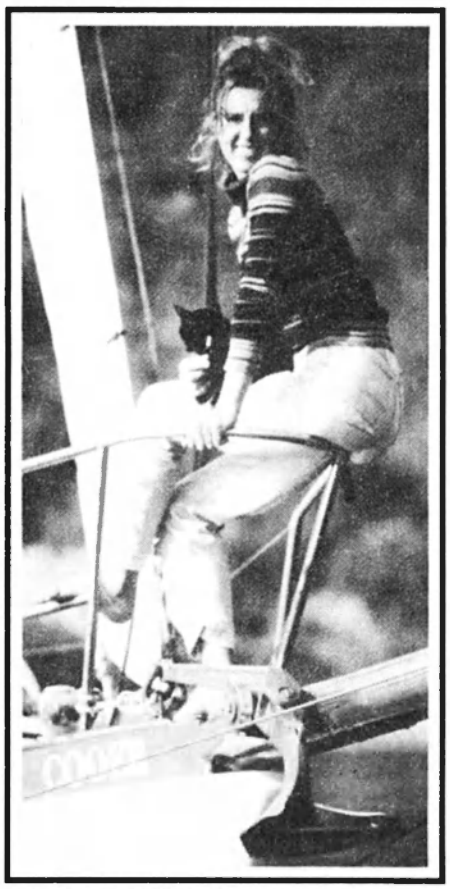
■ People

Two Friends, a Cat and a Classic Wooden Boat

Plus that vital ingredient – Ham Radio!

Maxine Godley, a non-amateur, tells of her enthusiasm for the communication wonders of ham radio.*



Jill Knight VK3CMF, "Fletcher" and "COOEE".

A Mackay ham radio operator provided a valuable link when I wanted to make contact with my best friend, solo sailor Jill Knight VK3CMF on the historic yacht "COOEE". We had not seen each other for nine years as she sailed around the world. Jill was in mid-Pacific in August, heading for Tahiti, Suva and Noumea, her last landfall prior to returning home to Brisbane.

Bob and Betty Neilson, VK4AAU and VK4WAM, agreed to help me so I could pass on important information and make arrangements to welcome Jill in New Caledonia. The 20 metre band has notoriously poor propagation at present and this was Jill's preferred frequency. Bob had not used this band for years but "dusted it off" and gave it a go. The first contact was pretty awful and Bob suspected a defect "up the pole". Between scheduled contacts Bob tackled the problem with soldering iron, nuts and bolts – the whole thing being reassembled as Jill was calling us. Bob completed repairs, we raced to the radio just in time, and the signal was excellent.

Not only did I want to visit Jill as she waited for the westerlies to subside in Noumea, but communication was under way in Brisbane to import "Fletcher", Jill's cat who has been her only companion for so long. She was not able to communicate closely enough with Australia's Quarantine Service whilst sailing, and it seemed that her only option would be to find a home for Fletcher in Noumea, thereby farewelling her little friend. It's not common for yachts to arrive in Brisbane with an animal on board for import, so a lot of information had to be collated to assist the Quarantine authorities to make this most important decision.

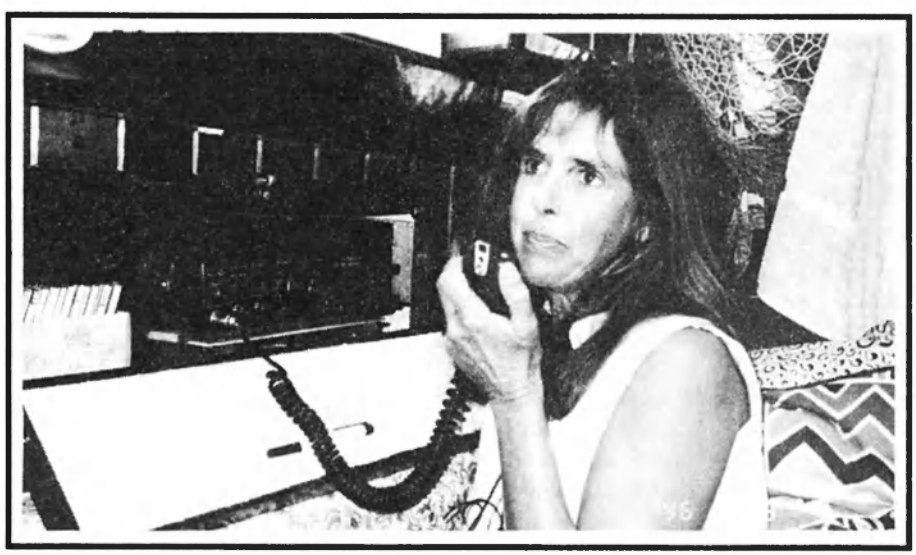
Sunday morning became the regular contact day for me and my partner, John, with Bob and Betty welcoming us in the front garden and proceeding upstairs to the set. It was always exciting for me to speak to my dear friend of 30 years and to know that we could help her in such a practical way through the ham radio network.

During the first few contacts I was almost in tears to hear Jill's voice so clearly after so many years of letters to her all around the world.

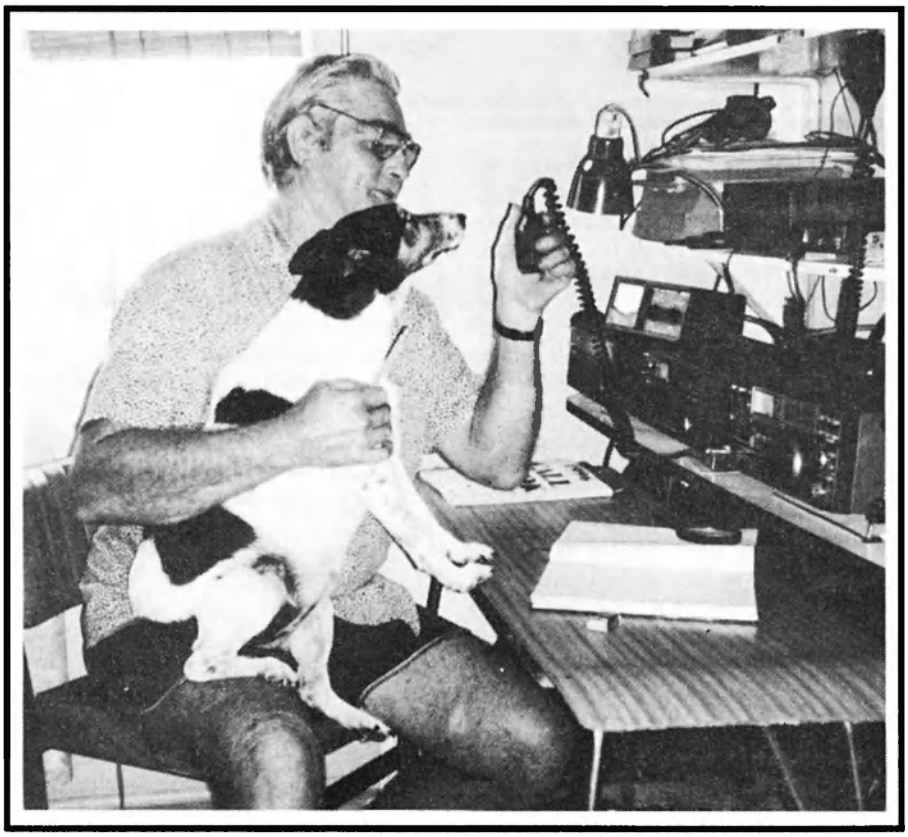
Bob spent a lot of time perfecting the contact each week; shifting to different frequencies, tuning and twiddling a multitude of knobs and buttons.

Alan McCaskill, a good friend of the Neilsons, also took a close interest and communicated from his station VK4SKL in Alligator Creek near Mackay.

Sunday after Sunday went by with Jill sailing closer and with me arranging for leave from my job, airline bookings,



Jill VK3CMF operating her IC-737 on board "COOEE". Jill uses a half wave dipole antenna for 20 m, and an Outbacker mounted on and earthed to the life lines on the boat.



Bob Neilson VK4AAU, and second operator, at the station he shares with his wife Betty VK4WAM.

new sailing charts for Jill's entry to Brisbane, finalising details with Quarantine and a multitude of other duties.

Soon I was on the plane and what a joyful reunion it was at Noumea airport. The airport bus dropped us in total darkness near the bay and we made our way down a dark embankment, through long grass to the dinghy, and out to yacht "COOEE".

Next morning I felt slightly disoriented as I spoke to Bob and John from Jill's maritime mobile station.

Fletcher had been unexpectedly quarantined in Noumea for five days and this really threw a spanner into my careful negotiations. John was able to take over with my Brisbane Quarantine contact while I worked with Jill to execute a mountain of new certificates, authorisations and clearances, fighting a new battle to regain the hard-won minimum quarantine period of 30 days.

In between all this Jill, Fletcher and I enjoyed the best of isolated islands, blue-green water and white sand and caught up on some of those nine years.

It was a sad return to Australia after three weeks, this time to prepare for Jill's imminent return. "COOEE" is 102 years old and possibly the oldest boat to have completed a circumnavigation. 14 metres overall, this New Zealand-built classic wooden, gaff-rigged tops'l cutter was built for bay and harbour racing. Jill had it modified to sail it alone and, in completing a circumnavigation, proved it a solid, secure design. It was a remarkable feat over seven years – full of danger, endurance and wonderful adventure.

Her yacht club – Mooloolaba in Queensland – met her with a flotilla of sail and motor boats and the media warmly welcomed her and Fletcher on TV, radio and in print. Fletcher was granted her minimum 30 days in quarantine and much of this certainly never could have been accomplished without the network of ham radio – but more particularly, the kindness and perseverance of Bob and Betty Neilson in Mackay – WE NEVER STOP THANKING THEM!

**C/o PO Box 2175, Caulfield Junction VIC 3161*

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ALARA

Sally Grattidge VK4SHE, ALARA Publicity Officer*

Congratulations

Debbie VK5JDM (ALARA Historian) is now VK5DEB. Angela VK3MDA is now VK3FAS.

Perth

ALARAMeet 1996, to be held on 28-29 September, is rushing towards us; so, if you plan to go, please let Bev VK6DE know ASAP. The tally at the time of writing (April) was 52 adults and five children. Bev needs numbers so that she can finalise bookings for tours, etc. Contact Bev if you need to know the prices for children. The meet coincides with the Royal Show and school holidays, so do not leave your bookings until the last minute or you may miss out. Non-members are also welcome to join in all or part of the weekend. YLs who are planning to be in or near Perth at the end of September contact Bev (see below) if you wish to join any of the pre-booked activities.

For those staying on for the Monday, which is a public holiday, a trip to Mundaring Weir in the Darling Range is being organised with lunch at the lake; sounds a great way to relax and finish all the conversations you started at the weekend. There could even be a trip to Rottnest Island on the Tuesday. After that, you are on your own; let poor Bev have her nervous breakdown in peace!

Costs and details are in the April *Newsletter*, or contact Bev Hebiton VK6DE, PO Box 299, Geraldton WA 6530. Many of us in areas with few ALARA members would hesitate to take on the task of organising a meet, but dauntless Bev has met the challenge, even doing it by remote control as Geraldton is some distance from Perth. She is going to be a hard act to follow.

PS. Don't forget the "Special Event". All members can participate, even if not able to attend the meet. Read the July *Newsletter* to find out what this means!

History

Last year a call was put out to early YLs to tell their stories, and these have now been assembled in a file for ALARA's records, with copies sent to the WIA Federal Historian for publication at some future date. This project is ongoing and stories, papers, photographs, etc relating to early YLs are always welcome; send to the President, Secretary or Historian.

This information was supplied by Bron VK3DYF who has been ALARA secretary for four years and Editor for many years before that. Bron is stepping down and, by this time, we should have a new secretary. Many thanks to Bron for all her hard work.

Wyong Field Day

Dot VK2DDB and Margaret VK2MAS presided over the ALARA table at the Central Coast Field Day held at Wyong in February. Beryl VK2BBM and Anne VK4ANN were early visitors and enjoyed looking at Margaret's photographs from her New Zealand trip. Nancy Karas (XYL of John VK2EEH) joined ALARA at the Field Day, and Pauline VK2GTB was there at the WICEN table. Pauline is very active with WICEN in her area. VK2 now has a little mascot doll (it's catching on) complete with miniature radio and callsign VK2MA.

Sponsorship

Sponsorship is a great way to make contact with YLs in other countries. Here is how it works.

1. You either find a DX YL yourself who would like to become a member of ALARA, and who will, if possible, sponsor you into her home association; or you can ask the Sponsorship Secretary to find a YL you can sponsor. You can even choose a country, city, area if you like.
2. You make contact with the DX YL telling her something about yourself. This contact is usually by letter.
3. Once all is agreed, you forward a year's subscription ($8.50 covers economy airmail) to the ALARA Treasurer together with the YL's name, callsign and address.

At the time of writing, there were a couple of DX YLs looking for VK ALARA members to sponsor, a VK3 YL was looking for a sponsor in Wales, and some ZL YLs were interested in sponsoring YLs from VK. Contact Gwen VK3DYL.

Thelma Souper Memorial Contest

Pat Pavey VK3OZ

Having received my copy of the WARO Bulletin from Val ZL2PZ, I made a last minute decision to try my luck in the Thelma Souper Memorial Contest on 13-14 April. Conditions on 3.5 MHz were very good and I was able to make 63 contacts on Saturday evening.

Encouraged by this, I duly appeared again on Sunday and, after twenty minutes, made the first contact. Being unable to break in on the ZL girls, I selected a frequency and waited for conditions to improve. Fortunately, this strategy was successful as, once the ZLs copied my CQs, they came to me, and every half hour period I received calls from a number of stations for repeat contacts.

This was my first participation in this contest and the decision to enter was only taken on Saturday afternoon but it was a very enjoyable experience. I was made very welcome by the ZL girls who regularly encouraged my efforts, not to mention the OMs, whose contacts far outnumbered the YLs. I was very impressed by the support and enthusiasm from the OMs for this contest and hope to be back again next year.

Well done Pat for persevering to gain a total of 133 contacts. Perhaps this will encourage more VK YLs to have a go next year.

Prodigal Sue?

Sue, now VK5AYL, was active in amateur TV when she lived in VK2 several years ago. She moved to VK5 in time to attend the Adelaide ALARAMeet, but has been rather quiet since while living in the hills with no antennas to play with. Now we hear she has moved to the plains and married an OM who used to be interested in amateur radio, so we hope she will be back on the air before too long.

With Bells On

Margaret VK4AOE attended the wedding of her step-granddaughter earlier this year, and Robyn VK4RL's daughter was married in April. Robyn made the dress and did all the make-up for the bride and her attendants, doing their nails the day before. All this on top of starting her own beauty business, so Robyn has not had much spare time to play radios recently.

**C/o PO Woodstock, QLD 4816*

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Help stamp out stolen equipment – keep a record of all your equipment serial numbers in a safe place.

AMSAT Australia

*Bill Magnusson VK3JT**

National co-ordinator
Graham Ratcliff VK5AGR
Packet: VK5AGR@VK5WI
AMSAT Australia net:
Control station VK5AGR
Bulletin normally commences at 1000 UTC, or 0900 UTC on Sunday evening depending on daylight saving and propagation. Check-ins commence 15 minutes prior to the bulletin.

Frequencies (again depending on propagation conditions):

Primary 7.064 MHz (usually during summer).

Secondary 3.685 MHz (usually during winter).

Frequencies +/- QRM.

AMSAT Australia newsletter and software service
The newsletter is published monthly by Graham VK5AGR. Subscription is $30 for Australia, $35 for New Zealand and $40 for other countries by AIR MAIL. It is payable to AMSAT Australia addressed as follows:

AMSAT Australia
GPO Box 2141
Adelaide SA 5001

SUNSAT Launch Date Announced

(From SpaceNews) Reliable sources indicate that the launch date of the SUNSAT satellite has been set for 6 March 1997. SUNSAT is an amateur satellite sponsored by the University of Stellenbosch, in South Africa. SUNSAT's mission will be closely tied in with education. Three school projects have been accepted for inclusion on the satellite's payload so far and, although final preparations are being made to the spacecraft, time still remains for the inclusion of four additional school projects.

One of the more unusual projects riding on SUNSAT is an experiment that will monitor the internal sounds of the spacecraft during the early part of its mission in space. Through this experiment, it should be possible to hear things such as the gravity gradient boom extending and locking into place, "creaking" sounds caused by thermal changes to the spacecraft structure, and sounds from the reaction-wheel assemblies.

Sounds from the spacecraft will be available in real-time through a two metre FM downlink transmitter, and promise to hold a lot of interest.

Do I see some eyebrows raised? SOUNDS in space? How can this be? One can only assume that the audio transducing device (microphone) is mechanically fixed to the space-frame and works by sound vibration conduction. It will surely be interesting to follow this one through.

DO-HOP (double-hop) Working Through Amateur Radio Satellites

This is a challenging mode of operation. I'm not sure if any stations have tried it here in VK. Please let me know if you have. It involves working through two satellite transponders in series. It has been possible in the past when some operational satellite transponder input and output frequency bands overlapped. This can be a bit of a nuisance if both satellites are in range and you aren't interested in DO-HOP but, if you are, it can make life very interesting. Several conditions need to be met to have a successful two-way DOHOP contact.

1. The first satellite, let's call it sat-A, must be in range for you.
2. It has to have a downlink passband which at least partly overlaps the uplink passband of the second satellite, sat-B.
3. For a two way contact the satellites have to be operating in "opposite" modes, say B and J modes.
4. The two satellites have to be in mutual range so that their footprints overlap and they can "see" each other over their respective horizons.
5. The station you are hoping to contact must be in range of sat-B.
6. Finally, you need a lot of experience and patience, a pretty good station and a quiet location.

Only on rare occasions will you be able to satisfy all these conditions. You transmit up to sat-A and your signal is re-broadcast and picked up by the receiver of sat-B. It is then down-linked to the other station. The other station takes the reverse route through the two transponders and back to you. Sounds easy? Read on.

The Doppler shift alone is very difficult to predict and cope with when you have two satellites converging on each other and then diverging at speeds of up to tens of thousands of km per hour. It can work in your favour, however. The signals will drift rapidly away from any "transceive" setup thus minimising the risk of feedback across the system. This means it would be virtually impossible to monitor your own transmission in the way you normally would when working through a single transponder. The mutual footprint of the satellites is most likely quite small and certainly less than either single footprint at either station. It may only amount to a few minutes.

The conditions are difficult to meet and require a lot of planning and some good tracking software. Many tracking programs will only display one satellite at a time on the screen. James Miller's SATFOOT program is one which will display multiple footprints and would suit this purpose. Some tracking programs will predict mutual satellite co-visibility which would also be useful.

Here is a summary of some recent (1993) European activity from Pat G3IOR which may spur some locals to make the quite considerable effort to try this mode of operation.

DOHOP Satellite News

Following in the footsteps of Ray Soifer W2RS, who accomplished cross satellite radio contacts using OSCARs 6 and 7 in 1974/5, Pat G3IOR and Dave G4CUO achieved "DOHOP" success with OSCAR-10 to RS-6 on CW on 7 May 1984 at 0711 GMT After many attempts, they finally made successful contact and also contacted Heinz DL1CF using OSCAR-10 and RS-5 on 21 September 1984 under less-than optimum conditions.

The next attempt was to link from OSCAR-13 to OSCAR-12. After weeks of trying, John WA3ETD called on SSB voice to make the first double hop across the pond. John commented, "Guess we made a little history on this one, Dave". The contact was made using 70 cm USB for an uplink, two metres across on LSB, and a downlink on 70 cm USB on 24 November 1987 at 2136 GMT.

Enter the 1990s with RS-10/11 and RS-14. This time, a team of interested satellite hams including Ron G3CAG, John G4ZHG, Ian GONKA, Ted G6HMS and Richard G7MUB, along with their mentor Pat G3IOR, planned their cross satellite contacts on the chance that RS-14 would be switched to mode "B". Little did they think that Leo UA3CR would take the experiments seriously.

Ian made a request for RS-14 to be switched to mode "B" via packet radio and (surprise, surprise), a reply was received that read, "Which day would you like, and which transponder?" Leo then put the team in direct contact with Andy RK3KP at RS3A via packet radio. The team had six weeks to practice the technique of working through two satellites travelling towards each other at a combined speed of 36,000 km per hour Compensating for the double reversed Doppler shift as the two satellites passed was part of the challenge. Many hours of practice were spent when Europe had gone to bed, and the QRM was at minimum.

Confirmation arrived that Andy would switch RS-14 over to mode "B" on 7 February 1993 for three orbits before the satellite was out of his range. During the first orbit, orbital predictions and final operating frequencies were finalised with the DOHOP team which had grown to include LZ2JH, DJ2MHJ, DJ0MY and many SWLs calling in on a DOHOP net on 80 metres. Others were in contact via two metre FM.

The moment that signals were heard from RS-14 will remain one of the most memorable occasions for the team. The satellite had been switched over just for a bunch of hams in Sherwood Forest. On the second orbit, all of the members teamed up on the transponder four minutes before DOHOP time. With 30 seconds to go, all stations changed from RS-10 (two metres up) to RS-14 (70 cm up). Window time was 3 minutes, 10 seconds.

The first station to appear out of the noise was the newest member, Richard G7MUB, with a good (5x3) signal followed by the rest of the team. Good signals were copied with very unusual Doppler shift. The time was 0012 GMT. By the third orbit at 2.00 am local time, the team was ready for the big hop across the pond. Unfortunately, the word that the transponder on RS-14 was switched on had not got across due to problems with the 20 metre link. With a window of only two minutes, the first station heard was F8SH followed by W1NU and K2WER, all on CW along with Ron, G3CAG, and John, G4ZHG.

Well, there you are. Remember, all this happened in 1993 when RS-14 was operational. As far as I can see the only hope today would be to use Fuji and AO-13. They seem to be the only two operational satellites with "opposite" transponders whose passbands overlap. Your timing will have to include a seventh factor, the range of AO-13. It would be unreasonable to attempt this if AO-13 was too far out in orbit. It may well prove impossible, but it has been done in the past with AO-10 and Fuji. If you decide to give it a go and eventually have some success, please let me have details for the column.

Next month ... Six monthly update of all amateur radio satellite frequencies and modes.

*359 Williamstown Rd, Yarraville VIC 3013
CompuServe: 100352,3065
Internet: 100352.3065@compuserve.com
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WIA News

British Amateurs Get 73 kHz Allocation

Further to a WIA News item published in February, the Radio Society of Great Britain (RSGB) has released news that British amateurs can now use a low frequency allocation centred on 73 kHz.

The allocation is only 2.8 kHz wide, that is, plus or minus 1.4 kHz from 73 kHz. All modes may be used, according to the RSGB report, and individuals have to apply to the RSGB first to gain access to the allocation.

The WIA is still pursuing a low frequency allocation for Australian radio amateurs, proposed to be in the 150-200 kHz region, to coincide with allocations available to New Zealand, Papua New Guinean and American amateurs.

Aerial Power and Communications Cables Under Attack

A Melbourne suburban council has recently adopted a policy to rid its municipality of all power lines and telecommunications cables.

Banyule City Council in Melbourne's north-east describes aerial power and communications cables as dominating the urban landscape, and that the poles they hang from are ugly and unsafe. The council wants all such wiring in its municipality to be located underground by the year 2015.

The policy will affect power supply companies and communications carriers, the state and federal governments, and even property owners who are to be required to bury cables on their land.

The implication for amateur radio from this policy is that it may draw attention to antennas and masts, with the danger of consequent calls for them to be rigidly controlled. Ill-informed calls might arise for them to be put underground, too.

Municipal councils in other areas around Australia have, or are discussing, similar policies. The Kuringai Council in Sydney has a policy opposing above-ground communications cables and telecommunications masts towers.

There is an irony arising from the Banyule Council move in that it takes in the former city of Heidelberg, which lost a court battle in the 1970s to stop a radio amateur putting up a mast.

The case set a local precedent in town planning appeals which was relied on for many years to show municipal councils that a ruling had been made which declared amateur radio was a normal, acceptable activity in a residential dwelling.

German Amateur and Cosmonaut Sets a Space Record

Thomas Reiter DF4TR ended a record 180 days in space on 29 February with the successful landing of the Soyuz TM-222 spacecraft which ferried Reiter and two Russian cosmonauts back from a mission aboard the MIR orbital complex, according to the ARRL Letter.

Reiter has entered the record books as the first European Space Agency (ESA) astronaut to perform a spacewalk and the first European to make a second walk in space, as well as completing the longest mission aboard MIR by a non-Russian.

Reiter, 37, had been aboard MIR since September 1995, with Russian cosmonauts Yuri Gidzenko and Sergei Avdeev.

Awards

*John Kelleher VK3DP - Federal Awards Manager**

A new Australian award is in the offing. It has not yet received the official nod, but it does require you to place your Federal Electorate on your QSL card, when replying to contacts made with all amateurs in the name of the award, which I hope will be up and running by mid-year.

A letter has been received from Soyuz Radiolyubitelei Rossi, hereinafter referred to as SRR, a member of IARU, in which it is clearly stated that they are the official Russian body dealing with all matters concerning Amateur Radio. From their address, PO Box 59, Moscow 105122, Russia, they also run the official Russian QSL Bureau. This letter, dated 26 December, 1995 also contains a list of official office bearers. For those interested, the e-mail address is dateline@online.ru. The letter was signed by Andrew Chesnokov UA3AB, Vice-President, SRR.

Certificado Del Mediterrano (CDM)

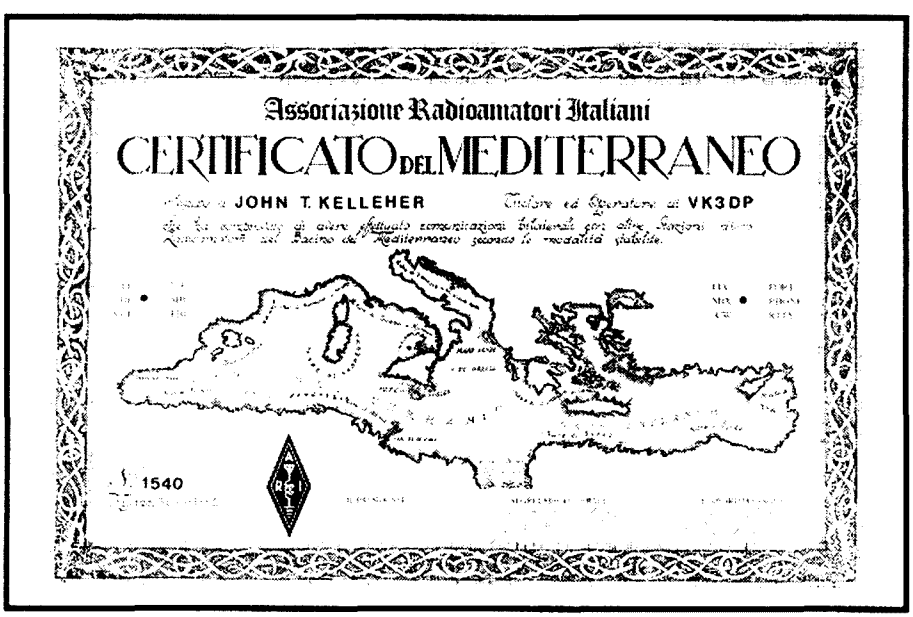
This award is offered by Associazione Radiotechnica Italiana (ARI) the official Italian Amateur body.

Contact at least one fixed station in 22 of the countries on the list shown below, and at least 50 amateur stations located in Italy for a total of 72 contacts since 1 June 1952. Stations may be worked once only. Two classes are offered, mixed mode or phone only. Specify when applying. Minimum reports are 33 or 338. The countries are: Spain, Balearic Islands, Ceuta and Melilla, Morocco, France, Algeria, Corsica, Sardinia, Sicily, Lebanon, Egypt, Greece, Dodecanese Islands, Crete, Mount Athos, Turkey, Syria, Yugoslavia, Albania, Malta, Gibraltar, Cyprus, Monaco, Tunisia, and Libya.

The ARI Awards Manager reserves the right to demand information on one or more claimed contacts, if necessary. The fee for all ARI awards is $US3.00 or 10 IRC. Apply to: The Secretary, ARI, Via Scarlatti 31, 20124 Milan, Italy.

Worked All Italian Provinces (WAIP)

Contact on the HF bands since 1 January 1949, at least 60 provinces of the Italian Republic. Minimum reports 33 or 338. The provinces are: Agrigento (IT9), Alessandria (I1), Ancona (I6), Aosta (IX1), Arezzo (I5), Ascoli Piceno (I6), Asti (I1), Avellino (I8), Bari (I7), Belluno (I3), Benevento (I8), Bergamo (I2), Biella (I1), Bologna (I4), Bolzano (IN3), Brescia (I2), Brindisi (I7), Cagliari (IS0), Caltanissentta (IT9), Campobasso (I8), Caserta (I8), Catania (IT9), Catanzaro (I8), Chieti (I6), Como (I2), Cosenza (I8), Cremona (I2), Cuneo (I1), Enna (IT9), Ferrara (I4), Firenze (I5), Foggia (I7), Forli (I4), Frosinone (I0), Genova (I1), Gorizia (IV3), Grosseto (I5), Imperia (I1), Isernia (I8), L'Aquila (I6), La Spezia (I1), Lecce (I7), Livorno (I5), Lucca (I5), Macerata (I6), Mantova (I2), Massa Carrera, (I5) Matera (I7), Messina (IT9), Milano (I2), Modena (I4), Napoli (I8), Novara (I1), Nuoro (IS0), Oristano (IS0), Padova (I3), Palermo (IT9), Parma (I4), Pavia (I2), Perugia (I0), Pesaro (I6), Pescara (I6), Piacenza (I4), Pisa (I5), Pistoia (I5), Pordenone (IV3), Potenza (I8), Ragusa (IT9), Ravenna (I4), Reggio Calabria (I8), Reggio Emilia (I4), Rieti (I0), Roma (I0), Rovigo (I2), Salerno (I8), Sassari (IS0), Savona (I1), Siena (I5), Siracusa (IT9), Sondrio (I2), Taranto (I7), Terni (I0), Torino (I1), Trapani (IT9), Trento (IN3), Treviso (I3), Trieste (IV3), Udine (IV3), Varese (I2), Venezia (I3), Vercelli (I1), Verona (I3), Vicenza (I3), and Viterbo (I0).



The 375 x 265 mm three colour Certificado Del Mediterrano awarded to John VK3DP.

Alpine Flowers Award

DX stations require six confirmed contacts from the following: Italy, I1, 2, 3, IK1, 2, 3, IN3, IV3, IX1, IW1, 2, 3; Switzerland or Liechtenstein; Austria, OE2, OE3, OE6 to OE9; France; Germany, DOK, A, C, T or U; Yugoslavia, YU3/S5.

Contacts after 1 January 1966. GCR list and $US5.00 to: Dolomites Radio Club, 139031 Brunico, PO Box 26, Italy.

PO Box 2175 Caulfield Junction 3161

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WIA News

Old Sol on a Downhill Run

Solar activity continues to be extremely low so far this year, with extended periods of no sunspots at all being reported.

Current projections still have the sunspot minima, which is the count of sunspots and sunspot groups, occurring sometime this year. However, the minima in the solar flux – that is the radiation emitted by the sun at a wavelength of 10.7 cm – is unlikely to occur before early 1997.

Band conditions for 160 and 80 metre enthusiasts will continue to be favourable for some time, but conditions on the higher bands won't begin to lift appreciably until late 1997-early 1998. However, although geomagnetic conditions have been quiet for long periods, when they do become unsettled the maximum useable frequency can get a boost, providing DX opportunities on the higher HF bands for the alert operator

Contests

*Peter Nesbit VK3APN - Federal Contest Coordinator**

Contest Calendar Jun – Aug 96

Jun 1/2	RSGB Field Day CW	(May 96)
Jun 8	Asia-Pacific Sprint	
Jun 8/9	ANARTS WW RTTY Contest	(May 96)
Jun 8/9	South American WW CW	(May 96)
Jun 15	QRP Day Contest (VK)	(May 96)
Jun 15/16	VK Novice Contest	(May 96)
Jun 15/16	All Asia CW DX Contest	(May 96)
Jun 22/23	ARRL Field Day	(May 96)
Jul 1	Canada Day CW/Phone	
Jul 6	Australasian Sprint (CW)	
Jul 6	NZART Memorial Contest	
Jul 6/7	CQ WW VHF Contest	
Jul 13	Australasian Sprint (Phone)	
Jul 13/14	IARU HF Championship	
Jul 20	South Pacific 160 m Contest	
Jul 20	Colombian DX Contest (Phone/CW)	
Jul 27	Waitakere 80 m Phone Sprint	
Jul 27	West Australian Annual Contest (SSB)	
Jul 27/28	RSGB IOTA Contest	
Aug 3	Waitakere 80 m CW Sprint	
Aug 3	West Australian Annual Contest (CW)	
Aug 3/4	YO DX Contest	
Aug 10/11	Worked All Europe CW	
Aug 17/18	Remembrance Day Contest	
Aug 17/18	Keyman's Club of Japan (CW)	

Readers may remember that, a couple of months ago, I floated the idea of a new contest for 160 m for amateurs in our part of the world, and asked for input from interested parties. Well, I'm delighted to say that things have moved very quickly since then, and the first such contest will take place this July! I am indebted to John Litten ZL1AAS for offering to manage this inaugural event, which has received an enthusiastic reception in New Zealand. Let's show the Kiwis that we can be just as enthusiastic, and help to make this event a real winner.

The present plan is to alternate the management of the contest between Australia and New Zealand, the same as for the VK/ZL DX Contest. However, John and I are already stretched to the limit, so if you are interested in running it next year, please get in touch! The task will be easy and quite enjoyable, not only because you will be helping your fellow amateurs by running a great contest, but you will also get to see first hand what everyone else is working, and using, on top band. I will be happy to answer enquiries on 03 9337 9981 (AH).

For information and assistance this month, many thanks to VK5GN, VK5OV, VK6NK, G3UFY, VE2ZP, ZL1AAS, ZL1BVK, and LCRA. Until next month, good contesting!

73,
Peter VK3APN

Asia-Pacific CW Sprint

1230-1430z, Saturday, 8 June
1230-1430z, Saturday, 19 October

In this sprint contest, the object is for stations in the Asia-Pacific region to work as many stations worldwide as possible, within two hours, on 20 and 40 m CW. Output power is limited to 150 W. Exchange RST + serial number, and count one point per valid QSO. *The called station (usually the CQer) must QSY at least 1 kHz after a QSO.* The multiplier is the total number of prefixes, per WPX rules (ie each prefix once only, not once per band). Final score equals valid QSOs x multiplier. Post your log to: James Brooks, 15 Balmoral Road #03-08, Singapore 259801, Singapore, postmarked within seven days; or e-mail to 9v1yc@equator.lugs.org.sg within 72 hours.

Canada Day Contest (CW and Phone)

0000-2359z, Monday, 1 July

This contest, which runs on the first of July each year to celebrate Canada's confederation, takes place this year on a Monday. This means that those of us who are lucky enough to be at home that day, should be much sought after by the VEs and VOs.

Bands are 160-2 m, CW and phone. Suggested frequencies are (CW) 25 kHz up from the band edge, and (SSB) 1850, 3775, 7075, 7225, 14175, 21250, 28500. Check for CW activity on the half hour. Note, no CW QSOs in the phone sub-bands, and vice-versa.

Any station can work any other, once per band and mode. Exchange RS(T) and serial number; Canadians will send RS(T) and province/territory. Score 10 points for Canadian QSOs including VE0 (ie maritime mobile), and two points for others. Canadians with RAC suffixes are worth 20 points. Multiplier is Canadian provinces and territories (max 12), counted once per band and mode: VO1/2 (NFD); VY2 (PEI); VE1/CY9/CY0 (NS); VE2; VE3; VE4; VE5; VE6; VE7; VE8; VE9; VY1 (Yukon). Final score is points x multiplier. Send log and summary sheet by 31 July to: RAC, PO Box 356, Kingston, Ontario, K7L 4W2, Canada.

11th Australasian CW and Phone Sprints

6 July (CW), 13 July (Phone); 1100-1159z Sat.
Presented by David Box VK5OV

The Adelaide Hills Amateur Radio Society is pleased to announce the 11th Australasian Sprints, which are open to all amateurs and SWLs in VK, P2 and ZL. The object is to make (and SWLs to hear and log) as many contacts with amateurs in VK, ZL and P2 as possible, without duplication, on 80 m during a one hour period. Groups of amateurs using a single callsign, eg clubs, are also eligible. Frequencies are 3500-3700 kHz (CW) and 3535-3700 kHz (phone). RS(T) is optional, and the minimum exchange is a serial number starting at any number between 001 and 999, reverting to 001 if 999 is reached. *(Note: RS(T) will be required if working participants in the NZART contest taking place at the same time).*

For each QSO, logs must show the date and time (UTC), callsign worked (or both callsigns for SWLs), and serial numbers sent and received. Logs must be accompanied by a summary sheet showing the name and date of the sprint, the operator's name and address, points claimed, a declaration that the operator has observed the rules and spirit of the contest, special information (eg QRP or mobile operation), and any comments. Multioperator/club entries must show the callsigns and names of all operators.

Send logs to: AHARS, PO Box 401, Blackwood, SA 5051, to be received by Friday, 16 August, with the envelope endorsed CW, Phone, or SWL Sprint. Alternatively, logs can be sent via packet to VK5AOV @ VK5WI.#ADL.#SA.AUS.OC.

Certificates will be awarded to the highest scoring station in each section in each VK, ZL, and P2 call area. Trophies will be awarded to the outright winners. A certificate will also be awarded to the highest scoring Novice entrant in the CW Sprint, providing that the recipient is not entitled to another CW Sprint award. Other awards may be made at the Contest Manager's discretion. Standard disqualification criteria apply, and the Contest Manager's rulings and decisions are final.

NZART 80 m Memorial Contest (CW)

0800-1400z, Saturday, 6 July

VKs are invited to join ZLs in this yearly contest to commemorate amateurs lost in World War II. It is open to single operator stations on 80 m, fixed and mobile. The contest has six

operating periods, each of one hour, from 0800z-1400z.

A station may be contacted TWICE during each operating period – once on phone and once on CW, provided that such contacts are not consecutive. Exchange RS(T) plus serial number commencing at any number between 001 and 300 for the first contact. On phone, score 15 points for the first QSO with a scoring area, 14 points for the second QSO with that area, descending to one point for the 15th and subsequent QSOs with that area. The same scoring system is used for CW, except that QSO points remain at five for the 11th and subsequent QSO with that scoring area. Scoring areas are VK and ZL prefixes/areas, and DXCC countries. The rules for SWL entrants are similar except that the callsigns of the stations heard and being worked must be given, and only the cipher of the station heard is required.

Send logs and summary sheets ASAP to: Memorial Contest, PO Box 20 332, Auckland 7, New Zealand. Nominate the category entered (Open; Phone; CW; Beginners CW; QRP; Homemade SSB), and include a points summary showing the number of QSOs and points for each VK/ZL call area worked. Certificates will be awarded to the top three scoring VKs.

IARU HF Championship

1200z Sat to 1200z Sun, 13/14 July

This popular contest runs on the second full weekend of July each year. Bands are 160-10 m. Categories are single operator, CW only, phone only, mixed; multioperator single transmitter mixed mode only. Multioperator stations must remain on a band for at least 10 minutes at a time *(exception: IARU member society HQ stations may operate simultaneously on more than one band with one transmitter on each band/mode, providing only one HQ callsign per band is used).*

Exchange RS(T) and ITU zone (P2 = 51, VK4/8 = 55, VK6 = 58, and VK1/2/3/5/7 = 59). HQ stations will send RS(T) and official society abbreviation.

Claim one point for QSOs within own zone or with an HQ station, three points for QSOs with a different zone in own continent, five points for QSOs with different continents. Multiplier is total ITU zones plus IARU HQ stations worked on each band. Final score is total QSO points from all bands x sum of multipliers from each band.

Include a dupe sheet for 500+ QSOs. Send logs postmarked by 9 August to: IARU HQ, Box 310905, Newington, CT 06131-0905, USA. Official forms and an ITU zone/prefix/continent map can be obtained from the same address on receipt of a large SASE with two IRCs or equivalent. Certificates to the top scorers in each category, in each state, ITU zone, and DXCC country. Also, stations with 250+ QSOs or 50+ multipliers will receive achievement awards.

1st South Pacific 160 m Contest

0500-2359z, Saturday, 20 July

In this contest, which is scheduled for the third full weekend of July each year, the objective is for VK, ZL and P2 stations to work as many local and overseas stations as possible on 160 m. DX stations are also encouraged to participate, but can only work VK, ZL, and P2.

Sections are Phone, CW, and SWL (all single operator). Exchange RS(T) plus serial number. Stations should claim two points per QSO with their own call area, or five points per QSO for all other call areas. For VK and ZL entrants, if the number in your callsign differs from your actual location, please follow your callsign with the appropriate numeral to indicate your location.

The multiplier is the number of VK and ZL call areas worked, plus the number of DXCC countries worked. The final score equals the total QSO points times the multiplier.

Certificates will be awarded to the top scoring stations in each section, in each call area of VK and ZL, and each DXCC country. Send your log, signed summary sheet, details of your station, and any comments to: John Litten ZL1AAS, Onemana Post, Whangamata, New Zealand, to be received within six weeks from the end of the contest. For 1996, this is 2 September. Logs on disk are most welcome.

Colombian Independence Day Contest

0000-2400z, Saturday, 20 July

This is a worldwide contest, all bands 80-10 m. Categories are Phone and CW (not mixed): single operator (single and all band), and multioperator (single and multitransmitter). Exchange RS(T) plus serial number. Score five points per HK QSO, three points per QSO with stations in another country, one point per QSO with stations in same country, and 10 points for QSOs with official HK HQ Stations. The multiplier is the total countries including HK plus HK call areas worked on each band. "HK" includes all Colombian prefixes. Final score is total QSO points from all bands x sum of multipliers from all bands. At least 2% of QSOs must be with HK, and 10% with stations outside your country. Send logs postmarked by 31 August to: Colombian Independence Day Contest, Apartado 584, Santafe de Bogota, Colombia.

20th West Australian Annual Contest

SSB: 1030-1330z Saturday, 27 July
CW: 1030-1330z Saturday, 3 Aug
(Presented by Cliff Waterman, VK6NK)

The object of this contest is to promote contacts on the 80 m band between VK6 and the rest of Australia and overseas, and for SWLs, to hear and log as many VK6 stations as possible. Call "CQ WA", "CQ WAA", or "CQ Contest", keeping CQs brief (3 x 3 max), as excessively long CQs risk disqualification. Prearranged contacts are not allowed.

VK6 stations will send RS(T) plus Shire Code. All others should send RS(T) plus a serial number commencing at 001. Stations may be worked twice on the night, ie once during 1030-1300z, and again during 1300-1330z.

VK6 stations should claim five points for each QSO with VK6, two points for VK1/2/3/5/8, six points for VK4, four points for VK7, and 10 points for VK9/0 and overseas. Stations outside VK6 should claim three points per QSO. Multiply the total number of points by two per VK6 Shire worked. *(Note: VK6 stations north of the Tropic of Capricorn should apply a further multiplier of 1.3 to their overall score.)* SWL participants score as above using the outgoing Tx score.

Log sheets should be headed with the date and operator's callsign, and include UTC time, callsign worked, RS(T) sent, RS(T) and shire code received, shire multiplier, and points claimed. Total the points on each page and bring the running total forward. Attach a summary sheet showing the callsign, name, address, score calculation, a declaration that the rules and spirit of the contest were observed, details of equipment and antenna, and any comments. Send your log to: WAA Contest Committee, PO Box 65, Lancelin, WA 6044, to arrive not later than 6 September for both contests.

Waitakere 80 m Sprint

Phone: 1000-1100z, Saturday, 27 July
CW: 1000-1100z, Saturday, 3 August

This 80 m contest is open to all VK and ZL amateurs. In fairness to other amateurs, it is requested that no linear amplifiers be used in the contest. Call "CQ Sprint", and exchange serial numbers commencing at one and incrementing by one for each contact. RS(T) is not required.

Logs must show the stations worked, and the serial numbers sent and received. Attach a summary sheet and send the log to: Sprint Contest Manager ZL1BVK, 14 Takapu Street, Henderson, Auckland 1208, New Zealand, to arrive by 2 September. Alternatively, logs may be sent via packet, using three columns only with no commas or other delimiters, to: ZL1BVK @ ZL1AB. Certificates will be awarded to the overall winner, the best score in each ZL call area, and the three best VK scores.

RSGB Islands On The Air Contest

1200z Sat – 1200z Sun, 27/28 July

This SSB contest is intended to promote contacts between qualifying IOTA island groups and the rest of the world, and to encourage expeditions to IOTA islands. Sections are: IOTA Island Stations (ie those with an IOTA reference); World; and SWL.

Use 80-10 m, SSB only. UK stations may not use 3.5 or 7 MHz between 0800 and 1600z. Following IARU resolutions, please avoid 3.65-3.70 and 14.3-14.35 MHz. Exchange RS plus serial number, plus IOTA reference number if applicable. Score 15 points per QSO with an IOTA station (including UK), and five points for contacts with stations in another DXCC country. The multiplier is the total IOTA references per band added together. Final score is (total QSO points, all bands) x (total multipliers, all bands). SWLs can only log stations outside their own country, except for new multipliers.

For each band submit a separate log, multiplier list, and dupe sheet. Send log and summary sheet to: RSGB IOTA Contest, C/o S Knowles G3UFY, 77 Bensham Manor Road, Thornton Heath, Surrey CR7 7AF, England, to arrive by 31 August. Certificates will be awarded to the leading stations in each section and continent.

PO Box 2175, Caulfield Junction, VIC 3175

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Dedicated to the memory of JA1MP, the founder of Yaesu Musen, we are proud to announce the release of Yaesu's latest high performance HF base transceiver, the new FT-1000MP.

Based upon the legendary performance of the FT-1000 which, for more than half a decade, has been highly acclaimed by the world's top DXers, Yaesu has created a new 100W HF masterpiece built upon proven RF design and the introduction of a new technology to the Amateur marketplace: Enhanced Digital Signal Processing (EDSP). Teamed up with Direct Digital frequency synthesis, an outstanding receiver section featuring a high intercept front-end and a wide variety of IF filters (including a Collins Mechanical Filter), the FT-1000MP's exclusive EDSP facilities provide an impressive array of IF-based noise-reduction and interference rejection filters for enhanced receiver performance, as well as flexible tailoring of the transmitter for outstanding signal clarity.

The performance of digital processing systems is highly dependent on the quality of software inside the transceiver, and here Yaesu's experience with software design really shines through. Yaesu's IF-based EDSP provides 4 random-noise filtering protocols, audio enhancement with 4 equalisation programs for Tx and 3 for Rx, and an automatic notch filter which identifies and eliminates multiple interfering carriers or heterodynes. Front panel selectable EDSP filter contours (Low, Mid, or High-Cut responses; or Bandpass) aid in QRM rejection, providing improved signal-to-noise ratios and razor sharp selectivity. A comprehensive menu system allows you to easily hear the effect of various EDSP settings, so you can choose the best selection for your operating conditions.

In keeping with the improvements that the EDSP facilities provide, the FT-1000MP also provides new features such as selectable flat response or optimised receiver front-ends, 3 antenna connectors (2 main antennas and an Rx-only socket), selectable tuning steps as small as 0.625Hz, and a Shuttle-jog tuning knob for fast QSY operation. For optimised transmit audio, different SSB IF offsets can be set for both normal and RF speech-processed transmissions, and can be used in conjunction with the Tx EDSP functions. Separate bar-graph S-meters are provided for each receiver, and even a synchronous detection system is used for better AM reception on the Shortwave bands.

Standard features include SSB/CW/AM/FM operation, an in-built AC power supply and Automatic antenna tuner, 13.5V DC socket, dual-mode noise blankers, 500Hz CW and 6kHz AM IF filters, full break-in CW, an in-built electronic keyer with memory, a multi-colour high resolution display, an RS-232 computer interface, and a MH-31B8 hand microphone.

With the new FT-1000MP due to arrive soon, now's the time to call us for a copy of Yaesu's 12-page colour booklet explaining more about the FT-1000MP's new level of HF performance and design excellence. We're sure you'll soon agree that the world of HF transceivers has just taken a giant leap forward.

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DICK SMITH ELECTRONICS

Divisional Notes

Forward Bias – VK1 Notes

Peter Parker VK1PK

VK1 Award Net Starts

Interstate amateurs will find it easier to work the often elusive VK1 prefix, with the re-commencement of the VK1 Award Net. The net, which started in April, is conducted on 3.570 MHz after the VK1WI News callback.

Interstate operators are invited to call in and make contacts with VK1 stations. Such contacts will count towards the VK1 Award. 20 are needed for VK HF operators, while just 10 contacts are required for VHF/UHF stations, or those operating from outside continental Australia. Note that contacts must be with 20 different callsigns; repeats do not count towards the award. However, contacts with VK1 amateurs transmitting from outside the ACT are valid. As with most awards, contacts through terrestrial repeaters cannot be claimed.

Apart from the basic certificate, endorsements are available. For VK HF operators, these are:- Bronze, 50 contacts; Silver, 75 contacts; and Gold, 100 contacts.

In line with the basic award, endorsement requirements are relaxed for DX and VHF/UHF stations. In these cases, available endorsements are:- Silver, 25 contacts; and Gold, 50 contacts.

Submission of a log extract signed by the VK1 Awards Manager, or two other amateurs, to the VK1 Division, is required to claim the award, which is a handsome certificate featuring Canberra's Black Mountain Tower. Cost is $3.00 Australian for VK amateurs, or five IRCs for overseas applicants. Endorsements cost $1.00 (or two IRCs) each. Applications can be sent to:- Awards Manager, WIA ACT Division, GPO Box 600, Canberra 2601.

The VK1 Division hopes that the Net and Award will increase on-air operating by VK1 amateurs, who are well-known for their HF inactivity, and foster more interest in VK1 from interstate and overseas. Already, at least one Tasmanian amateur has worked over 200 different VK1 stations on HF over the years.

VK1 DX Cluster Trial

A local packet BBS sysop is gauging local support for a VK1 packet radio DX cluster. Carl VK1KCM reports that he has placed a trial DX Cluster compatible program on his BBS.

The program is called Clusse and, while it doesn't have exactly the same interface as the standard Packet Cluster, it works in a similar fashion.

To use it, connect to VK1KCM-1 and type DXC.

Carl is looking into having it connected to other Packet Cluster systems.

Broadcast Move Successful

As reported last month, the VK1WI broadcast has moved from a Wednesday to a Sunday evening. The move has been popular with listeners, with callback numbers up 50 to 100 percent.

News Relay Changes

After two years of relaying the VK1WI Broadcast on 80 metres and, more recently, running the VK1 Awards Net, John VK2EJC has decided to stand aside and let another person try their hand at performing this task.

In the twelve months that I've been Broadcast Officer, I've found John a pleasure to work with. His dedication and enthusiasm will be missed. So, on behalf of the VK1 Committee and the dozens of people who have listened to the 80 metre relay, I would like to thank John for a job well done.

VK1WI/Forward Bias on E-mail

Listeners and readers are now able to lodge contributions to the VK1WI Sunday Broadcast and Forward Bias via Internet e-mail. The address to which items should be sent is parkerp@pcug.org.au. However, due to technical difficulties at the time of writing, it is preferable to send longer messages via packet radio to VK1PK@VK1KCM if this mode is available to you.

VK2 Notes

Richard Murnane VK2SKY

Annual General Meeting

The Divisional AGM was held at Amateur Radio House last month. The turnout was modest, compared with the politically tumultuous years of the recent past.

All outgoing Councillors were re-elected; this, together with the lower attendance at the meeting, was seen as an indication of general satisfaction with the current state of affairs within the Division.

Councillor Cesar Miranda VK2TCM subsequently resigned from his position, which prompted a number of comments on the packet network, mainly from amateurs who are not members of the Institute. As a result of Cesar's resignation, the next highest polling candidate, John Hams VK2IH was deemed.

We extend our congratulations to all successful candidates, and we thank Cesar for the fine work he has done in the service of the Division.

The 1996-97 Council then is Michael Corbin VK2YC, President; Eric Fossey VK2EFY, Membership Secretary; John Hams VK2JH, Dural Officer; Peter Jensen VK2AQJ, Vice President; Pieter Kloppenburg VK2CPK, Parramatta Officer; Tony Liolio VK2ZLT, Assistant Dural Officer; Geoff McGrorey-Clark VK2EO, Education Officer, QSL Bureau Liaison; Eric Van De Weyer VK2KUR, Treasurer; and Ken Westerman VK2AGW, Affiliated Clubs Officer.

As an aside, one of the more interesting reports that came to light at the AGM was an analysis done and presented by Bruce Carroll VK2DEQ, who found a correlation between the fiscal fortunes of the Division, and the 11-year sunspot cycle. Noting that the Division's relative finances seemed to lead the sunspots by a year or so, we can expect DX conditions to start improving in the very near future – HI! (In the past, others have noted a similar correlation between the sunspot cycle and the level of political angst in the general amateur community. No doubt, some enterprising university student could get a PhD out of this observation.)

NSW Clubs List on Web

Would you like some free publicity for your club? Affiliated clubs are again invited to submit more details about their clubs, such as meetings, special events, etc for inclusion on the Division's Web page. Better yet, if your club has its own Web page, please send the URL to me on Internet at *richardm@eta.org.au*, or on packet to *VK2SKY@VK2OP.NSW.AUS.OC*.

Thought for the month: *"Computers in the future may weigh no more than one and a half tons."* Popular Mechanics, forecasting the relentless march of science, 1949.

VK6 Notes

John R Morgan VK6NT

Divisional AGM

At the AGM, held in Perth on 30 April 1996, there were insufficient nominations for the positions on the Divisional Council, so all those nominated were declared elected. At the Council Meeting on 7 May 1996, appointments were made by Council

to fill the vacancies, and so the office-bearers for 1996/97 are: President, VK6LZ Cliff Bastin; Vice President, VK6KZ Wal Howse; Secretary, VK6ZLZ Christine Bastin; Treasurer/Federal Councillor, VK6OO Bruce Hedland-Thomas; Alternate Federal Councillor, VK6UU Will McGhie; Membership Secretary, VK6IW Dave Wallace;

Councillors, VK6TS Tony Savory, VK6XH Keith Bainbridge, and VK6ZGT Glen Thurston.

New Venue for Meetings

In order to restore our General Meetings to the long-standing formula of the third Tuesday of each month, and in order to save money, the Divisional Council has decided to change the meeting venue.

So, until further notice, General Meetings will be held on the third Tuesday of each month in the Board Room, 3rd Floor, CWA House, 1174 Hay Street, West Perth, commencing at 8 pm. There is no meeting in December. All interested persons (members and non-members, licensed or listener) will be made welcome. Free coffee and biscuits are available at "half time".

Meetings of Council will be held on the first Tuesday of each month, in the smaller Function Room at the same location.

How to Get There

CWA House is a three-storey office-block on the north side of Hay Street in West Perth, about 80 m west of the intersection with Havelock Street.

The entrance to the rear car-park is via the laneway at the western end of the building. You are requested not to park in the residents' bays, which are the ones directly in line with the building's rear doors. Enter the building via the front or rear doors, and take the lift to the top floor, where the meetings will be held in the Board Room. The rear entrance and facilities are wheelchair-friendly.

The exit from the car-park is via the laneway at the eastern end of the building. Be advised that this section of Hay Street is a one-way road, and so all traffic must therefore turn right on leaving.

VK6WIA News Broadcast

The Division's Broadcast Officer, Tony VK6TS, has taken a few months' leave while he moves house. Until Tony has re-established his shack, Phil VK6KS has volunteered to take over, and transmit the broadcast from the Club Station VK6QC, which is located at the Para-Quad Recreation Centre in Shenton Park.

WIA Bookshop

Members will be pleased to learn that Roy Watkins VK6XV has volunteered as the Divisional Bookshop Officer. The preferred address for postal correspondence is now PO Box 10, West Perth WA 6872.

WA Repeater Group AGM

The AGM was held on the evening of Monday, 6 May, and was attended by only seven members. The following were appointed for the next 12 months: Patron, VK6MM "Mac" McDonald; President, VK6KRB, Ralph Bradstreet; Vice President/Secretary, VK6LZ Cliff Bastin; Treasurer/Membership, VK6ZLZ Christine Bastin; Technical Officer, VK6UU Will McGhie; Committee/Net Controller, VK6CSW Clive Wallis; Committee, VK6KCQ Eve Morgan and VK6NT John Morgan.

The two required auditors were not appointed, since it was preferred that they should not be members of the Committee. The Secretary would appreciate hearing from any volunteers.

WARG invites you to take part in its informative and entertaining VHF net, held every Sunday morning, commencing at 10.30 am. Listen for VK6RRG on the Lesmurdie repeater (VK6RLM, 146.750 MHz). Meetings are held at the Scout Hall on the corner of Gibbs Street and Welshpool Road, East Cannington, on the first Monday of every month, starting at about 7.30 pm. The odd-numbered months are General Meetings, and the even-numbered months are Technical Meetings.

If You Have Material ...

All material for inclusion in this column must arrive on or before the first day of the month preceding publication. Packet mail may be sent to VK6NT@VK6ZSE.#PER.#WA.AUS.OC, or write to PO Box 169, Kalamunda WA 6076, or telephone (09) 291-8275 any time.

"QRM" News from the Tasmanian Division

Robin L Harwood VK7RH

Tasmania was shocked and appalled by the tragic events at Port Arthur on 28 April. A lone gunman, armed with an extremely high-powered weapon, mercilessly gunned down 35 innocent people. This horrific event has deeply affected the psyche of the entire state and the impact of it has left its mark on many, not only here in this beautiful island, but throughout the nation and indeed throughout the world.

As a mark of respect, those attending the May monthly meeting in the Southern Branch held a minute's silence. Divisional Council wishes to also express our sincere condolences to those who have been affected by this tragedy.

On 27 April, the Divisional Council met in the north-western town of Penguin, which is halfway between Burnie and Devonport. This was the first full meeting since the Annual General Meeting in March. Unfortunately, our Divisional President was unable to attend due to work commitments in Hobart, so VK7ZDJ, who is Divisional vice-president, took the chair.

Quite a deal of housekeeping was done at this meeting, with Council deciding who will fill the Divisional ex-officio positions for 1996. We also discussed the agenda for the upcoming Federal Convention in Melbourne with our Federal Councillor and decided our response to the various agenda items. There was a hefty inwards correspondence file, some of which involved lengthy discussions. As well, 13 new members were accepted into the Division, which some are saying might be a record for VK7.

The casual vacancy on Council has still to be filled and the Northern Branch is to choose nominees to submit to Council at its June monthly meeting. The next scheduled Council meeting will be held in Launceston on 22 June; the final venue will be announced on the VK7WI weekly broadcast.

On 15 April, the Division lost its donated e-mail address of *wiatas@tamarcom.com.au*, when that provider suddenly went out of business, only giving six hours warning for subscribers to download any outstanding e-mail. Hundreds of users were caught as the lines were disconnected ahead of the six hour warning. Therefore, we recommend that any Divisional e-mail be sent to the Secretary's private e-mail address at *robroy@tassie.net.au* but with the mail clearly marked for WIA Tasmanian Division. An alternative e-mail site is currently being investigated by the President.

A suggestion was raised informally at Council that perhaps the Division could investigate the feasibility of feeding VK7WI to the various centres by landline for rebroadcast. The audio quality has suffered via the existing two metre relays, especially by the time it gets to the north-west. At this juncture we don't know if it would financially viable to landline to the north and north-west, but I am certain that the Broadcast Officer will be doing his sums.

The following have been appointed by Council to fill the ex-officio positions: FTAC, VK7AX; Education Officer,

VK7KK; QSL Bureau, VK7PP; Historical Officer, VK7RO; IARU Monitoring Service, VK7RH; Hon Solicitor, Mr P Corby VK7ZAX; Awards Manager, VK7BE; Hon Auditor, Mr Justin Cook; Broadcast Officer, VK7JK; "QRM" Correspondent, VK7RH; and WICEN Co-ordinator, VK7PU.

In addition, Jim Forsyth VK7FJ was re-appointed as Federal Councillor for the next 12 months.

Meetings for June

The Southern Branch will be meeting at the Domain Activity Centre on Wednesday, 5 June, commencing at 2000 hours.

The Northern Branch will be meeting at St Patrick's College. A talk on Computer Networks entitled "Exploding your Lan" will be given by VK7KJC. It will be on Wednesday, 12 June, commencing at 1930 hours. The College entrance is on Mount Leslie Road, Prospect.

The North-west Branch will be meeting at the usual venue at 1945 hours on Tuesday, 11 June. More details on VK7WI.

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WIA News

New WIA Members

The WIA bids a warm welcome to the following new members who were entered into the WIA Membership Register during the month of April 1996.

L30930	MR W RITTER
VK1HBH	MR R E HOWIE
VK1KIP	MR B F KOBIER
VK1KT	MR K E THRELFALL
VK1KZ	MR J V LOFTON
VK3BEZ	WIA EASTERN ZONE ARC INC
VK3JBH	MR M CATIC
VK3TJN	MR B PATERSON
VK3TJY	MR J YOUNG
VK5AZ	MR R K VON SANDEN
VK5VST	MR S T VICKERY
VK6BCP	MR W PORT
VK6XAM	MR A MURACE
VK6YET	MR B A F BLUM
VK6YGM	MR S W L CHEW
VK7HCK	MR C J KLEY
VK7HSE	MR S V EVANS
VK7KF	MR T N PEARSON
VK7NIK	MR N J KLEY

The VK4 Division advises of the following new members:

J HIGHMAN	VK4BUZ
S SALVIA	VK4EMS
J VALERO	VK4FKV
S BURJAK	VK4BSB
R INGHAM	VK4IRC
K CAVANAGH	VK4SP

Club Corner

Oxley Region Amateur Radio Club

The Oxley Region Amateur Radio Club will once again be holding its Annual Field Day at the Sea Scout Hall, Buller Street, Port Macquarie on the NSW Holiday Coast.

The Field Day will be a single day event on Sunday, 9 June 1996, commencing at 9 am. All the usual events, such as equipment displays, trash and treasure markets, and fox hunts will be held. There will be a "talk-in" on the VK2RPM repeater on 146.700 MHz.

The co-ordinator will be Bruce Walker VK2HOT, who can be contacted on 065 838 360. Further information on the Port Macquarie area can be obtained from, and accommodation bookings can be made through, the Port Macquarie Visitors Information Centre on 065 831 077.

Peter Cox VK2IPC
Publicity Officer

Moorabbin and District Radio Club Inc

Weekly Award Nets

The MDRC Weekly award nets are active every Monday night. The first is a VHF net commencing at 7.30 pm on 146.550 MHz FM. Next is the usual net at 8 pm on 3.567 MHz, plus or minus QRM. Look out for the club callsign of VK3APC.

Novice Classes

Do you know someone who is interested in studying for their Novice Licence? Are they having trouble finding a study course?

For those interested, contact the course organiser, Glen Moore on (03) 9865 7040 during business hours or (03) 9531 9301 after hours. The course will be conducted on Wednesday evenings between 7.30 pm and 9 pm. Glen will be able to advise of the cost and answer any questions you might have.

Denis Babore VK3BGS

Radio Amateur Oldtimers Club (RAOTC)

At the committee meeting on Tuesday, 14 May, Secretary/Treasurer Arthur Evans VK3VQ recommended that the current annual subscription of $5.00 be continued and that, in future, a nominal $2.50 entrance fee be charged to cover cost of the membership certificate, postage, etc.

The Secretary's recommendations were accepted and will apply in the next financial year, July 96 to June 97.

Election of office bearers resulted as follows: President and Broadcast Presenter, Allan Doble VK3AMD; Vice President and Assistant Broadcast Co-ordinator, John Fullagar VK3AVY; Secretary/Treasurer, Arthur Evans VK3VQ; "OTN" Magazine Editor, Stewart Day VK3ESD; Broadcast Co-ordinator, Ron Fisher VK3OM; Club History Co-ordinator, Bill Gronow VK3WG; and Committee Members, Ken Seddon VK3ACS and John Tutton VK3ZC.

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FTAC Notes

*John Martin VK3KWA, Chairman, Federal Technical Advisory Committee**

New Records

The distance for the new 1296 MHz mobile record between VK3XPD and VK3ZQB has been confirmed as 260.4 km.

Permitted Transmission Modes

Thanks to those amateurs who wrote with comments on the recent article on permitted modes. One interesting point is that the mode designators like 4K00J3E have been used for some years in RIB71 and its predecessors, but no-one has complained about them before. It seems that the new licence conditions have been read more carefully than the old ones were!

40 Metres: Digital Modes

Comments are still invited on the proposal to expand the 40 metre digital modes segment to 7030 – 7045 kHz. If there are any strong objections, it would help to receive them before the decision is made!

*PO Box 2175, Caulfield Junction, VIC 3161

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Support the WIA in order to protect amateur radio frequencies

Education Notes

Brenda M Edmonds VK3KT Federal Education Coordinator*

In my last column I described the status of the Syllabuses and Question Banks, and promised further information about the Question Banks.

While the Banks were being revised, a lot of effort was put into producing a complex computer program which can compile and print acceptable examination papers at the touch of a computer button. The Banks were designed to complement the program. Test runs have produced, within minutes, a high proportion of useable papers. Papers will still require human checking until the program has been used enough to ensure that no possible problems have been overlooked.

The Committee decided that satisfactory papers should have:

* only one question from any specific topic;

* no overlap of topics from different syllabus sections; and

* no question which might give a lead to the answer of another question on the same paper.

In addition, for consistency, all papers should have:

* a similar distribution of levels of difficulty;

* a similar number of questions needing diagrams; and

* an even distribution of a, b, c or d for correct answers.

To achieve all this:

a. each syllabus section was divided into a number of subsections equal to or more than the number of questions to be taken from that section, with only one question to be taken from each subsection;

b. where topics recur in later subsections, or questions could prompt answers to other questions, exclusion codes were applied;

c. each question was coded with a degree of difficulty, and an overall distribution of difficulties determined;

d. an acceptable range of questions with diagrams was set; and

e. the numbers of a, b, c and d answers was evened throughout the Bank. (This does not, however, preclude an uneven distribution on a finished paper as the letter of the correct answer is not a criterion in the selection program.)

The Advanced Question Bank contains 1000 questions, distributed in accordance with the formula used on an examination paper, ie 20 questions per question on a paper. The Novice Bank, because of the much shorter syllabus, was set at 500 questions, but has in fact reached 550, ie 11 per question on a paper, to ensure that all topics are adequately covered. The Regulations Bank was much more work. It will contain about eight questions per question on a paper.

As yet we are still awaiting comment on the Advanced and the Regulations Banks from the SMA. The Novice Bank will be submitted to the SMA very shortly. Let me again assure candidates that plenty of notice will be given before questions from the revised Banks are used for examination papers.

The Question Bank Committee has now disbanded, at their request. I would like to repeat my earlier thanks and appreciation for the time, effort and expertise which they contributed, and for their tolerance of my queries and requests – and my cooking.

**PO Box 445, Blackburn VIC 3130*

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How's DX

*Stephen Pall VK2PS**

Discussing propagation and the subject of the "bottom of the cycle" is a daily topic among DXers talking on the air. Figures are quoted, theories are discussed and opposite opinions are heard on the same afternoon from different parts of the world. Many express the opinion that we have reached the solar minimum and that propagation is on the "uptake". Others are quoting the very low 10 cm flux numbers to support their own views.

Many of us listen to the "figures" as given at 45 minutes past each hour by WWV on 15, 10 and 5 MHz. These solar flux numbers relate to the 10 cm solar flux which is the measure of the sun radiation taken daily, usually at Ottawa, Canada, at 2800 MHz. This solar flux is also an indication for the ionisation density of the ionosphere in the F region. A solar flux number of 66 represents "quiet sun" conditions.

Admittedly, the solar flux numbers were consistently low during April. Most of the days they were below 70 but, on 30 April, the number was as low as 65. Is this the end of the cycle? *"Not at all,"* says Dr Richard Thompson, a solar scientist with the Ionospheric Prediction Service. *"There are no new reverse polarity sunspots on the sun besides those reported earlier A rise in numbers of these reverse polarity sunspots would indicate the beginning of the new cycle."* Dr Thompson is of the opinion that, with the decay of cycle 22, the bottom of the cycle will last longer and deeper than with previous cycles. The official confirmation of reaching the bottom of the cycle comes after all the relevant information from all over the world is collected and analysed. This will take many months of study; therefore, the event occurs first and the announcement follows at least six months later.

The other important "figure" of what is relevant regarding propagation, is the "A" index. This index is the daily value of the geomagnetic disturbances which occur on earth. These disturbances result from changes in the speed or density of the solar wind which, when it reaches the earth, distorts the earth's magnetic field.

The variation in the strength and direction of the magnetic field is measured near the surface of the earth (called "magnetic disturbance") which, among other phenomena, disrupts high frequency communications. *"This local disturbance varies at different points of the earth,"* says Dr Phil Wilkinson, an ionospheric research scientist with IPS. *"The local A index figures have a relation to the land masses on the earth and, as the northern hemisphere has more land than the southern hemisphere, local values which influence the conditions could be different."*

One hears a lot about "planetary A index" known as Ap. This is a global figure, a composite index collected from many points of the globe. If the value of the planetary A index is seven or less, we talk about quiet condition. If it is between eight and 15, it is in an unsettled state, and a figure of 16 to 29 would indicate an active geomagnetic disturbance. In the month of April we had either quiet or unsettled conditions, except for a few days when the magnetic field was active. The figures given by WWV often quote the Fredericksburg A index, which comes from an observatory near Washington DC, and is therefore a northern hemisphere index.

The K index is defined from the total variation of the geomagnetic field over a three hour interval of universal time (UTC) with the index scaled in a manner which depends on the location of the site. So, when you hear the K index which quotes Boulder, Colorado that is where it was measured.

In Australia the geomagnetic information comes usually from the solar observatory at Learmonth, Western Australia. The active DXers, who are on the band for a few hours each day, did notice in March and April that, despite the very low flux numbers, propagation was from average to good and, on some days, was even excellent. These enhanced conditions were not due to the rise of the solar cycle, but to the Vernal Equinox factor which occurred on 21 March. This is the day when the sun crosses the equator, and the number of daylight hours and the number of night hours are equal all over the world. At this time of the year, the absorption in the ionosphere is much lower, there is greater ionisation, and propagation between the southern and northern hemispheres is much improved. There is spring in the north and autumn in the south, and the ionosphere is more similar and stable than during the summer or winter seasons. This produces a marked improvement in openings between the continents, especially in the north-south direction and vice-versa, especially before local sunrise and sunset times. Similar enhanced conditions, to a lesser degree, occur in October and November with the autumnal equinox which is on 21 September.

If you are a serious DXer, and make use of the solar indices as a guide to propagation, why not use also the services of the IPS in Sydney where a recorded message will tell you about the local Australian propagation conditions? The recorded information is changed each day at 2300 UTC time. The message is not long and, due to competitive telephone charges, a phone call to (02) 414 8330 will not cost you very much. Good luck!

Croker Island, NT – VK8

The ARRL has its DXCC program and the RSGB has its own IOTA. The IOTA (Islands On The Air) program was started by a British short wave listener, Geoff Watts (BRS 3129). He wrote, in 1964, *"Now that propagation conditions are poor, DX getting scarce, the possibility of brand new DXCC countries eventually becoming extremely remote, top DXers retiring because there is nothing new left to work, it is proposed that an entirely new DX achievement be created, the Islands On The Air Award, to promote more activity and interest among all DXers, many of whom could go on brand new island DXpeditions themselves."*

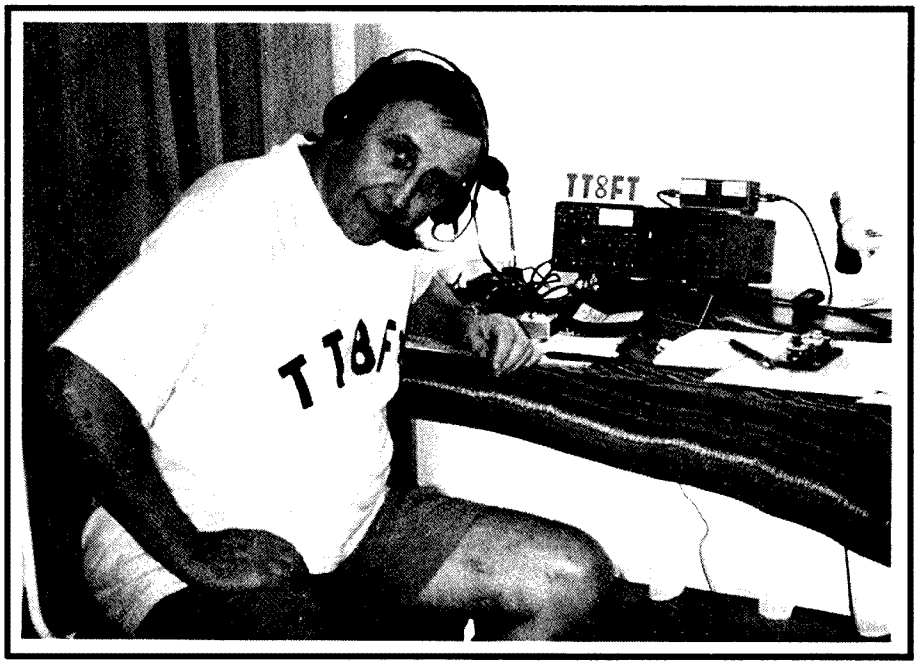
This spirit of "island hopping" is driving a young novice DXer, Stuart VK8NSB, to organise and go on his third IOTA expedition. The group of DXers who will go to Croker Island will be Stuart VK8NSB, the well known senior island hopper Mal VK6LC/VK8LC, as well as an enthusiastic short wave listener, Bob Finlayson.

Croker Island is located about 300 km NE of Darwin in the Northern Territory (11-12.5° S and 131.5 – 134.5° E). The traditional Aboriginal owners agreed to allow an amateur radio DXpedition on the island. Accommodation for the group will be organised by the principal of Mamaruni school. Out of the total seven days (8 to 14 August) two days will be spent with the school children teaching and showing amateur radio to them and having some fun activities. The rest of the time will be a full scale activity with three stations operating 24 hours a day. The activity will give a new reference number in the IOTA directory.

A special QSL card will be provided for those who send their cards to the QSL manager VK8HA at his callbook address (VK8HA, H G Anderson, PO Box 619, Humpty Doo, NT 0836).

Sable Island – CY0AA

Sable Island is a 44 km long and 1.5 km wide sandbar located in the Atlantic Ocean, 270 km east of Halifax, Nova Scotia (43° 57'



Frank DL7FT active in Chad as TT8FT.

N, 59° 55' W). It lies in the path of most storms which travel up on the Atlantic coast of North America.

The island, known as the "Graveyard of the Atlantic", has claimed more than 500 ships and 10,000 lives since the 16th century. Discovered by the Portuguese in 1583, the island is a sorry tale of attempted colonisation. It is an inhospitable environment with its lack of a harbour, the constantly changing sands and the howling winter storms. The island, since its discovery, has been in the hands of the Portuguese, the French, the British, shipwrecked sailors, and pirates.

The British Admiralty finally established a life saving station on the island in 1802. Lighthouses were built. Even with the advent of 20th century, life was hard on the island. Despite lighthouses, vessels continued to run aground on the island, the last shipwreck being the MANHASSET which foundered in 1947. That same year a radio beacon was installed and has warned off vessels ever since. The island is now a restricted area, in order to protect the fragile eco-system. The island is currently populated by weather station personnel and visiting scientists. A herd of over 200 wild Sable Island horses, descendants of early French colonist horses, roam the island as free as the wind.

A three member team of DXpeditioners, Mike VE9AA, Wayne W90EH and Ken WA8JOC, will be visiting the island for a 15 day activity from 18 June to 2 July. The usual DX frequencies will be used from 2 to 160 metres. QSL for all HF contacts to be sent to WD8SDL with the usual return envelope and return postage. Bureau cards will be handled but they are a lower priority, The team declared they "will not run lists", and "will try to use standard splits".

Only orderly pile-ups will be tolerated. You are asked to listen for instructions to be given by the operator. Use your complete call only. Good luck!

Uncle Margie Island - VK9XZ/6

Neil VK6NE advises that the VK9XZ/6 team (VK6BFI Joe, VK6UE Bill, VK6KTN Gerald and VK6NE Neil) travelled north from Perth to Geraldton, then by a 61 foot lobster boat the "Lady Kaye" to the island called Uncle Margie in the Pelsart section of the Houtman-Abrolhos group of islands. This ragged chain of more than 100 islands is located 450 km NNW of Perth and 60 km west of the port of Geraldton.

The winds in the area are never less than 22 knots, the islands can be lonely, uncomfortable and dangerous, and there is never enough fresh water. There are 193 fishermen licensed to work on the 22 islands from March to May each year. It is illegal for visitors to stay ashore overnight unless invited to a fisherman's camp.

Uncle Margie Island is only about three metres above sea level. During the short duration of this IOTA activity, which centred around the Australia Day long weekend (26 January), about 2,500 QSOs were made. The group of amateurs, who call themselves the West Australian Island Hoppers, is looking forward to a similar adventure to an as-yet unknown destination around Australia Day next year.

Chad - TT8FT

Chad is a former French colony in the middle of Africa. It has been an independent republic since 1960. The capital N'Djamena is in the south-western part of the country near the lake of Chad. This is the country where the well known German DXer, Frank Turek DL7FT, landed on 22 February for a 14 day activity. Frank's QSL card and a photograph arrived the other day with an interesting letter which clearly indicated the difficulties of a sole DXer in a strange country which has very few radio amateurs and of whom almost all are visiting from another country.

Here are some details from Frank's letter, *"It was very difficult to get my amateur licence, being number three from the new Government, as the first German amateur in Chad. I was alone and my French, which is the official language of the country, is very limited. A knowledge of Arabic would have been useful. There was this big market outside my hotel and I was the only white person among the many hundreds of locals. When I was outside my hotel I engaged a policeman as my bodyguard but, of course, I had to pay him an hourly fee for his services. The police had checked out my transmitting station three times and so did the hotel manager. In addition, I had to go with the Police Lieutenant by taxi to the Surete (Security) with one extra passport photo to get the Surete rubber stamp into my passport and I was issued with a separate ID card. Only after these formalities were completed was I allowed on the air next day. I was using an ICOM 740, 100 watts, and a 220 volt power supply. I used an FD4 antenna for 80, 40, 20, 17, 12 and 10 metres at a height of 15 to 20 metres. I used a separate dipole on 15 metres. I also had a "brand new" home-made antenna with me for 160 metres, but the hotel manager did not allow me to put this long wire across the main street. Some days I worked up to 17-18 hours continuously, drinking only about five litres of water and no other nourishment. From time to time there was competition on the air. TT8BP and TT8AB on SSB, and TT8DJ and TT8SS on CW, became active. The temperature was between 39° to 41° every day with 15-20% humidity. There are millions of mosquitoes and malaria is quite frequent."*

So ends Frank's letter. We, the armchair DXpeditioners, have it easy. Our colleagues, who go places to provide us with a rare DX country, deserve our greatest respect.

Future DX Activity

* Per LA7DFA is now active on Jan Mayen Island as JX7DFA. QSL via LA7DFA, Per Einar Dahlen, N-8099, Jan

Mayen, Norway or via PO Box 105, N-6520, Rensvik, Norway.

* Since the middle of April there is a new DX net in operation. The well known DXer OE6EEG is the net controller on Tuesdays at 0600 UTC on 14220 kHz and every Friday and Saturday at 1400 UTC on 14220 kHz.

* Graham VK9WG is active on Willis Island. He is part of the team of four island scientific personnel. He is not very active due to work commitments but he was heard on Sunday, 28 April working many stations. He will be on Willis until the end of June. Personnel on Willis is changed every six months and it is not known whether the next group will have a radio amateur amongst them. Graham uses a 100 metre long wire antenna, end fed with a tuner, which favours the southerly direction (he is on the northern end of the wire). QSL via the Bureau only to VK5GW.

* Warren VK0WH on Macquarie island was heard more often recently, trying to decrease the pile-up. He is active mostly on CW in the 40 m band on Sundays, Tuesdays and Thursdays at around 0930 UTC. He is transmitting on 7009 kHz and listens on 7012 kHz. Occasionally he is also heard on 14040 kHz CW.

* Sam FT5WE from Crozet occasionally joins the ANZA net (14164 kHz at 0500 UTC), giving VKs and ZLs the opportunity to work this rare DX country.

* Eric F5CCO plans to be on the air from 27 June to 4 July from J6 Grenada.

* Jean-Pierre F5FHI is active as 9U5DX in Burundi. QSL via F2VX. EA1FH was also heard using the 9U5CW callsign.

* In mid-June, the Grand Bahamas will be activated by WA4VCC, K4MQG and AA4R using the callsign K4MQG/C6.

* OD/F5PWJ will be active from Lebanon on CW and SSB on all bands till 30 September. QSL via F5PRR.

* In July and August, V5/ZS6YG will be on the bands from Namibia. The operator is Charlie KY0A. QSL to home call.

* Valentin RU1ZC will be active for three months from July from the Russian Antarctic Base SAAM MIRNY using the R1ANZ callsign. QSL via RU1ZC.

* Joe N1OCS is active, when work pressure permits, from Ghana as 9G5RC. This is a re-issued callsign. Do not confuse this activity with previous operations. Joe's permit expires 31 December 1996. QSL to home call.

* Des G0DEZ will operate as ZD8DEZ from late May until the end of the year from Ascension Island. QSL to his home address, Des Watson, 12 Chadswell Heights, Lichfield, Staffordshire, VS13 6BH, England.

Melville Island, NT, Stuart VK8NSB (l), and David VK8HZ (r) with pre-school children and teacher Mrs Cook.

* FT5WE is often on 40 metre CW at his sunset time of 1400 UTC. His correct QSL route is via F5GTW.

* Sanyi HA7VK (ex-XU7VK and XU95HA) and his wife Judith HA7RJ will arrive in North Korea on 27 May 1996 as visitors and will stay there until the end of July. Sanyi will try to obtain permission to operate.

Interesting QSOs and QSL Information

* FG5FC – John – 14250 – SSB – 0451 – Apr (E). QSL via F6DZU, Hubert Loubere, 289 Ave De Caupos, F-40600, Biscarosse, France.

* HS50A – Dale – 14320 – SSB – 1316 – Apr (E). QSL via the Thailand QSL Bureau.

* 4L7AA – Mike – 14246 – SSB – 1231 – Mar (E). QSL to The Manager, PO Box 32, Warsaw 19, Poland.

* ZK2ZE – Morten – 7006 – CW – Mar (E). QSL to LA9GY Morten Antonsen, Hallsetereina 6, N-7027, Trondheim, Norway.

* TP0CE – 14214 – SSB – 0617 – Mar (E). QSL to Francis Kremer, 31 Rue Pasteur, F-67490, Dettwiller, France.

* A45ZN – Tony – 14217 – SSB – 1310 – Apr (E). QSL to Anthony George Frank Selmes, Box 981, Muscat 113, Oman.

* VK9XM – Martti – 14164 – SSB – 0543 – Apr (E). QSL to JA1BK, Kan Mizoguchi, 5-3 Sakuraga Oka 4 Chome, Tama City, Tokyo, 206, Japan.

* FT5WE – Stan – 14173 – SSB – 0608 – Apr (E). QSL to F5GWT Daniel Piolat, 3 Rue de Belvedere, F-38300, Bourgoin Jallieu, France.

* D2/YO9CWY – Dan – 14164 – SSB – 0534 – Apr (E). QSL to YO9CWY, Daniel Motronea, PO Box 133, Buzau, R-51000, Romania.

* FS/OK1HOB – 14164 – SSB – 0537 – Apr (E). QSL to OK1MKD Josef Snabl, Puchmajerowa 1218, CS-54401, Dvur Kralove, Czech Republic.

* IR8ANT – Ciro – 14222 – SSB – 0548 – Apr (E). QSL to I8ACB, Ciro Accardo, Via Nazionale 366, CP 118, 1-80059, Torre Del Greco, Italy.

* EM1OC – Vlad – 14224 – SSB – 0602 – Apr (E). QSL to UY5XE George A Chlijanc, Box 19, 290000 Lvov, Ukraine.

From Here and There and Everywhere

* Barbara V85BJ, Brian V85EB and their family left Brunei on 6 June 1996. They are coming home to Australia. Barbara advises that all mail, including direct QSL cards for V85EB and V85BJ should be sent to PO Box 62, Northbridge, NSW 2063. QSL cards via the bureau should be sent to her QSL Manager VK2KFS.

* Despite very bad propagation and lack of operators, the special event station VK2IMD, celebrating the birthday of Marconi on 20 April, made a total of 375 QSOs. 24 DXCC countries were worked with a total prefix tally of 127 by only six operators. The station also worked two other Marconi stations in the USA. If you require a QSL card from VK2IMD, send your card to WAHRA (Wahroonga Amateur Historical Radio Association), PO Box 600, Wahroonga, NSW 2076, Australia with the appropriate self-addressed reply envelope and sufficient return postage.

* Many "island chasers" missed out on the very short activity by VK2BRT on Broughton Island, a new island for the IOTA award. Propagation was not at its best,

favouring mainly the northerly direction. According to well informed sources, there is a possibility that a second activity will take place during this year by another group of operators.

* The last time there was activity from Clipperton Island was five years ago. Jay WA2FIJ has been reported to be interested in returning to the island in March 1997. At the moment he is searching for hams, or friends of hams, with a sailboat capable of making the trip.

* New prefix from Italy. When the Italian authorities ran out of the I prefix they introduced the IK prefix in 1980. Within 15 years they ran out of the IK prefixes. New Italian amateurs are now being given IZ prefix callsigns with a three letter suffix from AAA to ZZZ. Within a few years Australia will be in a similar situation.

* Jim VK9NS was in a happy mood the other day. After many months of negotiations, lots of difficulty and waiting patiently, he received his Indian licence with the callsign VU2JBS, the suffix of which happens to be his initials. The importation licence to allow him to take equipment to India will follow shortly.

* It is with great regret that I report the passing of Bob VK9ND on Norfolk Island. Bob, who had many friends on the airwaves, was also a well known DXer. He will be missed by the amateur community.

* Len VK8DK returned to the "Red Centre", after a long holiday in Europe, to take up his position at a new location at Ali-Curung, formerly known as Warrabri. This is a community of 400 aborigines located 190 km south of Tennant Creek and 20 km east of the Stuart Highway. Len is employed there in an administrative capacity by the community. Very few of us know that Len once held a licence in Europe with the call 0Z7CK many, many years ago.

* According to Bob KK6EK, all the direct QSLs for XR0Y and XR0Z have been sent out, a total of 20,000 of them.

* QSLs for DX1EA, YV3A, CP6/0H0XX, CP6AA and OH0XX/DU1 are to be sent to Olli Rissanen, Suite 599, 1313 So Military Trail, Deerfield Beach, FL 33442, USA (mail drop only).

* Several Russian stations are asking QSLers not to send reply envelopes but pre-addressed labels and two IRCs as return postage.

* Pirate department. 9N1JAR, 3V8AS and TT8AK are suspected pirates, so do not waste energy, time and money QSLing them. 9K2EC reports that a pirate has used his callsign on 80 m SSB. He has no antennas for 80 m and operates almost exclusively on CW.

* Olympic confusion. Stations operating from the State of Georgia, Atlanta being the capital, may substitute the number 4 in their callsign with 96 or 26 from 15 April to 31 August. Stations in Georgia with any other number may add 00 to their number.

* R1FJZ leaves Franz Josef Land in August when he will pick up his QSL cards from his mail drop DF7RX.

QSLs Received

VK9XZ/6 (3w VK6NE) – T32ZB (7w DL4ZB) – TT8FT (4w DL7FT) – XY1HT (5w G3NOM in Thailand) – TN7OT (2w AL7OT) – TP0CE (3w F6FQK).

Thank You

Many thanks to my supporters who regularly supply me with news and information. Special thanks go to VK2DEJ, VK2KAA, VK2KFU, VK2TJF, VK2XH, VK4AAR, VK4FW, VK5WO, VK8DK, VK8NSB, VK9NS, DL7FT, VE1CBK, V85BJ, YJ8AA, ARRL DX Desk, IPS Radio and Space Services in Sydney (especially Dr R Thompson and Dr P Wilkinson), and the publications *QRZ DX, The DX Bulletin, The DX News Sheet, The DX News Magazine, INDEXA, 425 DX News* and *Go List QSL Managers list.*

*PO Box 93, Dural NSW 2158

ar

WIA News

Intruders Chased From Two HF Bands

A Western Australian amateur was able to get a Russian broadcaster to move from the 40 metre band by the simple expedient of faxing the station director!

In January, Alek Petkovic VK6APK monitored a station on 7070 kHz signing "Voice of Russia World Service". As this is in the exclusive amateur segment of the 40 m band, Alek obtained the station's fax number and advised them that "operation of broadcasters in this part of the band is not permitted". He also reported the intrusion to the International Amateur Radio Union Monitoring Service (Intruder Watch) and the International Telecommunications Union (ITU).

The station subsequently decamped for another frequency and Alek received a reply by fax in mid-March.

Meanwhile, in April, the 40 m band was used by Australian military forces during war games off the Western Australian coast, which involved the RAAF and the Royal New Zealand Air Force (RNZAF).

WIA Intruder Watch Coordinator in the west, Graham Rogers VK6RO, said a 10 kW teletype signal was transmitted on the weekend of 13-14 April from the RAAF base near Perth. Appearing on 7003 kHz, it was on the air for several days and was also heard on the east coast.

The transmission stopped after the WIA contacted the Spectrum Management Agency's Perth Area Office during office hours on the following Monday (15 April).

Intruder Watch has issued a world-wide alert for observations of the Brazilian Navy using 14,002 kHz for teletype transmissions. The 75 baud, 850 Hertz shift transmissions use the call sign PWK33 and have been heard in Europe.

Reporting intruders pays off. A list of frequent and persistent intruders is available from the WIA Federal Intruder Watch Coordinator, Gordon Loveday VK4KAL. His mail address is Freepost Rubyvale 4702, Queensland, or on packet VK4KAL@VK4UN-1.

Olympic Call Signs for US Amateurs

American radio amateurs in the State of Georgia began using special call sign prefixes in April to celebrate the holding of the 100th modern Olympic games in the State's capital city, Atlanta.

The US Federal Communications Commission (FCC) has announced three permitted optional variations for call sign prefixes. These include exchanging the US's 4-district (W4, N4 etc) alpha prefix to either "96" to mark the year, or "25" to signify the 25th modern Olympics. The third option is to add a "double zero" after the current district digit in the call sign.

So, you might hear, instead of W4XYZ, "96-4-XYZ" or "25-4-XYZ", or even "W4-00-XYZ".

The special optional call sign prefixes began appearing on the bands after Easter and will be heard on the air until 31 August.

Meanwhile, in Europe, the Republic of Austria celebrates its millennium this year and Austrian amateurs have been authorised to use the special prefix "OEM", in place of their normal "OE" prefix, for the year, from 1 January to 31 December.

You may have already heard a few OEM1xx call signs on the band, instead of the usual OE1xx. The added M stands for the Latin word "mille", meaning 1000.

The Austrian amateur society, OVSV is sponsoring two special awards for the occasion, cryptically known as the WOEM and MOEM. Details from the OVSV.

Novice Notes

*Peter Parker VK1PK**

Operating an HF Station – Part One

Having obtained a callsign, established a station and erected an antenna, the next step is to learn how to operate it. This requires an ability to adjust equipment to transmit a clean signal, as well as a knowledge of basic operating procedures. *Part One* will focus on the latter, while *Part Two* looks at some of the specialised operating activities, such as DXing and awards and contests, enjoyed by amateurs. While Novice licensees may now use digital modes on HF, this series concentrates on SSB and CW operation.

Which Band?

Amateurs have a range of bands from which to choose. Thus, at any one time, a well-equipped amateur station can contact stations over various distances by selecting the right band. Band conditions vary according to the season, time of day and sunspot activity. Novice licensees can use HF segments 3.525 – 3.625 MHz (80 metres), 21.125 – 21.300 MHz (15 metres), and 28.100 – 28.600 MHz (10 metres).

In very general terms, the lower frequency bands (such as 80 metres) are most used at night, while the higher bands (10 and 15 metres) are more active during the day. These higher bands are also greatly affected by sunspot numbers, with the ability to make DX (overseas) contacts on them peaking in years of high solar activity. At the moment, we are in the trough of the eleven-year sunspot cycle (Figure 1), so we can look forward to improving conditions in the next few years. At this phase of the sunspot cycle, 15 metres is likely to yield more DX contacts than 10 metres for the Novice operator, though ten metres can still be productive, particularly during major contests.

Around mid-winter and mid-summer, ten and six metres come alive due to a phenomenon known as "sporadic-E". Sporadic-E occurs during all phases of the sunspot cycle and permits distances of approximately 500 to 2000 kilometres to be covered, even with just a few watts and simple antennas. It can occur at any time, but is more prevalent during the day.

The time of day is an important determinant of band conditions. While local contacts are possible on 80 metres during daylight hours (particularly in winter), it is during the evening that this band finds most use, with distances of up to 3000 kilometres being typical. An important advantage of 80 metres is the almost blanket coverage that is obtainable. This is in contrast to the higher bands where a "skip-zone" exists between the limit of ground-wave coverage, and where the sky-wave, reflected from the ionosphere, returns to earth.

For cross-town communication (say up to 20-30 kilometres), any HF Novice band will provide results, though 10 metres is preferred, because of its lack of crowding, low band noise, and relative efficiency of mobile antennas. Somewhat longer distances can be spanned on 80 metres, or else on the higher bands when sporadic-E propagation is apparent. DX contacts are most prevalent on 15 and 10 metres (mainly during the daytime), but could be possible on 80 metres if you possess an antenna whose radiation pattern is concentrated at low angles.

The Antenna

It is assumed that an antenna has already been erected. The typical Novice station may include a dipole or inverted vee for 80 metres, a trap vertical or small beam for 10 and 15 metres, and a ground-plane, discone, J-pole or similar antenna for VHF/UHF, with different capabilities on different bands in line with the operator's interests. All these antennas can be constructed at home; details are provided in magazine articles and in the standard antenna handbooks.

Making Contacts

There are more similarities between HF SSB and CW operating procedures than there are differences. In both cases, it is wise to tune across the band you intend to use prior to transmitting. This provides a general impression of band conditions.

Assuming the transceiver and/or antenna tuning unit are properly tuned up (a process which, if performed on-air at all, should be done on a clear frequency at low transmit powers), the process of seeking contacts can begin. There are three main ways of obtaining contacts. These are as follows:

Responding to a CQ call: Tuning across the band may reveal one or more stations calling CQ. A CQ, which is a general call to all amateur stations, is your invitation to respond. Such a response takes the form of sending the other station's callsign, followed by your own callsign, perhaps sent several times if signals are weak.

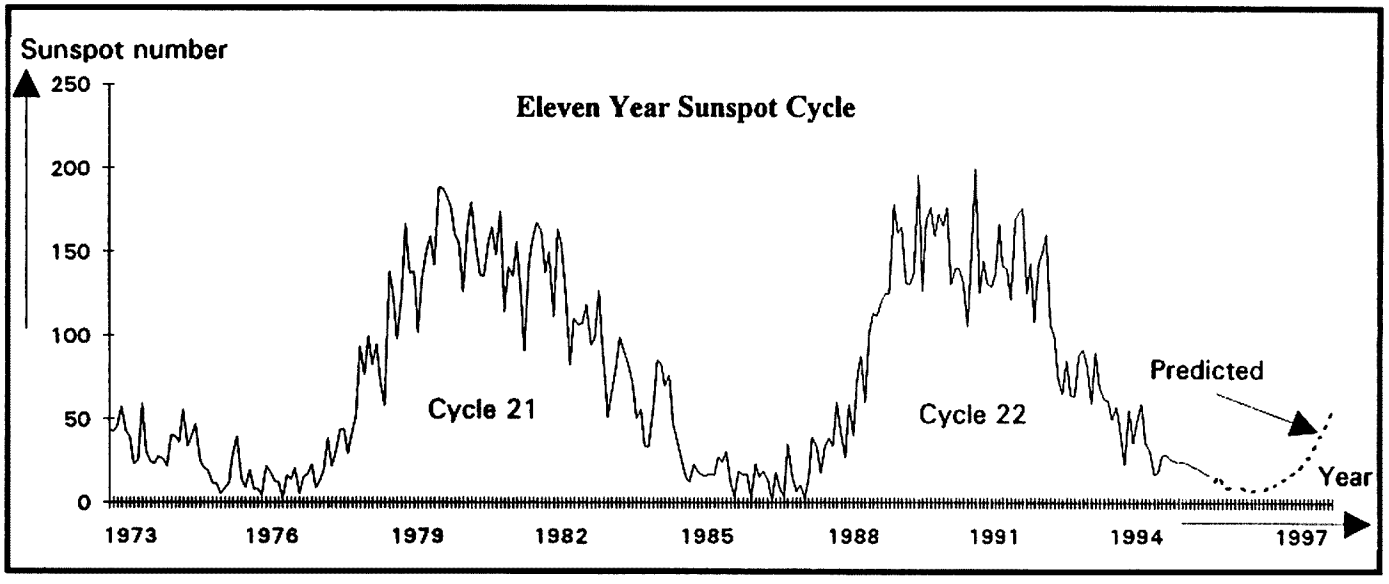


Figure 1 – Chart of sunspot activity over recent years.

If the calling station is VK6AA, and your callsign is VK1AA, your response on SSB could be:- VK6AA, THIS IS VICTOR KILO ONE ALPHA ALPHA, VK1AA.

On CW, you would send:- VK6AA de VK1AA VK1AA VK1AA K. In this case, "de" means from, while "K" is an invitation to transmit (or "over" on voice).

If the station replies to another station, you may wait until the contact finishes, or move to another frequency. On the other hand, the calling station may ask "QRZ?". This indicates that the station heard a signal, but was not able to decipher the callsign. The correct procedure in this case is to repeat your call, possibly speaking (or sending) a little slower this time.

Calling CQ: If no other stations are calling CQ, it is a good idea to issue a call yourself, especially if you have reason to suspect that the band may be open (eg hearing beacons on 10 and 15 metres). After selecting a clear frequency, it is polite to ask if it is in use. On SSB, this is accomplished by announcing your callsign and asking if the frequency is occupied, while CW operators simply send "QRL?". If no response is received, the frequency is yours to use.

The length of CQ calls depends on band activity and conditions. If band occupancy is sparse, a longer CQ call is suggested to attract the attention of the casual listener tuning across the band. In order to maximise the chance of obtaining contacts, and to minimise interference with other operators, the Amateur Radio Bandplans should be adhered to at all times. Essentially this means not operating SSB on frequencies reserved for CW or digital modes. Bandplans are published annually in the *WIA Radio Amateur's Callbook*.

On SSB, a typical CQ call is as follows:- CQ CQ CQ CQ CQ CQ CQ CQ CQ THIS IS VK1AA, VICTOR KILO ONE ALPHA ALPHA, VK1AA, CALLING CQ AND LISTENING (before calling, make sure you are on the right sideband – LSB for 80 m, USB for 15/10 m).

A CQ call on CW may be:- CQ CQ CQ DE VK1AA VK1AA VK1AA K.

Higher speed operators may choose to make their calls longer, to increase the chance of the call being heard. However, this should not be overdone; hearing 20 CQs before a callsign is sent will cause most listeners to seek contacts elsewhere.

"Tail-ending": An effective means of obtaining contacts (especially if using low power) is by the use of "tail-ending". This means listening in to a conversation, and calling one of the stations involved immediately after the contact ends. Timing

Table One – CW Procedural Signals (Prosigns)

CQ	A general call to all amateur stations.
AR	End of message, full stop.
K	"Over", invite any station to transmit.
KN	A specific station only to transmit.
BK	Invite receiving station to transmit.
R	All received OK.
SK	End of contact.
CL	Going off the air (clear, switching off).

Note that all two-letter prosigns are sent with the letters merged together (except CQ).

Table Two – Commonly Used Q Signals for CW Work

QRL?	Is this frequency in use? (use this just before calling CQ).
QRM	Man-made interference (eg other stations on/near your frequency).
QRN	Natural interference (eg thunderstorm activity)
QRO	High(er) power.
QRP	Low(er) power – normally five watts or less.
QRQ	Send faster (eg QRQ 12: please send faster at 12 wpm).
QRS	Send slower (eg QRS 8: please slow down to 8 wpm).
QRT	Stop transmitting.
QRX	Please wait (eg QRX 1: please wait one minute).
QRZ?	Please call again (used when a station has responded to CQ call, but you missed their callsign).
QSB	Fading signals.
QSK:	"break-in mode" – your equipment allows listening while sending. QSL? Can you acknowledge receipt (of message)?
QSO	Conversation.
QSY	Move to another frequency (eg QSY 3530 means QSY to 3.530 MHz).
QTH	Transmitting location.

Note: The above lists the most commonly used Q-codes for amateur CW operation. The meanings shown are those that are most used on-air, and vary slightly from the definitions in the standard handbooks. To ask a question, simply attach a question mark (?) to the Q-signal; for instance, QRQ? means "Shall I send faster?". While Q-signals are sometimes used on SSB, plain English is probably as effective in most cases.

Table Three – Common Abbreviations for CW Work

ABT	About
AGN	Again
AS	(Please) wait
CQ	Calling any station
CUL	See you later (similar to BCNU, HP CU AGN, etc)
ES	And
FB	Fine Business, excellent
GM(N)	Good morning (night)
GUD	Good
HR	Here; Hear
HW	How
NR	Number (used in contests)
PSE	Please
RST	Signal report (see later)
SIG	Signal
SRI	Sorry
TKS, TNX,	
TU	Thank you
UR	Your; You're
VY	Very
WKD	Worked
WL	Well; Will
WX	Weather

Abbreviations for other words exist, but their use is less prevalent than those in the list presented here. Their use can make CW communication faster and more pleasurable, particularly at slower speeds.

is important here, particularly if unable to hear all stations on frequency.

When "tail-ending", the call made can be just as if one was answering a CQ. If used with care, "tail-ending" is probably the best way to make contacts on the HF bands.

During the Contact

Once contact has been established, the first few exchanges normally entail a swapping of RST signal reports, names and locations (QTH) with the other station. From this point, the conversation may extend to the antenna and equipment, and (unfortunately) the seemingly ubiquitous weather report. Discussion beyond this point is a matter for those concerned, though amateur regulations and ethics mean that there are some topics best left alone.

The purpose of signal reports (see Table 4) is to give your contact some idea of how their signals are being received. Signal reports on phone consist of two digits. The first of these is readability (R), on a scale of 1 to 5. The second figure given is the strength (S) of a signal, this time on a scale of 1 to 9. The third digit, used by CW operators to indicate the purity of the received tone, is also on a scale of 1 to 9. Because of the quality of most modern equipment, reports of less than T9 are rare.

Some tend to accept the S-meter as gospel, without realising that S-meter calibrations vary between transceivers. Cases of people refusing to give signal reports if a signal (though perfectly readable) is not moving their meter's needle are not uncommon. If in doubt as to what report you should give, it is best to ignore the meter on your transceiver entirely.

Ending a Contact

If the time that it can take is any guide, many people have trouble ending contacts. On CW, this manifests itself in the endless repetition of 73, BCNU, CUL, CUAGN and other solecisms, while on SSB, many a fictitious saucepan must have boiled over! Try to end contacts cleanly and keep the number of "final-finals" to a minimum; this makes it easier for other stations who might want to call one of those about to depart.

Conclusion

This article has provided some pointers on basic operating techniques. Join me in August for Part Two, which includes more detailed information on DXing, contests and award hunting.

7/1 Garran Place, Garran ACT 2605
VK1PK @ VK1KCM.ACT.AUS.OC
ar

Table Four - Standard Readability and Strength Scale

(source: ARRL Handbook)

Readability

1	unreadable
2	barely readable, occasional words distinguishable
3	readable with considerable difficulty
4	readable with practically no difficulty
5	perfectly readable

Strength

1	faint signals, barely perceptible
2	very weak signals
3	weak signals
4	fair signals
5	fairly good signals
6	good signals
7	moderately strong signals
8	strong signals
9	extremely strong signals

Tone

Scale of 1 to 9. Nearly all signals today are T9.

Packet World

*Grant Willis VK5ZWI**

Introduction

Over the past couple of months, we have been looking at how packet radio works and, in particular, how the Amateur AX.25 protocol has been constructed. For many of us, this is how most of our packet radio communications will be conducted. There are, however, many different and more advanced techniques that can use packet radio frames to provide a far wider range of services and facilities. The TCP/IP packet switching protocol was born as a result of work done on the original predecessor to the Internet we know today. TCP/IP is a very powerful networking system, and through the efforts of people like Phil Karn KA9Q and many others, TCP/IP is available via Amateur Packet Radio. John, VK1ZAO takes us through how TCP/IP and AX.25 work together this month.

TCP/IP Implemented Over AX.25

TCP/IP implements the ISO layered protocol standard, but in four levels rather than seven (see Fig 1). However, as with the standard, each layer has a particular function to perform, and only passes data to the layer one above and below, and communicates with other stacks by talking to the layer at the same level. The acronym TCP/IP is actually derived from two of the most commonly used protocols in the centre layers.

Data Encapsulation

Data Encapsulation describes the way in which the data from each layer is passed to the layer below. This layer then adds its necessary control header and passes this frame as data to the layer below it (see Fig 2). That layer again adds its control header and passes this whole lot on as data to the next level down, etc. On reception, as the data progresses back up the stack, each layer checks the header for its level and decides what to do with the data segment. Do we ask for a resend, discard because it's not for us, do some requested operation, or pass the data up to a higher level?

We shall look at each of the frame

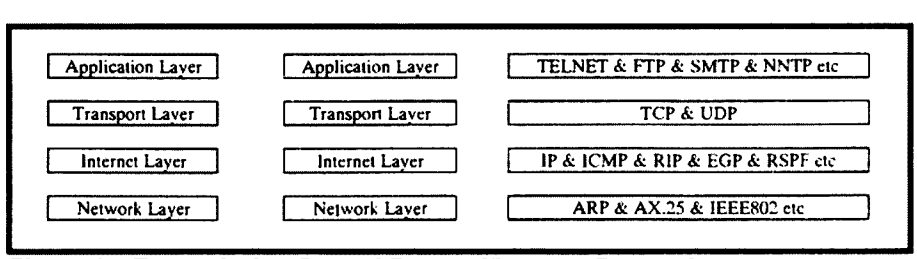


Figure 1 - Transmission Control Protocol/Internet Protocol

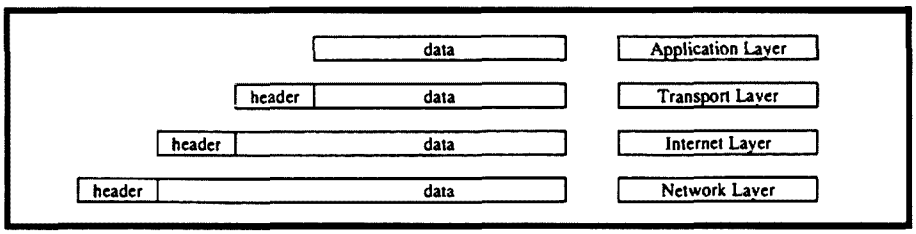


Figure 2 - Data encapsulation

structures used to pass a typical data packet using TCP/IP over AX.25

TCP - Transmission Control Protocol

(Refer to Fig 3)

Functions: To keep track of which application sent the data, and which application is to receive that data. Also to keep track of sequence numbers both ways so that lost frames can be detected - checksum to ensure validity of data - other control fields.

Source & Destination Ports (16 bits + 16 bits) - Indicate the service required, and maintain what is linked to what at each end.

Sequence Number (32 bits) - The sequence number of the first data byte of this segment - similar to AX.25's sequence number but here we count bytes, not frames, and we use a 32 bit number not a 3 bit number.

Acknowledge Number (32) - Next sequence number that we expect to receive (valid if ACK control bit set) used as in AX.25 to detect lost data.

Data Offset (4 bits) - Due to variable "Options" field we need to know how long the TCP header is. This field gives us that length in 32 bit words.

Reserved (6 bits) - Next 6 bits.

Control Bits (6 bits) - URG - Urgent Pointer Valid; ACK - Acknowledge Field Valid; PSH - Push Function; RST - Reset the connection; SYN - Synchronise Sequence Numbers (connect); FIN - No more data (disconnect).

Window (16 bits) - How many bytes we are willing to accept - largest amount of unacknowledged data.

Checksum (16 bits) - Checksum over all of (TCP) header and data.

Urgent Pointer (16 bits) - Locates urgent data in data field.

Options (32 bits) - Variable additional bytes at end of header - must be padded out to 32 bits. 32 bits in amateur packets. Type 2 Option (Maximum segment Length), Length 4 bytes, 16 bit maximum segment size in bytes.

IP - Internet Protocol

(Refer to Fig 4)

Functions - Identify level of service required - Fragmentation control of datagram - Lifetime of datagram (in case it gets locked in a routing loop) - Identify the Transport Layer Protocol being used (TCP or other) - Identify Sender and Receiver addresses.

Version (4 bits) - Identifies the version of the Internet header (currently version 4).

IHL (4 bits) - The length of the header in 32 bit words. Allows for inclusion of a variable option field after the destination address but before the data.

Type of Service (8 bits) - Precedence of Service and delay/throughput/reliability. "0x00" Normal/Routine for amateur use.

Total Length (16 bits) - Total length including Internet Header and data. Identification (16 bits) - Value assigned by sender to aid re-assembly of datagrams.

Flags (3 bits) - Indicates whether the datagram may be fragmented, and whether this is the last fragment of the datagram.

Fragment Offset (13 bits) - Indicates the location of this fragment for re-assembly in units of 8 bytes (64 bits).

Time to Live (8 bits) - How long this datagram is allowed to live - each forwarding decrements this field by 1. If it gets to zero the datagram dies. To protect against infinite routing loops.

Protocol (8 bits) - Indicates the Transport Layer this data is to go to. Header Checksum (16) - Checksum of the IP header is checked and re-computed at each step (TTL changes).

Source Address (32) - IP address of the origin of this data (the IP number 44.136.1.80, etc). This and the destination address must be mapped to a physical device by the network layer. In the amateur world this means mapping an IP number to the callsign field of the AX.25 frame. This callsign being the next in the chain, and not necessarily the final destination.

Destination Address (32) - Destination IP address of this data.

Options (variable x 32) - Not used in amateur packets.

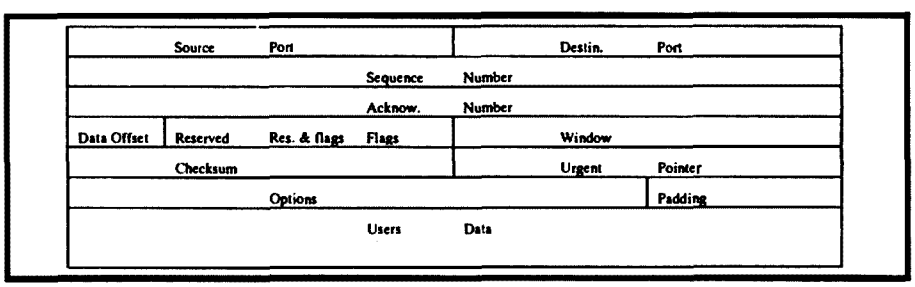


Figure 3 - TCP Transmission Control Protoco

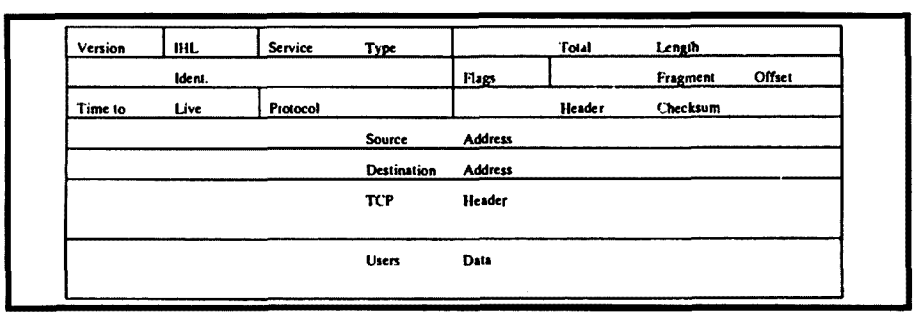


Figure 4 - IP Internet Protocol

AX.25 - Network Protocol

(Refer to Fig 5)

Functions - Move data from one hardware location to another. These hardware addresses may map to the Internet Addresses contained in the IP Header, or they may simply be one step closer in a string of hardware addresses through which the packet must transfer to get to its final destination. Note here that, although the error detecting/resending afforded by a "connected" AX.25 link may be used, it is not really necessary as such errors can be detected and handled by the TCP. We may, therefore, send data in UI (unnumbered information) frames and not bother with a formal AX.25 connection.

Destination Address (56 bits) - Callsign and SSID of the destination of this part of the link.

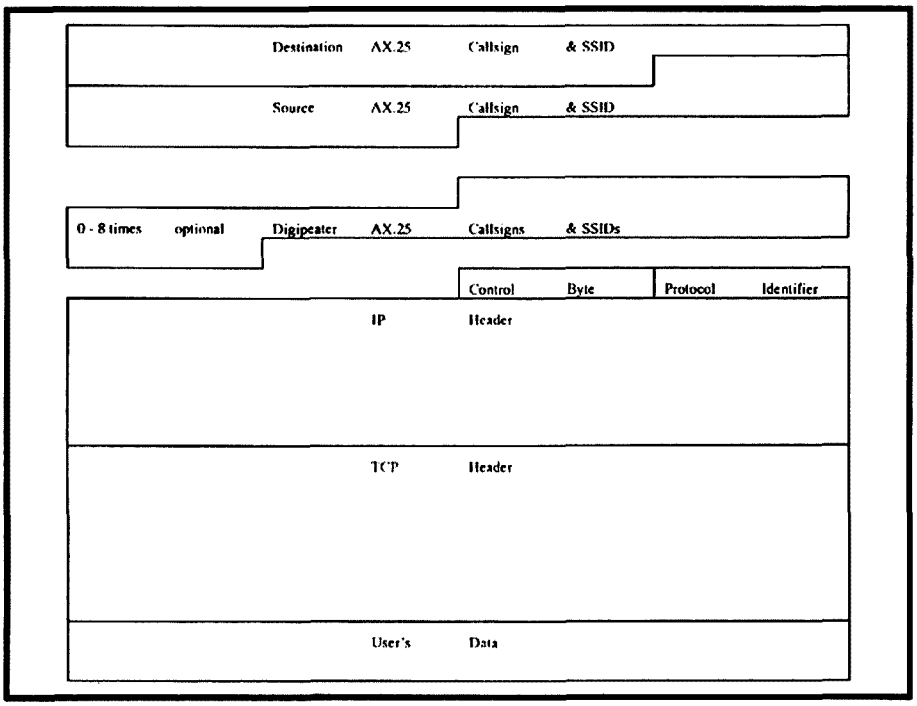


Figure 5 – AX.25 Network Protocol

Source Address (56 bits) – Callsign and SSID of the source of this leg of the link.

Digi (56 bits x 0-8) – Up to 8 callsigns through which the data is to be routed to get to the destination.

C (8 bits) – AX.25 Control Byte.

P (8 bits) – AX.25 Protocol Identifier.

This frame, when transmitted will be prepended by a flag, and terminated with a 16 bits FCS and then the next flag.

Summary

I hope that this paper has been of some assistance in introducing you to the world of amateur packet communication at the physical level, gives you a slightly better idea of how data is exchanged from one system to another, shows you how ONE of the other transport layers is implemented on top of the basic AX.25 structure, and that you have gained some insight into the channel sharing used by the majority of AX.25 implementations.

Conclusion

Lastly I would like to refer you to the references that I used in preparing this paper, and encourage you all to delve into the exciting processes that enable you to so easily communicate keyboard to keyboard, or to send a message to another amateur who resides in almost any location on Earth. **John Woolner, VK1ZAO** (Paper Presented to the Canberra Packet Radio Group's Technical Symposium 1995).

Thanks to John VK1ZAO for allowing us to reproduce his paper for a wider audience.

The following references can be used for those who are interested in pursuing this further. If you have any particular topics you would like to see covered in forthcoming issues of Packet World, why not put your thoughts either on packet or in the post. I can be reached at one of the following addresses:-

Packet: VK5ZWI@VK5TTY.#ADL.#SA.AUS.OC

Internet: gwillis@dove.mtx.net.au

Post: Packet Doctor, C/o WIA SA Division, GPO Box 1234 Adelaide 5001

References

Amateur Packet Radio and TCP/IP – Phil Karn KA9Q

AX.25 Link Layer Protocol Specification Version 2.0 – ARRL American Radio Relay League

AX.25 Link Access Protocol Amateur Packet Radio Version 2.2 – William A Beech NJ7P, Douglas E Nieslsen N7LEM, Jack Taylor N7OO – ARRL

RFC: 791 – Internet Protocol Specification – Information Sciences Institute RFC: 793 – Transmission Control Protocol Specification – Information Sciences Institute

TCP/IP Network Administration – Craig Hunt – O'Reilly & Associates

Local Area Networks – John E McNamara – digital press

The Matrix – John S Quarterman – digital press

Basics of Data Communication – Harry R Karp – Electronics Book Series

**C/o GPO Box 1234, Adelaide SA 5001*
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Internet: gwillis@dove.mtx.net.au

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Pounding Brass

*Stephen P Smith VK2SPS**

A reminder that the North East Radio Club's two metre Morse code beacon has been shifted to a new frequency and a new location. The beacon is operating under the callsign of VK5VF on 145.660 MHz and resides on top of Mt Lofty for greater coverage.

Output is 10 watts and the cycle is as before, that is 10 minute segments of random generated characters from 5 to 12 wpm, starting at 8.00 am/pm local Adelaide time.

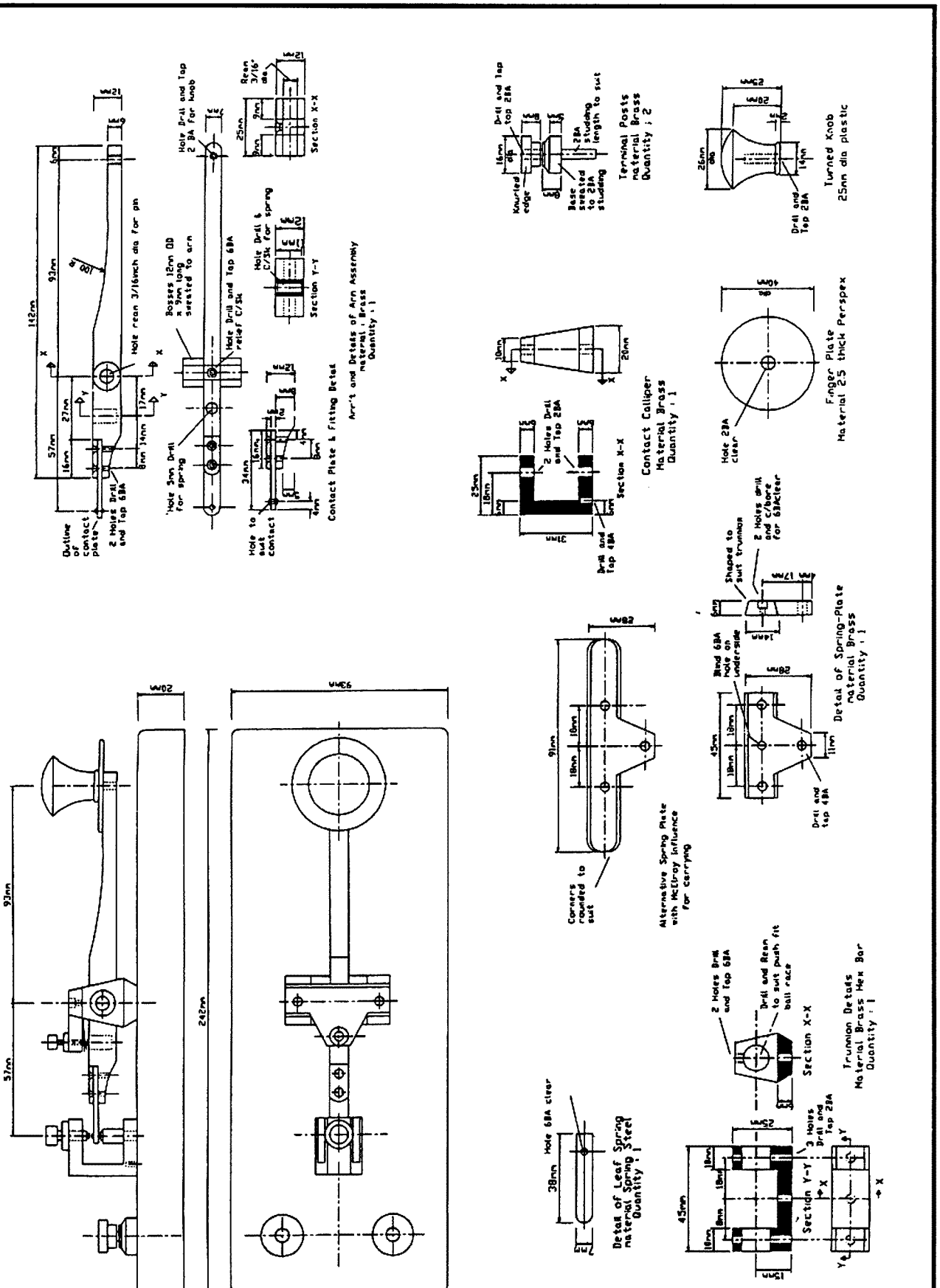
Golden Section Morse Key Project

This month we will continue with the straight key construction project designed by Dr Jim Lycett G0MSZ. The diagram, reproduced here with permission from Morsum Magnificat, provides all the remaining mechanical details.

Next month we will conclude this interesting project.

**PO Box 361, Mona Vale NSW 2103*

ar



The Golden Section Morse Key – arrangement and details.

International Amateur Radio Union Monitoring Service (IARUMS) – Intruder Watch

*Gordon Loveday VK4KAL**

IARUMS News

The radio telephone link heard on 18.155 MHz has now been reported operating on 18.175 MHz, which is outside our band. This move was caused by world-wide amateur radio QRM!

Radio Pakistan has vacated the frequency it occupied for far too long. This advice came from the SMA – I assume they mean 7.018/4 MHz? But let us continue to check this frequency. The general feeling is they will return when they think it safe to do so. Keep it on your list!

An update on the OTHR mentioned in my April column. I believe the government has given permission for this operation to go ahead regardless of amateur opposition. This will not stop observations from other regions, including our own. What action will be forthcoming from VK? Do you think the WIA should have meaningful discussions with the Minister for Communications about these intrusions into our legitimate HF bands? It is NOT war-time.

Once again an official protest, lodged on 13 March 1996, has been made to the Technical Director, Voice of Islamic Republic of Iran in Tehran, for the removal of their broadcast station operating on 7.070 MHz. All previous requests have been ignored, so don't hold your breath.

A fax was sent on 12 March 1996 to the "Main Centre for Control of Broadcasting Networks, Ministry of Telecommunications of Russian Federation" regarding Voice of Russia transmissions on 7070 kHz. A reply has been received ... in Russian! So, until we can get a translation, we can only guess. I am indebted to a VK6 observer for this information. Thanks, Alek.

Please let IARUMS know what non-amateur signals stop you using any part of the exclusive amateur bands. We must have this information so we can start taking remedial action. Yes, it is hard, unrelenting work to keep what we have left of our bands. If your IARUMS co-ordinators can do the worst of it, what is stopping you from helping them? Or are you one of those who think the bands are not worth fighting for?

The IARU Monitoring System – Part 6

(Previous issues of *Amateur Radio* magazine contain parts 1 to 5 of this series about the IARU Monitoring System.)

Reports

It is preferable that reports be typewritten. Where this is not possible, hand written CAPITAL letters should be used. Normal amateur abbreviations and Q codes may also be used on reports, "normal" being those abbreviations appearing in lists given in ARRL, RSGB, & ITU publications.

Allocation of Frequency Spectrum for Purposes of Intruder Watch

160 Metres

1800 – 1825 kHz. Amateur Service is Primary Service exclusively.

1825 – 1875 kHz. Amateur Service is Secondary, not exclusive.

80 Metres

3.500 – 3.700 kHz & 3.794 – 3.800 kHz

In IARU Region 3 the 80 m band is shared with fixed services. It is NOT exclusive to the Amateur Service. F1B and A1A non-amateur signals CANNOT be considered to be intruders. But broadcast stations are intruders!

40 Metres

7.000 – 7.100 kHz is Primary Amateur Service exclusively. Non-amateur signals ARE intruders.

7.100 – 7.300 kHz is shared by international broadcast stations ONLY. Any non-amateur signal, other than broadcasters can be considered to be an intruder. Non-amateur F1B and A1A signals ARE intruders.

30 Metres

10.100 – 10.150 kHz is shared with Fixed Service stations. The Amateur Service DOES NOT have exclusive use of these frequencies. Broadcast stations are intruders.

20 Metres

14.000 – 14.250 kHz is Primary Amateur Service. Any non-amateur signals are those of intruders.

14.250 – 14.350 kHz is a segment shared with Iran, The People's Republic of China, and the USSR fixed services. It is NOT exclusive to the Amateur Service. F1B & A1A signals (RTTY and CW) of non-amateur stations cannot be considered as intruders, but broadcast stations are.

17 Metres

18.088 – 18.168 kHz is shared with the Fixed Services. Non-amateur F1B and A1A signals are NOT intruders, but broadcast stations are.

15 Metres

21.000 – 21.450 kHz is exclusive to the Amateur Service.

12 Metres

24.890 – 24.990 kHz is SHARED with F1B and A1A signals.

10 Metres

28.000 – 29.700 kHz is Primary Amateur Service.

I hope this series about the IARU Monitoring System has given some idea of the "workings" of the IARUMS, and whetted your collective interest in adding your "bit" to the cause.

**Federal Intruder Watch Co-Ordinator, Freepost No 4 Rubyvale QLD 4702 or VK4KAL@VK4UN-1*

ar

WIA MORSE PRACTICE TRANSMISSIONS

VK2BWI	Nightly at 2000 local on 3550 kHz
VK2RCW	ontinuous on 3699 kHz and 144.950 MHz 5 wpm, 8 wpm, 12 wpm
VK3COD	Nightly (weekdays) at 1030 UTC on 28.340 MHz and 147.425 MHz
VK3RCW	Continuous on 144.975 MHz, 5 wpm, 10 wpm
VK4WIT	Monday at 0930 UTC on 3535 kHz
VK4WCH	Wednesday at 1000 UTC on 3535 kHz
VK4AV	Thursday at 0930 UTC on 3535 kHz
VK4WIS	Sunday at 0930 UTC on 3535 kHz
VK5AWI	Nightly at 2030 local on 3550 kHz
VK5RCW	Continuous on 144.975 MHz, 5 wpm to 12 wpm
VK6RCW	Continuous on 147.375 MHz, 4 wpm to 11 wpm
VK6WIA	Nightly at 1930 local on 146.700 MHz and nightly (except Saturday) at 1200 UTC on 3.555 MHz

Over to You - Members' Opinions

All letters from members will be considered for publication, but should be less than 300 words. The WIA accepts no responsibility for opinions expressed by correspondents.

Bletchley Park

The Milton Keynes and District Amateur Radio Society are running their normal "Car Boot Sale", but with a difference this year, on 1 September 1996.

We hope to attract and establish the whereabouts, eventually, of some 12,000 people who once worked at the Government Code and Cypher Centre in Bletchley Park, North Buckinghamshire. Since a great number of them were "communicators", it follows that they may have taken the amateur radio path at some time in their lives. We would like to make this an annual get-together and hopefully bring news of old friends from all over the world.

The Bletchley Park Trust are keen to build up their growing database of former residents of the Park. We are finding new leads through the continuous stream of visitors that come twice monthly to see the Museum.

Des Shepherd G3LCS
Station Manager GB2BP
Bletchley Park
England

(The full notice was supplied but it is only relevant to UK readers. Ed)

Hamads Work!

In February, *Amateur Radio* carried my classified advertisement seeking a manual for an army surplus transmitter. Almost immediately the magazine came out, I received two manuals, one from Peter VK2EMU and one from Ken VK4DKM.

I would like to thank both these gentlemen for their generosity and their display of the best of the amateur spirit. With an extra manual I was able to pass one on to another operator.

If you ever feel a little cynical about human nature, this is the sort of thing to restore your faith in it. Thanks again.

John Faulkner VK2DVW
PO Box 57
Bexley North NSW 2207

QRP Awards (1000 Miles/Watt)

I thought you might be interested to hear that I have recently received three "1000-Mile-Per-Watt" awards. The award is issued by the *QRP Amateur Radio Club International* in the USA for confirmed contacts using less than five watts and where the distance divided by the power equals or exceeds 1000 miles per watt. The awards I received were for the following confirmed contacts:

HK5BEG Cale, Columbia, 4 April 1994, 14 MHz, RST 579, 8,740 miles;

XE1/KC5APT Veracruz, Mexico, 4 April 1994, 14 MHz, RST 559, 7,926 miles; and

FE5VV Attignat, France, 28 August 1994, 14 MHz, RST 569, 10,584 miles.

All three contacts were made using 4.5 watts from a 20 metre version of the Tassie Devil, designed and built by Ian Smith VK8CW. The antenna was a rotatable trapped dipole about 15 metres high.

It proves, once again, that a little can go a long way!

Peter Taylor VK4FV
36 Sundance Way
Runaway Bay QLD 4216

Assistance with Croker Island

We hope to activate Croker Island for IOTA purposes in August 1996. Every island around the world has an IOTA number when activated. Croker has never been activated, so would be a rare and new island to the world of amateur radio.

This project will be activating the island for seven days, 24 hours a day. The callsign is yet to be finalised, but we hope to obtain VK8CI from the SMA office in Darwin. Malcolm Johnson VK6LC/VK8LC will be the senior operator.

A special QSL card is in the process of being made up and all sponsors will have their logos on the QSL card.

We are looking at a cost of around $2,000. We are not asking for this money from the WIA but are going to ask other groups such as JARL, ARRL, Yaesu, IOTA, Dick Smith, RSGB and many more. Any assistance the WIA or members could provide would be of great help to us. I am a full member of the WIA and have been since I was licensed.

I, Stuart, can be contacted by phone on (089) 635 530; and Bob can be contacted on (089) 279 381.

Bob Finlayson (SWL)
Stuart Birkin VK8NSB
PO Box 205
Karama NT 0812

Can You Help?

Recently I visited Cape Otway and found that guided tours are being given over the lighthouse area. When I mentioned my presence there at 13 RDF station (later No 13 Radar) during the Second World War, the remains of the concrete building which housed the radar were included in the tour. The guide asked me to give a short talk and later to send any relevant material in my possession. This has been done and all the staff there found it most interesting. The information sent included copies of prints of an LW/AW receiver and an LW/AW installation in a tent showing the "fly swatter" antenna.

Here comes the question. Does anyone have photos of the station showing buildings and possibly layout? If they do, may I have copies of them or a loan of any negatives, please? I will be glad to refund any expenses involved.

For the information of anyone who was there, the whole area is now overgrown with two metre plus shrubs and all that is readily visible is the concrete walls of the "doover" installation building with only the massive gear and shaft which were used for rotating the antenna. The antenna shaft was cut off at roof level with an oxy torch.

Neil Trainor VK3IJ
133 Bladin Street
ar

Repeater Link

*Will McGhie VK6UU**

Repeater Licences

In VK6 we have just renewed all repeater licences that WARG hold. It appears that the SMA are having some difficulty with records of existing repeaters and links. I have heard and read from several sources that some of the SMA's records on amateur repeaters are not available. This is making it difficult when it comes to re-licensing.

CTCSS

CTCSS is five letters you see often in relation to FM communication and voice repeaters. I'm sure many of you understand its application and use, but I'm equally sure there are many of us that have a lack of understanding of CTCSS.

CTCSS Stands For

The most obvious question is what does this odd collection of letters stand for? CTCSS is short for, Continuous Tone Coded Squelch System. Quite a mouth full. Other labels are used such as Code Guard and Sub Tone to describe this mute system for FM receivers.

Not Perfect

As mentioned in last months *Repeater Link*, a squelch (mute) system is required for FM operation. The FM receiver, when not receiving a signal, produces a large amount of noise out of the speaker. Without a squelch to turn off the noise in the absence of a signal, monitoring on an FM receiver is very tedious.

CTCSS is a better mute system than the standard mute. So what is wrong with the standard mute as found in FM receivers? The answer is, it is not perfect. As good as it is, it can still be falsely triggered by all sorts of interference. These include interference from all manner of electronic devices. In particular, when mobile, where you are driving past a wide variety of interference sources, the mute will open. Added to this is receiver overload and, in particular, the pager.

Pagers Again

Since the introduction of pagers, with no guard band between them and our two metre band, mobile and base operation on two metres FM in much of Australia's populated areas has become difficult. There are areas where the sheer power and number of pager transmissions makes two metre operation impossible. In Perth, one such area is on the western side of the central city area. While driving through this area the two metre mobile is unusable, with almost continuous interference. The standard mute remains open most of the time, with loud pager noises.

CTCSS Operation

So how does a CTCSS mute system handle this situation? With the normal mute, operation in these areas is very difficult, but with the receiver using the CTCSS mute, operation is only slightly affected. There are two aspects to pager interference when operating mobile in such areas. They are when there is an amateur signal and when there is not.

Situation 1

If you are driving through "pager alley" and there is no amateur signal on the channel you are tuned to, with the standard mute you are bombarded with pager audio coming and going. Very annoying, and you either put up with it, or turn the audio down or off. With CTCSS operating there is no pager audio. The receiver remains tightly muted and you hear nothing.

Situation 2

This is where there is an amateur signal, such as a repeater signal encoded with CTCSS. There is a difference between the operation of the two mute systems in this situation, albeit subtle at times. If the amateur signal is stronger than the pager interference, with both systems you hear the same result, the amateur audio. If the pager signal is stronger you hear the pager with the normal mute, but with CTCSS you hear nothing, the pager signal is muted out. This is preferable to being blasted with pager noise. In practice the brief breaks in audio when the pager is stronger can almost go unnoticed with CTCSS.

Works Well

CTCSS works very well. No longer are you besieged by interference from all sides. What you hear is what you want to hear, the amateur transmission.

Work

So how does CTCSS work? This system requires a low frequency tone between 67 Hz and 250 Hz to be added to the transmission. This tone is then detected and decoded at the receive end, and operates a switch to connect the audio to the volume control, and hence the loud speaker. No tone no audio. Correct tone, audio.

A low frequency tone was required so it would not be heard. This is not entirely true, as depending on the receiver and speaker size, CTCSS tones can be heard, albeit at a low level. Modern receivers have a low-cut audio filter fitted to eliminate the CTCSS tones from reaching the speaker.

Encoding

The CTCSS encoded tone at the transmitter is adjusted to be about 10% of the normal audio. This means, in a 5 kHz deviation system, the CTCSS level is set for 500 Hz deviation. From an installation point of view, the CTCSS tone must be injected after the mike amplifier. These low frequencies do not make it through the low-cut filter in the mike amplifier circuit. This does make the installation of CTCSS to a transmitter more difficult than DTMF tones, which can be applied to the mike input.

Decoding

Decoding of the tone by a suitable decoder produces a logic output that is used to gate the receive audio on and off. The modern CTCSS decoder is very sensitive and can decode a tone with a signal-to-noise of just a few dB. The CTCSS decoder is as sensitive as the normal mute, opening on signals that have little intelligible audio.

Make Your Own

If you have a converted commercial FM transceiver that is not fitted with CTCSS decode or encode, you can make and install your own. The other option is to buy a ready made CTCSS board. SIGTEC make a number of these boards that are very small and work well. However, the cost may put you off at around $100.

If you want to make your own, I will provide a couple of circuits in next month's *Repeater Link*, one of a decoder and the other of a encoder. Both circuits use the NE 567 IC. It is not easy to make an encoder. The low frequency tone has to be a good sine wave, with a stable frequency. Making a 123 Hz oscillator that will stay within 0.2 of a Hertz is surprisingly difficult.

CTCSS Frequencies

67.0, 71.9, 74.4, 77.0, 79.7, 82.5, 85.4, 88.5, 91.5, 94.8, 97.4, 100.0, 103.5, 107.2, 110.9, 114.8, 118.8, 123.0, 127.3, 131.8, 136.5, 141.3, 146.2, 151.4, 156.7, 162.2, 167.9, 173.8, 179.9, 186.2, 192.8, 203.5, 210.7, 218.1, 225.7, 233.6, 241.8, 250.3 Hz.

Strange Frequencies

The choice of the different frequencies used for CTCSS does look a little odd. The reason is to have as many tones as could be put into the window between 67 Hz and 250 Hz, and still be successfully separated and

decoded. Also, none of them can be harmonically related. A decoder on say 140 Hz could decode a 70 Hz tone, due to the presence of the second harmonic on 140 Hz.

Standards

The WIA, a few years ago, advised that 123 Hz should be used if a repeater requires to have a CTCSS decoder fitted on the receiver, due to interference to the repeater. This would require the user to encode his/her transmission with 123 Hz.

In VK6, several of our repeaters are encoded with 123 Hz. That is, the repeater's transmission has a 123 Hz tone for users to run their receivers in the CTCSS mode. May I suggest that, in order to standardise, when fitted, all repeaters transmit 123 Hz. No repeaters in VK6 require the user to transmit 123 Hz to access a repeater. The need is there on several of our repeaters, but due to most amateurs not having CTCSS encode capability, the requirement has not been installed. It is a chicken and egg situation.

To start the ball rolling, make the effort on your repeater and install 123 Hz encode on the transmission. Users then are encouraged to experiment with this useful facility.

The sooner CTCSS is used both ways, between repeater and user, the sooner much of the pager, and other, forms of interference will be less of a problem.

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VK6UU @ VK6BBR
ar

Technical Correspondence

All technical correspondence from members will be considered for publication, but should be less than 300 words.

Vee Antenna Gain

The articles by Rob Gurr VK5RG on HF antennas have been interesting and informative. However, some readers might have been puzzled how the gain of a vee antenna could increase by "up to 3 dB" by adding resistive terminations (page 7 of April 1996 *Amateur Radio*). The follow-up note (page 15 of May 1996 *Amateur Radio*) provided partial explanation but, without wishing to detract from Rob's excellent work, I thought further explanation of vee antenna gain was warranted.

In its basic form, the legs of the vee antenna are unterminated. This makes the antenna resonant, causing it to have a limited operating bandwidth. Away from resonance, the reactive component of the feedpoint impedance rises rapidly, making it difficult to drive the antenna efficiently. This reactance vs frequency characteristic is steeper than that of a half wave dipole, because the legs are several times longer than those of a dipole, and thus go out of tune more quickly. In addition, the unterminated vee is bidirectional, albeit somewhat unsymmetrical.

However, if the legs are terminated, the antenna becomes non-resonant, and is much easier to drive across a broad bandwidth. Providing the terminating resistors are reasonably well matched to the leg impedance, the feedpoint impedance will remain essentially resistive with frequency variations. The absence of reflections from the ends of the legs also causes most of the reverse lobe to disappear, and the directive gain to be up to 3 dB greater. However, up to half the total input power will be dissipated in the terminating resistors, causing the total antenna loss to increase by up to 3 dB. One factor balances the other, and the overall result is that in the forward direction, the radiated field strength will remain largely unchanged.

The reason we say "up to 3 dB" is that the vee antenna is already partially unidirectional. For example, Mininec shows that if the legs are four wavelengths long, the directivity will be 8.3 dBd and the F/B ratio 2.4 dB. Even in the most optimistic case, if we were able to terminate the legs to ensure complete cancellation of the rear lobe (ie infinite F/B ratio), the most the directivity could rise would be 1.99 dB.

Regarding the "20 m Delta V" antenna shown in Figure 15 of the April article, the wires between the legs and the terminating resistor will behave as an end fed dipole, creating unwanted sidelobes and spoiling the F/B ratio. The same applies to the antenna shown in Figure 14, although the pattern degradation will be much less if the wire is close to the ground or buried. A better approach, used commercially, is to bury a ground screen under each resistor. Due to the high resistances involved, the screen need not be elaborate; its main purpose is to provide capacitance to the earth and minimise the contact resistance, so that the total resistance seen by each leg is not too dependent on local ground conductivity.

Finally, I would recommend to anyone considering building a vee antenna to first model it with an antenna modelling program, preferably one which can automatically optimise the antenna dimensions to achieve a specified result. For example, starting off from the length and apex angle published in the ARRL Antenna Handbook (10th Edition) for a two wavelength unterminated vee, I was able, with Mininec, to significantly increase the gain and F/B ratio by increasing the leg length 11%, and reducing the apex angle from 73° to 59.5°. As my version of Mininec does not contain an optimisation routine, these results took a lot of tedious trial and error, so even better results are probably obtainable.

An interesting result was the discovery that the gain of the unterminated vee (in free space) appears to peak around a leg length of four wavelengths, and fall off at longer lengths. This conflicts with the ARRL Antenna Handbook, which shows vee antenna gain increasing monotonically with leg length. The Handbook concedes, however, that mutual impedance between the wires has not been taken into account. It appears that with long leg lengths, the effect of mutual impedance may have a more disastrous effect on gain than originally thought. However, this does not appear to be too much of a problem with shorter vees (ie up to four wavelengths). I have yet to perform a similar investigation into the terminated vee, but would not be surprised to find a similar peaking of gain.

The Handbook also advises: *"for the same total wire length, the rhombic gives greater gain than the vee ... the directional pattern is less affected by frequency when used over a wide frequency range. The disadvantage is that additional supports are required."*

Much further work needs to be done, but it appears that for leg lengths up to four wavelengths, one has the choice of the vee for ease of construction, or the rhombic for ultimate performance; but for lengths greater than four wavelengths, the rhombic looks like the only sensible choice.

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ar

VHF/UHF – An Expanding World

*Eric Jamieson VK5LP**

All times are UTC.

After the mass of reporting for the April and May issues regarding the sustained tropospheric opening between Perth and Mount Gambier/Melbourne, this month is decidedly low-key.

From VK6

Frank VK6DM refers to the recent tropospheric opening saying: *You certainly have a comprehensive report. It was an unusual opening, I heard nothing of the Adelaide two metre beacon, yet Mt Gambier two metre beacon was almost continuous.*

I cannot work much DX as I am seven km west of Wal VK6WG at Albany. I live on a farm, and have about +2 degree horizon in your direction. Have only two m & 70 cm gear. Did contact you once on two metres many years ago.

Note that the distance 1760 km for VK5DK to myself is not correct, it should be approx seven km more than Wally VK6WG. [Distances were only approximate, as stated ... VK5LP.] This would be about 15 km less than Wal VK6KZ/p on Torbay Hill. It was very interesting with Wal there, I could call him almost any time to see how he was going. One morning when I couldn't hear anything here in the valley, Wal reported that he could hear beacons on all bands to 3.4 GHz. So, if you want to work DX then you first choose the site!

Contacts on 24 GHz

In the January issue I referred to a possible 24 GHz contact involving Ashley VK2XSO. Thanks to Tony VK2TJF who initiated contact with Ashley, and to Wal VK6KZ who managed to reach Ashley and received the following reply:

Yes, I have been active on 24 GHz. I haven't had any QSOs near 400 km! That would be inherent of narrow-band gear, which I don't have for 24 GHz, yet.

The best results I've had so far have been 40 km from Kurrajong on the edge of Sydney down to Castle Hill. That has been wide-band FM using klystron driven tellurometers. I also had some 24 GHz Gunn diode systems but I haven't tested them over any large distances.

Can't say I can remember the last time I dragged out the 24 GHz stuff, but was about 18 months ago. The 40 km path in question is always clear, and it would have to be raining or very humid for any sort of drop in signal. It could easily be repeated any day.

I did have other longer paths to test (58 and 80 km) but I haven't tried them. I have no doubt the system will work over those paths if attempted. I'm a long way off a world record and haven't bothered to enter QSLs for it because I'm too lazy!

The tellurometer is a 24 GHz klystron with some weird complex circular polarised waveguide and the antenna is a one foot cassegrain feed dish which is moulded into the case. Otherwise, they look like the 10 GHz versions. The other 24 GHz Gunn diode equipment comes from mutilated radar detectors.

New Beacons

Don VK6HK advises: *That from 18 April 1996 a new 50 and 144 MHz beacon service commenced continuous operation from a location near Bunbury, Western Australia, locator OF76.*

The transmitters have been established on 50.306 and 144.560 MHz with the particular long term aim of providing a useful signal level for the investigation of propagation to the west towards Africa across the Indian Ocean. The effective radiated power on a bearing of 260 degrees is approximately 100 W, horizontally polarised. About 10 W ERP is radiated on the reciprocal bearing of 080 degrees true. The antennas are three and four element Yagis respectively, mounted 25 m above ground. The site is about 300 m above sea level, with the Indian Ocean as horizon at about 20 km distant.

The "rear" lobe should provide a useful signal towards the Eastern States of Australia. The keying mode is on-off on 50.306 and FSK on 144.560 MHz. The latter is key down on 144.560 MHz, with key up 800 Hz lower.

The keying cycle is somewhat different from normal. It is VK6RBU, long dash, followed by 10 seconds of 5 mS pulses spaced 100 mS. The purpose is to provide the basis for individuals to experiment with looking for backscatter echoes from reflecting media, by displaying the signal on a CRO. The same keyer is used on 50 and 144, so the 144 signal might be used to trigger the display of 50 MHz echoes, and so determine the distance away that these are occurring.

Any reports of these transmitters to VK6HK, QTHR or packet VK6HK@VK6BBR.#PER.#WA.AUS.OC please.

New Zealand

Cliff ZL1MQ was to float my idea of a VK and ZL calling frequency of 50.130 MHz in the April issue of *Break In*. It will be interesting to see how much feedback results, as the idea in VK was broken only by the deafening silence!

Cliff also writes: *They have a Sunday night band report on 3.820 MHz, with ZL1 and ZL2 as regulars and occasionally ZL3 and ZLA. ZL2CD can no longer operate from Wellington due to TVI and Channel 1 TV. Those in a Channel 1 area can operate only from 51 MHz up, with some doing quite well using 50 MHz receive and 51 MHz transmit. Those who had a permit to operate on 50 MHz in October 1995 were required to sign a 20 year agreement, expiring October 2015, with the licensing authority, that they would transmit on a non-interference basis to television.*

TVNZ bought second-hand Channel 1 transmitters in 1995, we can only guess that they came from VK when Channel 0 was closed, so it appears we are "stuck" with Channel 1 for twenty years!

VK2FLR Reports

The following was received from **Mike VK2FLR** and, unfortunately, had to be held over due to the mass of tropospheric reporting during April and May.

Mike reports that: *The summer DX season produced a fair swag of Es on 144 MHz. One of the best was to VK2FZ/4 on 20/1 with 5x7 signals both ways. At just over 800 km this constitutes the shortest skip I have heard on 144 MHz.*

I again operated from Tumut between Christmas and New Year with the usual aircraft-enhanced signals on 144 and 432 into Sydney, Canberra and Melbourne, sometimes simultaneously. The portable operation was an FT736 with 25 watts on both bands to a six element Yagi on two metres and a 15 element NBS Yagi on 70 cm.

On the ARRL EME scene I was on for the October session but, because the North American window coincided with early evening prime time TV in eastern Australia, I was restricted to the European window, working five stations.

EME conditions have not been good in recent months as the Faraday rotation seems much slower now that we are approaching solar minimum. Until recently, Faraday could be relied upon to rotate every 60-90 minutes or so, producing reasonable signals for at least part of the time. But it is now common to be locked out for the whole of a typical three hour window to Europe or the Eastern US. Of course, sometimes it works

the other way and you can be locked in for hours!

During the VHF Field Day I had a random meteor scatter attempt with Alan VK5BW/p. The contact nearly came off as Alan had copied both callsigns and was sending me reports when he lost power half way through the one hour sked. A pity as it might have stirred some of the VK5s to try the mode.

Since VK5VF on 144.450 MHz can be heard via meteors in Sydney, any VK5 running about 100 watts to a 10 element Yagi or better should have no trouble completing a meteor scatter contact.

One item of interest is the welcome return of Rod VK2BQJ at Oyster Bay. Rod is slowly getting things together again for 432 and 1296 MHz. He has participated in a recent bulk order for 1296 transverter kits from VK5 Division, which should result in several new Sydney stations on 1296 MHz.

Six Metre Tropo Scatter

John VK3ATQ phoned to say he has been conducting six metre scatter experiments every weekend for years. He runs 100 watts to a six element NBS Yagi at 23 m on 50.115 MHz before work, between 7.15 and 7.30 EST (2115 to 2130 UTC). Andrew VK7XR is usually 5x1, but sometimes CW is necessary over the 400 km path.

He frequently works Rob **VK2TWR** at 450 km despite Rob running only 10 watts to a five element at 30 m, soon to be upgraded to 100 watts. Rob at Nimmitabel is 1000 m ASL and this probably accounts for the contacts. Signals are around 3x1 on SSB and 519 on CW. Falling snow will prevent contacts to Rob, but snow on the ground is no problem.

I queried these 10 watt contacts between John and Rob as they almost seem like groundwave, the low power tending to rule out scatter contacts. John replied that Rob's location is similar to that of a prime portable site and we all know what elevation can do to enhance VHF signals. Whatever the mode, they are being made consistently.

Other possible contacts are Rob VK3DEM, John VK3BQF, Mark VK2EMA and Eddie VK1VP, the latter worked recently. Another interested station is Andrew VK2ANS in Sydney.

John urges others to try this mode. The paths to 400 km are usually reliable but the signals not strong; however, not knowing who may be heard, makes the effort worthwhile.

John also said that Frank VK7ZMF lost his 16 m (50 foot) DL6WU six metre Yagi in a recent gale. However, by Christmas he expects to have a pair of these Yagis operational! The mind boggles at the wind loading such a system presents, but we wish Frank well; their performance should be exceptional. *[I am pleased to say my long-boom six element withstood a recent 140 km/h gust without damage - thankfully it was pointed in the right direction for maximum protection ... VK5LP]*

Nev **VK2QF** sent a fax to say he has changed houses in the same Hargraves area but is without a shack or antennas. However, forward planning indicates a shack and three towers will be in service by March 1998. His main interest will be six metres and for this he will use a long Yagi at 24 metres.

Rod VK2TWR, apart from having successful low power contacts on six metres, is also active on 144 and 432 MHz. On 1/2 at 2315 he worked John VK4FNQ in Townsville 5x8 on 144 MHz Es. 14/2: 2048 **VK7XR** on both bands, and again on 15/2. On 24/3 there was a small six metre opening and VK2TWR worked VK4BRG and VK4CWJ. 30/4: 1040 VK7XR 5x3; 3/5: VK7XR 5x1, both contacts on 144 MHz and the distance 680 km.

TEP Contacts

Graham VK6RO reports that on 19/4 between 0600 and 0625 he worked JA0, JA1 and JA2 areas with signals to 599. At the same time, TV carriers were noted on 48.240, 48.250, 49.750, 55.250 and 57.750 MHz. The contacts appeared to result from an Es extension as one JA reported he had Es to Taiwan.

John VK4KK reports intermittent JA contacts into Brisbane, and John VK4FNQ reports the same for the Townsville area. Based on previous years it seems likely that there will be increased JA TEP activity next October, with successive years providing more contacts each equinox. Phil VK5AKK also worked JA.

Two Metres

Rob VK3DEM at Bairnsdale sent a fax to say that on 19/1 he worked ZL3TLG 5x2, and on 21/1 ZL1TWR 5x3-5 at a distance of 2459.4 km, ZL3AIC 5x5, copies of QSL cards sighted.

A set of good conditions on 20/4 produced the following contacts on 144.200: VK1BG 5x4, VK1BUT 5x1, VK1DO 5x5, VK2BAF 5x2, VK2BWT 5x4, VK2TWR 5x7, VK2ZAB 5x3, VK3AJN 5x9, VK3AMZ 5x5; on 21/4: VK1BG 5x8, VK1DO 5x7, VK1VP 5x5, VK2BBF 5x2, VK2BIT 5x2, VK2BWT 5x3, VK2ZAB 5x2, VK3AUU 5x8.

A dispatch from **VK4IF/VK4JSR** reports that: *Strong Meteor Scatter "pings" have been received from stations on 144 MHz to the south of VK4. On 3/5 in Brisbane, VK2TWR was heard 5x9 for 15 seconds and VK3AUU was 5x5 for five seconds. On 4/5 VK3AMZ was 5x7 for five seconds. These are UTC days and the time between 2200 and 2230. Apart from these strong bursts, several small "pings" were received during the morning.*

Ron VK3AFW also sent a report of 144 MHz contacts made via meteors: 3/5: VK3AUU worked VK2DVZ. On 4/5 VK3AUU to VK2DVZ, VK3AMZ to VK2DVZ and VK2DXZ, VK3BRZ to VK2DVZ, all reports S5, time 2200. A tropo contact between VK7XR and VK2TWR occurred on 29/4.

In addition, some of Ron's contacts have been: 3/4 2210 to VK7XR 5x3 tropo; 5/4 2021 VK4OE meteor; 24/4: 2247 VK1BG, 2256 VK1DO 5x2, 2257 VK2BIT 5x1, 2303 VK1BUC 5x7, all via aircraft enhancement.

Europe

I have just received the April news sheet from **Ted Collins G4UPS,** and he asks that wide distribution be given to the following: *The club station of the European Radio Communication Agency, located in Copenhagen, Denmark at grid JO65hq, will soon be on six metres with the exotic callsign 5P1ER. The station will run 100 watts to a six element Cushcraft antenna from a tower 15 m above the roof of the five storey building in which the Agency is situated.*

Although the European Agency is on sovereign territory, this station does not count as a separate entity for DXCC, but rather as a unique Danish station. Knowing this, a pile-up should be avoided when F2 next allows the station to be heard.

First Es in Europe for the year available on 21-27-28/4 with contacts to DL, EH, F, HA, I, OE, OH, OK, OZ, SM, SP and YL. That's twelve countries for openers!

Lack of Packet News

For some time I have wondered why I never see anything on my packet system relating to VHFSIX, or SIX NEWS, 50 MHz, etc. For some reason it is not being listed for me and others in VK5 to read. John VK4FNQ sent me a copy of the message list for the past couple of months, and there are scores of messages listed which I could sort through and use in the compilation of my notes.

Until I find out what is going on, John has kindly offered to send me copies of the information I need. I just hope, that for whatever reason, the appropriate information is not being deliberately filtered out at some point in the message path. But it seems very strange that only the VHF information is missing, everything else appears to be there, including general information from overseas, Australia and

New Zealand. After the expense of installing a packet system, I am not privy to all that appears on it. Why?

Internet Six News

Courtesy of **John VK4FNQ**, I have received with thanks the April copy of *Internet Six News* which originates from Geoff GJ4ICD in Jersey. I am grateful to at least be receiving this information.

1/4: VK3SIX on 28 and 50 MHz have closed down for the time being.

3/4: e-mail pages: **Geoff GJ4ICD** says: *We shall be introducing the 50 MHz Email listing soon as a separate 50 MHz page on Internet Six News....we already have over 3000 Email addresses for 50 MHz but no callsigns as they are on our mailer, therefore, could all 50 MHz amateurs send a one line Email with their: Call, Name, Email address to: equinox@itl.net.*

4/4: SV9SIX beacon is off the air for an undefined period. VP2EA on 50.012 is again operational.

13/4: VK4FNQ reports JA beacons at 0915 - JA2IGY, JA66YBR. Heard JA6TEW calling. TV video on 49.745, 49.750.

14/4: JAs to VK - 0803 VK8RH, 0805 VK5AKK, 0811 VK8MS, 0824 VK5ZBK.

26/4: SK3SIX beacon off due to snowstorm which destroyed the antenna and transmitter on the mountain site.

28/4: Bob WA1OUB reports that: *He copied very weak 48.250 European video from 1400 to 1420. Signals peaked to S1 with what appeared to be meteor enhancement which is typical of a partially open (triple hop) path. This is quite early in the season and may be an indicator of good things to come.*

Closure

Remember that June and July are months when it is not unusual for Es to appear, most commonly on six metres.

Closing with two thoughts for the month:

1. Education is the ability to listen to almost anything without losing your temper or your self-confidence; and

2. The reward of a thing well done is to have done it.

73 from The Voice by the Lake.
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Packet: VK5LP@VK5WI.#ADL.#SA.AUS.OC
ar

Spotlight on SWLing

*Robin L Harwood VK7RH**

Please note that there are changes to my postal and e-mail address. My postal address now is 5 Helen Street, Newstead TAS 7250. My Internet provider suddenly went out of business and didn't give much warning to the hundreds of subscribers. This meant that I hurriedly had to scramble to a more reliable source. I am now with an excellent server with faster connections than was previously available. This is especially noticeable on the Web and downloading relevant information is much quicker.

There are over 30 major international shortwave broadcasters who now have a presence on the Web. It is fairly easy now to click and retrieve schedules, compared to looking through Newsgroups such as "rec.radio.shortwave" or "rec.radio.info". These sources do continue but mainly contain comments from listeners and/or broadcasters on related topics. Some frequency information is still readily available.

Not all Internet users, however, readily obtain access to the World Wide Web. Newsgroups are text-based, while Web sites (or home pages) are usually graphics. This means that it often takes longer to download information from a home page which includes graphics. However, many sites do have a text-only facility and it can save time (and money) by clicking on at that point.

Some broadcasters are also placing audio from their programming in various formats on these sites. Most of these are in the Real Audio format and, before you can access files, you must have that necessary software readily available. If you don't have this, there usually is a pointer to the relevant site for you to retrieve it. The audio quality is variable and certainly not hi-fi. It can be garbled, due primarily to congestion on the Net.

Little audio clips are useful, especially for Interval Signals and Identification announcements. I have heard these from Radio Liberty. Another widely used format on the Net is .wav files. I have often taken short audio news clips in this format from CNN but I was recently caught while downloading the English news from the VOA in Washington. After 20 minutes and roughly three megabytes, with no sign of when the file would end, I disconnected. It is much easier listening to the 10 minute bulletin direct on shortwave!

I have an apology to the Southern Cross DX Club in Adelaide. In last month's column I reported that the future of the club was in question and that their monthly "DX Post" had been cut back to bi-monthly. I can now report that the Club's future is assured and, thanks to the membership who have rallied around, "DX Post" will revert to being monthly as from this month.

Bravo! Those who, fortunately, have Internet access are indeed able to follow what is happening, yet the majority of listeners and DXers rely on their monthly magazines to keep abreast of developments. Their address is GPO Box 1485, Adelaide SA 5001 and the subscription is $AUS28.00 per annum.

I notice that Radio Ulan Bator in Mongolia is heard on 12085 kHz between 1200 and 1300 UTC in English. It is directed to Australia and SE Asia. A parallel frequency of 9745 kHz was quoted but not heard here. The announcers appeared to be British or Australian which made for better listening as the modulation was terrible, yet the signal of the carrier is quite strong. They also announced a 0900 UTC release on 12085 and 11850 kHz.

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ar

VK QSL BUREAUX

The official list of VK QSL Bureaux. All are Inwards and Outwards unless otherwise stated.

VK1		GPO Box 600 CANBERRA ACT 2601
VK2		PO Box 73 TERALBA NSW 2284
VK3	Inwards	Box 757G, GPO MELBOURNE VIC 3001
	Outwards	40G Victory Blvd ASHBURTON VIC 3147
VK4		GPO Box 638 BRISBANE QLD 4001
VK5		PO Box 10092 Gouger St ADELAIDE SA 5001
VK6		GPO Box F319 PERTH WA 6001
VK7		GPO Box 371D HOBART TAS 7001
VK8		C/o H G Andersson VK8HA Box 619 HUMPTY DOO NT 0836
VK9/VK0		C/o Neil Penfold VK6NE 2 Moss Court KINGSLEY WA 6026

What's New

Bob Tait VK3UI introduces new products of interest to radio amateurs*

JCK Neck Microphone IC-X07

DAYCOM Communications Pty Ltd supplied this interesting microphone to test.

I have to say that it is a little different to the old throat microphones of yesteryear.

As I drive a vehicle which has an ambient noise level of around 80 dBA at around 80 kph, I was keen to try it out. On air reports could not detect any apparent vehicle noise; however, I did receive reports that the audio was a little deeper than usual. Most of my contacts were surprised to learn that I was using this little microphone.

The assembly comprises a spring ring, which is hinged in the centre, and at the end of this ring is an electret microphone. A short fly lead from the microphone housing has an earphone attached which allows the microphone to be clipped around your neck with the earphone in your left ear. The received audio response was similar to my Walkman. At 100 kph it got a bit noisy, but I could still copy the local repeater.

Also attached to the microphone housing is the main cable which has a PTT attached to it at about waist level. At the end of this cable is the standard handheld connector used on Yaesu, Kenwood, Alinco and Icom rigs. In the side of the PTT switch is a socket for an extension PTT which allows a finger operated PTT to be interfaced. The normal PTT has a belt clip for attachment to a trouser belt if required.

When attached the microphone sits to the left of your throat. I found that it was very comfortable to wear, even for up to an hour. I also tried the IC-X07 whilst bicycle mobile and pedestrian mobile and found it easy to use.

The IC-X07 is available from Daycom Communications Pty Ltd at $79.50.

MFJ-114X Giant Wall/Desk Mounted Clock

This unit is ideal for the short sighted, or for those visitors who won't take the hint and go home at a reasonable hour. With the readout at 60 mm high the numerals are a bit hard to miss.

Time setting is very simple with one button which toggles between hours and minutes, and another for setting the figures. The procedure is then repeated for UTC.

A selector switch allows either local time or UTC to be selected. The display for local time is 12 hour format and for UTC is a 24 hour format. Two AA batteries provide a backup supply is case of a power failure; during backup the LED displays are turned off to conserve power. The main power is provided by a 12 volt AC plug pack rated at 500 ma. This clock is covered by 12 months warranty.

The clock suffered from one annoying problem in that the display locked up if the mains supply was interrupted more than once within a period of 30 seconds. To reset the display, simply remove the backup batteries, then replace them and reset the time. This type of failure could occur if a vehicle ran into a local power pole where the supply is not immediately shut off.

This clock is available from Daycom Communications Pty Ltd at $89.00.

MFJ-864 HF/144/440 MHz SWR Bridge/Power Meter

The new MFJ-864 operates from 1.6 MHz to 60 MHz on HF, and on 144 and 440 MHz. The band selection is provided by a simple six position switch. The meter is a single scale cross needle movement measuring 50 mm by 25 mm. It has two ranges for each band selected, the low power range being 0 to 30 watts for forward power and 0 to 6 watts reflected power.

On the high power range it is 0 to 300 watts forward power and 0 to 60 watts reflected power. This instrument incorporates two bridges, one for HF and one for VHF/UHF. This arrangement allows you to monitor both HF and VHF/UHF with the same unit.

If you are the proud owner of an IC706 or DX-70 the MFJ-864 is just the thing for you. An inbuilt meter lamp is provided for connection into the lighting circuit of your vehicle. On air tests on all HF bands, 144 to 148 MHz and 430 to 450 MHz, compared favourably with the readings obtained from my commercial units.

The MFJ-864 is available from Daycom Communications Pty Ltd at $189.00.

**C/o PO Box 2175, Caulfield Junction VIC 3161*

ar

Silent Keys

Due to space demands obituaries should be no longer than 200 words.

The WIA regrets to announce the recent passing of:-

K M (Ken)	CARLTON	VK3MKC
W J (Jim)	BERRY	VK4WB
W R	WOODLEY	VK6DJ

William James Berry VK4WB

The writer knew Jim at Silkstone State School. We were both eight years old. His first involvement in radio was making a crystal set from a circuit drawn by his teacher.

In secondary school, Jim produced, as a project, a Micrometer Screw Gauge, an instrument he used up to the date of his decease.

Joseph Berry, Jim's father, was his first employer on a drilling rig test boring for Cracow Gold Mines and later the foundations for the Storey Bridge in Brisbane.

Several years of various jobs followed after leaving his father until finally, before WWII, Jim went into a reserved occupation as an instrument mechanic.

Post war, Jim started his own business repairing and maintaining taxi meters. This business he ran until his retirement five years ago. Most of the meter test instruments were designed and built by Jim, including those used when taxi meters became all electronic.

Jim was a keen motor-cyclist and regularly rode a modern fast machine up to the date of his 80th birthday. He will indeed be sadly missed by those who knew him. He died at his home from a burst aorta. Jim never married, claiming that he was always too busy to find a partner.

Jim was a consistent station each day on the well known Coral Coast Net, controlled by Les Bell VK4LZ at Airlie Beach. Jim will be sadly missed by everyone of the stations participating in that large group every day.

King Saxelby VK4ADS

ar

Update

Page 21, *Amateur Radio* April 1996

The gremlins have been at work. The caption to the photograph in the ALARA column had VK9NL and VK6DE reversed. Bev VK6DE is seated and Kirsti VK9NL is standing. Our apologies for any confusion this mix-up may have caused.

It might be a good idea to correct your copy of the April 1996 issue of *Amateur Radio* now.

ar

HF Predictions

Evan Jarman VK3ANI

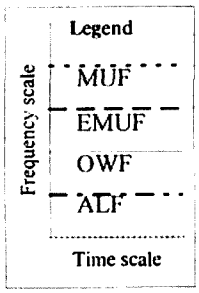
These graphs show the predicted diurnal variation in key frequencies for the nominated circuits. They also indicate a possibility of communication (percentage).

The frequencies identified in the legend are:-

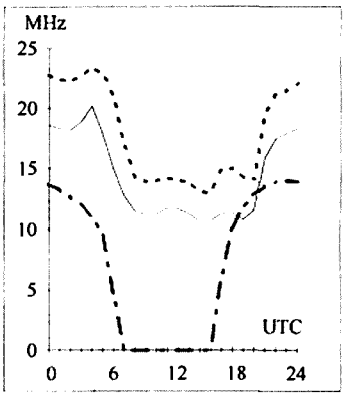
Maximum Useable Frequency (50%)
E layer MUF
Optimum Working Frequency (90%)
Absorption Limiting Frequency

The predictions were made by one of the Ionospheric Prediction Service Stand Alone Prediction Systems. The T index used is shown above the legend. The Australian terminal azimuth (degrees), path length (kilometres) and propagation modes are also given for each circuit. **ar**

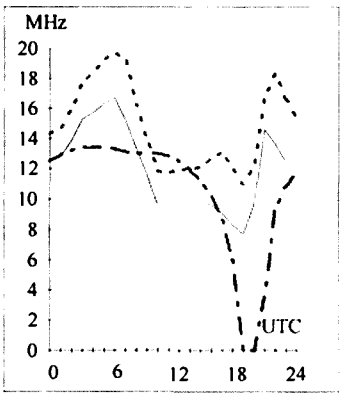
T index:8



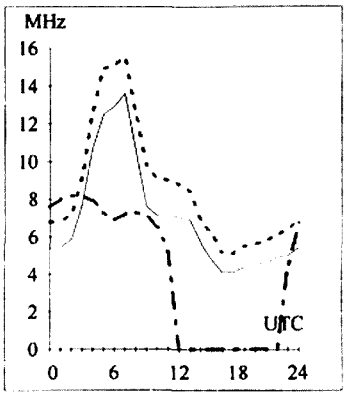
Adelaide-Honalulu 57
First 3F 2-4 3E 0 Short 9160



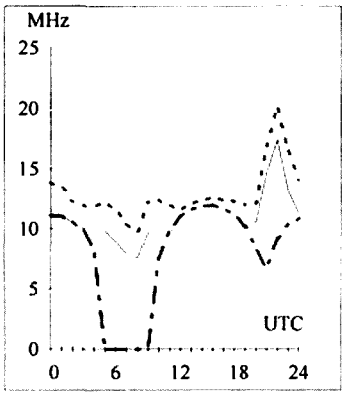
Brisbane-Berne 315
First 0-5 Short 16321



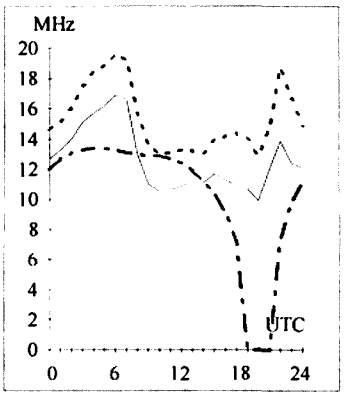
Adelaide-Marion Is 225
Second 4F 9-10 4E 0 Short 8027



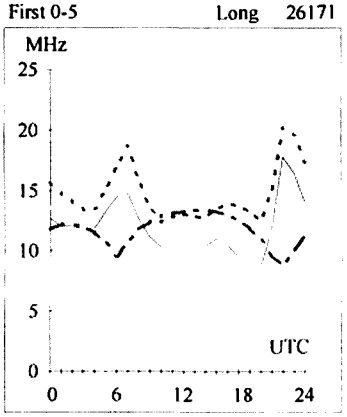
Brisbane-Brasilia 152
First 0-5 Short 14700



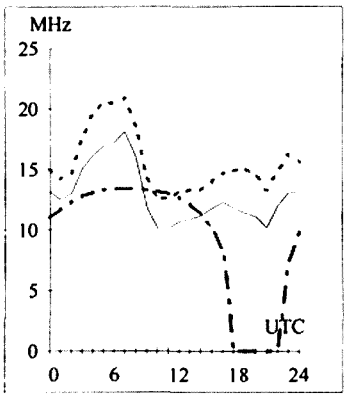
Canberra-Amsterdam 315
First 0-5 Short 16624



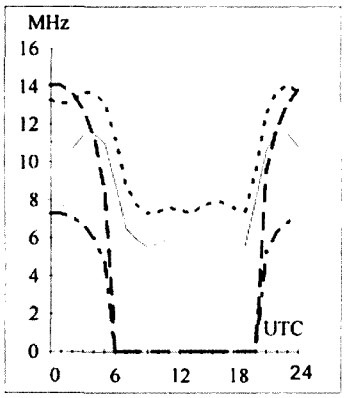
Darwin-London 145
First 0-5 Long 26171



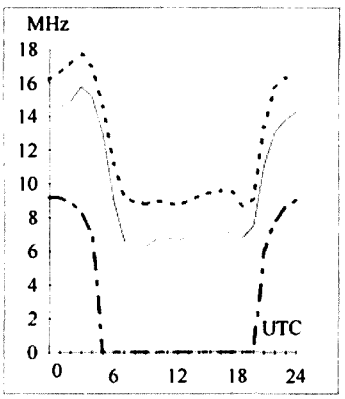
Adelaide-MonteCarlo 298
First 0-5 Short 15771



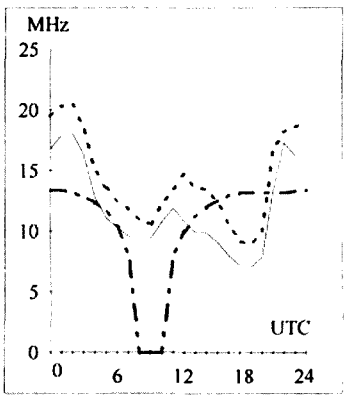
Brisbane-Noumea 70
First 1F 13-18 1E 3 Short 1471



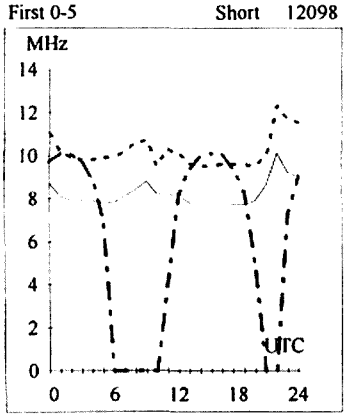
Canberra-Auckland 102
First 1F 6-8 1E 0 Short 2299



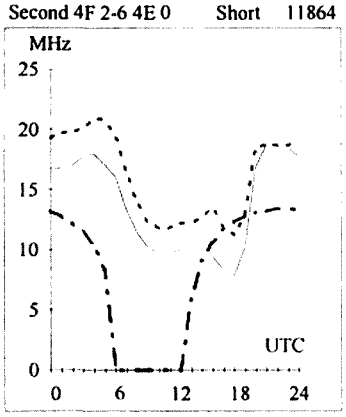
Darwin Louisville 45
First 0-5 Short 15400



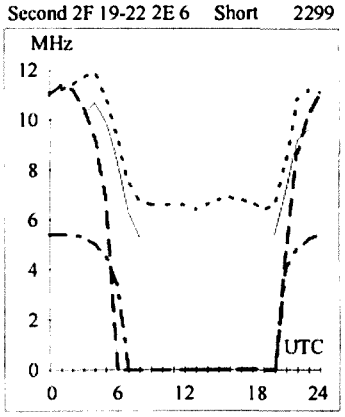
Adelaide-Montevideo 167
First 0-5 Short 12098



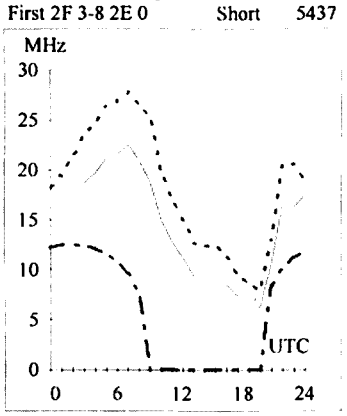
Brisbane-Vancouver 43
Second 4F 2-6 4E 0 Short 11864



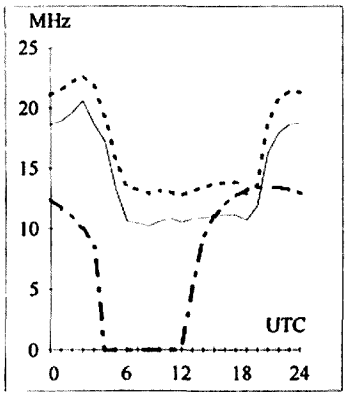
Canberra-Auckland 102
Second 2F 19-22 2E 6 Short 2299



Darwin-Tokyo 10
First 2F 3-8 2E 0 Short 5437



Hobart-Los Angeles 66
First 0-5 Short 12820



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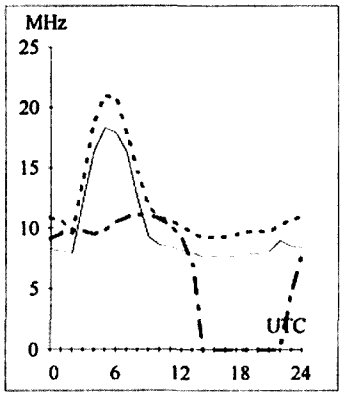
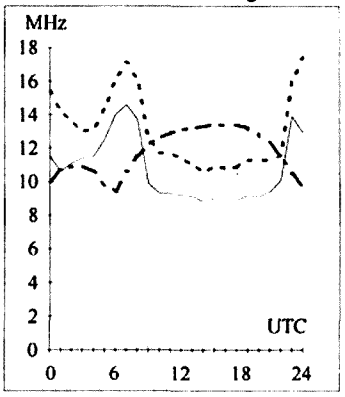
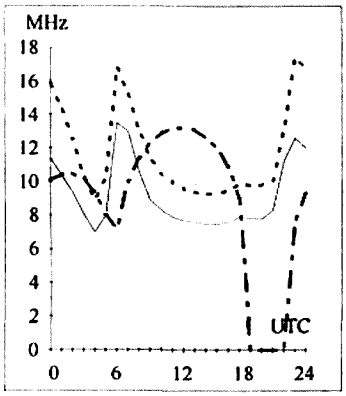


Perth-London 133
First 0-5 Long 25544



Sydney-Dakar 211
First 0-5 Short 17590



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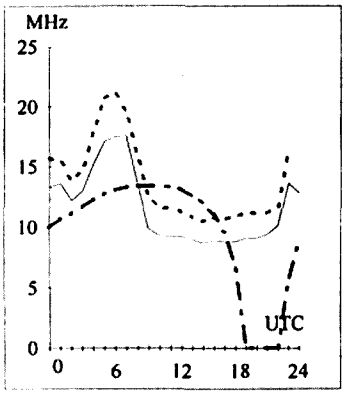

Melbourne-Ottawa 63
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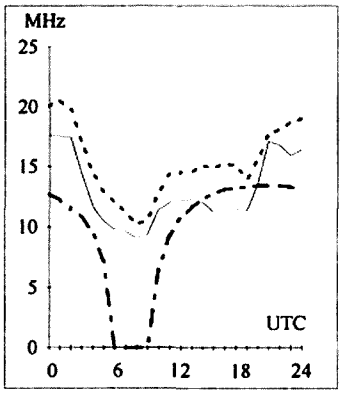
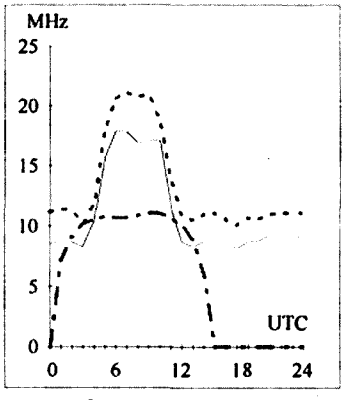
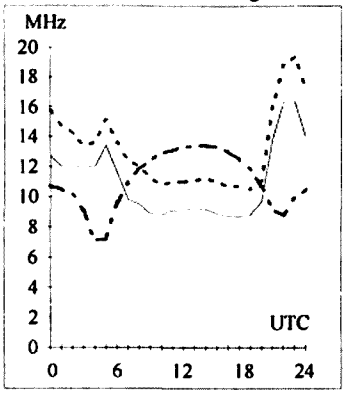


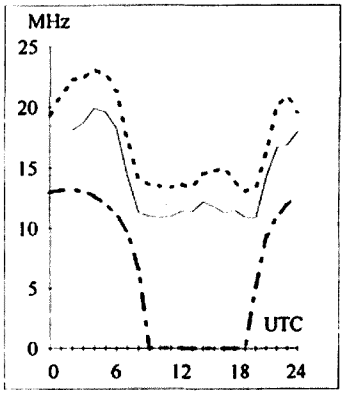
Perth-Pretoria 249
First 3F 3-4 3E 0 Short 8327



Sydney-London 139
First 0-5 Long 23032



Hobart-Tokyo 354
First 3F 2-5 3E 0 Short 8770



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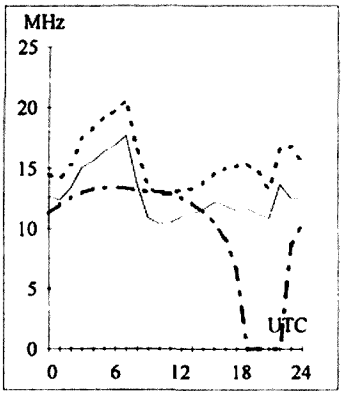

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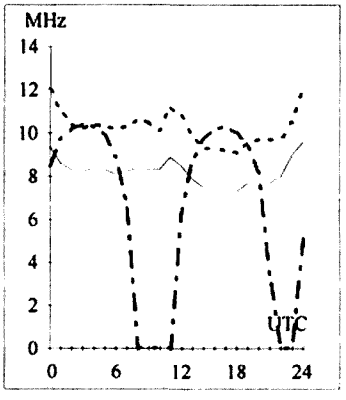

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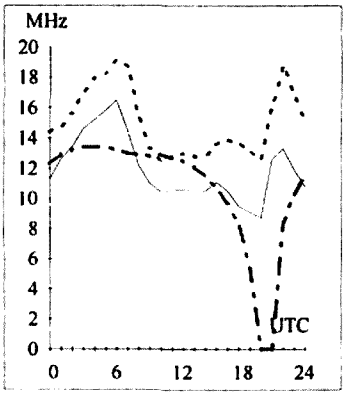

Darwin-Tokyo 10
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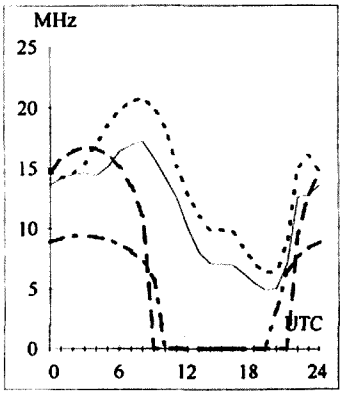

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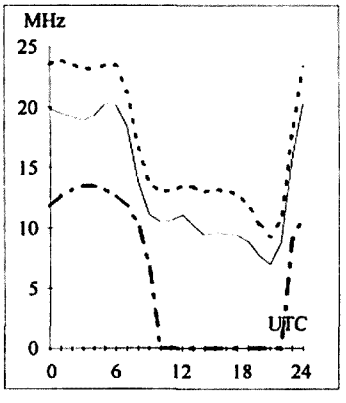

Perth-Seoul 9
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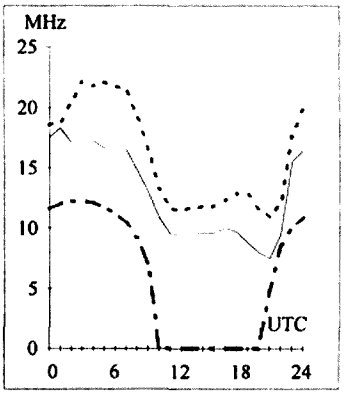
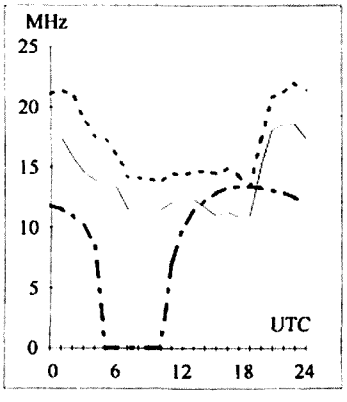


Sydney-Miami 86
First 0-5 Short 15026



HAMADS

TRADE ADS

• **AMIDON FERROMAGNETIC CORES:** For all RF applications. Send business size SASE for data/price to RJ & US Imports, PO Box 431, Kiama NSW 2533 (no enquiries at office please ... 14 Boanyo Ave Kiama). Agencies at: Geoff Wood Electronics, Sydney: Webb Electronics, Albury: Assoc TV Service, Hobart: Truscotts Electronic World, Melbourne and Mildura: Alpha Tango Products, Perth: Haven Electronics, Nowra: and WIA Equipment Supplies, Adelaide.

• **WEATHER FAX** programs for IBM XT/ATs *** "RADFAX2" $35.00, is a high resolution shortwave weatherfax, Morse and RTTY receiving program. Suitable for CGA, EGA, VGA and Hercules cards (state which). Needs SSB HF radio and RADFAX decoder. *** "SATFAX" $45.00, is a NOAA, Meteor and GMS weather satellite picture receiving program. Needs EGA or VGA & WEATHER FAX PC card, + 137 MHz Receiver. *** "MAXISAT" $75.00 is similar to SATFAX but needs 2 MB of expanded memory (EMS 3.6 or 4.0) and 1024 x 768 SVGA card. All programs are on 5.25" or 3.5" disks (state which) plus documentation, add $3.00 postage. ONLY from M Delahuntly, 42 Villiers St, New Farm QLD 4005. Ph (07) 358 2785.

• **HAM LOG v.3.1** – Acclaimed internationally as the best IBM logging program. Review samples....AR: "Recommend it to anyone"; The Canadian Amateur: "Beyond this reviewer's ability to do it justice. I cannot find anything to improve on. A breakthrough of computer technology". ARA: "Brilliant". Simple to use with full help, the professional HAM LOG is immensely popular (now in its 5th year), with many useful, superb features. Just $59 (+ $5 P & P), with a 90 page manual. Special five hour Internet offer. Demos, brochures available. Robin Gandevia VK2VN (02) 369 2008 BH fax (02) 369 3069. Internet address: *rhg@ozemail.com.au.*

• **FERRITE SLEEVED BALUN:** Excellent performance when used in G5RV, dipole or beam antennas etc. 50 ohm, 1.5 – 30 MHz. Fitted eyebolts for use as centre insulator. SO239 (UHF) socket. Eliminates radiation from coax feedline. Helps reduce TVI, BCI, RFI and noise on receive. Maintains balance in antenna. **Only** $64 (+ $5 p&p). Alpha Tango Products, Box 441, Kalamunda WA 6076. Ph (09) 294 4725.

FOR SALE NSW

Deceased Estate of Steve Scott VK2FVB. HF Transceiver **Ten Tec Corsair 2**, s/n 56102625, $1,500; HF Transceiver **FT101** with 11 meters, s/n IJ114114, $450; Yaesu **FRG-7**, $80; HF Linear **Amitron AL811**, few hours use, $800; **Power supply 35 amp** GME electrophone PSA1225, $200; **Morse keys**, Air Ministry type D Ref 10F-7373, $70; Wood & Brass, $70; **Desk mikes Shure**, 2 of, $20 ea; Satellite Station **FT290R** all mode 2 m with 30 watt linear **Toko Hipower HL- 30V**, $500; 2 **Rotators** with 2 m and 70 cm beams, azmuth (Alliance) elevation (CDE), this station was very successful on OSCAR 10 and 13 with a 25 watt 70 rig, $400; **2 m and 70 cm pre-amps**, Advanced Receiver Research SP144VDG, SP423VDG, $100 each; **Baycom modem**, $40; 2 m HT **Icom 022E** with speaker mike, $150; **VHF Admittance Bridge** Wayne Kerr Labs type 8801, VHF Admittance bridge Wayne Kerr Labs type 8901, **CRO** Gossor CDU 150 CT531/3 6625 99 223 1190, $700; **RF Signal Generator** oscillator Test no. 1 CT212; **Power supply** variable 10 amp 0-15 V, 2 of, $50 ea; **Micro Ammeter** desk mount, $15; **Picolog A/D converter** for PC with data logging software, used for antenna test range, $50; **Handi Counter** model 2210A frequency counter 10 Hz-2.4 GHz, $220; **DC power shack distribution box** metered, $20; **AVO DA116** digital multimeter, $40; **Micronta analog multimeter**, $25; **SWR meters** Royce 2-098, $30, Albrec Electronics 3.5-150 MHz, $50, Unbranded 2 m, $25; **Transistor checker** GSD #7, $10, Homemade, $20; **Ammeter** back mount, $10; **Reference amplifier**, $30; **Drill press** 1/3 hp 1/2" chuck on stand with roller support stand and 2 machine vices, $150; **BBC computer** CP/M, 2 drives, monitor, teletext reader, $10. Contact Elsa on (049) 705 266 or Steve VK2SPT (049) 42 8208.

Kenwood TS430S, power supply **PS430**, tuner **AT250**, dip meter **DM-81**, SWR/PWR meter, Asahi ME-11X 80 m **dipole**, telescopic tube masts (3), all books, car mount, $600 the lot. Geoff VK2POA (02) 416 8663.

Yaesu FT757GX with manual, mic, good cond, cont Rx, $1050, s/n 081048; **AT180** tuner, $180 or both together, $1,150 ono. M Tremble VK2BIS (02) 9971 5267 LAO.

Yaesu FT101B HF 100 W transceiver, manual, YD148 desk mike, $350; **MFJ901B** antenna tuner, $60; **MFJ-815B** HF pwr swr meter, $70; **3 Ele 10 m beam**, $50; **Hustler 5 band HF vertical**, $90; **TV-Type rotator** 240v, $70; **Shinwa low-pass filter**, $20. Darrell VK2MNA QTHR (049) 33 2791.

Hills Teletower approx 45 feet, ready to erect, all guys, etc good condition; **Daiwa rotator** and cable; **TH3JR** with balun and coax in storage near Bateman's Bay, the lot $350 ono. Geoff VK2EKP (02) 310 4294.

Shack Clearance, going overseas. **TH6DXX** beam, **Daiwa rotator**, 60 ft winch up **Hills tower** with Kevlar guys, $950, all working, will separate; **Power Supplies** 12 V 15 A heavy stuff, $90 each; **Printers Oki Microline 80 & 84**, A4 width and 15", $35 each; **Z80 based home computer**, disk drives, can be machine code programmed, runs CPM, Wordstar, free to a good home. Household items, workshop tools, eg 10" sawbench & planer, bandsaw, pillar drill, sailboard. Cables, plugpacks, battery charger, bits and pieces at give away prices, arrange a visit, upper Sydney Northshore. Ted VK2EZQ (02) 477 7834.

Yaesu FT209RH 2 m handheld, new battery, case, YH2 headset with VOX, vgc, s/n 180658, $320 ono; **Alinco ALX2T** 2 m handheld, s/n 31073328, new battery fitted, charging cradle, $200 ono. Bruno VK2BPO QTHR (02) 713 1831.

Swan T/M 700CX, s/n 19372, power supply 230X, s/n 2253, xtal filter 16 pole, complete with circuits, spare valves 8950, $500 near offer. H Chapman VK2BHC (02) 644 1929 Licd amateurs only.

Yaesu FT990, s/n IL909231, all filters and MD1C8 mike, $2,850; **Coman** tribander, $350; **Rotator** 502SAX, $250; **Bencher** iambic key, $60; **LP filter**, $50. All ec. Ian VK2UG (043) 92 1234.

Blower Fans for linear amplifiers with built in air filter and air flow switch, 2 1/2" x 3" outlet, quiet running, $25. Ray VK2FW (063) 65 3410.

Hewlett Packard sig gen 608D 10-470 MHz, $325; **Philips** amplifier AM17 class C 100 W linear 70-175 MHz, $250; **Marconi** sig gen TF144 10 kHz – 72 MHz, $295. Peter VK2CPK (02) 605 4790.

Quartz crystals 100 kHz Brookes type MO in sealed glass envelopes, 14 mm dia x 65 mm long, wire lead connections, $10 each. Phil (02) 871 1060 or (019) 90 4724.

Kenwood TS600 6 m all mode transceiver, s/n 710099, mic, manuals, $350; **Tokyo** Hi Power 6 m 80 W linear, HL86V, s/n 819604, preamp, $175; **Kenrotor KR400** rotator control unit, cable, $200; **Telegraph key** Hi Mound BK100, $100. All in vgc. Kevin VK2BKG QTHR (049) 82 2250.

Shack Clearance Sat mornings June 8 and 15, changing QTH, 2 and 6 m valve gear, ground planes, 40 and 80 wire antennas, 2 x 2 oregon mast, lifetime collection vintage "bits and pieces", Vidicon camera, PE cell gear, noise and distortion meter. Arthur Brown VK2IK QTHR (02) 876 1465.

Antenna 20 m monoband 3 element Yagi, perfect condition, cost over $300, sell for $175; **15 m monoband** 3 element Yagi, $35. Both for $200, buyer collect. **MFJ SSB/CW filter**, $55; **HF SWR/PWR meter**, $25. John VK2KV (047) 87 7003.

FOR SALE VIC

Kenwood TS140S 160-10 m 100 W with 30 memories and general coverage receive, $925. Bert VK3BH (03) 9857 9438.

ATN 13-30-8 8 element log periodic antenna, 13-30 MHz complete with all parts and accessories inc balun, manual, vgc, $500; **Frequency counter** Topward TFC-1207 10 Hz-1 GHz variable gate times, attenuator, leads, manual, vgc, $150. Bruce VK3WL, Lara, (052) 82 2664 AH or (03) 9480 0111 BH or Mobile (018) 67 6199.

FL110 linear, all band, as new, s/n 9E060241, $275. Peter VK3NZG (059) 83 2702.

Magicom inbuilt speech processor suits Kenwood TS120 series, new, $75; **UHF dipole** array 420-480 MHz, 3dB eliptical, $45; **Yaesu FT227RA** mobile, scanning microphone, $200. Kerry VK3KFC (054) 60 4726.

Drake SSR communications receiver, $150; **Trio audio generator**, $150; Dick Smith laboratory **oscilloscope** 6.5 MHz, **CAT** Q-1280, $200; **Hustler 5BTV** vertical antenna, $200. Alan VK3TIY QTHR (054) 43 4750.

MTR8000 remote, converted to 6 m, programmed with all repeaters and simplex freqs Australia wide, includes DTMF and Selcall, $200. Tony VK3ZOT (03) 9728 5598 AH.

Radio Amateur World Callbook on CD-Rom, latest version, $35. Damien VK3CD (054) 27 3121.

Yaesu FT-77 HF xcvr, 100 W, with manual and mic, s/n 3E040763, $400. Bert VK3DVY (052) 21 6804.

Yaesu FT-757GX, cat system transceiver with MD-1 desk mic and manual, all in pc, $900. Dean VK3JBH (03) 9796 3128.

Yaesu FL-2100Z, all band linear, ec, $700. Yaesu FP-12 15 amp PSU, $200. Icom IC-02A HH. Spkr/mic, charger, etc, $200. Kenwood TS-520S, ec with CW filter, $375. Ron VK3OM QTHR (059) 44 3019.

FOR SALE QLD

6 meter collinear vertical, 6 dBd, 4 radials, very good bandwidth, excellent construction and performer, made by Com-an-tenna, less than 6 months old, as new cost $157, sell $110. Bernie VK4EJ Strathpine (07) 3205 5098.

Kenwood TS940S HF transceiver with built-in ATU, s/n 9060269, vgc, with mic and manual, orig box, $2,550 ono. Carsten VK4CIC (07) 3264 6443.

Packratt PK232MBX, s/n 45723, Packtor,

Amtor, packet, RTTY, etc, $400; **Icom 275H**, s/n 1819, all mode 100 W 2 m, all accessories, $1,700. P Oliveri VK4PO (07) 3408 6005.

Valves for amateurs and restorers, octals, novals, sockets, 807, 12BY7A, 12AX7, 12AU7A. Some used, all tested. Rectifiers, regulators. Kenwood **MB100** mobile rack for 130S. HF/VHF **variable capacitors**. Send sase for list. Ted VK4YG QTHR (070) 97 6387.

Tribander beams, **Wilson SY-2** 4 el, $250; Hygain **TH6DXX** 6 el, $400; Yaesu **FT101ZD**, $450; 80 ft 4-stage **telescopic tower**, $700; **Valves**, ancient and modern, ARRL antenna **handbooks**, **Scope** iron. Hadgraft, 17 Paxton St, Holland Park Qld 4121 (07) 3397 3751 AH.

ATU, $50; **Linear amp**, $100; **Digital clock**, $10; **Antenna selector box**, $80; **4-band transceiver**, $150; **Digital keyer**, $50; Trio receiver **9R-59DS**, $100; Dick Smith **CRO**, $80; **Audio Oscillator**, $50; RF all band **sig gen**, $50; **Capacity meter**, $20; **RF voltmeter**, $50; **BC221** wavemeter & x/tal calibrator, x/tal spot XXX & band calibrator, $50. A Donaldson VK4ABD QTHR (074) 91 2974.

Kenwood TS-50S HF transceiver and **SGC SG-230** antenna tuner, brand new and unopened, value $2,725 sell $1,950 ono. Greg (07 3837 3027 BH or (07) 3279 6035 AH.

FOR SALE SA

Tektronix 453 oscilloscope, has problem with HV power, 100 MHz dual channel, includes service manual, price is right – **free**. Arrange for shipment or pick up in Alice Springs. Includes service manual. "JJ" VK8JJ (08) 8953 2209

Log Periodic (8 el), **RF connectors, microphones, new mic cords, antenna bases, CRO probes**, 10-11 m **5 element beam**, 40 channel and 18 channel switches for PLL 02H CB radios. Much more, from $1.00. Paul VK5MAP QTHR (086) 51 2398.

FOR SALE WA

Yaesu FL2100Z linear amplifier in vg condition, covers 10 through 160 metres. Syd VK6HE (09) 293 2347.

Yaesu FT620B 6 m transceiver, s/n 51002171, in original carton with all accessories, manual, $100. Chris VK6DDX (09) 447 9152.

WANTED NSW

Telecom "Attache" **13.8 volt power supply**. Ken VK2SX (0412) 00 3517 or (02) 413 1846.

Mecrograph or **The McDonald Pendograph** or any unusual Australian keys or jiggers. Pay top dollar for any of the above. Steve VK2SPS (02) 9999 2933 after 6pm.

Morse register made by Siemens Bros & Co Ltd Woolwich. This is clockwork driven device which prints Morse characters on paper tape. Also **Type A Mark 3** spy radio. Ric VK2PH (02) 817 0337.

Singer FM10CS handbook, loan or copy to enable repair of same, all costs, priority mail, etc covered. Ray VK2FW (063) 65 3410.

WANTED VIC

Speaking digital multimeter (for visually handicapped experimenter), Radio Shack/Tandy/ Micranta or similar. Reasonable price paid or appropriate swap. Drew VK3XU QTHR (03) 9722 1620 AH or (03) 9253 6199 BH.

TA33Jun or **TH3Jun** antenna, must be in sound condition with undamaged traps. **TA33Jun traps** without metalwork also considered. George VK3GI (054) 27 2576.

WW2 Type 2 Mark 2 transceiver for Moorabbin and District Radio Club Museum. I sold mine many years ago. It was in a wooden box. Alf Chandler VK3LC QTHR (03) 9589 5344.

Headset, or headset plug with some lead attached, for army radio **Type A510**. I also need any technical information for army **No 19 Mark Three** wireless set. Clem VK3CYD (051) 27 4248 AH.

Coaxial adaptor 1 5/8 inch male to N. Roy VK3ARY QTHR (03) 9807 4798.

WANTED QLD

Ten Tec Corsair II, model 561, must be vgc with manual, no mods. Dick VK4GOR QTHR (07) 3379 1600.

Heathkit 6 m amplifier, Heathkit 2 m all-mode transceiver, Heathkit **SB200** amplifier, Heathkit **VHF SWR-power meter**, Heathkit **HF SWR-power meter**, Heathkit rotary **coax switch**, Heathkit **HW16**, **HW101**, **DX40**, **DX60** transmitters/ transceiver for operational Heathkit Museum. Contact "Doc" VK4CMY PO Box 24, Dalveen Qld 4374 or phone (076) 85 2167 before 8 pm please. Vietnam Veterans Wireless Group.

WANTED SA

Three back issues of **Amateur Radio Action**, April, May and June 1995. Hank VK5HAO (08) 272 7435 after 6 pm local or 0830z.

Volt meter 0-20 V 70 mm x 70 mm, must be in good condition and good working order. Also **EAT300** Emtron tuner (not cross needle), must be in good condition and good working order. Paul VK5MAP QTHR (086) 51 2398.

WANTED WA

Any **old valve radios**, parts and circuit diagrams, also any early or unusual **valves** for collection, any help appreciated, distance is no problem. Ray VK6KRP Phone/fax (09) 296 1702 or (018) 94 0572.

WANTED TAS

AWA Volt Ohmyst model 2A56074 with probe IR56075. Doug VK7DK QTHR (003) 98 1170.

MISCELLANEOUS

• **THE WIA QSL Collection** requires QSLs. All types welcome especially rare DX pictorial cards and special issue. Please contact Hon Curator Ken Matchett VK3TL, 4 Sunrise Hill Road, Montrose Vic 3765, Tel (03) 728 5350.

• **CONVENTION** for Radio and Computer enthusiasts in Rockhampton, 21 – 22 September. Trade displays, technical talks, ARDF and more. Entertainment for the spouse. Mark the date. Phone (079) 34 2910 or (079) 28 2533 for more info. Doug Kraatz, WIA Central Queensland Branch.

ar

Hamads

Please Note: If you are advertising items For Sale and Wanted please use a separate form for each. Include all details: eg Name, Address, Telephone Number (and STD code), on both form. Please print copy for your Hamad as clearly as possible.

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WIA Divisions

The WIA consists of seven autonomous State Divisions. Each member of the WIA is a member of a Division, usually in their residential State or Territory, and each Division looks after amateur radio affairs within its area.

Division	Address	Officers			Weekly News Broadcasts		1996 Fees
VK1	ACT Division GPO Box 600 Canberra ACT 2601	President Secretary Treasurer	Philip Rayner John Woolner Bernie Copier	VK1PJ VK1ZAO VK1KOX	3.570 MHz LSB, 146.900 MHz FM each Sunday evening commencing at 8.00 pm local time. The broadcast text is available on packet, on Internet aus.radio.amateur.misc newsgroup, and on the VK1 Home Page http://email.nla.gov.au/~cmakin/wiaact.html	(F) (G) (S) (X)	$70.00 $56.00 $42.00
VK2	NSW Division 109 Wigram St Parramatta NSW (PO Box 1066 Parramatta 2124 Phone (02) 689 2417 Freecall 1800 817 644 Fax (02) 633 1525	President Secretary Treasurer (Office hours Web:http://sydney.dialix.ozau/~wiansw e-mail address: wiansw@sydney.dialix.oz.au	Michael Corbin Eric Fossey Eric Van De Weyer Mon-Sat 11.00-14.00 Mon 1900-2100)	VK2YC VK2EFY VK2KUR	From VK2WI 1.845, 3.595, 7.146*, 10.125, 24.950, 28.320, 29.120, 52.120, 52.525, 144.150, 147.000, 438.525, 1281.750 (* morning only) with relays to some of 14.160, 18.120, 21.170, 584.750 ATV sound. Many country regions relay on 2 m or 70 cm repeaters. Sunday 1000 and 1930. Highlights included in VK2AWX Newcastle news, Monday 1930 on 3.593 plus 10 m, 2 m, 70 cm, 23 cm. The broadcast text is available on the Internet newsgroup *aus.radio.amateur.misc*, and on packet radio.	(F) (G) (S) (X)	$66.75 $53.40 $38.75
VK3	Victorian Division 40G Victory Boulevard Ashburton Vic 3147 Phone (03) 9885 9261 Fax (03) 9885 9298	President Secretary Treasurer (Office hours	Jim Linton Barry Wilton Rob Hailey Tue & Thur 0830-1530)	VK3PC VK3XV VK3NC	VK3BWI broadcasts on the 1st and 3rd Sunday of the month, starts 10.30 am. Primary frequencies 1.840 AM, 3.615 LSB, 7.085 LSB, and FM(R)s 146.700 Mt Dandenong, 147.250 Mt Macedon, 147.225 Mt Baw Baw, and 2 m FM(R)s VK3RMA, VK3RSH and VK3ROW. 70 cm FM(R)s VK3ROU and VK3RGL. Major news under call VK3WI on Victorian packet BBS.	(F) (G) (S) (X)	$72.00 $58.00 $44.00
VK4	Queensland Division GPO Box 638 Brisbane QLD 4001 Phone (074) 96 4714	President Secretary Treasurer	Geoff Sanders John Stevens John Presotto	VK4KEL VK4AFS VK4WX	1.825 MHz SSB, 3.605 MHz SSB, 7.118 MHz SSB, 14.342 MHz SSB, 28.400 MHz SSB, 29.220 MHz FM, 52.525 MHz FM, 146.700 MHz FM, 147.000 MHz FM, 438.525 MHz (Brisbane only), regional VHF/UHF repeaters at 0900 hrs Sunday. Repeated on 3.605 MHz SSB & 147.000 MHz FM, regional VHF/UHF repeaters at 1930 hrs EAST Monday. Broadcast news in text form on packet under WIAQ@VKNET.	(F) (G) (S) (X)	$72.00 $58.00 $44.00
VK5	South Australian Division 34 West Thebarton Rd Thebarton SA 5031 (GPO Box 1234 Adelaide SA 5001) Phone (08) 352 3428	President Secretary Treasurer	Peter Watts Maurie Hooper Charles McEachern	VK5ZFW VK5EA VK5KDK	1827 kHz AM, 3.550 MHz LSB, 7.095 AM, 14.175 USB, 28.470 USB, 53.100 FM, 147.000 FM Adelaide, 146.700 FM Mid North, 146.800 FM Miidura, 146.825 FM Barossa Valley, 146.900 FM South East, 146.925 FM Central North, 147.825 FM Gawler, 438.425 FM Barossa Valley, 438.475 FM Adelaide North, ATV Ch 35 579.250 Adelaide. (NT) 3.555 USB, 7.065 USB, 10.125 USB, 146.700 FM, 0900 hrs Sunday	(F) (G) (S) (X)	$72.00 $58.00 $44.00
VK6	West Australian Division PO Box 10 West Perth WA 6872 Phone (09) 351 8873	President Secretary Treasurer	Cliff Bastin Christine Bastin Bruce Hedland-Thomas	VK6LZ VK6ZLZ VK6OO	146.700 FM(R) Perth, at 0930 hrs Sunday, relayed on 1.825, 3.560, 7.075, 14.116, 14.175, 21.185, 29.680 FM, 50.150 and 438.525 MHz. Country relays 3.582, 147.350(R) Busselton and 146.900(R) Mt William (Bunbury). Broadcast repeated on 146.700 at 1900 hrs Sunday, relayed on 1.865, 3.563 and 438.525 MHz; country relays on 146.350 and 146.900 MHz.	(F) (G) (S) (X)	$60.75 $48.60 $32.75
VK7	Tasmanian Division 5 Helm Street Newstead TAS 7250 Phone (003) 44 2324	President Secretary Treasurer	Andrew Dixon Robin Harwood Terry Ives	VK7GL VK7RH VK7ZTI	146.700 MHz FM (VK7RHT) at 0930 hrs Sunday relayed on 147.000 (VK7RAA), 146.725 (VK7RNE), 146.625 (VK7RMD), 3.570, 7.090, 14.130, 52.100, 144.150 (Hobart) Repeated Tues 3.590 at 1930 hrs.	(F) (G) (S) (X)	$72.00 $58.00 $44.00
VK8	(Northern Territory is part of the VK5 Division and relays broadcasts from VK5 as shown received on 14 or 28 MHz).						

Note: **All times are local. All frequencies MHz.**

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July 1996
Volume 64 No 7

Amateur Radio

Journal of the Wireless Institute of Australia

Full of the latest amateur radio news, information and technical articles including...

- **1995 Federal WIA Annual Reports**
- **Review of Yaesu FT-900 All Mode HF Transceiver**
- **An Experimental Receiver for 2 Metre FM**

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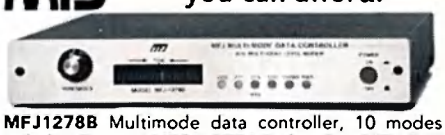

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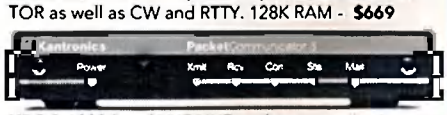

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Amateur Radio

Journal of the Wireless Institute of Australia

Vol 64 No 7 ISSN 0002-6859 July 1996

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Cover

Mal Johnson VK6LC operating from shack No 1 (80 and 40 m) on Sandy Island OC-214. See *How's DX* (page 36) for a report on this IOTA DXpedition.

(Photo by Mal VK6LC)

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Editor's Comment

Hams in the News

I am writing this on 10 June, the Queen's Birthday holiday in all States except Western Australia. Just to be a little different, the VK6s observe the Queen's Birthday on 30 September. Actually, the Queen's real birthday is 21 April.

Twice a year, on Australia Day and the Queen's Birthday holiday, notable people are recognised by being awarded medals in the Order of Australia. Once, many years ago, British honours were awarded on the Queen's birthday and on New Year's Day, but Australian honours were introduced and first awarded in 1975.

The preceding two paragraphs have taken a surprising amount of research to produce. The various dates involved are not as well publicised as they might be. But never mind. Why have I gone to all this trouble? Because, in the list of medals awarded in the General Division of the Order of Australia there is one of our colleagues, Ron Churcher VK7RN of Devonport, Tasmania. Congratulations, Ron!

Only five months back, in the Australia Day honours list, we had another amateur recipient, Don Hopper VK7NN. Two VK7s! How many in the mainland states? Only one. Graham Ratcliff VK5AGR was awarded an OAM (for his satellite work) in the 1991 Australia Day honours. It does seem that Tasmania has a magnetic attraction for medals. Well done VK7!

Another notable amateur was not only seen on TV in most States, but also made the front page of the Brisbane Courier-Mail on 26 April. This was Harry Angel VK4HA, aged 104, who led the Brisbane ANZAC Day march in a

Continued on page 55

CONTRIBUTIONS TO *AMATEUR RADIO*

Amateur Radio is a forum for WIA members' amateur radio technical experiments, experiences, opinions and news. Manuscripts with drawings and/or photos are always welcome and will be considered for possible publication. Articles on computer disk are especially welcome. The WIA cannot assume responsibility for loss or damage to any material. *"How to Write for Amateur Radio"* was published in the August 1992 issue of *Amateur Radio*. A photocopy is available on receipt of a stamped, self addressed envelope.

■ WIA News

Roger Harrison VK2ZRH, Federal Media Liaison Officer

IARU Committee Looks at Future of the Amateur Radio Service

The International Amateur Radio Union (IARU) has set up a committee to examine the International Telecommunications Union (ITU) radio regulations covering the Amateur Service and the Amateur-Satellite Service in the context of the ITU's program to simplify the radio regulations over forthcoming World Radio Conventions (WRCs) in 1997 and 1999.

The IARU aims to ensure that the Amateur Service remains viable, meaningful and of value, not only to licensees, but also to the general public. The Amateur Service regulations are to be discussed at WRC-99.

The IARU Working Group on *The Future of the Amateur Service* is charged with studying the ITU radio regulations with a view to formulating any possible changes needed to arrive at a better definition of the Amateur Service and perhaps a more accurate representation of the aims, requirements, obligations and privileges for the Amateur Service in the next century. IARU Vice-President, Michael Owen VK3KI, is a member of the working group.

Issues being considered include:

*the definition of the Amateur Service;

*the character and content of transmissions by amateur stations;

*the provisions required for emergency (that is, disaster) transmissions;

*easing of requirements to achieve international recognition of the Amateur Service;

*the technical and operational qualifications for transmitting amateurs; and any other question or issue the working group considers relevant.

The working group intends to start discussions within the amateur radio community by way of supplying discussion topics and background information, and suggesting possible solutions.

The working group is to invite IARU member organisations (the WIA is one), regional groups (IARU region associations in Regions 1, 2 and 3), amateur groups and individuals to comment on issues raised.

At the IARU Region 1 Conference in October this year, it is anticipated that most of the member societies (from Europe, the Mediterranean and Africa) will have reactions to many of the points raised so far.

The Region 3 Conference in Beijing next year should see further discussion, in conjunction with many other WRC-99 issues, which will then be only two years away. The WIA plans to send a delegation to Beijing.

The WIA welcomes input from interested individuals or groups. Please direct your correspondence to your Division's Federal Councillor. *(Thanks to John Arsse VK4QA and Graham Kemp VK4BB for assistance with material).*

AGM Sees President Re-elected, SMA Praise Exposure Draft

Neil Penfold VK6NE was re-elected unopposed for a third term at the Annual General Meeting of the WIA, held in Melbourne over 18-19 May.

The three directors elected at the 1995 AGM were also returned to office for 1996-97, being Peter Naish VK2BPN, Lance Bickford VK4ZAZ and Rowland Bruce VK5OU. Peter Naish remains WIA Federal Secretary.

By agreement with the WIA's sister society across the Tasman, the New Zealand Amateur Radio Transmitters (NZART), each hosts visitors to the society's AGM from its counterpart every alternate year. This year it was NZART's turn to come to Australia, with President Jim Meachen ZL2BHF and Carol Gaudin ZL2VQ, attending the Melbourne meeting in the Ibis Hotel.

The AGM dinner on the Saturday evening was honoured to have the manager of the SMA Victorian Area Office, Peter Young, attend. Peter gave an informative and thought provoking speech covering issues on licensing, regulations and electromagnetic compatibility (EMC). He praised the Institute's Exposure Draft document on amateur radio licensing for being comprehensive, carefully thought out and well argued.

Mr Young, also a licensed amateur, added his own observation that EMC issues will likely become a challenge for radio amateurs in the future and suggested it was perhaps an issue that needed as much attention as licensing had gained in recent years, particularly as it was getting increasing attention in the media and by municipal councils. A lively question and answer session followed Mr Young's speech.

WIA President, Neil Penfold VK6NE, subsequently wrote a letter of thanks to Peter Young.

International Contestants Fly in for Direction Finding Championships

Contestants from half a dozen overseas countries fly in this month for the Second Region 3 Amateur Radio Direction Finding (ARDF) Championships, being held in Townsville over 15-20 July.

The Chinese Radio Sports Association (CRSA), the Japan Amateur Radio League (JARL), the Korean Amateur Radio League (KARL), and the New Zealand Association of Radio Transmitters (NZART) are all fielding teams for the Championships. Several small teams from eastern Europe are also participating. A local team is contesting the Championships on behalf of the WIA.

There will be society officials accompanying the teams from overseas. The new Secretary General of the CRSA, Chen Ping BA1HAM, who is also Chairman of the International Amateur Radio Union (IARU) Region 3 ARDF Committee, is to be the guest of the Townsville Amateur Radio Club, which is hosting the Championships.

ARDF is a cross between a cross-country run and the old familiar amateur radio fox hunt. Several transmitters are placed at intervals along a course. They turn on and off in a timed sequence. Bands used are 80 m and 2 m. Contestants travel on foot and have to find the transmitters and complete the course in a given time. ARDF is an activity for young and old alike. Only simple, handheld equipment is required.

This activity is growing in importance around the world, and particularly in the Asia-Pacific region. Australia won the privilege of hosting the 2nd Region 3 ARDF Championships at the IARU Region 3 Conference held in Singapore in September 1994.

Reprieve for 6 m from Radar Interference

A 49.8 MHz "wind profiler" radar was proposed by the Bureau of Meteorology earlier this year to be located near Wollongong, on the coast south of Sydney. But, potential problems for six metre band operators in the surrounding region were averted thanks to liaison between the Spectrum Management Agency (SMA), the Bureau of Meteorology and the WIA's Federal Technical Advisory Committee (FeTAC).

These wind profiler radars employ a large antenna array aimed vertically and generate RF pulses of more than 50 kilowatts in order to detect wind patterns in the lower atmosphere which threaten the safety of aircraft. The radars are generally located in the vicinity of flight paths associated with nearby airports.

Although the antennas fire the RF vertically, the modulation products from the pulsed signal spread several hundred kilohertz away from the centre frequency and the "spill" from the antenna sides yields strong signals across the lower portion of 50 MHz. As this is the DX end of the band, operators use very sensitive receivers and thus a 49.8 MHz wind profiler radar can wreak havoc. One of these radars has been operating for some years near Darwin but, thanks to the efforts of local amateur Rex Pearson VK8RH, it coexists through cooperation with the makers and Bureau of Meteorology operators who have set the frequency and the pulse repetition rate so that a null in the modulation products occurs at the low end of the 50 MHz band.

The 49.8 MHz radar proposed for Wollongong was to be ex-NOAA (National Oceanographic and Aeronautic Administration of the US), similar to that operating in Darwin. However, following discussions with the Bureau of Meteorology and assistance from John Patterson VK3ATQ, a CSIRO scientist with expertise in radar systems and the effects of high power signals on receiver front ends, a decision has been made to substitute a new 44 MHz radar at Wollongong and to relocate the 49.8 MHz unit at a remote site. The new 44 MHz radars are being developed in Adelaide. *(Thanks to FeTAC Chairman, John Martin VK3KWA).*

Have you advised the WIA Federal Office of your new callsign? Use the form on the reverse of the *Amateur Radio* address flysheet.

EMC Highlighted at Sydney Conference and Workshops

A three-day conference and series of workshops on electromagnetic compatibility and interference in Sydney in the first week of June highlighted health, technical and regulatory issues in the lead up to mandatory standards to be enforced from 1 January next year under the Spectrum Management Agency's EMC framework.

Opened by the Spectrum Manager, Christine Goode, those attending the industry conference heard presentations from international speakers Don White, a world authority on EMC and author of many books on the subject, and David Imerson from Britain, Chairman of the European Competent Bodies Association and manager of EMC-IBM in the UK. Among the other speakers, Dr Ken Joyner from Telstra gave a talk on the contentious subject of health issues in relation to mobile phones, while the executive manager of the SMA's Business Directions Group, Roger Smith, explained aspects of the EMC framework.

The EMC framework (outlined in previous *WIA News* releases) aims to address compatibility problems arising from wanted and unwanted emissions and interference arising from the use of consumer and industrial electronic and electrical equipment.

WIA representatives Dr David Wardlaw VK3ADW and Roger Harrison VK2ZRH attended the event.

Heat Over US Satellite Proposal

The American Radio Relay League (ARRL) has launched a campaign to head off a proposal from US commercial satellite interests to seek allocations in the two metre and 70 centimetre bands for future low-earth-orbit (LEO) satellites.

The American LEO satellite industry is flying the proposal in preparation for consideration at the next World Radio Conference in 1997 (WRC-97).

Apparently, one of the WRC-97 agenda items being forwarded to the US Federal Communications Commission (FCC) includes consideration of possible additional frequencies for the mobile satellite service, which already has allocations below 1 GHz. In early May, according to the ARRL, an industry representative proposed a list of "candidate bands" for little LEOs, including 144-148 and 420-450 MHz.

The ARRL argued that "no one with the slightest background in radiocommunication could possibly believe that a mobile-satellite service could be introduced into either band without disrupting existing and future amateur operations."

As the FCC's process for public participation in decisions has been "streamlined" in the preparations for WRC-97, circumventing earlier surfacing of this proposal, the ARRL has urged its members and other US amateurs to take advantage of the FCC's invitation to send "input at any time".

A similar proposal has not, so far, surfaced in Australia, but the WIA is monitoring the situation. Dr David Wardlaw VK3ADW is the WIA's representative on the Australian WRC preparatory working groups.

■ Equipment Review

Yaesu FT-900 All Mode HF Transceiver

*Reviewed by Ron Fisher VK3OM**

FT-900 transceiver with front panel attached, and HM-31 microphone.

After a long delay, Dick Smith Electronics have decided to introduce the FT-900 to the Australian market. The FT-900 has been available on overseas markets now for nearly two years, although the Australian version is an updated model fitted with a Collins 455 kHz mechanical filter in place of the more usual ceramic filter.

The FT-900 slots between the FT-840 and the FT-990 and, with the recently introduced FT-1000MP, gives Yaesu one of the widest ranges of HF transceivers on the Australian market.

FT-900 Features And Facilities

The FT-900 is a direct descendent of the FT-890 and has inherited many of the FT-890's excellent features; however, it also perpetuates a few of its mistakes.

The main feature of the FT-900, setting it apart from the earlier model, is the remotable front panel. The FT-900, however, is not a miniature transceiver like the TS-50, IC-706 or DX-70. It is a normal size transceiver, identical to the FT-840, FT-890 and the old FT-757. The actual dimensions are 238 mm wide, 93 mm high and 253 mm deep, with a total weight of 5.3 kg.

About two thirds of the front panel can be removed for remote installation. This remote section contains all of the essential operating controls, leaving such things as the direct frequency entry pad, keyer controls, microphone gain and RF power controls, MOX, VOX and AGC selectors, and the headphone socket, on the remaining section of the front panel. The remotable panel contains an excellent LCD which gives frequency readout, a multi-function bar graph metering system, mode and VFO indicators, and the memory channel indicator. Controls include audio gain and squelch, notch and IF shift, clarifier control, plus 21 push buttons that control power, meter selection, mode selection, VFO and memory selection, and up/down buttons for band selection.

The microphone is also connected to the remote panel section via an eight pin telephone modular plastic connector. Connection of the remote front panel to the main chassis of the transceiver is via a single eight-pin sliding connector which mates when the remote panel is clipped on to the transceiver. There are no messy cables and plugs to tangle; Yaesu have got their remote system right first off.

Unfortunately, a remote cable was not included with our review transceiver, so I can only guess that it would work well. The remote cable is available as an option and the kit includes a mounting bracket for the panel.

Transceiver technical features include a receiver with full general coverage from 100 kHz to 30 MHz with all modes available. The transmitter has an output of 100 watts on all HF amateur bands from 160 to 10 metres, but not including 6 metres. Again, the transmitter has provision for all modes which include SSB, CW, AM and FM.

An automatic antenna tuner, which can be installed in the transceiver, is available as an extra cost option. This was not included in our review transceiver so, unfortunately, I cannot comment on its performance.

The inclusion of a "Collins" mechanical filter in the 455 kHz IF section is interesting. I would guess that many newcomers to the hobby might not have heard of mechanical filters or know how they work. Let me give a quick explanation. Mechanical filters were developed in the early 1950s to provide a solution to the problem of achieving a selectivity curve with a fiat top and very steep sides. In those days crystal band pass filters had not been developed to any extent and high frequency filters of, say, 5 and 8 MHz were unknown. The Collins Company in the USA developed a series of filters which operated at 455 kHz for use in their 75A series receivers. The filters used input and output transducers with disk resonators in between. Bandwidths of 300 to 6000 Hz were available. However, with the introduction of high performance crystal filters, mechanical filters became less common.

The filter used in the FT-900 does not

give any indication of just where it was manufactured. The type number is certainly of Collins origin but there is also a Yaesu part number on it. Regardless of this, it works very well. Its performance would be very much better than the original ceramic filter installed in the earlier series, but how much better than the optional crystal filter available at the time is hard to say.

The bandwidth of the mechanical filter is rated at 2.75 kHz and, as we will see later, the response is very smooth and flat. Optional filters are available for CW operation with bandwidths of 250 and 500 Hz but no narrow SSB filters are available. The optional filters are not easy to install. A circuit board has to be removed and the new filter soldered in place. The FT-840 and the new FT-1000MP use plug-in filters which can be installed in seconds.

Several useful operating aids are included. For the receiver, an IF shift and a notch filter help to reduce interference. A receiver front-end single position attenuator and a switch to bypass the receiver RF stage (the IPO or intercept point optimisation) control strong signal inputs that might cause receiver overload. There is no RF gain control. A receive-only clarifier, which has a range of +/- 9.9 kHz, is included but, as we shall later see, has one serious problem.

On the transmit side, a speech processor gives the audio a very worthwhile boost. Yaesu call this a frequency shift processor. The carrier oscillator can be adjusted from -300 to +500 Hz to set the audio response to suit any particular taste. Our on-air tests were carried out with this set to -100 Hz which gave the best audio balance using the supplied MH-31 microphone.

For the CW operator, an electronic keyer is in-built with a front panel speed control. Reverse sideband switching helps the operator to dodge QRM. Either semi or full break-in operation can be selected. Transmitter power output is adjustable from the maximum of 100 watts or so down to QRP levels. Finally, a thoughtful feature; the tilt bail that lifts the front of the transceiver has a rubber cover which will protect the finish of your desk top.

FT-900 on the Air

The first thing needed to put the FT-900 on the air is a 20 amp, 13.8 volt DC power supply. A generous length DC lead, terminated with a standard six pin plastic connector, is supplied with the transceiver. Dick Smith Electronics no longer import Yaesu power supplies, so you won't be able to purchase the matching FP-800. However, there is some good news with power supplies. See the D-3800 power supply review elsewhere in this issue.

The first thing noted when the FT-900 is switched on is the display. It has a bright orange background with black figures. It's quite startling. Three tuning rates are selectable via the menu system and give 2.5, 5, or 10 Hz steps. I must say that I much prefer slow tuning rates so the 2.5 Hz step rate is to my liking. I cannot say the same about the tuning knob, which is small and not well placed. I guess this is caused by the constraints of the remote front panel. It is, however, very smooth and has a good spinning action.

Two often-used controls are very close to the tuning knob. These are the VFO A/B button and the clarifier control. I found that I often knocked the tuning off-frequency when using these controls. Also, for base station use, the tuning knob is too high. However, if a remote front panel is essential, then this is a small price to pay.

Speaking about the clarifier, this is another fault carried over from the FT-890. There is one main problem. If you are offset by, say, 5 kHz there is no way to cancel this except by turning the clarifier control back to the zero setting, which might involve several revolutions of the control. Strange, to say the least. It would seem to have been a simple thing to provide a second function on the clarifier button to clear the offset back to zero.

In general, the receiver sounded very good within the constraints of the rather small top-mounted speaker. I would recommend an external speaker for home-station use and, of course, it would be essential for mobile use if the main transceiver section is remotely mounted.

The slightly wider selectivity provided by the Collins filter shows up with excellent SSB audio quality; however, the audio response on AM reception was very poor (see later test report). I actually found that AM sounded better with SSB selected and the carrier tuned to zero beat. I suspect that Yaesu are using excessive audio tailoring after the AM detector which may well be modifiable.

Band changing is very easy with several methods available. With the front panel attached for base-station use, you have the greatest choice. The keyboard at the bottom right of the front panel provides direct access to each amateur band and, of course, with the direct digital synthesiser used in the FT-900, the last used frequency on each band

FT-900 transceiver with the front panel detached.

returns each time. The same keyboard allows direct frequency entry by pushing the "ENT" button and then entering each digit in turn.

On the remote panel section, bands are changed via the up/down buttons. Either amateur bands or general coverage stepping is controlled by the HAM/GEN button situated under the display. With HAM selected, again the last used frequency on that particular band is returned. Also, there are two VFOs which allow two bands or two frequencies on the same band to be selected with the push of a button. The FT-900 has 100 memories, all of which are fully tunable up or down from the memory frequency. Ten of these memories can be set to provide upper and lower frequency limits for use in the "scan" function.

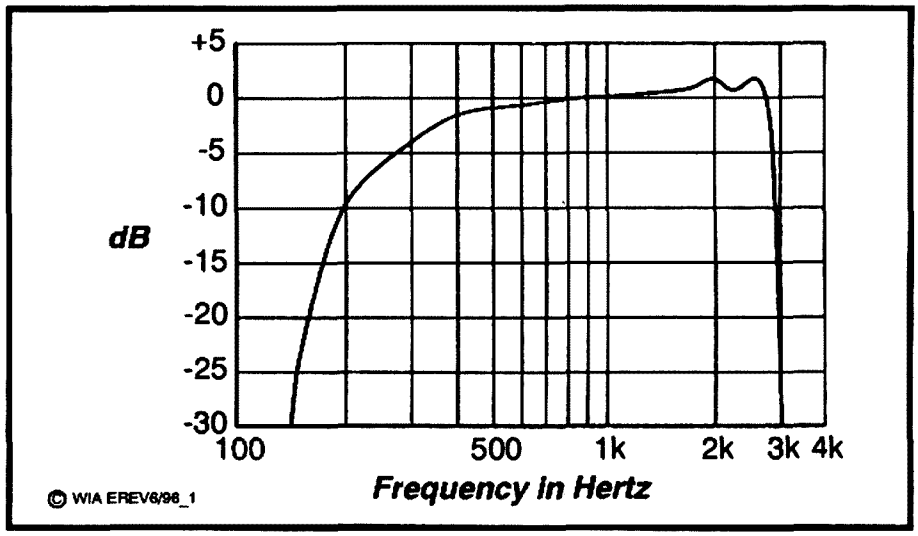
SSB transmission tests were carried out using the supplied HM-31 hand microphone. As the microphone connection is via an eight pin telephone-type connector, I was not able to test the transceiver with other Yaesu microphones that I have, but quality reports were very good with the HM-31.

The in-built speech processor adds quite a bit of bite to the transmitted audio and this, along with the ability to shift the carrier point relative to the filter, allows the operator to optimise the transmitted audio to suit individual voices.

The cooling of the FT-900 is very efficient. The entire top of the cabinet is part of the very efficient heat sinking system. However, I must admit to getting quite a shock when the cooling fan came on for the first time. It was louder than expected. The fan is thermostatically controlled, and under normal temperature conditions, only comes on infrequently. After a while I did get used to it. There is no doubt that it does its job well.

HM-31 Microphone

This is a brand new type for Yaesu and is supplied as standard equipment with the FT-900 and also the new FT-1000MP. It is quite comfortable to hold and the push-to-talk button operates a microswitch which only needs light pressure to actuate. The microphone insert is a 600 ohm dynamic unit which produces very acceptable audio quality. There are three up/down buttons recessed into the top front of the case with the centre button switching the "fast" tuning function on and off. I found these buttons rather difficult to use and would prefer to have them on the top. On the rear is a two position tone switch. Position one gives full frequency response, while position two gives a degree of bass cut. Most contacts preferred position two. The curly cord is connected via an eight pin modular connector to the microphone and also to the transceiver. The HM-31 supplied with the FT-1000MP uses a standard eight pin metal connector at the transceiver end. By the way, the HM-31 is made in China.



Transmit audio response of the FT-900 on 14.2 MHz, no compression, no ALC, 20 watts output at 1 kHz.

FT-900 On Test

I carried out the usual series of tests, starting with transmitter power output and current drain. These tests were conducted using a 13.8 volt regulated power supply which was, in fact, a Yaesu FP-707 which is possibly very near in design to the unobtainable FP-800.

Band	Power Out	Current Drain
1.8	109 watts	17.0 amps
3.6	106 watts	16.8 amps
7.1	106 watts	16.8 amps
10.1	105 watts	16.8 amps
14.2	107 watts	17.0 amps
18.1	103 watts	17.5 amps
21.1	105 watts	17.0 amps
24.9	102 watts	17.5 amps
28.5	100 watts	17.5 amps
29.5	97 watts	18.0 amps

With the power control set to minimum, the power output on all modes varied from 2.0 watts on 1.8 MHz down to 1.5 watts at 29.5 MHz. These are ideal levels for QRP operators.

The usual test for transmitter intermodulation distortion was carried out. Again this is done by comparing the distortion of the review transceiver with that of a transceiver that produces a known amount of distortion. The figure for the FT-900 was 22 dB compared with full SSB power output at 14.2 MHz. This is about average for a 12 volt powered transceiver although, as we have seen in previous reviews, some rigs are very much better in this respect.

The frequency response test for SSB transmit proved to be one of the best yet measured. The curve was within +/- 1 dB from 500 Hz to 2.8 kHz, with the -6 dB response at 250 Hz and 2.9 kHz and an extremely sharp cut-off above this; no doubt this was due to the excellent response of the Collins mechanical filter. Carrier and sideband suppression were also excellent, both being in the region of -50 dB.

The LCD readout for output power is very accurate in its reading. It is calibrated at 10, 25, 50, 100 and 150 watts.

Receiver Tests

The first receiver test was to check the S meter calibration. The S meter on the FT-900 is, of course, not a meter but a bar graph as part of the LCD. It is

calibrated at S1, 3, 5, 7, 9 and +20, 40 and 60 dB over S9. The results with both the attenuator and IPO switched out were:

S Level	Input Required
S1	2.5 µV
S3	3.1 µV
S5	6.3 µV
S7	10.6 µV
S9	80.0 µV
S9+20 dB	800.0 µV
S9+40 dB	10000 µV
S9+60 dB	0.07 V

Switching from band to band, the signal input to give an S9 reading was:

Band	Input for S9
1.8 MHz	70 µV
3.6 MHz	80 µV
7.1 MHz	80 µV
10.1 MHz	80 µV
14.2 MHz	80 µV
18.0 MHz	80 µV
21.0 MHz	100 µV
24.5 MHz	100 µV
28/29.5	125 µV

The calibration for FM on 29.5 MHz was similar, with S9 requiring 100 µV input. Squelch sensitivity for FM at 29.5 MHz was 0.1 µV, with the receiver sensitivity for the same mode and frequency measured at 0.25 µV for 12 dB SINAD with the preamp on and attenuator of – somewhat better than the specified 0.5 µV.

Sensitivity on the lower bands was measured at 14.2 MHz USB. At 0.25 µV I measured 16 dB SINAD as against the specified 12 dB, again an excellent figure. The received frequency response for SSB was essentially the same as I measured for SSB transmit. The AM receive response was measured with the following results:

Frequency	Response
100 Hz	-12 dB
200 Hz	-3 dB
400 Hz	0 dB
800 Hz	0 dB
1.0 kHz	0 dB
1.5 kHz	-2 dB
2.2 kHz	-6 dB
2.5 kHz	-8 dB
2.7 kHz	-9 dB
2.8 kHz	-10 dB
3.0 kHz	-12 dB

As you can see from this, the AM response is actually inferior to the SSB response at the high frequency end. The low end is slightly extended but the overall -6 dB response of 150 Hz to 2.2 kHz is very poor.

Receiver Audio Power Output and Distortion

Yaesu receiver audio output impedance is four ohms as distinct from the eight ohms used by most of the other manufacturers. It's important to note this if you intend to connect a speaker that you might have in the junk box. Maximum power will be reduced by using an eight ohm speaker.

Maximum power output is 2.2 watts at 7% distortion. This exceeds the specified 1.5 watts at 10% by a generous margin. With the output reduced to normal listening level of around 100 milliwatts, the distortion dropped only 0.6%. A minimum signal of 1.5 µV is required to produce maximum audio power. With an eight ohm load connected, the power output drops to 1.5 watts at 15% distortion.

FT-900 Instruction Manual

If there is one thing that deserves the highest praise with the FT-900, it is the instruction manual. The general quality of the printing and reproduction of photographs is excellent. This is a manual that you will actually enjoy reading and, when finished, you will know all about your transceiver. However, one small item lets it down. I would like to see heavier and better quality paper used for the covers. The existing covers are little heavier than the internal pages and I think would soon become dog eared. A full schematic diagram is supplied. I score the FT-900 manual 9 out of 10.

FT-900 Conclusion

I would have to rate the FT-900 as a very competent transceiver. Using it as a home station, you will find most of the facilities that are needed for general operating. To make use of the remote front panel, you will need the optional YSK-900 separation kit and possibly the ATU-2 automatic antenna tuner. The six metre cable supplied with the separation kit should enable placement of the transceiver proper in the boot of the car. I feel it is too large to slide under one of the front seats; however, this probably depends on your car.

Our review transceiver was supplied to us by Dick Smith Electronics to whom all enquiries should be directed. The FT-900 is priced at $1995. The YSK-900 separation kit is priced at $99.95 and the auto ATU is $499.

24 Sugarloaf Road, Beaconsfield Upper VIC 3808

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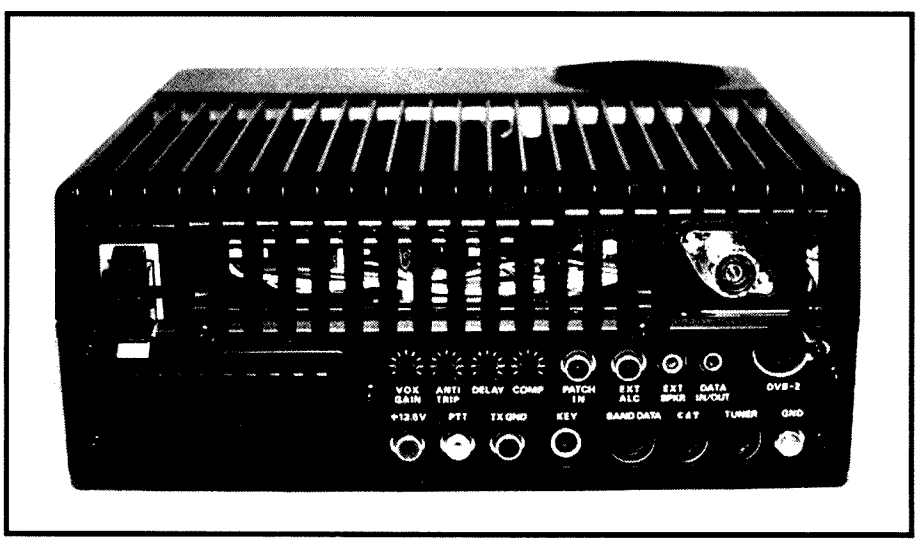

Rear panel of the FT-900.

■ Receivers

An Experimental Receiver for Two Metres FM Using a Car Radio

For those with few funds and a creative bent, Peter Parker VK1PK suggests one way to monitor VHF signals.*

Here is a project which is considered suitable for Youth Group leaders or those in the teaching profession to use in attracting beginners to the field of radio.

The use of AM car radios can greatly simplify the design and construction of receivers for the amateur bands. Just a simple converter plus a 455 kHz BFO can transform any car radio into a usable multi-mode receiver for any HF or VHF band. While receivers for HF, six and two metres have been constructed, only the two metre unit will be described here.

In this receiver, an AM car radio is used as a tuneable IF/detector/audio strip, covering 0.5-1.6 MHz. Many advantages over conventional homebrew regenerative, direct conversion and superhet receivers are offered by this technique. The most obvious are extreme simplicity and low cost. AM-only receivers are readily available second-hand for $5-10 each. An AM receiver can be made to receive all modes by adding a simple BFO for CW/SSB reception, or tuning to one side of an FM signal to resolve it through "slope detection".

The car radio's 1.1 MHz tuning range is wide enough for numerous applications, and its ease of tuning is better than on many homebrew and commercially made shortwave receivers. The combination of crystal controlled converter and car radio provides good frequency stability for SSB reception, while most sets feature five push-button "memories" for your favourite frequencies.

Car radios generally exhibit a higher standard of performance than is usual with domestic portable receivers, and their metal cases are another bonus; with a few precautions, breakthrough from AM broadcast stations can be virtually eliminated.

The receiver presented here is an example of how this technique can provide good performance for the minimum of cost. You will find that reception of local repeaters will be almost as good as with your regular transceiver and that frequency drift is too slight to be noticed. The set lacks a squelch circuit, though this is no great liability, as the hiss from FM receivers is more objectionable than from the AM system used here.

Note that sensitivity of this mixer-only design is not high, and it is recommended that a proper outdoor antenna for 2 m be used for best reception. Those residing some distance from desired stations should consider adding a front end amplifier to boost signals. Audio quality is surprisingly good with normal 5 kHz deviation FM signals despite the use of slope detection. It will never be quite as good as with conventional FM receivers, but on the stronger signals the set's performance leaves little to be desired. It should be possible for the experimentally-minded to fit a proper FM detector and squelch circuit to the car radio should they so wish. *(Note that using slope detection for FM reception does not offer the impulse noise reduction or limiting properties of a proper FM detector. Ed)*

How it Works

Fig 1 shows a block diagram of the whole receiver. Incoming signals around 147 MHz are mixed with a locally produced 145.9 MHz oscillator to produce a difference frequency in the 0.5-1.6 MHz range. This difference frequency is fed to the car radio to be converted to 455 kHz, amplified, detected and amplified again as an audio signal. In this setup, the first intermediate frequency is tuneable (0.5-1.6 MHz). This allows us to cover a range of frequencies, while retaining the frequency stability of a crystal-controlled first local oscillator.

The mixer uses the readily available BF115 NPN transistor. The sharp front-

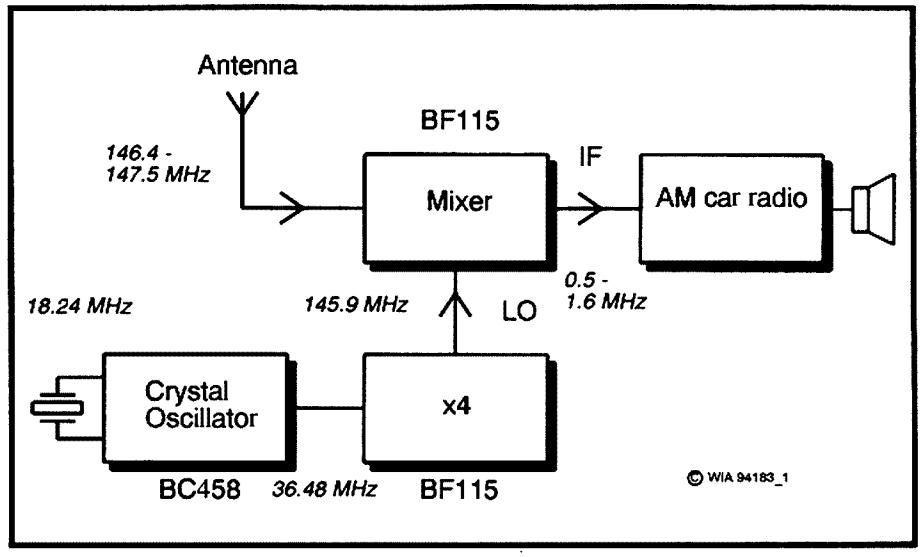

Figure 1 – Block diagram of the 2 m FM receiver.

end tuning of most car radios renders a tuned choke in the mixer's collector unnecessary. Instead, an RF choke is used to provide a broadband response between 0.5 and 1.6 MHz. A single tuned circuit tunes the input to 147 MHz. Both the transistor and the antenna are tapped down the coil to preserve mixer stability and ensure sharp front-end tuning. The circuit originated in Ref 2, and has been modified only slightly.

A well tried circuit has been used for the 18 MHz crystal oscillator (Ref 3). The common BC548 operates well in this circuit. The 36 MHz second harmonic is taken from the BC548 collector. The 1 µH inductor and the 30 pF capacitor attenuate other output frequencies. A two turn winding around the 1 µH coil takes enough output to drive the quadrupler which, like the mixer, uses a BF115 transistor. The collector tuned circuit is adjusted to resonate at 146 MHz. Ref 4 provided the circuit for the multiplier, which worked well without need for modification.

Selection of the Crystal

Start by choosing the frequency range that you wish to tune. You are limited by the 1.1 MHz tuning range of the car radio. It is desirable to cover all repeater outputs and commonly used simplex frequencies. In Australia, the required range is 146.26 to 147.375 MHz.

A local oscillator frequency of 145.9 MHz is most appropriate as it will provide a range of 146.425-147.500 MHz. In addition, re-peaking of the front end will allow you to tune the 144.300 to 145.375 MHz range as well.

Note that because there is only one tuned circuit prior to the mixer, and a low IF is used, this receiver may exhibit rather poor image rejection performance. To minimise the reception of unwanted commercial VHF signals, the local oscillator should not be operated higher in frequency than the desired tuning range. Keeping the oscillator below the tuning range keeps spurious responses within the two metre band.

If a crystal has to be purchased, it should be a fundamental (parallel-mode) unit for 18.2375 MHz. Load capacitance can be 30 pF. Alternatively, an "available" crystal can be used. It may be on a different frequency to that recommended previously, so the receiver's coverage will miss some frequencies. The prototype, for example, uses an 18.260 MHz crystal. As a result, all repeater outputs are tuneable, but simplex frequencies below 146.600 MHz cannot be received.

Construction of the Converter

Several methods of construction could be used for the converter. The technique used here is simple, cheap, quick and permits modifications to be easily made. It is thus ideal for VHF equipment. Components are mounted on a 6 x 15 cm piece of un-etched blank printed circuit board material.

All components which are connected to earth are soldered directly to the copper surface of the board, while the remaining parts are simply supported by their connections to other components. Where there are no components to support a connection point, a high value resistor (>1 megohm) is soldered to the board to act as a standoff. The resistor's high value ensures that proper circuit operation is not affected by this addition.

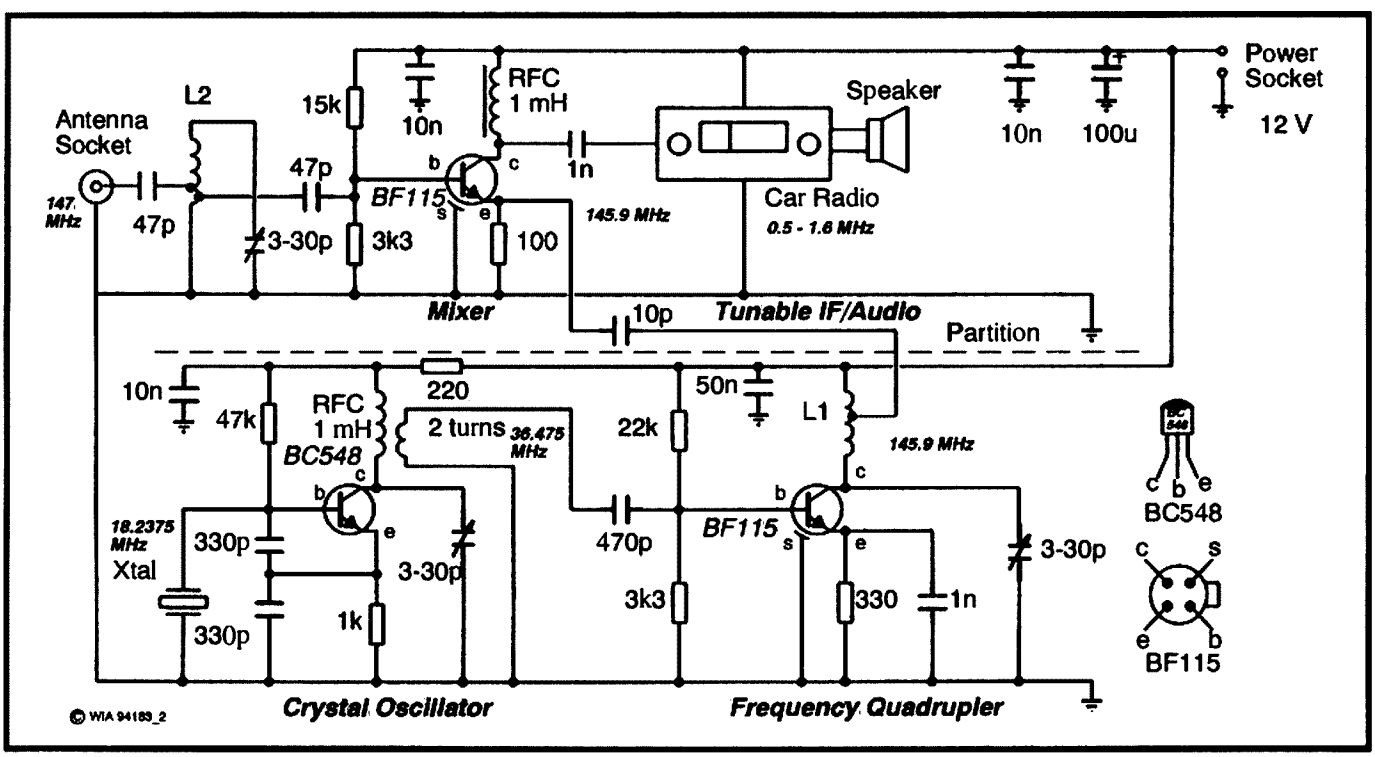

Figure 2 - Schematic diagram of the 2 m FM receiver.
Coil details: L1 (multiplier coil) is 5 turns, 5 mm diameter, 12 mm long. Wire is about 0.7 mm in diameter. The tap is 1 1/2 turns from the 12 V end. L2 (front-end coil) is 5 turns, 0 mm diameter, 20 mm long. Wire is about 0.7 mm in diameter. Both taps are 1/2 turn from ground.

(Beware high impedance points in other circuits which could be affected by this technique. Ed)

Testing Stage-by-Stage

The oscillator should spring to life once 12 volts is applied to the free end of the 220 ohm resistor. If a two-turn coil is wound around the barrel of the 1 µH inductor, some RF should be detectable with an RF probe or frequency counter, if one side of the two-turn coil is earthed.

Adjusting the trimmer will cause the output level to vary. The trimmer should be peaked to give maximum output on the crystal's second harmonic (ie around 36.6 MHz). The frequency as displayed on a frequency counter should remain stable.

Once satisfied with the operation of the crystal oscillator, the next stage to build is the quadrupler. This stage is as simple as the oscillator to construct, except that this time a coil (L1) needs to be wound. The caption to Fig 2 provides sufficient information.

Connecting power should cause an RF signal to appear on the unconnected end of the 10 pF capacitor. There will be several peaks and troughs in output as the quadrupler's trimmer capacitor is adjusted. One of those peaks will be on our desired frequency of 145.9 MHz. Once again, a frequency counter is invaluable when performing this type of work.

Construction of the mixer can now commence. This part of the circuitry must not contain any long lengths of unshielded lead. Failure to observe this rule will make the receiver prone to break-through from local broadcast stations. For this reason, coaxial cable must be used to link the converter's mixer output to the antenna socket on the back of the car radio's case.

Alignment

This process is very simple. A signal of about 147 MHz is required. This can either come from a local repeater which is in use or be generated locally by a signal generator or hand-held 2 m transceiver. With an outdoor antenna (such as a 1/4 wave ground plane) connected to the receiver, it should be possible to resolve FM transmissions by tuning to the centre of the signal, then slightly off to one side. Tune for best clarity. If signals cannot be received, try adjusting the front end trimmer capacitor; tuning is quite sharp. Once signals are heard, re-peak the oscillator and multiplier trimmer capacitors for maximum signal strength.

After peaking the front end, the receiver is ready for operation. As a finishing touch, you may care to make a new dial scale to give an indication of the frequency being received. If your local oscillator injection frequency is 146.000 MHz, however, you will not need to make this addition; simply add 146 to the existing numerals on the dial. For example if the set's dial is on "8" or "80" (ie 800 kHz), you are tuned to 146.800 MHz.

If your converter has been properly built, there should be no significant break-through of AM broadcast stations. Should you reside in an area near broadcast transmitters and experience reception of unwanted broadcast stations, you could enclose the converter in a metal box. If only one station is marring reception, and this disappears when the antenna is removed, a tuned trap on the offending frequency wired across the converter's antenna socket may effect a cure.

Further Thoughts

A simple receiver for two metres FM has been described. It is easy to build and low in cost, and is capable of providing good reception of local FM activity. However, for serious work, the receiver needs added sensitivity, and a proper FM detector, plus improved image rejection characteristics. In each case a little added complexity will be needed to improve performance.

One potential for the use of this receiver could be as part of an ultra simple FM transceiver for repeater operation. A conventional crystal controlled FM transmitter is constructed. It is modified so that the crystal oscillator and multipliers are operational during both transmit and receive. A small amount of RF (at the transmit frequency) is taken from the final multiplier and fed to the mixer in this converter. The repeater's output frequency is mixed with the transmit frequency to produce a fixed IF of 600 kHz, which is fed to the car radio. Because the oscillator and quadrupler are made redundant with this technique, only the mixer transistor is required. Thus, to convert any 2 m transmitter into a transceiver for the repeaters, all one needs is one transistor mixer and an AM car radio.

For six metres, the technique is the same except that the car radio is tuned to 1 MHz to accommodate the wider repeater split.

The receiver in its present form tunes only the most popular 1 MHz segment of two metres. Through the use of "reverse-tuning" or "band imaging" techniques, almost the entire band can be covered by just two crystals. For instance, a 146.4 MHz crystal gives 146.950-148.000 MHz on its forward tuning range and 144.800-145.850 MHz on its image. The addition of a crystal on 145.400 MHz will provide 145.950-147.000 and 143.800-144.850 ranges.

If you are willing to put up with "backward tuning" and image problems,

WIA News

User Survey for Radio VNG

The National Standards Commission is conducting a survey among users of the time and frequency standard broadcasts of Radio VNG, which can be heard in the 5 MHz, 10 MHz and 16 MHz bands.

The National Standards Commission anticipates some effects from the re-organisation of administrative and funding arrangements for most public sector services since the recent change of government. These changes may have important implications for the future of Radio VNG, according to the Commission, hence the user survey.

The three-page, 16-question survey paper can be obtained by contacting Dr Richard Brittain, Secretary of the National Time Committee, at the National Standards Commission on telephone number (02) 888 3922, fax number (02) 888 3033, or via e-mail to richardb@ozemail.com.au.

this approach represents an economical way of tuning the whole band. While I have not tried this technique with this converter, an HF converter was successfully constructed using this method. With two crystals, 3.5-7.5 MHz continuous coverage was obtained.

The lower frequencies used allowed a high degree of image rejection to be achieved. This is difficult on VHF with low intermediate frequencies.

Although SSB reception has not been tried on this receiver, previous experience with converter/car radio combinations on both HF and six metres has been encouraging. The BFO can be either on 455 kHz or at the signal frequency. The latter is probably the most attractive if you are using this receiver in conjunction with a SSB/DSB or CW transmitter.

Running a low powered carrier signal on the receive frequency (originating from the transmitter) removes the need to build a 455 kHz BFO. To properly resolve incoming signals, the transmitter needs to be at least slightly frequency agile. Ref 5 shows a suitable companion 2 m QRP DSB transmitter for this receiver.

An RF preamplifier must be added to this converter to ensure good sensitivity if you intend to use the receiver for SSB/CW working.

Appendix

If you need to buy a crystal for this converter, the following suppliers should be able to help:-

Beacon Crystals, 24 Stanley St, Leabrook, SA 5068 Ph (08) 332 3031

Max Howden Crystals, Box 287, Lilydale, VIC 3140 Ph (03) 9735 4661

J & A Crystals, 20 Delville Ave, Mentone, VIC 3194 Ph (03) 9583 4533.

References

1 DeMaw, D: FM Pip-Squawk MK III, QST August 1971.

2 Tilton, EP: 50 MHz Transistor Transceiver MK II, QST Feb 1967.

3 Hepburn, H L: Amateur Building Blocks – Pt 4, Amateur Radio, Nov 1975.

4 Reed, J A: Minimum 2-Metre Satellite Transceiver, QST May 1983.

5 DeMaw, D/Hayward, W: Solid State Design for the Radio Amateur, ARRL, 1986.

** 7/1 Garran Place, Garran ACT 2605*

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■ Technical

Technical Abstracts

*Gil Sones VK3AUI**

Whilst preparing *Technical Abstracts* I noted some Silent Keys whose work is well known to those of a technical bent. They were all noted in *QST* for February and March 1996 as Silent Keys. They had contributed a great deal to amateur radio. They were:-

Helge O Granberg K7ES/OH2ZE, who worked for Motorola writing many technical publications;

Frank C Jones W6AJF, who had many achievements and technical publications; and

Philip Rand W1DBM, who did much pioneering work on TVI.

Direct Conversion Receiver

A simple direct conversion receiver appeared in *CQ DL*, November 1995

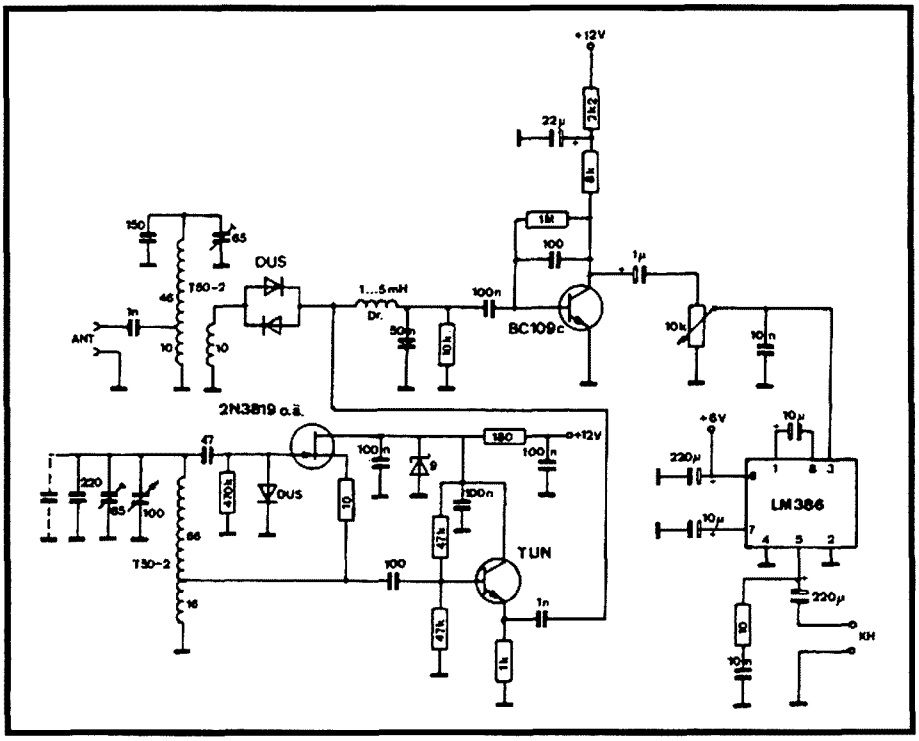

Fig 1 – Direct conversion receiver.

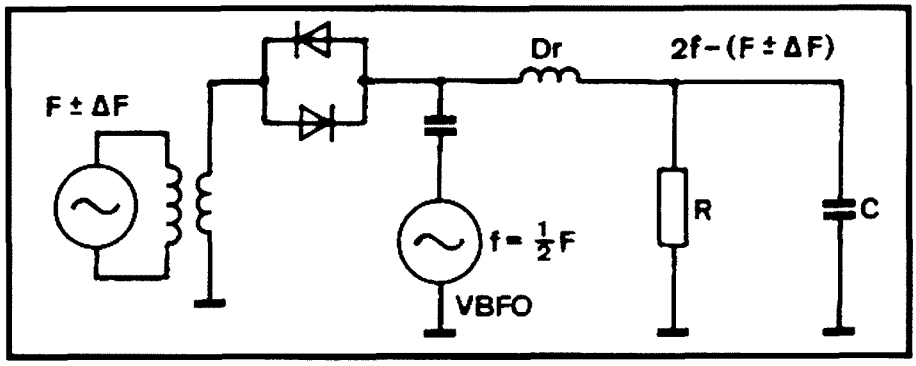

Fig 2 – RA3AAE mixer basic circuit.

issue. The author was Rudolf Burse DK2RS who used the mixer circuit originating from V Polyakov RA3AAE. This uses anti-parallel diodes driven by a VFO on half the frequency. The diodes used are general purpose diodes such as 1N914s.

The complete circuit is shown in Fig 1 and is for 80 or 160 metre operation. Alternatively, 40 and 30 metre operation could be achieved with minor changes. The components are all relatively uncritical and readily obtainable. The Amidon toroids are advertised by local suppliers. A basic circuit of the mixer operation is shown in Fig 2.

Diplexers

A diplexer allows two bands to be combined on to one cable. They can be used to connect a dual band aerial to two radios or to connect a radio with one output connector to two aerials. A design using coaxial cable stubs appeared in *RadCom*, March and April 1996 issues, from John Regnault G4SWX.

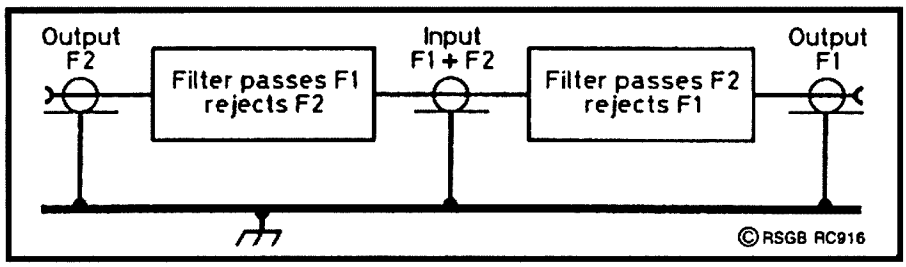

Fig 3 – Diplexer as two black boxes.

The basic diplexer block diagram is shown in Fig 3. The diplexer consists of a combination of filters which accept and reject the two frequencies. In this way the signals appear at one port from the two other ports without passing between the two other ports. The elements inside one of the filter blocks are shown in Fig 4. The open circuit stubs provide attenuation at F2 whilst the line sections provide isolation at F2 and matching at F1. The complete diplexer is shown in Fig 5.

However, while this configuration is fine for most uses there are some problems where F1 and F2 have a third

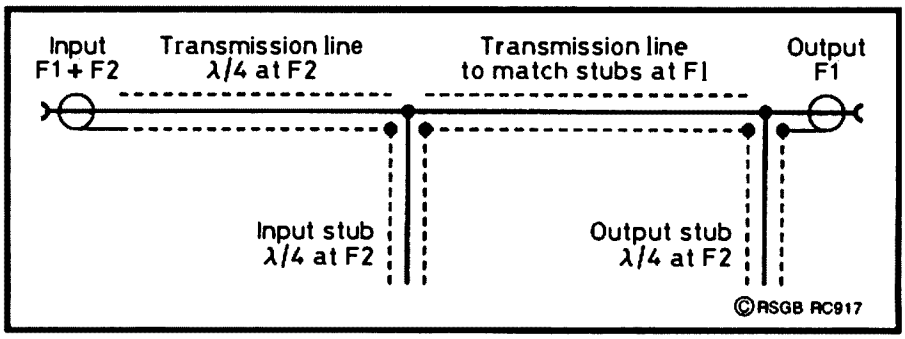

Fig 4 – Coaxial diplexer element.

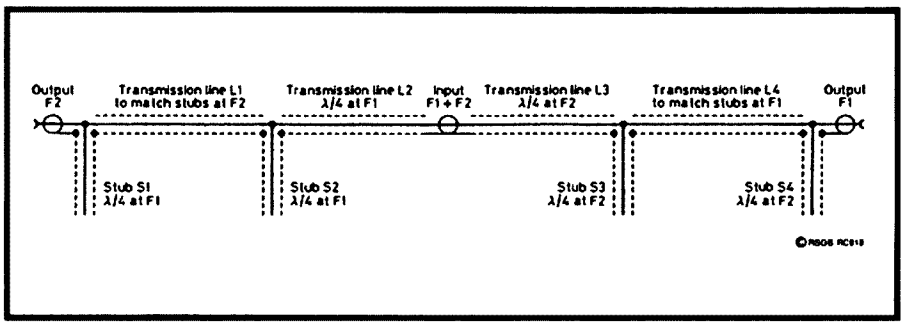

Fig 5 – All coaxial diplexer.

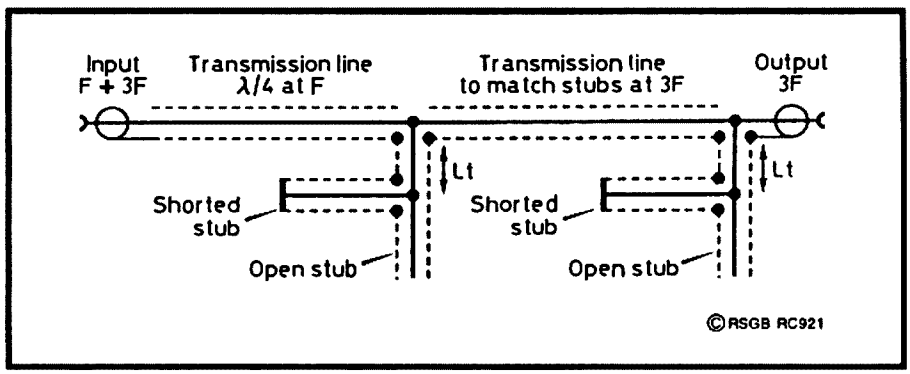

Fig 6 – Stub filter coaxial diplexer element to pass third harmonic.

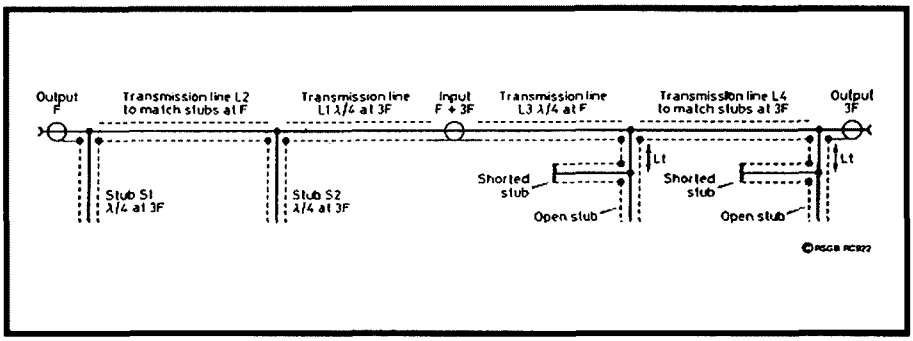

Fig 7 – Diplexer for third harmonically related bands.

harmonic relationship. This is the case for 144 MHz and 432 MHz, and for 50 MHz and 144 MHz, and a different basic accept/reject circuit is needed for the port operating at the harmonic frequency. 144 MHz is near enough to three times 50 MHz for this circuit. The answer is a slightly more complicated stub filter to pass the third harmonic signal source. This is shown in Fig 6.

The combined circuit useable for 50/144 MHz or 144/432 MHz diplexers is shown in Fig 7. The shorted stubs are connected at a tapping point on the open circuit stubs. The length of the open circuit stubs includes the length to the tapping point.

The lengths of cable for the diplexer are given in Table 2 for the 50/144 MHz design, and in Table 1 for the 144/432 MHz design. If you use connectors you should allow for the lengths of the connectors. The author, however, directly soldered the cables and stubs together except for the Tee connection between the two halves of the diplexer. This was to avoid inadvertent disconnections which might make the diplexer less effective. Remember, you will have a sensitive receiver front end on the other frequency port when transmitting. It is more accurate to trim the stubs to final length after construction. The soldered junctions can be protected by encapsulation.

The performance of the diplexer designs is shown in Figs 8, 9, 10, and 11. The cable used has a velocity factor of 0.66 and is RG213 or a close equivalent. RG58 could be used but is smaller and will result in increased losses and a lower power capability. RG213 will work at the 100 watt level.

Before use the diplexer should be checked for operation. Transmit into one port and see what appears at the other with a detector. All ports should be matched for these checks. There should be only a very small voltage at the other port with the full signal passing through to the common port.

C/o PO Box 2175, Caulfield Junction VIC 3161

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	S1 S2 L1	L2	L3	O/C stub	S/C stnb	tapping pt Lt	L4
function	λ/4 @ 432	match@144	λ/4 @ 144	≠ λ/4@144	λ/2 @ 432	λ/4 @ 432	match@432
% λ @ 144	0.084	0.205	0.250	0.268	0.168	0.084	0.249
length	115mm	280mm	342mm	367mm	230mm	115mm	340mm

Table 1 – 144/432 MHz diplexer coax dimensions.

	S1 S2 L2	L1	L3	O/C stub	S/C stub	tapping pt L1	L4
function	λ/4 @ 144	match@50	λ/4 @ 50	≠ λ/4@50	λ/2 @ 144	λ/4 @ 144	match@144
length	342mm	790mm	990mm	1052mm	690mm	342mm	1000mm

Table 2 – 50/144 MHz diplexer coax dimensions.

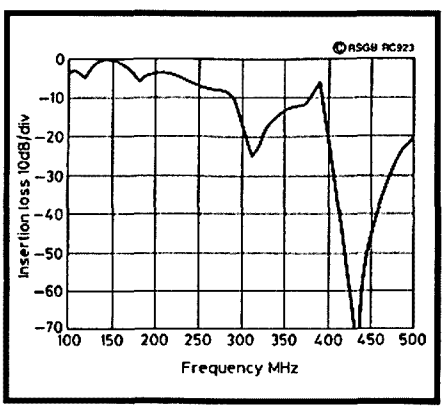


Fig 8 – 144/432 MHz diplexer – 144 MHz port.

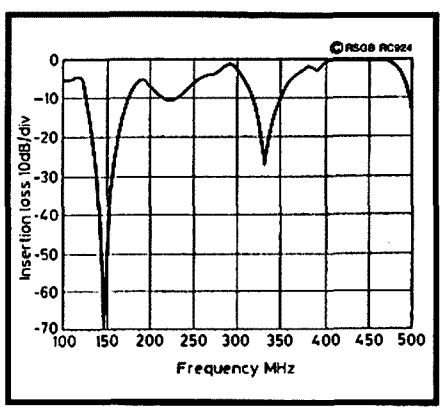


Fig 9 – 144/432 MHz diplexer – 432 MHz port.

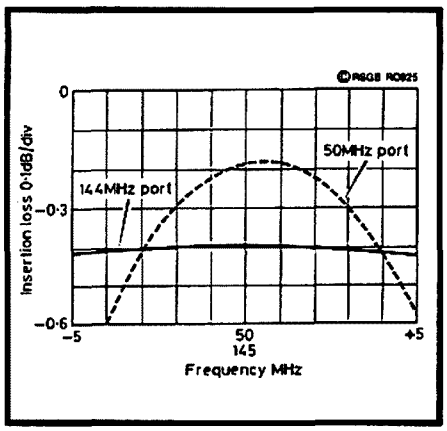


Fig 10 – 50/144 MHz diplexer passbands.

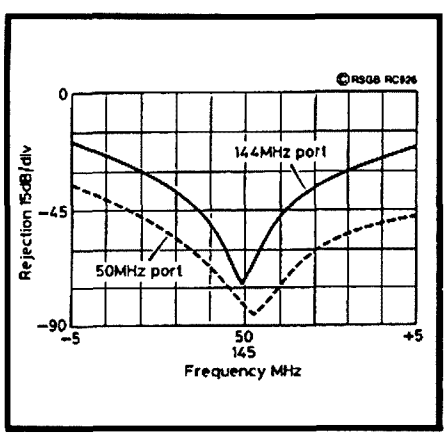
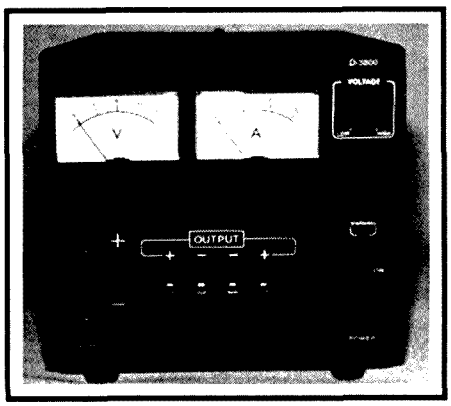


Fig 11 50/144 MHz diplexer stopbands.

■ Equipment Review

Dick Smith D-3800 Power Supply

*Reviewed by Ron Fisher VK3OM**



Dick Smith D-3800 power supply.

Up until now it's been an expensive job to obtain a 13.8 volt high current power supply to operate a 100 watt HF transceiver. Matching transceiver supplies these days are nudging the $700 mark and, in some cases, are not available at any price. I am sure that Dick Smith Electronics have been embarrassed many times by not being able to supply any sort of power supply to go with a new Yaesu transceiver. I guess they probably recommended the customer should purchase a VK Power Mate kit and build one up at a total cost of around $300 plus several hours work to put the whole thing together.

Well, things have now changed. As often happens these days, the Chinese have come to the rescue. At $299, how could you go past it?

Specifications -

Input : 230-240V AC 50Hz.
Rated DC output : Adjustable from 3v to 15v nominal.
DC current rating : Refer to chart below.
Cooling system : Convection and thermally-switched fan cooling.
Overload protection : - Dissipation limiting circuitry for pass transistors
- 30 amp instantaneous current limit circuitry.
- AC mains circuit breaker (3 amp)
- Transformer thermal fuse.
- Fused transformer auxiliary secondary winding.

Metering : DC volts - 0 to 15V nominal
DC amps - 0 to 30A nominal

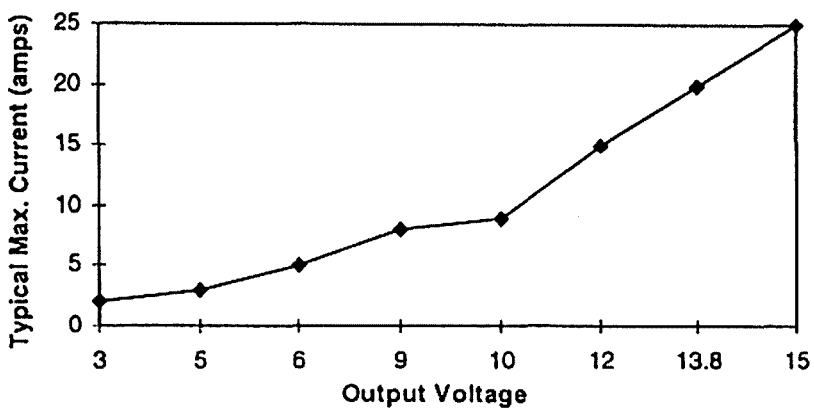


Figure 1 – Plot of output voltage against typical maximum current (reproduced from the supplied documentation).

D-3800 Power Supply Features and Facilities

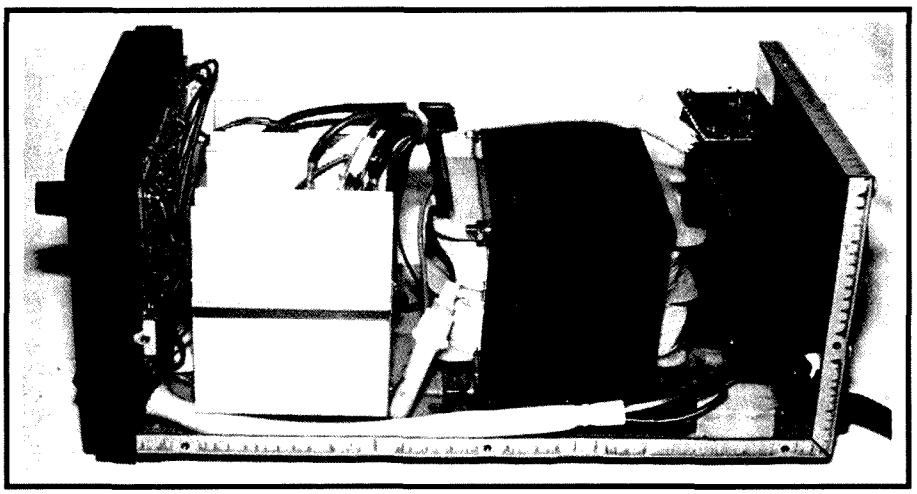
This supply gives you an output voltage variable from three to 15 volts with a maximum output of 25 amps. Actually, this needs to be qualified to some extent, because the 25 amps is only available at 15 volts. As the voltage goes down, so does the available current, so that by the time you get to three volts the maximum current available is down to about two amps (see Fig 1). At the usual 13.8 volts, the maximum continuous current is about 20 amps, but it will still handle peaks up to 25 amps that might be required by a 100 watts plus PEP output transceiver.

The supply is a solid transformer type with full electronic regulation. It is not a switched mode supply. It measures 320 mm deep, 150 mm high and 145 mm wide and weighs in at a hefty 8.6 kg. There are two separate meters to monitor both voltage (0 to 15 V nominal) and current (0 to 30 A nominal), and three sets of DC output terminals, one pair rated at the full output current and two rated at a maximum of three amps each. A thermally switched cooling fan, mounted on the rear panel, sucks air through the entire cabinet. Overload protection includes 30 amp instantaneous current limit circuitry, a three amp AC mains circuit breaker, a transformer thermal fuse and a fused transformer auxiliary secondary winding. The metal cabinet is finished in matt black and presents a very neat appearance.

D-3800 In Use

The operation of the power supply is, in general, quite straightforward. However, there are a few strange things that you need to know about. Unfortunately, the instruction sheet (a double sided A4 sheet only) appears to be a bit misleading.

Overload protection does not work the way the instructions say it should. It states, *"The front panel overload LED*



The D-3800 power supply with the cover removed. Note the hefty transformer, and the cooling fan on the rear panel.

will light if excessive current is drawn. When excessive current is drawn the output voltage of the power supply will automatically be reduced but will return to its pre-set voltage when the excessive load is removed". Well, not on our review power supply.

I found that if I drew current in excess of that rated for the voltage output, the voltage remained at that setting but the current limited down to about one amp. To restore full current it was necessary to remove the load completely (zero current) and then start again. At no time did the overload LED indicator come on.

However, in spite of this anomaly, the power supply worked well in practice. The output was very clean with extremely low ripple, even at a full 25 amps output; also the supply ran cool at all times.

Conclusion

There is no doubt that this power supply represents excellent value for money. I noted an advertisement in the USA magazine *QST* for what appears to be the same unit for $US249. This converts to about $AUS315, which makes the list price of $299 excellent value by any standards.

Perhaps Dick Smith Electronics could take a look at the supplied documentation and make some improvements. For instance, no circuit diagram is included.

Our review power supply was supplied to us by Dick Smith Electronics.

**24 Sugarloaf Road, Beaconsfield Upper VIC 3808*

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WIA FEDERAL 1995 ANNUAL REPORTS

Here are precis versions of the 1995 Annual Reports adopted by the Federal Council of the WIA at the 1996 Annual Federal Convention and approved for publication.

Federal President

Each year with New Year's Resolutions in mind, many look forward to promoting and progressing the aims of amateur radio. The questions then arise, what are their aims and how may they be implemented? Each Division is autonomous and builds up its strategies for its own purposes. Divisions differ vastly in their financial operations with Divisional components ranging from $14 to $25.25. There have been moves in the past, and some recently, to bring them into line along with changes to voting at the AGM.

The past year's report could be one of gloom and despair; instead, it should be seen as one of stability entering the WIA with the new structure of Directors and Councillors working to produce a stronger and more forward-looking organisation.

Executive

The new Directors took up their positions and quickly formed into a cohesive group. Allocations of portfolios spread the workload. Peter Naish was elected as Company Secretary, Lance Bickford took on AR and related areas, Rowland Bruce, Membership and Recruitment.

Peter Naish quickly associated himself with the financial situation determining the tasks and action necessary to arrest the decline in finances. His arrangement with the auditors to examine the Institute's affairs progressively through the year has effectively replaced the office of Secretary of the Institution as employed in the past.

Articles of Association

The book has finally been written. Each Division has been provided with a diskette copy of the Articles of Association, and the Memorandum of Association. The Institute thanks the VK3 Division for the effort; hopefully, this work will prove its worth with the need to alter anything a long way off in the future.

In January 1972 the WIA became a Company, Limited by Guarantee, or an Incorporated Company. The re-write or updating is the first major act of alteration to have taken place in the last twenty-three years. Of some interest is the noting of who was the first executive. Michael Owen, David Wardlaw, David Rankin and Bill Roper are all still active in amateur affairs. The other two names are Ken Pincott, who is still an active amateur, and George Pither, who passed away some years ago.

Membership

Declining Membership is, and has been, attributed to many causes. However, Divisions should now be actively pursuing recruitment, aided by the donation of an ICOM transceiver. This action was initiated by Roger Harrison, our Media Liaison Officer. It has been offered as a prize in the recruitment and retention drive.

Amateur Radio and Callbook

Amateur Radio continues to be the tangible benefit of membership. It has been published in its present format now for several years. With Lance Bickford now having the portfolio of oversighting its production, along with the reader's survey, some changes may be expected. The magazine consumes a large proportion of the income, and the members rightly expect a quality product. The call book is the yearly publication which has its share of production problems. This year, although not a production problem, the SMA records were only good up to April '95. Their computer system seems to have a dislike for the Institute's computer.

International

The WIA continues to be well represented overseas by David Wardlaw. His ongoing commitment to this work requires substantial absences from his professional work. Members should be grateful that he is prepared to do this necessary work, not only overseas, but he represents the Institute at the RCC meetings, and the SMA Liaison meetings also.

His workload eased slightly with his standing down from the Directorship of the Region 3, after many years. Many would envy his working knowledge of the international affairs concerning amateur radio.

SMA

A significant change took place during the year with the formation of the three man Liaison group. This group comprising David Wardlaw, Roger Harrison and myself, met with the SMA in Canberra on agreed dates. Agenda items were circulated well in advance of our meetings, and each meeting has been conducted in an atmosphere of conviviality. Most of the items on the agendas had supporting papers which aided discussions. SMA provided its personnel for the day's meeting with up to eight members providing expertise on the relevant area to which the agenda item referred. The two meetings in '95 covered over 33 items of business.

'95 will probably be best remembered for the anguish over licence fees. A tremendous effort by the amateurs of Australia saw the fees reduced from $71. Work is still in progress with an Exposure Draft being drafted and its subsequent submission to the Government.

The TLSs were seen in their draft form, and eventually the WIA agreed to their content. This is not to say that we accepted them as the final TLSs. We are aware that the future will see further fine-tuning of them. The new method of issuing regulations covering amateur operations does not need the Radcom Act to be changed, but the SMA may, by determination, alter the TLSs.

In December, Austel and the SMA were joined into a single identity. At the time of writing it is unknown how the amateurs will be affected by this merger.

Office and Staff

Through the year the office staff performed well, often under adverse conditions and criticism. With the coming and going of two Secretaries the associated duties with the position were carried by the Office Staff. When finally the position was taken over by Peter Naish, he found no fault in their work. The staff have worked well with Peter, the auditors commend their efforts, and the general overall functional ability of the office is very good.

Average monthly hours of attendance by Office staff has fallen from 146.5 hours in 1990 to 91 hours in 1995.

From the phone calls that are known or originate from the various sources, ie, Divisions and Directors, the Office Staff have to respond to many. They are resourceful enough to answer most questions. However, now with Directors with portfolios, it should be noted that perhaps these people should have the inquiry directed to them in the first place.

It has been a busy year. I've been involved in Federal activities now for some years, and cannot remember one which caused so much use of the President's "spare time". However, the work has been done, usually without delay. Perhaps the ensuing year will see the WIA more forward-looking, Divisional stability enhanced and, last but not least, membership increased.

Neil Penfold VK6NE
Federal President

ALARA

The Australian Ladies Amateur Radio Association Inc had a busy year with membership only slightly down on the previous year. Propagation is still a problem for the ALARA Contest participants. *Amateur Radio* magazine continues to provide ALARA with an opportunity to tell about our Association. ALARA became incorporated early in 1995 after a good deal of work by several members.

The 1996 ALARAMeet will be held in Perth on 28 and 29 September. Changes to the Committee are Bron Brown VK3DYF as Minute Secretary and Robyn Pye VK4RL as VK4 State Representative. Lunches continue to be held in various States.

ALARA 1995-1996 Committee

President	Christine Taylor VK5CTY
First Vice-Pres	Judy Atkins VK3AGC
Second Vice-Pres	Bev Clayton VK4NBC
Secretary	Bron Brown VK3DYF
Treasurer & Souvenir Custodian	Margaret Schwerin VK4AOE
Minute Secretary	Bron Brown VK3DYF
Publicity Officer	Sally Grattidge VK4SHE
Contest Manager	Marilyn Syme VK3DMS
Historian	Deb Matthews VK5JDM
Sponsorship Sec.	Gwen Tilson VK3DYL
Awards Custodian	Jessie Buchanan VK3VAN
Librarian	Kim Wilson VK3CYL
Editor	Dorothy Bishop VK2DDB

ALARA State Representatives

VK1/2	Dorothy Bishop VK2DDB
VK3	Bron Brown VK3DYF
VK4	Robyn Pye VK4RL
VK5	Meg Box VK4AOV
VK6	Bev Hebiton VK6DE
VK7	Helene Down VK7HD

Christine Taylor VK5CTY
President

AMSAT-Australia

The number of amateur satellite operators has stabilised during 1995 with the majority of operators being active on the 9600 baud digital packet radio satellites and, to a lesser extent, the 1200 baud PACSATs.

The voice/CW communication amateur satellites such as AMSAT-OSCAR-10 and -13, the Russian RS-series of satellites and Fuji-OSCAR-20's analogue transponders, still

continue to have a dedicated band of users, but one has to admit that there has been a mass exodus to the digital satellites.

Similarly, during 1995 the major activity on board the Russian Space Station, MIR has been packet radio with infrequent voice contacts being made on odd occasions.

In 1995, the Space Shuttle Amateur Radio Experiment (SAREX) activities have continued on a number of Space Shuttle missions both voice and packet radio giving many Australian amateur radio operators the chance to talk to the astronauts. Unfortunately, there have been no Australian schools involved in the SAREX school contacts this year, but at least one school in 1996 has already been scheduled for a prearranged contact. Australian schools are again invited to send a SASE to AMSAT-Australia C/o GPO Box 2141, Adelaide SA 5001 if they would like to have students contact astronauts on board future Shuttle SAREX missions carrying amateur radio. Such contacts can be either direct on 2 m or via a phone link to my QTH.

In 1995, no Australian representative attended any of the Phase IIID Experimenter's Meeting in Marburg, Germany. However, in May 1996 I will (with the support of the Wireless Institute of Australia) be attending the Phase IIID Orbit Analysis and Command Station Seminar in Marburg, Germany and then travelling to Orlando, Florida where the Phase IIID spacecraft is being built. Phase IIID is currently due to be launched in November 1996 or early in the first quarter of 1997.

During 1995, no new amateur satellites have been successfully launched, primarily due to either the failure of the launch vehicle or malfunctions in the primary payload. This has not dampened the enthusiasm of amateur satellite builders as both spacecraft are currently being rebuilt for later launches and six new amateur satellites are currently under construction throughout the world for launches in 1996, 1997 and 1998.

During 1995, AMSAT-OSCAR-13 has continued to favour the Southern Hemisphere stations. The Mode-S transponder has seen many Australian amateur radio operators become active on the 2.4 GHz band in preparation for the Phase IIID satellite. AMSAT-OSCAR-10 continues to provide excellent communication even though the on-board computer failed in 1986.

Throughout 1995 Bill Magnusson VK3JT has again continued to keep the readers of *Amateur Radio* up-to-date with the timely material he has provided in his AMSAT-Australia column. Bill's efforts continue to generate a steady trickle of interest in the Amateur Satellite Service. In 1995 I received over 500 mail items requesting general information on amateur satellites and satellite tracking software. Also, the AMSAT-Australia monthly Newsletter has increased its total number of subscribers (started in April 1985) to over 900 but, with the advent of Internet available to the general public, the newsletter has seen a decrease in the number of renewals.

Finally, I would like to thank the WIA for its continued support of the Amateur Satellite Service via the activities of AMSAT-Australia and ask that the 1996 Federal Convention recommend that the WIA continue to support AMSAT-Australia financially at the present level.

Graham Ratcliff
AMSAT-Australia National Coordinator

Awards

Achievements

Fully operative computer database incorporating all active WIA DXCC files. The bi-annual DXCC listings are derived from this database. An extremely good rapport with all awards recipients.

Problems

There has been a noticeable down-turn in applications for most awards. This is primarily caused by lack of communications due to the lack of propagation. The WAVKCA Award, however, maintains a degree of popularity. As a consequence, income from awards applications has dropped noticeably. There is also a lack of incoming information on DX Awards.

On some occasions I have had to "manufacture" information gleaned from old publications, to create entries for *Amateur Radio* magazine. Continued requests for information on "local" awards seems to have fallen on deaf ears.

Conclusions

Activity over all, has been pleasing, with one exception. I would like to see and experience more active association between the WIA co-ordinators and the WIA Executive.

John Kelleher
Awards Manager

Education

During 1995, the activities in Education were concentrated on the finalisation of the Question Banks.

Achievements

* completion of the AOCP/AOLCP bank to draft stage, its presentation to Council and submission to the SMA, and obtaining of publication quotes;
* completion of the Regulations Bank to draft stage and its submission to the SMA;
* production and submission of a draft Regulations syllabus;
* completion of sophisticated computer programs to allow production on demand of uniform standard theory and regulations examination papers and Morse code receiving tapes;
* ongoing negotiations with the SMA on Question Banks and syllabuses; and
* establishment of an Examinations Committee to assist the Federal Office in examination matters and oversee preparation of new examination materials from the new Question Banks.

Disappointments

* the extended time taken by the SMA to respond to submissions;
* the refusal of the Federal Council to publish the AOCP/AOLCP Bank in the form recommended by the Committee.

Intentions for 1996

* completion of the NAOCP Bank and all negotiations for approval of Question Bank and syllabus materials;
* release of all Question Banks to the public and to IARU societies;
* replacement of all existing Examination materials with new versions created from the Question Banks.

The Question Bank Committee will be disbanded early in 1996 at the members' request. I wish to express my most sincere appreciation for the time, effort and expertise which they have contributed over the last three years.

Brenda M Edmonds, VK3KT,
WIA Federal Education Co-ordinator

Federal Technical Advisory Committee (FTAC)

Membership and Organisation

There have been few changes to the membership of the FTAC panel. A current list of panel members is appended to this report. I would like to thank panel members for their efforts during the past year.

There are still difficulties in obtaining information, comments, or replies to outgoing mail, from some TACs. This has limited the ability of FTAC to fully carry out its consultative and co-ordination roles. Decisions have still been made but usually by means of setting a deadline for responses and assuming that silence is taken to mean assent. It is understood that everyone can only spend so much time on voluntary work for the WIA, but it would help if TACs could review the situation and, if possible, find ways of giving a higher priority to national liaison and co-ordination.

Activities and Achievements

During the past year, activities such as updating of the beacon and repeater data base, and processing of record claims, have continued. The Australian Amateur Band Plans have been revised and copies circulated to all Divisions for further distribution to members. For the first time in some years, the band plans have also been published in *Radio and Communications* magazine. A revised (easier to read) version of the band plans is being prepared for inclusion in the information package sent to amateur examination candidates. Information papers on permitted transmission modes, and a detailed paper setting out guidelines for the operation of unattended transmitters – including beacons and repeaters – have also been prepared and circulated.

A large amount of time was also spent during 1995 on preparing material relating to our new licence conditions. Much of this work has come to a satisfactory conclusion, although we are still waiting for the TLS for beacons and repeaters to be finalised.

Problems and Unfinished Business

There is continued need for strong support and publicity for the band plans. It is a matter of concern that some amateurs disregard the "gentlemen's agreements" simply because they are co-ordinated by the WIA. Consultation and communication in these areas would be much more effective if the WIA's image could be improved and its membership could be significantly increased.

The development of beacons has been retarded by licence fee increases, especially as beacons tend to take second place to repeaters when it comes to allocation of funds. Priorities in this area need to be reconsidered in view of the technical importance of beacons. Repeaters are also faced with problems of increased running costs, interference and overcrowding in some parts of the country. There is a need for a national review of repeaters, with special attention to their cost effectiveness and spectrum efficiency.

John Martin VK3KWA
Chairman FTAC

Historian

During 1995 material was received from ALARA, which was much appreciated. Some more information on members of the Wireless Reserve in the RAAF in 1945 was received, but it

is obvious that much of what should be in the collection has been lost in transfer from one Historian to the next. Any more data on this group will be most welcome. The work already started by Bob Cunningham VK3ML is being very useful.

In 1996 I intend to investigate the possibilities of:

a. Receiving a Community Heritage Grant from the National Library of Australia to assist with maintenance of archival material; and

b. Collaboration with a Tertiary institution on the management and potential of the collection.

John Edmonds VK3ATG/AFU
Federal Historian

WIA QSL Collection

Achievements

Selected parts of the collection continue to be exhibited at Radio Conventions. These seem to have created considerable interest amongst the friends of radio exhibitors as well as among amateurs themselves.

The year 1995 saw very close ties being established between myself and the Officer in Charge of the Austrian QSL collection. This collection, together with our own collection, are arguably the largest collections in the world. Considerable numbers of QSL cards are exchanged on a fortnightly basis.

Moves were made in 1995 to ensure the safe storage of valuable cards in that some steel filing cabinets were purchased.

Problems

The task of filing many thousands of QSL cards is particularly time- consuming. Although carried out most willingly, I feel that some effort must be made to recruit other helpers in the task of maintaining the collection, particularly as we look forward to the future.

I should like to see more use made of the collection by radio historians. Many articles in radio magazines could have been illustrated had a request for a photostat QSL been made.

Summary

Our QSL collection remains a source of first-hand historical information in that original documentation by early experimenters is being preserved as well as being a record over many years of the changes in the type of equipment used and the main events taking place throughout a country's history. More effort needs to be made, however, in bringing this valuable source to the attention of both radio amateurs and the public. It could possibly be used as part of a WIA membership/publicity drive.

Ken Matchett VK3TL
Honorary Curator

VK9/0 QSL Bureau

The past year has seen an increase in short term visits by overseas operators to the VK9 Call areas. This is, in itself, good for the Australian Tourist Industry. Unfortunately, the Bureau has major problems with the visits.

Since April 1995 the SMA has ceased supplying the monthly updates of the callsigns to the WIA. Since that time, cards coming into the bureau indicate that up to fifteen VK9 callsigns have been issued.

At the present time we have no record to check to see if the callsign being used is not a "SLIM".

An enquiry has been sent to the SMA requesting information on VK9/0 callsigns, and an indication was given that a charge may be made for the information. I hope that it is received as the Bureau is holding a number of direct QSL cards, and it would not enhance its reputation if the envelopes were to be returned marked "sorry no information available".

Neil Penfold
VK9/0 QSL Bureau Manager
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WIA News

SMA Proposes New Class Licences, Review of Apparatus Licence Fees

A new Class Licence covering radio-controlled models using equipment in the 29 MHz and 36 MHz bands has been proposed by the Spectrum Management Agency (SMA), with support for higher power transmitters and channel arrangements similar to those used by enthusiasts for some time.

Model radio-control transmitters in the 29 MHz and 36 MHz bands are presently covered under the SMA's Class Licence for Low Interference Potential Devices (RCL 1993/1, Item 29).

Lower-powered transmitters for radio-controlled toys are already provided for at 27 MHz, according to the SMA.

Transmitters having radiated powers ranging between 300 milliwatts and one watt effective radiated power (EIRP), for controlling sophisticated models, will be covered by the proposed Class Licence.

Channel usage arrangements intended for the safe flight of model aircraft using the 36 MHz band are to be specified in the proposed Class Licence.

Meanwhile, the SMA, in consultation with an industry working group from members of the Radiocommunications Consultative Council, is evaluating Apparatus Licence fees under the system introduced in April last year. Amateur Radio licence fees are not being considered as part of this review. As a result of decisions arising out of the working group's review, the SMA anticipates publishing a new edition of the Apparatus Licence Fee Schedule later this year. The last one, RIB 68A, was published in February this year.

New WIA Members

The WIA bids a warm welcome to the following new members who were entered into the WIA Membership Register during the month of May 1996:

L21014	MR D E MACPHERSON
L21015	MR M J SCHOLES
L21016	MR G PENON
L21017	MR I C F GRAY
L21018	MR M A JAMES
L21019	MR D WOODHEAD
L30931	MR R CAMPBELL-DRURY
L30932	MR T ILES
L30934	MR J CRERAR
L50344	MR R SACHSE
L50345	MR G D WILLIAMS
L60347	MR M J DIBDEN
LA0CX	MR U HEUBERGER
VK1PV	MR P VENTATRAMAN
VK2AEJ	MR O L HOLMWOOD
VK2AJ	MR R J BAILEY
VK2ARU	MR P K FROST
VK2BGP	MR G I POST
VK2BMC	MR W P JOHNSON
VK2DGS	MR G H SANDERS
VK2FLT	MR J J TREGILLGAS
VK2HKA	MR K A WICKS
VK2LAL	L HOGAN
VK2TAZ	MR P ROGENCAMP
VK2TIJ	MR P NGUYEN
VK2UAI	MR A R IRVINE
VK2UK	MR E KLEIN
VK3DBO	MR L J SNOOK
VK3DJM	MR J H MILLER
VK3EJP	MR J D PERKINS
VK3FES	MR G BAKER
VK3FFQ	MR L ROCK
VK3JGN	MR G MANN
VK5XPS	MR P A SMITH
VK5ZIL	MR S F WARREN
VK6AGA	MR J M GRIBBLE
VK6AKJ	MR K J WALDRON
VK6APG	MR P G SAFE
VK6BEB	MR A A SMITH
VK6JAY	MR L LASMANA
VK6KCH	MR C R HILL
VK6KQ	MR K R BRYNE
VK6MBG	MR A MARTIN
VK6MG	MR L P MCGUIRE
VK6OQ	MR S R WHITE
VK6PJB	MR P J BROWNER
VK6WU	MR R G JAESCHKE
VK6YCP	MR A L ROBINSON
VK6ZJ	MR D D KINNERSLEY
VK7HCR	MR C J READING
ZL1UJF	MR J FULLER

The WIA also bids a warm welcome to the following new VK4 Division members:

Paul Antuar	VK4KBD
Robert Murton	VK4ZOW
Martin Saunders	VK4HMJ
Roystan Colebourne	VK4NEC
Robert Benetti	VK2ZEB
Robert Cumming	VK4YBN
Roy Milner	L40373
FT Van Dore	VK4YAM

■ Computers

A Radio Amateur's Guide to the World Wide Web

Richard Murnane VK2SKY explains the Internet and how it is a useful adjunct to amateur radio.*

Introduction

Anyone who has listened to WIA Divisional broadcasts (in VK1 and VK2, at least) will have heard, and perhaps been perplexed by, the announcer reading out torturous cryptic codes, which invariably begin, *"h-t-t-p-dot-slash-slash..."* What are these tongue-tanglers, what do they mean, and how do they affect us radio amateurs? I hope to answer these and other questions in this article.

In the past two or three years, "the Internet" has become a beast of almost mythic proportions, growing in popularity (with some 10 million users today) and sophistication as it leaves the domain of the hacker and ponders whether it will become the next television.

Ten years ago, when "hacker" was a label one could wear with pride, the Internet was populated by such people, concentrated around universities and major computer companies. They were people for whom the arcane world of the Unix operating system, the dreaded "line eater" bug, and the apocryphal "kgbvax@kremlin.ussr" were everyday phenomena that could not be readily explained to ordinary mortals.

Rather like the radio amateurs of earlier generations.

Now, much as CB radio and cellular phones have made wireless communications into appliances for the "great unwashed", new computer software is turning the mysterious Internet into the so-called "Information Superhighway". "The Internet" is a cover-all term for a number of computer networks, all of which are linked to each other, forming one huge "net" that spans virtually the entire globe. The universities and large computer companies still form most of the "backbone" of the net but, in recent years, smaller companies and independent service providers have made the net accessible to an ever-growing number of people around the world (current estimates put the growth rate at about 10% per *month* – imagine that happening in amateur radio!)

With the increased net population has come a huge broadening in the kind of information to be found there. Any subject you can imagine (and probably a few you couldn't!) can be found "out there". This information forms an immensely valuable resource, for research, education, entertainment, etc. And, of course, some of that information is of particular interest to radio amateurs. The trick is finding it...

Duke of URL?

Which brings us back to that "h-t-t-p-colon-slash-slash" stuff. If all this great information is out there, how on earth do you find it? Well, every piece of information on the net is stored on a computer somewhere, in the form of a data file. Every such piece of information is termed a resource, and the key to locating that resource is called, not surprisingly, a *Uniform Resource Locator*, or *URL*. This is sometimes pronounced "earl", or just spelled out.

As its name suggests, a Uniform Resource Locator takes the same form, no matter what kind of resource it refers to. A URL has three parts:

a. the first part indicates how the resource is to be transferred between your computer and the one where it's stored;

b. the second indicates the unique identity of the computer where the resource is located; and

c. the third part indicates the name of the resource.

So, a typical URL is: *http://sydney.dialix.oz.au/~wiansw/index.html* which

The computer monitor screen while accessing the VK2 Division's World Wide Web page.

is the World Wide Web page (or site) of the WIA, NSW Division (more about the Web later.)

"http:" means that the resource will be transferred to your computer using the *Hyper Text Transfer Protocol.* Other possibilities are *"ftp:"* (File Transfer Protocol), another popular means of sending computer files around the net, *"mailto:"*, a means of sending electronic mail (like packet radio messages), and *"news:"* which refers to Usenet News.

Don't worry about all these terms for now: what matters is that both computers agree on how the information is to be passed between them.

"//sydney.dialix.oz.au/~wiansw" is the location of the resource: *"//sydney.dialix.oz.au/"* is the name by which the computer is known to every computer on the net. *"~wiansw"* indicates the name of the account holder on that computer (many computers on the net are shared by a number of users, so each has its own unique user name.)

Finally, *"index.html"* is the name of the file containing the information. This can sometimes be omitted, and the "Web server" program on the computer knows which file to send back if none is specified.

For comparison, the URL for a typical electronic mail address on the Web (mine) is: *mailto:richardm@zeta.org.au*

The order is slightly different here: *"mailto:"* means "send electronic mail", my user name is *"richardm"*, and my "home bbs", to borrow a packet radio term, is *zeta.org.au.*

Browsing Around...

Knowing the URL for a resource is all well and good, but how do you use it? Well, the first thing you need is a piece of software called a "Web browser". This program takes the URL, retrieves the resource, and displays it on your computer screen. The information can take many forms, such as printed text, images, movie clips, sound, and heaven knows what else in the future. Internet Service Providers normally provide their customers with the necessary software, so I won't cover the details of configuring such software (sadly, this is one area where the Internet isn't quite suitable for "appliance operators" yet, but it's nearly there).

Most of the information that you will find on Internet is in the form of hypertext, which lets you link resources together. For example, the VK2 Division Web page has links to other radio organisations like the ARRL and RSGB, links to government agencies like IPS Radio and Space Services, and the SMA, links to radio clubs around NSW and overseas, and many more. While reading the VK2 Web page, you can simply point your mouse to some text that looks like a "hot link" (such text is usually underlined and usually a different colour to the rest of the text), click the mouse button, and a few moments later you're looking at the linked Web page. Click on the "Back" button, and you return to VK2.

Hot links work a bit like the transporter in Star Trek. Press a button and you can go wherever the link has programmed you to go. Now, if you were to draw on a piece of paper a dot representing every Web page, then draw lines representing links between each page, you'd soon have something that looked like a huge spider's web, which is where the World Wide Web gets its name.

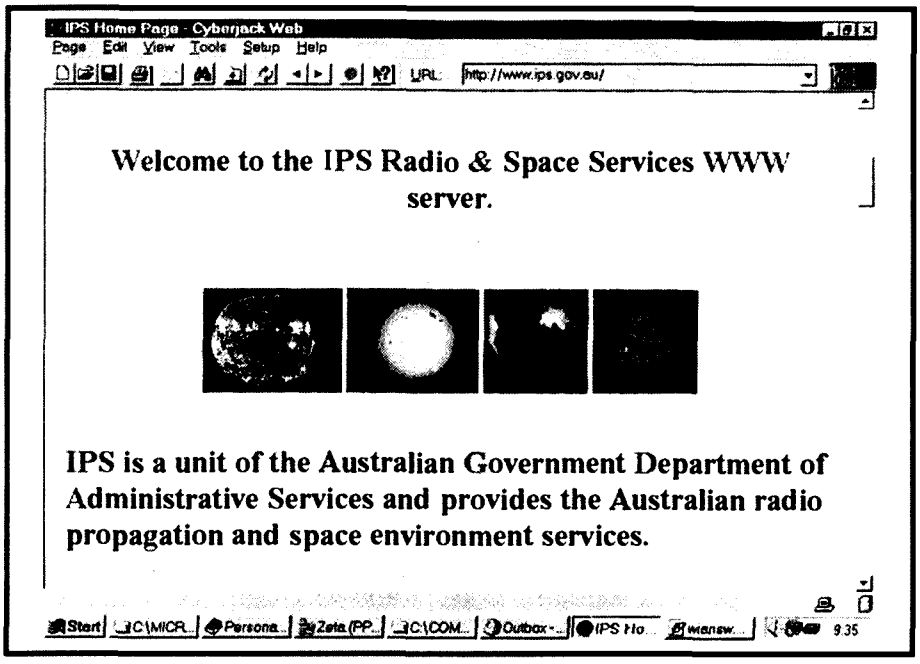
The Web has been described as a bookshop, where the books are scattered all over the place: when you look for a particular book, you can stumble across many more that have nothing to do with what you originally wanted, but which are interesting, nevertheless. Which leads us to an interesting question. If you want some information, and you don't happen to have URL to take you straight there, how do you find it?

Seek and You Shall Find

Fortunately, there are Web sites whose sole function in life is to seek out information elsewhere on the Web. These are known as *search engines.* These engines have a special part, called a web robot that spends its day "reading" web pages, storing key words and phrases from those pages, and storing them for later use. Then, when you come along and ask for a search based on, say, "amateur radio" and "australia", the search engine provides you with a list of matching URLs. Just click on one and away you go!

Interesting Sites

WIA state Divisions in VK1, VK2, and VK5/8 established World Wide Web sites last year, and these have proved very popular among Internet users, both in Australia and overseas (the VK2 Web page gets "visits" about 80 times every day). A Federal Web page was recently proposed at a recent Federal convention, so hopefully this will be up and running soon, offering a single reference point from which all other information about



The computer monitor screen while accessing the IPS World Wide Web server.

amateur radio in Australia may be accessed. The VK4 Division is currently developing a Web page, and we hope that VK3, VK6, and VK7 will join in the fun as well.

The Future

A few issues still need to be addressed before the net becomes a mass communication medium on the scale of radio and television:

Cost: Currently, to access the net, you need a computer and a high speed modem, an investment which can easily exceed the cost of a new HF rig. However, a dedicated "Internet box" was recently announced, costing around $US500; we can expect the price of such devices to fall dramatically as they become mass-market appliances.

Delivery: Today, Internet access is via telephone lines, the use of which may soon incur timed charges even for local calls. Pay TV providers are starting to look for other ways of filling their bandwidth delivery capacity by adding extra service, which is likely to include Net access; the extra cost on top of pay TV services may be minimal.

Addictions: A recent phenomenon reported in the United States has been "net addiction", where people interact with the world only via their computers, at the expense of dealing with people IRL ("In Real Life"). However, this might not be such an issue for those of us who spend prolonged periods in our shacks away from spouse and family!

Another concern that has been raised is the type of information that is available on the net. With a population soon to be in the tens of millions, there are bound to be clashes over what material is acceptable for publication on the net, especially with children having an increasing presence on the net. In the future, information on the net may carry a rating similar to that used with films, video and television, and users will be able to install "guardian" software to screen out unwanted types of material. Until that becomes a reality, perhaps the best policy for parents is to take an active interest in their children's use of the net, showing them how to use the wealth of information for positive purposes in their lives.

Returning to amateur-specifics, an increasingly prominent issue is that of the use of Internet-to-packet gateways. Current legislation prohibits traffic from non-amateurs from being sent on the amateur bands; however, this limits the use of the gateways by licensed amateurs who wish to use Internet as a faster alternative to message forwarding via the ether. In future, experimenters are likely to devise ways to make packet-Internet forwarding available to licensed amateurs, despite SMA regulations to the contrary. If done proficiently, nobody is likely to be any the wiser, and the SMA is unlikely to take action while it continues to ignore more serious breaches of the Radiocommunications Act.

But is it Amateur Radio?

Well, no. Some have expressed concern that we're all moving away from "real" amateur radio and towards Internet, to the detriment of our hobby. While Internet seems to have an attraction for youngsters that is missing from amateur radio, I think we must face up to a few demographic facts. The amateur population is aging, while the Internet community is growing ever younger; if we pretend that it doesn't exist, we will probably move inexorably into an evolutionary corner, and eventually die out. On the other hand, Internet offers a unique opportunity to expose a large number of people of all ages to the magic of our hobby. In the meantime, the communication resources available on the net are just too vast to ignore. Be careful though: you might never return to packet radio!

*PO Box R153, Royal Exchange, Sydney NSW 2000
Packet: VK2SKY@VK2OP.NSW.AUS.OC
Internet: richardm@zeta.org.au

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Help stamp out stolen equipment – keep a record of all your equipment serial numbers in a safe place

■ Foxhunting

Lost in Ballarat

The Triumph of Sheer Mindless Stubbornness Over Realism, Experience and Reason

*as told by Alex Edmonds VK3BQN**

It was late in the afternoon, cold, the sky was grey. We were doing something about a fourteenth circuit around an area of about three city blocks when the fox called up and said "time". He was giving up and going home.

We had just set a new record. We were the only team competing in the event, and we'd lost.

To understand how this was possible, you have to know that we had shown up in Ballarat for the Ballarat group convention on SATURDAY.

Few of the serious Melbourne Fox-Hunting teams show up on the Saturday for a single hunt, as that would mean either the cost of staying overnight or a lot of driving to take part in one event. For this reason, (or perhaps because they're replacing a clutch or, in extreme cases, a vehicle) the turnout for the Saturday afternoon events has been low each time we've been there.

As a result, a couple of years ago there were four teams in the Saturday hunt. Us and three Ballarat teams (yes, we came fourth. Shut up!).

This year, none of the locals entered. We rolled up at the gate, mostly set up, and said "when does the fox-hunt start". The people in the cars at the gate didn't really seem to know what was going on, so we drove into the ground and started asking people.

The answer was, basically, "whenever you want; you're the only team entering".

At first sight, this was encouraging. No competition. It meant that we actually stood a genuine chance. Foolish thought.

They decided to actually make us hunt. It was a two stage hunt on two metres. We eventually found the first stage, but we never did find the second. Partly this was due to poor preparation (no sniffer) and partly due to something I have never experienced before on a fox hunt – TOO MUCH signal.

Reception was full scale on the receiver meter WITH NO ANTENNA ATTACHED.

So much for radios in plastic boxes.

We circled the area, explored ALMOST every way in to where the fox actually was and must have been, at one stage, within roughly five metres of him (possibly less – we later worked out he must have been just the other side of a brick wall that we'd driven up to, but there was no way through from where we were).

After we'd been circling for 40 minutes or so, he decided we weren't ever going to find him (probably true, but still insulting) and called the event off.

FOX 1, HUNTERS 0.

In mitigation, I point out that there were only two of us. That meant no map-reader/navigator, a frequently vital team member (also, no decent maps).

Next morning was a sniffer hunt that I would have won, had I not had my fear of spiders get hold of me when I knew where it must be, under a large box, behind some bricks. Another hunter reached in past me and grabbed the transmitter (I should have clobbered him from behind before the judges could see it).

There followed another fox-hunt, and this time the Melbourne teams had shown up so there were five cars lined up. We had very carefully parked at the front of the starting line-up. We knew we weren't going to win, but we could cause some irritation amongst the ones who stood a chance. Old rule of fox-hunting – an annoyed fox-hunter is a less efficient fox-hunter.

In a burst of inspiration, BARG had come up with a concept that I've never heard of before. A multi-frequency, multi-stage, simultaneous hunt.

Transmitters running on four different bands from four different locations, with the contestants free to choose which order they would hunt them in.

Transmitters were running on 80 metres, 10 metres, two metres and 70 cm.

We began by following the only signal we could actually hear (after a little driving around), the 80 metre one. Having got somewhere near that fox I promptly lost all sense of direction, gave up on it and tried the other frequencies. 70 cm was nice and strong, so we followed it and actually found it. We then tried for the two metre fox, but time ran out on us (we have always been better on VHF hunts than on HF.)

Don't ask me how they scored that event. Frankly, I don't want to know.

The last hunt was a two legged two metre hunt in which we distinguished ourselves by finding the first leg and promptly forgetting that there was a second leg to be found. Neither of us quite understand this, except that it was possibly a simultaneous subconscious message regarding our abilities as hunters.

Results of the weekend? We were given "second place" in the Saturday hunt.

I'm not sure, but I think that was an insult. (My personal ability as a beam-swinger has never been in doubt. Whenever faced with a difficult choice I have always immediately taken stock of the situation, made a calm, rational decision, taken two Valium and collapsed in a whimpering heap. This hasn't helped our record any.)

Just to highlight the triumph, the shutter on my camera broke at some stage over the weekend, so that when I rewound the film to take it out, the whole film was massively over-exposed (this explains the absence of photographs accompanying this article).

As a team we have been going to the Mt Gambier convention to hunt every year for more than ten years, with occasional visits to Ballarat and other conventions.

So, have we ever won a hunt? Yes, surprisingly enough.

Once.

Many years ago, there was a single stage two metre night fox-hunt at Mt Gambier which ended earlier than expected. As a result, the fox decided to have one more unscheduled hunt. We won the unscheduled hunt. It was the only event ever run at Mt Gambier that there was no prize for.

Why do we keep trying?

I don't know. My psychiatrist won't tell me.

*PO Box 445, Blackburn VIC 3130

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■ Antennas

A Rotary Clothes Hoist 20 Metre Ground Plane Antenna

Neville Chivers VK2YO explains how to use your rotary clothesline as part of a DX antenna*

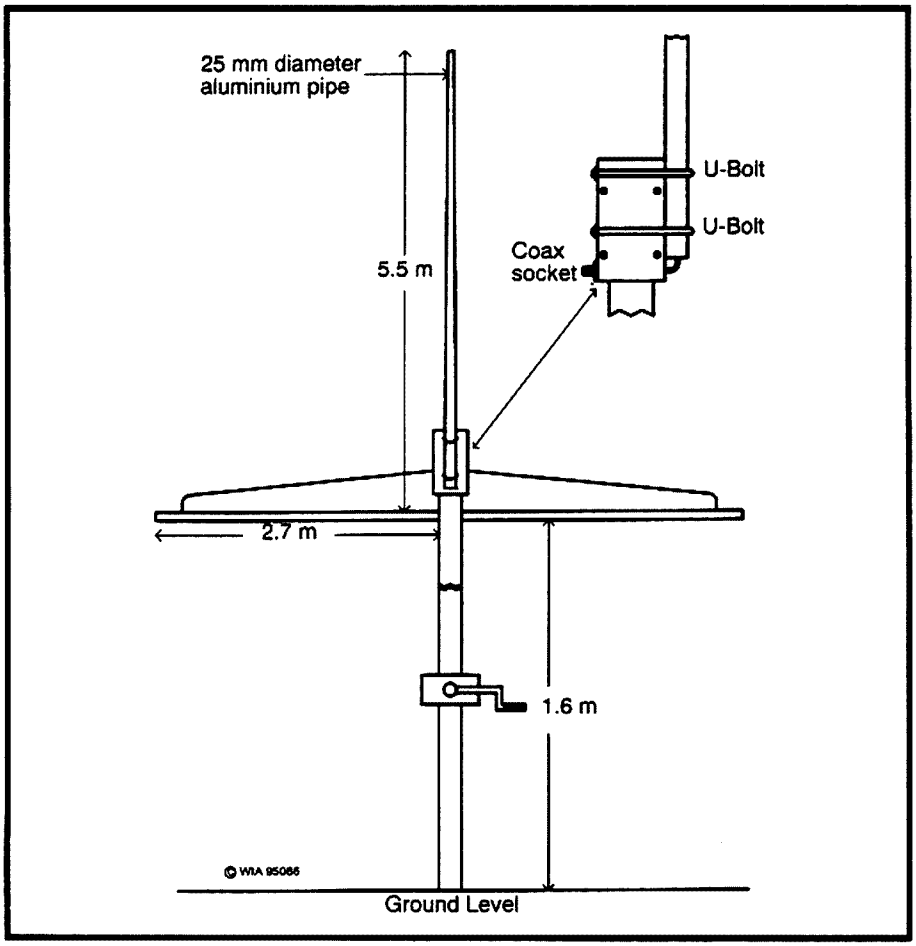

Figure 1 - Rotary clothes hoist 20 metre ground plane antenna (not drawn to scale). U-Bolts clamp the vertical antenna pipe to the wood block, insulating the pipe from the clothes hoist. U-Bolts are also used to clamp the wood block to the clothes line, and the coax socket braid connects under the nearest such U-Bolt.

The Problem

I was recently asked to advise a local amateur about possible antenna choices. His block of land slopes steeply down from the street to a rocky ledge upon which the house sits and then, at the rear of the house, drops away sharply to the creek at the back of the block. Upon the small amount of ground at the rear of the house stood a rotary clothes line. There was nowhere to locate a dipole or to run out an end fed wire.

The Solution

A vertical antenna was the only way to go. However, mounting a vertical antenna presented some difficulty. The tiled roof was of gable construction and was ruled out. The only mount available was the rotary clothes hoist which, it seemed, would also provide a ground plane or counterpoise for a quarter wave radiator even though the dimensions of the clothes hoist are somewhat less than a full quarter wave ground plane for 20 metres.

Construction and Adjustment

The antenna dimensions and construction are shown in Fig 1. The dimensions should only be taken as a guide as there are many variables involved. With the dimensions given the antenna dipped at 14.2 MHz and the SWR was 1.5:1 at the band edges. The SWR was measured using a Midland dual meter SWR bridge. At 14.2 MHz the radiation resistance was 65 ohms so that 50 or 75 ohm coax could be used. With the antenna connected to my TS680S transceiver full output was obtained between 14 and 14.3 MHz.

Performance

The antenna performs very well. It is as good as a horizontal wire antenna into Europe, Alaska, and New Zealand and is sometimes up to an S point better. Using an antenna tuner it loads up well on 15 metres and on 10 metres but loads poorly on 17 metres or 12 metres.

All measurements were made with the clothesline wound down which is its locked position. Raising the clothesline resulted in no discernible change in operation of the antenna. However, raising the clothesline allows it to freewheel in the breeze when drying clothes. This could lead to the coaxial cable being broken. As 20 metre DX operation is not usually a daytime pursuit the coaxial cable is left disconnected when clothes are drying.

Just in case anyone is wondering, there is no change in performance if clothes are on the line during operation.

Technical Editor's Note

Care should be taken when using this antenna. The clothesline could be hot with RF during operation and the RF radiation may be of concern to anyone using the clothesline. If the operator of the transmitter is also the user of the clothesline this is not a concern, but other household members should be warned to stay clear during operation of the transmitter.

** 51 Meeks Crescent, Faulconbridge NSW 2776*

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ALARA

Sally Grattidge VK4SHE, ALARA Publicity Officer*

Annual General Meeting – 27 May

After wildly fluctuating conditions on 80 m, the night of 27 May was surprisingly quiet and most members could hear most of the meeting most of the time. Present were Christine VK5CTY (net control), Bron VK3DYF, Sally VK4SHE, Robyn VK4RL, Poppy VK6YF, Margaret VK4AOE, Jean VK5TSX, Tina VK5TMC, Marilyn VK3DMS, Gwen VK3DYL, Pat VK3OZ, Judy VK3AGC, Bev VK6DE, Bev VK4NBC, Mary VK3FMC, Robyn VK3ENX and Maria VK5BMT/8 in Darwin.

All nominated office bearers were elected unopposed as follows:

Executive: President, Christine VK5CTY; Snr Vice-President, Judy VK3AGC; Jnr Vice President, Bev VK4NBC; Secretary, Tina VK5TMC; Treasurer/Souvenir Custodian, Margaret VK4AOE; Minute Secretary, vacant; Publicity Officer, Sally VK4SHE; and Editor, Dorothy VK2DDB.

Office Bearers: Historian, Deb VK5DEB; Awards Custodian, Jessie VK3VAN; Contest Manager, Marilyn VK3DMS; Sponsorship Secretary, Gwen VK3DYL; and Librarian, Kim VK3CYL.

State Representatives: VK1/2, Dorothy VK2DDB; VK3, Bron VK3DYF; VK4, Robyn VK4RL; VK5/8, Jean VK5TSX; VK6, Bev VK6DE; and VK7, Helene VK7HD.

Thanks to all outgoing and continuing officers, and a special welcome to Tina and Jean. We have all heard much about you and it is great to have you on the air and on the committee. Full names, addresses and phone numbers will be in the Newsletter.

Situation Vacant

Bron VK3DYF would like to retire, and certainly deserves to, after many years devoted to ALARA committee work. She has agreed to continue as minute secretary for the time being but, PLEASE, will someone come forward to take on this job. All you need is to be able to hear reasonably well at the meetings on 80 m. The minutes are not long, usually about one page. The meetings do not run at high speed and all on air will do everything they can to make sure you have all the information you require, and give LOTS and LOTS of help to any newcomer to the job. Don't be shy. This is a nice little job for someone who would like to help but perhaps feels they do not have the time or skills to take one of the more demanding positions.

New Addition

Added to the list of ALARA souvenirs is a magnetic bookmark, made by Tina VK5TMC, and ideal to send oversees as it is easy to post.

Packeteers

Quite a few YLs are finding packet a useful way of passing accurate information in spite of the inevitable problems which seem to be part of high technology. Please remember to keep the secretary up to date with the state of your packet station.

Margaret VK4AOE informs us that ALARA can now be found in the Special Interest pages of Packet Radio Teletext thanks to Graham VK4BB and Neil VK4NF.

New Member

Patsy KA7MZZ, sponsored by Sally VK4SHE. Patsy put out a CQ YL on packet which found its way to Townsville. Patsy lives in Oregon and is trying to contact YLs via packet in as many countries as possible.

New Subscriber

The Girl Guide Association in South Australia.

ALARAMeet Again

Please contact Bev VK6DE as soon as possible if you are going. She needs to know numbers for catering and bus tours, etc.

Wanderers

Judy VK3AGC was recently heard on the VK4YL net, from the QTH of Bev VK4NBC, while taking a well-deserved holiday in sunny Queensland. Maria VK5BMT called into the AGM from Darwin. On her way to Perth?

Contest Query

If a club is a member of ALARA and takes part in the contest, how does it score? As a club or as a member?

It has been resolved that a club or group taking part in the ALARA contest will score as a club, even if those involved are members. A club, or group as such, can be a subscriber (to the Newsletter) but not a full voting member.

Caught on the Net

Christine has often remarked on the variety of subjects discussed on Monday nights. A new one a few weeks ago was the problems of purchasing items of intimate apparel, namely supportive undergarments of an uplifting nature, faced by members of the fairer sex whose vital statistics are amplitude modulated.

VK3 Lunch

Present at the May luncheon were Elizabeth VK3NEP, Gwen VK3DYL, Jessie VK3VAN, and Mavis VK3KS. Bron VK3DYF arrived with suitcase, just off the train from Wangaratta where she had been visiting her two new granddaughters Kate and Emma, and their big brother Jason. As the girls were only three days old, Bron decided to wait a while before introducing them to amateur radio. Elizabeth is hoping to be on the air and on packet soon.

Long Path

Christine often sends me a report on the Monday night net which can be hard to copy from the far north. In May *Amateur Radio* it was mentioned that Bobbie VK2PXS had been absent from the net due to antenna problems. Her son, Frank VK2AKG, read the column and rushed over to fix the antenna (one of the traps had gone open circuit). Just goes to show the power of the press.

Night Train

Dot VK2DDB and OM Peter belong to the Hornsby Model Engineering Club and recently went to a night run. The five-inch gauge steam trains have front and rear lights, and the smoke and sparks from the funnels look like fireworks. Great fun; and don't model engineers get cross when you ask about their "toy" trains?

Still in the Dark

Sally VK4SHE recently went night orienteering in the bush and found it an interesting experience. Unless some younger and fitter YLs turn up soon, SHE is competing in the second IARU Region 3 ARDF Championships taking place in Townsville about the time you read this. In depth report in next issue!

**C/o PO Woodstock, QLD 4816*

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Remember to leave a three second break between overs when using a repeater

Awards

*John Kelleher VK3DP - Federal Awards Manager**

During the past few months, I have been listening to an earnest group of amateurs who have created what is now known as The Downunder County Hunter's Net on 14255 kHz. Their enthusiasm rubbed off on me, so I joined in. To date, I have increased my tally of US counties by another 12.

This Net operates on the above frequency, beginning at 0330 UTC, during the period of the USA weekends, ie Saturday, Sunday and Monday local. The main instigators are VK3ATZ and VK5AQZ, who welcome callers from all over Oceania to participate. I fully support this initiative, and to help in this cause, I include information taken from *The USA Counties Award Record Book.*

The United States of America Counties Award

The United States of America Counties Award, sponsored by CQ, is issued for CONFIRMED contacts with specified numbers of US counties under rules and conditions hereafter stated (as of 1 April 1983).

A. Awards Classes

The USA-CA is issued in seven different classes, each a separate achievement as endorsed on the basic certificate by use of special seals for higher class. Also, special endorsements will be made for all one-band or -mode operations, subject to the rules.

Class	Counties Req'd	States Req'd
USA-500	500	Any
USA-1000	1000	25
USA-1500	1500	45
USA-2000	2000	50
USA-2500	2500	50
USA-3000	3000	50

USA 3076-CA for ALL counties, and Special Honours Plaque, now available for $US40.00.

B. Conditions

1. USA-CA is available for all licensed amateurs everywhere in the world and is issued to them as individuals for all county contacts made, regardless of calls held, operating QTHs, or dates. Special USA-CAs also available to SWLs on a "heard" basis.

2. All contacts must be confirmed by QSL and such QSLs must be in one's possession for identification by certification officials.

3. Any QSL card found to be altered in any way will disqualify the applicant.

C. County Identity

1. The National Zip Code and Directory of Post Offices will be the official guide in determining identity of counties of contacts as ascertained by name of nearest municipality.

(Note: The following should only apply to stations in USA and Canada.)

Publication No 65 is available at your local post office or from the Superintendent of Documents, US Government Printing Office, Washington, DC 20402 (Price $9.50) Stock No. 039-000-00264-7, but will be shipped only to the USA or Canada.

2. Unless otherwise indicated on QSL cards, the QTH printed on cards will determine county identity.

3. For mobile and portable operations the postmark shall identify the county unless information stated on QSL cards makes other positive identity.

4. In the case of cities, parks, or reservations not within counties proper, applicants may claim any one of adjoining counties for credit (once).

5. QSO via repeaters, satellites, moonbounce, and phone patches are NOT valid for USA-CA.

Administration of USA-CA Program

1. The USA-CA program will be administered by a CQ staff member acting as

FT-1000MP


YAESU
HF TRANSCEIVER FT-1000MP
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LSB
USB
CW
AM
FM
RTTY
PKT
MAIN
SUB VFO B
SHIFT-WIDTH
NOTCH-NB
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YAESU Is About To Turn The World Of HF Transceivers On Its Head!

Dedicated to the memory of JA1MP, the founder of Yaesu Musen, we are proud to announce the release of Yaesu's latest high performance HF base transceiver, the new FT-1000MP.

Based upon the legendary performance of the FT-1000 which, for more than half a decade, has been highly acclaimed by the world's top DXers, Yaesu has created a new 100W HF masterpiece built upon proven RF design and the introduction of a new technology to the Amateur marketplace: Enhanced Digital Signal Processing (EDSP). Teamed up with Direct Digital frequency synthesis, an outstanding receiver section featuring a high intercept front-end and a wide variety of IF filters (including a Collins Mechanical Filter), the FT-1000MP's exclusive EDSP facilities provide an impressive array of IF-based noise-reduction and interference rejection filters for enhanced receiver performance, as well as flexible tailoring of the transmitter for outstanding signal clarity.

The performance of digital processing systems is highly dependent on the quality of software inside the transceiver, and here Yaesu's experience with software design really shines through. Yaesu's IF-based EDSP provides 4 random-noise filtering protocols, audio enhancement with 4 equalisation programs for Tx and 3 for Rx, and an automatic notch filter which identifies and eliminates multiple interfering carriers or heterodynes. Front panel selectable EDSP filter contours (Low, Mid, or High-Cut responses; or Bandpass) aid in QRM rejection, providing improved signal-to-noise ratios and razor sharp selectivity. A comprehensive menu system allows you to easily hear the effect of various EDSP settings, so you can choose the best selection for your operating conditions.

In keeping with the improvements that the EDSP facilities provide, the FT-1000MP also provides new features such as selectable flat response or optimised receiver front-ends, 3 antenna connectors (2 main antennas and an Rx-only socket), selectable tuning steps as small as 0.625Hz, and a Shuttle-jog tuning knob for fast QSY operation. For optimised transmit audio, different SSB IF offsets can be set for both normal and RF speech-processed transmissions, and can be used in conjunction with the Tx EDSP functions. Separate bar-graph S-meters are provided for each receiver, and even a synchronous detection system is used for better AM reception on the Shortwave bands.

Standard features include SSB/CW/AM/FM operation, an in-built AC power supply and Automatic antenna tuner, 13.5V DC socket, dual-mode noise blankers, 500Hz CW and 6kHz AM IF filters, full break-in CW, an in-built electronic keyer with memory, a multi-colour high resolution display, an RS-232 computer interface, and a MH-31B8 hand microphone.

With the new FT-1000MP due to arrive soon, now's the time to call us for a copy of Yaesu's 12-page colour booklet explaining more about the FT-1000MP's new level of HF performance and design excellence. We're sure you'll soon agree that the world of HF transceivers has just taken a giant leap forward.

Cat D-3400

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Sydney Area: 9937 3366

Outside Sydney (FREECALL) 1800 26 3922

DICK SMITH ELECTRONICS

USA-CA Custodian, and all applications and related correspondence should be sent directly to this person's QTH.

2. Decisions of the Custodian in administering these Rules and their interpretation, including future amendments, are final.

Record Book and Bookkeeping

1. The scope of USA-CA makes it mandatory that special Record Books be used for applications. For this purpose, CQ has provided a 64-page, 4.25 by 11 inch Record Book which contains application and certification forms and which also provides record-log space meeting the conditions of any Class award and/or endorsement required.

2. A completed USA-CA Record Book constitutes the medium of basic application and becomes the property of CQ for record purposes. On subsequent applications for either higher classes or for special endorsements, applicants may use additional Record Books to list required data, or may make up their own alphabetical lists, conforming to requirements.

3. Record Books are to be obtained directly from CQ, 76 N Broadway, Hicksville, NY. 11801 for $US1.25 each. Recommend two be obtained, one for application use, and one for personal file copy.

Application

1. Make Record Book entries necessary for county identity and enter other log data necessary to satisfy any special endorsements (band-mode) requested.

2. Have the certification form provided signed by two licensed amateurs (General Class or higher) or an official of a national-level radio organisation or affiliated club verifying that QSL cards for all contacts as listed have been seen. The USA-CA Custodian reserves the right to request any specific cards to satisfy any doubt whatever. In such cases, the applicant should send sufficient postage for return of cards by registered mail.

3. Send original completed Record Book (NOT a copy) and certification forms and handling fee. Fee for non-subscribers to CQ is $US10.00. For subscribers the fee is $US4.00. Subscribers please include recent CQ mailing label. Send to USA-CA Custodian, Dorothy Johnson, WB9RCY, 333 South Lincoln Avenue, Mundelein, IL 60060, USA. For later applications for higher class seals, send Record Book or self-prepared list per Rules and $US1.25 handling charge. For applications for later special endorsements (band-mode) where certificates must be returned for endorsement, send certificate and $US1.50 for handling charges.

Note: At the time any USA-CA Award certificate is being processed, there are no charges other than the basic fee, regardless of number of endorsements or seals; likewise, one may skip lower classes of USA-CA, and get higher classes without losing any lower awards credits or paying any fee for them.

I conclude this short resume with the comment that a great portion of the above generally applies to North American amateurs, even though the award rules specify worldwide operation. Also bear in mind that I am quoting from a US publication, and that names and addresses may have changed in the interim.

The Australian representative for CQ Magazine (when I last checked in 1986) was VK5IE. I suggest that questions may be directed to him, or to the various Net controllers.

PO Box 2175 Caulfield Junction 3161

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Club Corner

Riverland Radio Club Inc

"Communications 96" was held in Renmark on Saturday, 27 April and generated a lot of interest for the Riverland people as well as for visitors from SA and interstate.

Perfect weather conditions gave those who attended a chance to see some of the latest technology in communications. Great interest was shown in the GPS (Global Positioning System), Internet, satellite communications and pay TV.

The Buy and Sell stalls were well patronised and most stall holders were well pleased with the day.

Many thanks to our major sponsors, the SA Division of the WIA, and the Antenna and TV Systems Division of Hills Industries. Thanks also to Daycom Communications and ABC Radio 5MV for their support.

The Club will be holding their AGM on Thursday, 4 July at 7.30 pm.

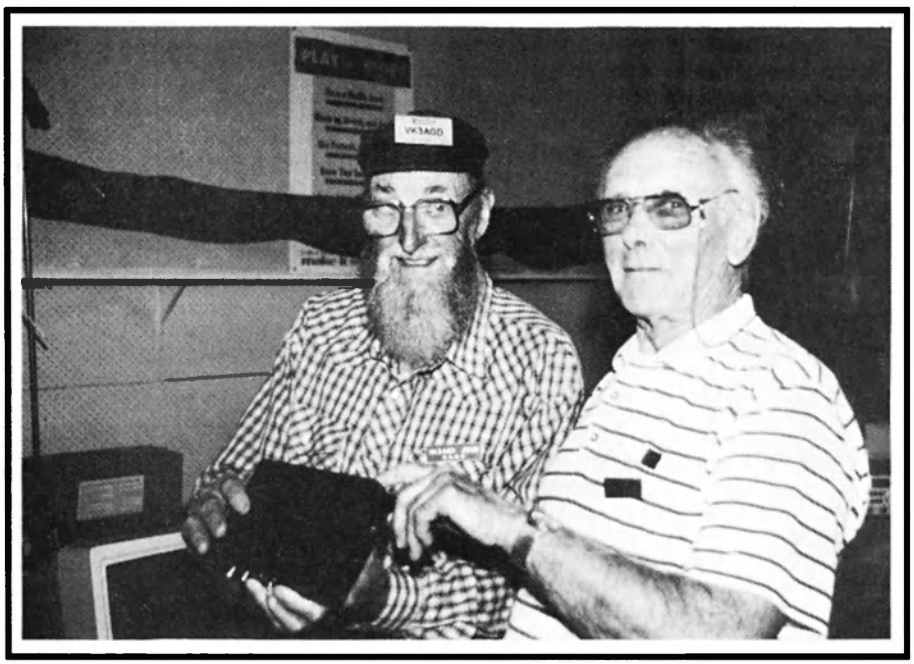
Doug Tamblyn VK5GA
Secretary
Box 646
Renmark SA 5341

The "Communications 96" banner placed at the main intersection in Renmark.

CW Operators' QRP Club Inc

Barry Samuels VK5BLS, our President, noted in March there are now 470 members from all over VK, and some overseas radio amateurs who are QRP operators. Homebrew by VK members is popular and technical articles continue to be regular features in the Club's quarterly journal *Lo-Key*, edited by Don VK5AIL.

A new book which should assist all radio amateurs who enjoy designing and building electronic projects will soon be available. *The Electronic Data Book for Homebrewers and QRPers, including QRP Yellow Pages*, edited by Paul Harden NA5N and Richard High W0HEP, is based on a series of articles which were published in the Colorado QRP Club Newsletter. The Data Book is spiral



"Woody" VK3AGD (left) and Hugh VK5BC examining a radio at "Communications 96".

bound, has 192 pages, and is divided into sections including QRP Rig Circuits and Analysis; Electronic Component Data Sheets with physical and electrical specifications and application notes; Specific Component Data Sheets with application notes and typical circuits; Reference Data for Homebrewers; QRP Operating Aids; and QRP Rig Lab Tests. The QRP Yellow Pages section gives details of mail-order suppliers in Australia, the UK and the USA, and has a listing of QRP clubs worldwide.

This book is a must for all home-brewers and the CW Operators' QRP Club is making this book available for purchase by all VK amateurs, whether they are club members or not. To order, send $25.00 plus $4.00 P&P (within Australia) to the Secretary, Kevin Zeitz VK5AKZ, 41 Tobruk Avenue, St Mary's SA 5042. And while you are about it, why not send Kevin an extra $10.00 and become a member.

Murray Lewis VK3EZM
CW Operators' QRP Club #234

Radio Amateurs Old Timers Club (RAOTC)

Although club membership is increasing quietly and steadily, we feel sure that quite a lot more operators could find membership worthwhile. Despite the club name ("old timer" is a long standing friendly greeting), age does not have any bearing on eligibility for membership. Clause 4 of the Constitution reads: *Eligibility for membership in the RAOTC is available to amateurs who have held or been qualified to hold an amateur licence for a period of 25 years or more.* This means that any amateur, licensed or qualified to be licensed before 1971 could be eligible. It is certainly good value for money.

The joining fee is $2.50 to cover printing and postage of the attractive 25 cm by 20 cm membership certificate. The annual subscription to cover 1 July to 30 June is only $5.00. Life membership is available for $100.

Members get two interesting and well-presented magazines each year, one in March and the other in September. The RAOTC has a broadcast of news and information on the first Monday of each month except January, transmitted on 2, 20, 40 and 80 metres.

The Club Secretary, Arthur Evans VK3VQ, at 3/237 Bluff Road Sandringham VIC 3191 or phone (03) 9598 4262, will be glad to send you an application for membership if you are interested. An application from can also be obtained from Allan Doble VK3AMD, 206 Poath Road, Hughesdale VIC 3166 or phone (03) 9570 4610.

Allan Doble VK3AMD

Summerland Amateur Radio Club

Summerland Annual Minifest

Sunday, 4 August is the date for the Summerland Radio Club Minifest. It will be held at the Clubrooms, 412 Richmond Hill Road, Goonellabah (Lismore) from 9.00 am to 4.00 pm.

There will be heaps of pre-loved goodies, plus display and commercial tables of new equipment, as well as competitions and refreshments.

For more information, contact John VK2FFO on (066) 224 969 or Bert VK2HIV on (066) 243 329. Or try the club BBS VK2SRC-2 direct or via VK2RPL-1, Rose Node 668900.

Graeme VK2GJ
Publicity Officer
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Contests

*Peter Nesbit VK3APN - Federal Contest Coordinator**

Contest Calendar July – September 96

Jul 1	Canada Day CW/Phone	(June 96)
Jul 6	Australasian Sprint (CW)	(June 96)
Jul 6	NZART Memorial Contest	(June 96)
Jul 6/7	CQ WW VHF Contest	
Jul 13	Australasian Sprint (Phone)	(June 96)
Jul 13/14	IARU HF Championship	(June 96)
Jul 20	South Pacific 160 m Contest	(June 96)
Jul 20	Colombian DX Contest (Phone/CW)	(June 96)
Jul 27	Waitakere 80 m Phone Sprint	(June 96)
Jul 27	West Australian Annual Contest (SSB)	(June 96)
Jul 27/28	RSGB IOTA Contest	(June 96)
Aug 3	Waitakere 80 m CW Sprint	(June 96)
Aug 3	West Australian Annual Contest (CW)	(June 96)
Aug 3/4	YO DX Contest	
Aug 10/11	Worked All Europe CW	
Aug 17/18	Remembrance Day Contest	
Aug 17/18	Keyman's Club of Japan (CW)	
Sep 7/8	All Asia DX Contest Phone	(May 96)
Sep 7/8	Bulgarian DX Contest	
Sep 14/15	Worked All Europe Phone	
Sep 21/22	SAC DX CW	
Sep 28/29	SAC DX Phone	
Sep 28/29	CQ WW RTTY DX Contest	

The rules for the ever popular Remembrance Day (RD) Contest appear this month, courtesy of Alek VK6APK. Last year's new rules worked very well, and a lot of positive feedback was received from entrants, so they have been retained intact.

To further stimulate activity, a small change has been made to the method of calculating the improvement ratio. Previously, the ratio for each Division was calculated from this year's total points divided by last year's total points (performed separately for HF and VHF, then averaged). Whilst simple to implement, this was unfair to those Divisions making a special effort to improve their score, because it effectively represented a 100% handicap for them the following year. Under that system, the best that they could realistically hope for was an alternating string of wins and losses.

To overcome this problem, from now on the improvement ratio will be based upon a weighted average, in which the effect of the previous year's score is reduced from 100% to 25%. Rather than a straight average of the previous four years, which would suffer from "bumps" as high or low scoring years moved outside a four year window, an exponential average will be used instead.

This is much simpler than it sounds. One simply notes the numerator and denominator used in the calculations for the previous year, multiplies the numerator by 25% and the denominator by 75%, and adds them together. The result becomes the denominator for the current year.

The reason for the 25% weighting is that, under the rules prior to last year, Divisional weighting factors were derived from a four year period (ie 25% weighting). Since everyone seemed happy with that, similar weighting has been adopted here.

I was going to present some figures to show how well this technique works; however, this is not meant to be a maths lecture, so I will leave it to the more enthusiastic readers to run some figures through their calculators.

Finally, a reminder about the new 160 m phone/CW contest on the 20th of this month. For once, we will not have to struggle along in someone else's 160 m contest; this one is all ours! Please give it your full support.

Many thanks this month to VK6APK, DL2DN, and JA1DD. Until next month, good contesting!

73, Peter VK3APN

Worked All Europe DX Contest

10/11 August (CW), 14/15 September (SSB), 9/10 November (RTTY); 0000z Sat – 2400z Sun.

The object is to work European stations (except in the RTTY section, where anyone works anyone). Bands are 80-10 m. In the contest, avoid 3550-3800 and 14060-14350 kHz on CW, and 3650-3700, 14100-14125 and 14300-14350 kHz on SSB. The minimum time of operation on a band is 15 minutes, although bands may be changed within this period if, and only if, the station worked is a new multiplier. Categories are single operator all bands; multioperator single transmitter; and SWL all bands. DX cluster support is allowed. A maximum of 36 hours is allowed for single operator stations, with up to three rest periods (mark them in the log).

Exchange RS(T) plus serial number. Additional points can be gained reporting QTCs, as follows. After working a number of European stations, details of those previous QSOs (ie QTCs) can be reported during a current QSO with a European station. In the CW and phone sections, QTCs are sent from non-European stations to European stations. In the RTTY section, QTCs can be sent to any station, including non-Europeans, outside one's own WAC continent. A QTC contains the time, callsign, and QSO number of the station being reported; eg "1307/DA1AA/431" means you worked DA1AA at 1307z and received serial number 431. Commence QTC traffic by sending the QTC series and number of QSOs to be reported; eg "QTC 3/7" indicates this is the third series and that seven QSOs will be reported. A QSO may be reported only once, and not back to the originating station. A maximum of 10 QTCs can be sent to the one station, who can be worked more than once to complete the quota. Only the original QSO, however, will have points value.

The multiplier on each band equals the number of European countries worked on that band (or on RTTY only, the number of DXCC/WAE countries), times a band factor. The band factors are four for 80 m, three for 40 m, and two for 20/15/10 m. Add the band multipliers together, and multiply by the sum of (QSOs + QTCs) to obtain the final score.

SWLs may log each station heard, European and non-European, once per band. Logs must contain both callsigns and at least one of the control numbers. Count one point for each station logged, and one point for each complete QTC received (max 10 per station). It is possible to claim up to two multipliers per logged QSO.

Use standard log and summary sheet format. Include a checklist for more than 100 QSOs on any band and, if more than 100 QTCs have been sent, include another checklist to show that the quota of 10 QTCs per station is not exceeded. Logs can be submitted in ASCII on DOS disk, providing a paper summary sheet is included. Send logs to: WAEDC Contest Committee, Box 1126, D-74370 Sersheim, Germany. Deadlines are 15 Sept (CW), 15 Oct (SSB), 15 Dec (RTTY). Comprehensive awards are offered.

European countries are: C3 CT1 CU DL EA EA6 EI EM/N/O ER ES EU/V/W F G GD GI GJ GM GM (Shetland) GU GW HA HB HB0 HV I IS IT JW (Bear) JW (Spitzbergen) JX LA LX LY LZ OE OH OH0 OJ0 OK/L OM ON OY OZ PA R1/FJL R1/MVI R/U (Russia) RA2 S5 SM SP SV SV5 (Rhodes) SV9 (Crete) SV (Mt Athos) T7 T9 TA1 TF TK UR-UZ (Ukraine) YL YO YU Z3 ZA ZB2 1A0 3A 4U (Geneva) 4U (Vienna) 9A 9H.

Keyman's Club of Japan (CW)

17/18 August, 1200z Sat – 1200z Sun.

This contest is designed for CW enthusiasts, and will particularly suit those who are collecting Japanese prefectures for awards. An interesting variation is the inclusion of 6 m. The only category is single operator multiband. Suggested

frequencies are 3510-3525, 7010-7030, 14050-14090, 21050-21090, 28050-28090, and 50050-50090 kHz. Exchange RST plus continent code (OC); JAs will send RST plus district code. Score one point per QSO. The multiplier on each band is the total number of JA districts (max 60). Final score equals total points x total multiplier. Show duplicate QSOs with zero points, attach a summary sheet showing all usual information, and send the log to: Yasuo Taneda JA1DD, 3-9-2-102 Gyoda-cho, Funabashi, Chiba 273, Japan, to be received by 29 September 1995. ASCII logs on DOS disk are most welcome.

1996 Remembrance Day Contest

Presented by Alek Petkovic, VK6APK

Purpose: This contest commemorates the amateurs who died during WWII, and is designed to encourage friendly participation and help improve the operating skills of participants. It is held annually on the weekend where the Saturday is closest to 15 August, the date when hostilities ceased in the south-west Pacific area.

It is preceded by a short opening address by a notable personality, transmitted on various WIA frequencies during the 15 minutes immediately before the contest. During this ceremony, a roll call of those amateurs who paid the Supreme Sacrifice is read.

A perpetual trophy is awarded annually to the WIA Division with the best performance. It is inscribed with the names of those Australian amateurs who made the Supreme Sacrifice, to perpetuate their memory throughout amateur radio in Australia.

The name of the winning Division each year is also inscribed on the trophy, which is presented at the Annual Federal Convention. The winning Division holds the trophy for the following 12 months, and receives a certificate. The leading entrants will also receive certificates.

Objective: Amateurs in each VK call area will endeavour to contact other amateurs in other VK call areas, P2 and ZL, on 1.8-30 MHz (10, 18 and 24 MHz excluded). On 50 MHz and above, amateurs may also contact other amateurs in their own call area.

Contest Period: 0800 UTC Saturday, 17 August to 0759 UTC Sunday, 18 August 1996. As a mark of respect, stations are requested to observe 15 minutes silence prior to the start of the contest, during which the opening ceremony will be broadcast.

Rules:

1. The contest categories are:

(a) High Frequency (HF) – for operation on bands below 50 MHz;

(b) Very High Frequency (VHF) – for operation on the 50 MHz band and above.

2. Within each category the applicable sections are:

(a) Transmitting Phone (AM, FM, SSB, TV);

(b) Transmitting CW (CW, RTTY, AMTOR, PACTOR, packet, etc);

(c) Transmitting Open (a) and (b);

(d) Receiving (a), (b) or (c).

3. All amateurs in Australia, Papua New Guinea and New Zealand may enter the contest, whether their stations are fixed, portable or mobile.

4. Cross mode and cross band contacts are not permitted.

5. Call "CQ RD", "CQ CONTEST", or "CQ TEST".

6. On bands up to 30 MHz, stations may be contacted once per band using each mode, ie up to twice per band using Phone and CW.

7. On the 50 MHz band 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 contact on that band and mode.

8. Multi-operator stations are not permitted (except as in Rule 9), although log keepers are allowed. Only the licensed operator may make a contact under his or her own callsign. Should two or more operators wish to operate a particular station, each will be considered as a separate contestant and must submit a log under their own individual callsign.

9. Club stations may be operated by more than one operator, but only one operator may operate at any time, ie no multi-transmission.

10. For a contact to be valid, numbers must be exchanged between the stations making the contact. The number will comprise RS (for phone) or RST (for CW), followed by three figures commencing at 001 for the first contact, and incrementing by one for each successive contact.

11. Contacts via repeater (including satellite) are not permitted for scoring purposes. Contacts may be arranged through a repeater. The practice of operating on repeater frequencies in simplex is not permitted.

12. On all bands except 160 m, score one point per completed valid contact, and on 160 m, score two points per completed valid contact. On CW, score double points.

13. Logs should be in the format shown below, and accompanied by a summary sheet showing the following information:

Callsign; Name; Address;
Category (HF or VHF);
Section (Phone, CW, Open, or Receiving);
Total score;
Declaration: *I hereby certify that I have operated in accordance with the rules and spirit of the contest.*
Signed: *Date:*

14. Entrants may submit one HF log, and one VHF log. Separate logs and summary sheets are preferred.

15. Entrants temporarily operating outside their allocated call area, who wish to have their points credited to their home Division, should make a statement to that effect on their summary sheet/s.

16. Forward the log/s and summary sheet to: RD Contest Coordinator, A Petkovic VK6APK, 26 Freeman Way, Marmion, WA 6020. Endorse the envelope "Remembrance Day Contest" on the front outside. Entries must be forwarded in time to reach the Contest Coordinator by Friday, 20 September 1996.

17. Certificates will be awarded to the leading entrants in each section, in each VK call area, P2, and ZL. Entrants must make at least 10 contacts to be eligible for awards, unless otherwise decided by the Contest Coordinator.

18. Any station observed as departing from the generally accepted codes of operating ethics may be disqualified.

Determination of Winning Division: Scores of VK0 stations will be credited to VK7. Scores of VK9 stations will be credited to the mainland VK call area which is geographically closest. Scores of P2, ZL, and SWL stations will not be included in these calculations. Entrants temporarily outside their allocated call area may elect to have their score credited to their home Division. If no such election is made, their score will be credited to the Division representing the call area in which they operated during the contest, as defined herein.

For each Division, an "improvement factor" will be calculated as follows:

(a) For transmitting logs only, the Division's total HF points will be divided by a weighted average of its HF points for the previous year. This weighted average will be determined from the numerator and denominator used to calculate that Division's previous improvement factor, and will equal 25% of the numerator plus 75% of the denominator;

(b) The same calculations will be performed for VHF;

(c) The average of (a) and (b) will be the improvement factor for that Division.

The Division with the highest improvement factor will be declared the winning Division.

Receiving Section Rules

1. This section is open to all SWLs in Australia, Papua New Guinea, and New Zealand. No active transmitting station may enter this section.

2. Rules are the same as for the Transmitting Section, as applicable.

3. Only completed contacts may be logged, ie it is not permissible to log a station calling CQ. The details shown in the example must be recorded.

4. The log should be in the format shown below.

Example Summary Sheet

Remembrance Day Contest 1996
Callsign: VK1XXX
Name: Joe Brown
Address: PO Box 123, Farm Orchard, ACT 2611
Category: HF
Section: Transmitting phone
Total Score: 505
Declaration: *I hereby certify that I have operated in accordance with the rules and spirit of the contest.*
Signed: *Date:*

Example Transmitting Log

Remembrance Day Contest 1996
Callsign: VK1XXX
Category: HF
Section: Transmitting phone

Date Time (UTC)	Band (MHz)	Mode	Call	No. Sent	No. Rcvd	Pts
0800	14	SSB	VK2QQ	58001	59002	1
0802	14	SSB	VK6LL	59002	59001	1
0805	14	SSB	VK5ANW	59003	58011	1
0807	14	SSB	ZL2AGQ	57004	57003	1
0809	14	SSB	VK4XX	59005	59007	1

Example Receiving Log

Remembrance Day Contest 1996
Name/SWL No: L30371
Category: HF
Section: Receiving phone

Date Time (UTC)	Band (MHz)	Mode	Calling	Called	No. Sent	No. Rcvd	Pts
0800	14	SSB	VK1XXX	VK2QQ	59001	59002	1
0802	14	SSB	VK1XXX	VK6LL	57002	57001	1
0805	14	SSB	VK5ANW	VK1XXX	59011	59003	1
0807	14	SSB	ZL2AGQ	VK1XXX	58003	59004	1
0809	14	SSB	VK7AL	VK2PS	59007	58010	1

**PO Box 2175, Caulfield Junction, VIC 3175*

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Divisional Notes

Forward Bias - VK1 Notes

Peter Parker VK1PK

Repeater Linking Comes to Canberra

A new 70 centimetre repeater and a link to Goulburn. That's the result of months of work by the VK1 Repeater Committee. The effort means that Canberra now has a second 70 centimetre repeater, transmitting on 438.375 MHz. You'll remember that frequency as the one formerly used by the Isaac's Ridge repeater. The repeater is automatically linked to Goulburn; no access tones are required by the user to operate the link.

It is easy to use the link. Local traffic will have a short tail, while more distant stations coming through the link will have a longer tail. Local signals will over-ride those coming through the link.

At the time of writing, the link is only to Goulburn. However, when the link to Wollongong is restored, Canberra amateurs will be able to talk to that city as well via UHF.

Neil VK1KNP advises that several working bees have been carried out on Mt Ginini prior to the snow season. Activities performed have included improving the earthing and power protection at the site; installation of Earth Leakage Circuit Protection; underground cabling; the replacement of rusting bolts on the Ginini tower; transporting an ex-TV station tower that had been donated to the Division from Mount Ginini to Roger VK2SRH's place at Murrumbateman; and general cleaning-up of the site

There has also been considerable antenna work, including an installation of a corner reflector for the UHF link to Goulburn; switching the PD220 7 dB gain collinear antenna over to the packet repeater; and a decision to use more rugged, lower gain antennas, due to the high failure rate of the PD220 collinears. The 2 m repeater receiver antenna is of this type at present. The 2 m voice repeater is currently transmitting into two stacked folded dipoles underneath the receive antenna. This configuration gives around 3 dB gain with a cardioid pattern toward Canberra.

VK1BP Opens

Some fifteen to twenty amateurs and scouting officials were at the Hughes Scout Hall on Saturday, 1 June for the official opening of VK1BP, the Scout Association's Amateur Station. The station, opened by Pat Boling the ACT Scout Commissioner, will be used for the education of Scouts in radio and electronics. One scout has already passed his Regulations exam.

New Awards Manager

VK1 now has a new Awards Manager. He is Simon VK1KFC. Simon replaces John VK2EJC who previously retransmitted this broadcast on 80 metres and ran the Awards Net. Congratulations to Simon for taking on this task, and thanks to John for his efforts over the last few years.

VK1 Award Net

Readers are reminded of the 80 metre VK1 Award Net after the 8 pm Sunday evening Divisional broadcast. Starting after the VK1WI 80 metre call-backs on 3.570 MHz, the award net has attracted interest from interstate amateurs as far afield as VK6. Both local and interstate amateurs are eligible to claim the award. All that is needed is 20 contacts with 20 different VK1 amateurs on HF, or 10 on VHF/UHF. The cost of the award is $3.00. Full information on award rules is given on the award net.

VK180 $3 Receiver Kit Popular

To foster amateur radio education and experimentation, the VK1 Division has developed an 80 metre direct conversion receiver project. Launched at May's Divisional meeting, the receiver proved an instant success, with thirteen of the fifteen short-form kits produced being sold on the night.

Based on the VK680 Receiver (*Amateur Radio*, September 1995), the VK180 uses two transistors and one IC. Controlled by a 3.58 MHz ceramic resonator, the set exhibits good frequency stability, is easy to tune and requires no alignment. Its unique construction, based on the use of adhesive copper tape, means that the project can be tackled with confidence by those with minimal construction experience.

The kits, containing a ceramic resonator, instructions, and copper tape, were marketed by the Division for just $3.00. All other parts to complete the project are readily available in Canberra, bringing the set's total cost to approximately $25.00. At the time of writing, there was just one kit remaining; however, the production of a second batch was being considered.

Updated Divisional Information on Internet

Updated information on the services the Division provides its members has now been placed on the Internet. You'll find it on two local home pages. Try the VK1KCM Home Page at http://email.nla.gov.au/~cmakin/wia/vk1guide.html
or the VK1DA Home Page at
http://www.ozemail.com.au/~andrewd/hamradio/index.html#vk1guide

Using VK1RGI

Neil VK1KNP, the convenor of the VK1 Repeater Committee, reminds repeater users that the time-out for the VK1RGI two metre repeater is exactly 2.5 minutes. He also points out the need for users to wait for the beep before commencing their overs; too many people time themselves out, having commenced their transmissions too soon.

New Venue for Committee Meetings

As foreshadowed in May's *Forward Bias*, a central venue has been obtained for the VK1 Division's Committee meetings. Held on the second Monday of the month, meetings are now held at the Mawson Primary School, starting at 8 pm. Members are invited to attend. General meetings continue to be held at the Griffin Centre on the fourth Monday of the month.

Operating Standards

Some concern has been expressed recently about the perceived lack of on-air decorum of some local amateur operators. Amateur communication can be intercepted by thousands of scanners and shortwave receivers across the country. We should ensure that the topics we discuss and the language we use is not of a nature so as to diminish our standing in the community.

VK2 Notes

Richard Murnane VK2SKY

Membership Drive Winners

Council have confirmed the following winners in the Membership Drive drawn at the Annual General Meeting:

Wyong Field Day Prize ($100 plus one year's membership) - Mr Michael Bogos VK2KSI from Ingleburn.

Grand Prize (WordPerfect 6.1 donated by Cesar Miranda) - Mr Robert F Kennedy VK2LBK from Telarah.

Winners have been notified and prizes posted to their QTH.

VK3 Notes

Brenda Edmonds VK3KT

1996 AGM

The 1996 AGM of the Victorian Division held at Ashburton on 29 May was attended by about 75 members.

For the first time in over 20 years an election was necessary to fill the 10 available seats on Council. Voting closed at the start of the meeting but, because of the time needed to count the votes, the meeting agreed that the counting be done by the Division's Auditors the next day and all attendees be notified by mail of the ballot results. The sealed ballot envelopes were opened and the number of ballot papers counted by four volunteers while the meeting progressed. In all, 682 ballot papers were lodged.

The following candidates have been declared elected:-

S Bushell	VK3HK
R Carmichael	VK3DTR
R Hailey	VK3NC
G Hunt	VK3ZNE
J Linton	VK3PC
G McDiartnid	VK3NE
P Mill	VK3APO
W Trigg	VK3JTW
G Viscaal	VK3MQ
B Wilton	VK3XV

Office bearers will be decided at the first meeting of the new Council, scheduled for 13 June.

As well as receiving the reports from the President, Secretary, Treasurer and Auditor, which had been circulated, the meeting considered and voted on a number of items for which notice of motion had been given.

The motions carried recommended that the incoming council give consideration to:-

(a) Investigating the feasibility of moving the present business office of the Victorian Division closer to the central business district of Melbourne (this motion succeeded because the Secretary abstained from voting or using the proxies he held. The Secretary advised the meeting he had a conflict of interest).

(b) Updating the Articles of Association and making same available to members.

(c) Holding the Annual General Meeting of the WIA Victorian Division on a Sunday.

Because of the unusual amount of business, there was little time available for general discussion on unscheduled topics; however, the meeting touched on the future of Division broadcasts and the need for improved communications with members.

Perceived Threat to Bands

Readers may be aware of an item on packet, under an ARRL identification, noting that the low earth orbit satellite (LEO) industry has listed the 2 m and 70 cm amateur bands as "candidate bands" for allocation to that service at WRC-97. At this stage the possible real effect of such an allocation in Australia is unclear.

The VK3 Division Federal Councillor will monitor the situation with the Federal SMA Liaison Team. We will keep you informed.

VK6 Notes

John R Morgan VK6NT

Divisional GM

The May GM was the first to be held at CWA House, and the 33 members present seemed to enjoy their new surroundings. The planned lecture by a representative from the SMA had to be postponed but, nevertheless, plenty of interesting business was discussed.

Venue for Meetings

General Meetings are held on the third Tuesday of each month in the Board Room, 3rd Floor, CWA House, 1174 Hay Street, West Perth, commencing at 8 pm. There is no meeting in December. All interested persons (members and non-members, licensed or listener) will be made welcome. Free coffee and biscuits are available.

CWA House is a three-storey office-block on the north side of Hay Street in West Perth, about 80 m west of the intersection with Havelock Street. The entrance to the rear car-park is via the laneway at the western end of the building. You are requested not to park in the residents' bays, which are the ones directly in line with the building's rear doors. Enter the building via the front or rear doors, and take the lift to the top floor, where the meetings will be held in the Board Room. The rear entrance and facilities are wheelchair-friendly. The exit from the car-park is via the laneway at the eastern end of the building. Be advised that this section of Hay Street is a one-way road, and so all traffic must therefore turn right on leaving.

Hamfest '96

This event, which is organised each year by the Northern Corridor Radio Group (known as the NCRG, club callsign VK6ANC), will occur on Sunday, 3 November 1996 at the Cyril Jackson Community and Recreation Centre, Perth. This is the same venue as last year's most successful gathering.

Do You Know VK6BDG?

I recently received a letter from Rob Tymms VK3BDU, seeking information as to the present whereabouts of James Basil Rodrigo, who has occasionally held the callsign VK6BDG (but currently does not), and who also operates from Singapore as 9V1WW. Rob has an airmail QSL card from UZ1PWA for "9V1WW via VK6BDG" which he cannot forward, and would appreciate your help.

Farewell, Old Friend ...

It is with sadness that I report the passing of my old friend Saxon, known in this house (unofficially, of course) as VK6DOG. He could recognise my voice, and that of my XYL Eve VK6KCQ, amongst all those to be heard on our local repeater. He also knew that he was supposed to stay out of the ever-overcrowded shack, but often his wag got the better of him, and he just could not help himself.

If You Have Material ...

Material for inclusion in this column may be sent to VK6NT @ VK6ZSE.#PER.#WA.AUS.OC, or to PO Box 169, Kalamunda WA 6076, or via telephone on (09) 291-8275.

"QRM" News from the Tasmanian Division

Robin L Harwood VK7RH

There was some concern and alarm raised from recent packet bulletins emanating from ARRL HQ in the USA, concerning a proposal by several commercial enterprises to have the 144 MHz and 420 MHz amateur allocations given over to low orbiting satellites for mobile communications, known as LEOS. The Southern Branch, at its June meeting, expressed its concern after the Divisional broadcast on VK7WI quoted the bulletins but decided to await what response was forthcoming from the Federal Office. We believe that the prompt response from concerned amateurs within North America has led to the Federal Communications Commission, the US regulatory body, to issue a clarifying statement on 5 June concerning the proposals.

It seems there are no plans to take away either 70 cm or 2 metres; it was only a suggestion from a working party to WARC '97. Over 1,000 responses were received and these have been forwarded to the appropriate working party. It is quite apparent that this WARC '97 Conference is going to be vitally important to all amateurs, and that urgent consideration has to be given by Divisional council to institute a WARC '97 appeal to fund adequate WIA representation at this Conference.

On behalf of the Tasmanian Division, I

would like to congratulate Ron Churcher VK7RN on being awarded the Order of Australia (OAM) in the Queen's Birthday Honours. He has been involved in various community activities in the Devonport area, including the Devonport Eisteddfod and Rotary. Also, he is currently the secretary of the Northwestern branch and was elected this year to Divisional Council. He is also a well-known 20 metre operator.

It looks likely that a six metre FM repeater could shortly be operational in the Launceston area. I do not have the precise frequency details but these will be announced over VK7WI.

Also, the amount of RF floating around Mount Wellington is substantial and recently caused some problems to some automobiles parked at the summit at the official opening ceremonies of the new tower. Ask VK7GL about it!

I reported in a recent column that the Division lost its e-mail address, when Tamar Communications ceased trading. Imagine our surprise when all outstanding e-mail was suddenly dumped in my personal mailbox. One was a membership enquiry from Hobart, which fortunately could be fixed. Yet there was a message from a VK4 sent in mid-April wanting to know what repeaters were in use in Launceston and when the next meeting was being held. A simple enough request, but the said gentleman had already arrived and departed by the time the e-mail message came out of cyber-space. I don't know if he was able to make contact with local hams while he was here but I am certain that help would have been forthcoming. If you come across the former Divisional e-mail address, please disregard it as it no longer exists.

In next month's column there will be a report on the next Divisional Council meeting, held in Launceston on the 22nd of last month.

Don't forget the meetings for July. They are: Southern Branch on Wednesday, 3 July at the Domain Activity Centre at 2000 EAST; Northwestern Branch on Tuesday, 9 July at the High School, Dial Road, Penguin at 1945 EAST; and Northern Branch on Wednesday, 10 July at St Patrick's College, Westbury Road (enter from Mount Leslie Road) at 1930 EAST.

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Help protect our frequencies - become an Intruder Watcher today

How's DX

*Stephen Pall VK2PS**

A few weeks ago I received a letter from an old-timer who asked for my help to identify a station he had worked. I quote from his letter: *"Yesterday afternoon I heard a dog-pile on 14020 kHz CW. The operator was very fast and very brief. Initially he was a good copy, but started to fade. I foolishly gave him a two burst of my callsign into the huge pile-up. To my utter amazement he came back, and gave me the usual 599. I replied with my report and he continued with his QRZ? and took the next one. Now comes the tricky bit. He did not send his callsign; if he did, he was often washed out with the huge pile up. Shortly after that, he went QRT. So now I am at a loss to know his call and QSL info. You might be able to help or suggest how else I could obtain the info."* I politely replied that I could not help.

Listening to a very busy net the other day with at least five rare DX stations in the background, two busy net-controllers, and a long queue of hopefuls all eager to have a contact with the DX, I heard a conversation along the following lines.

A passer-by old timer indicated that he wanted to have a contact with the DX station which he had just heard but he did not catch the operator's callsign. The polite net-controller, eager to please, told him to call the V51 station. The passer-by called the station with a VI prefix. He was corrected by the net-controller that the station was in Namibia. Our passer-by told the net-controller that he would then call the Libyan station. He was corrected again that the station was in Namibia, southern part of Africa. Back came the reply, *"I do not know that country"*.

You could almost hear in the background everybody in the queue gnashing their teeth and tearing their hair out.

What is the lesson out of this? If you are a beginner DXer, or an old-timer who occasionally bites into the DX-cherry, please listen first, long and hard. Do not jump in. Find out first, by listening, how the net works. Listen for the DX on the net. Get your correct bearing whether he is on the long-path or the short-path? If you cannot hear the DX, do not call it. Do not waste time. Wait your turn in the queue. These days, openings are very short and the DX station has limited time to stay on frequency. In pile-ups, listen, listen and listen! Sooner or later, the DX station will give its identification call. Concentrate on the correct callsign. QSL information is not of prime importance; that can be found out later. By listening first and acting later, you will not make a fool of yourself.

Lacepede Islands - VK6ISL - OC-214

The Lacepede Islands were discovered by the French explorer Baudin on his voyage of 1801-03 and named after M Lacepede, a naturalist. The islands are about 130 km north of Broome and 45 km offshore (122° 10' E - 16° 53' S). The four islands, West Island, Middle Island, Sandy Island and East Island, together with Robber Rocks and Weston Patch, occupy an area approximately 15 km by 8 km. The whole group is very low lying and surrounded by a large reef system.

Malcolm VK6LC, assisted by Dave VK6DLB, is a well known DXer who has visited many remote islands off the coast of Western Australia and the Northern Territory during the past 10 years in conjunction with the IOTA (Islands On The Air) program. The target of this latest expedition was Sandy Island, a low-lying, uninhabitated island infested with saltwater crocodiles.

The two amateurs travelled 2500 road kilometres from Karratha (VK6DLB) and Port Hedland (VK6LC) to Beagle Bay and return, and a total of 270 sea km on several trips between the mainland and Sandy Island. They carried 65 pieces of equipment weighing more than a ton in two four-wheel-drive vehicles with trailer attachments towing a five metre boat with a 175 HP motor. The boat, "Smart Move Too", was under the command of skipper Bill Johnson. It took them two days of travelling (14 and 15 May) before they arrived, exhausted, at Beagle Bay. The road from Broome is a rough dirt track which changes into sand tracks and takes eight hours of "hell" to travel 170 km.

At Beagle Bay the high tide was running out fast, leaving the loaded boat high and dry. They re-arranged the overloaded boat for two trips. It was a pitch black night and a nervous night was spent ashore with a close lookout for crocodiles. On the third day they were still not on the island. Wind and strong seas running at 2.5 m made it impossible to undertake the trip. After a 90 km round trip to Beagle Bay mission to stock up with fresh provisions, that afternoon the two hour, 45 km sea trip was under way at a speed of 22 knots. Time and the 9 metre high tide was running fast. Mal, his equipment and essential provisions were landed on the beach. Dave and skipper Bill went back to the mainland for the rest of the equipment.

Sunset was at 0930 UTC. Mal hurriedly set up his tent, moved the 5 kVA generator into position, erected the Butternut vertical antenna and, in 38° C heat, started to operate. He logged his first QSO with Denver 4S7DA at 0930. At 1217 UTC the new IOTA reference number OC-214 was received from Roger G3KMA.

On Friday, 17 May, two days behind schedule, Dave arrived with the rest of the equipment around midday. The rest of the day and the following night was spent getting all the equipment into place. By Saturday, 18 May, they were both completely exhausted, and the serious DXing was just starting. The weather was generally fine, with a hot 43° C in the shacks (tents) during the day and 22° C at night. Fortunately, there was a constant wind which kept the sandflies and mosquitoes away.

The final transmission was on Monday, 20 May at 2314 UTC. That night a storm, with high winds of up to 40 knots, and lasting seven hours, nearly blew them away. Operating on a 24 hours basis for three full days with very little sleep and the hot temperatures left them completely exhausted.

Tuesday, 21 May they rested, and started to dismantle the camp and repack the equipment, a 12 hour job. Wednesday morning, 22 May, they left the Lacepedes at 0415 UTC and arrived back at Broome around 1230 UTC.

During their three days of operation they were active on the 40, 20 and 15 metre bands for a total of 2104 QSOs. Six continents, 90 DXCC countries and 201 islands were contacted in a period when propagation, at the bottom of the solar cycle, was not favourable. As Mal said, "Who said there is no DX around?"

Equipment used included Yaesu FT-990, FT-757, and Kenwood TS-140 transceivers, with Transworld 1000 and Yaesu FL-2100Z amplifiers, a Butternut multiband vertical, an ATN 20 m monoband Yagi and an ATN 40 m four element 12 metre high Four Square vertical array. Power was supplied by 5 kVA and 1 kVA generators and heavy duty batteries.

The technical highlight of the expedition was the use of the giant Four Square vertical array manufactured especially by ATN Antennas for this expedition. After many months of planning, setting them out on the local beach at Port Hedland, tuning and re-tuning them, the array antenna system was a complete success. Tests have revealed that the front to back ratio was 30 dB and, comparing it against the single element Butternut, the forward gain was approximately 6db.

Dave VK6DLB on Sandy Island operating shack No 2 on 15 and 20 m.

Organising such a complex DXpedition is not easy, taking not only months but years of planning. Besides the variety of permits and licences required from a number of authorities, one has to think of the logistics of the matter. Radio equipment, power generators, 140 litres of fuel, a total of one kilometer of radial cables, 60 litres of fresh water, emergency rations and emergency water, tents, electric refrigerator, groundsheets, and many more other necessary items including a gimpy hammer and shovel.

And you need money, lots of it. Malcolm is one of those DXers who has financed all his expeditions during the past 10 years from his own financial resources. However, on this DXpedition he was assisted by some commercial sponsors, the Italian Diamond DX Club and many European and Australian and other IOTA hunters, world wide.

Nevertheless, after so many years of putting remote Australian Islands on the IOTA map, Malcolm's financial resources are exhausted and he will not be undertaking any future large-scale IOTA expeditions. The proposed Montgomery Island expedition near the Bonaparte Archipelago will not now take place. It would have required massive logistic resources, and lots of time and effort as the area is a completely isolated and uninhabited wilderness. Malcolm, therefore, will give back his government landing permit and will soon return to his family in Perth.

He will still take part in small IOTA experiments with phased vertical antennas. He is convinced that the Four Square array system has proved itself beyond doubt on island expeditions. His next experiment may take place as early as June/July and will feature a new ATN manufactured Four Square vertical array system for 20 metres. Mal hopes to be active from OC-140, the island where he started out on his DXpeditions 10 years ago. He hopes to be assisted by Terry VK6VS.

QSL for the Lacapede activity should be sent to IIHYW Gianno Varetto, PO Box 1 10060 Pancalieri, Torino, Italy with a return, self-adressed envelope and return postage.

Libya - 5A1A - Approved

It was announced, before the Dayton Hamvention on 17-18 May, that the 5A1A cards by the Ukrainian expedition and by the Libyan nationals are now acceptable for DXCC credit. Toly UT3UY, the leader of the Ukrainian DXpedition, was present at the convention and handed out about 600 handwritten cards for those who worked them. If you have already sent a card either to the OM or LZ managers as announced at the time of the activity, do not send a new card. Toly has already picked up those cards. There are 34,000 cards to be answered, so please be patient.

If you have not sent your card yet, because you have waited on approval of the activity, send your card direct to Anatoly Kirilenko, PO Box 439/3 Kiev-151, 252151, Ukraine. Include only one green stamp for return postage. Do not put any callsigns on any of the envelopes, and preferably use postal labels instead of postage stamps on your envelope.

There is also some talk that Toly will establish a QSLing point in the USA, but you will have to wait for further details. Toly can only confirm the contacts which were made in July 1995 with them. Any other contacts should be confirmed with the local operators. The station 5A1A has been allocated three box numbers, 78664, 78665 and 78666, and

it is reported that mail arriving at any of these three numbers will be delivered to the respective operators. It is rumored they only recently received cards and started to send them out. Enclose one or two green stamps for return postage.

For QSOs with 5A1A after July 1995, send your card to PO Box 78665, Tripoli, Libya.

Bouvet Island - 3Y5 - in 1998?

The South Sandwich Island Antarctic DX Group organizer, Tony WA4JQS, has announced that Gary Jones W5VSZ has been added to the SSIDXG team. Gary will fill the spot for a CW operator and will help to design and run a WEB site for the group.

At the Dayton Hamvention on 17-19 May, Luis XE1L was heard to say that the SSIDXG will be going to Bouvet sometime in December 1997 and/or January 1998. This news has not yet been officially confirmed, but somehow sounds familiar. Barry ZS1FJ, who last year visited Kermadec in a low-key operation, said in January this year that he anticipates a DXexpedition to Bouvet 3Y5 in 1997 courtesy of the South African Government with provision for transportation to and from the Antarctic. "I expect to be there for at least two weeks; two illustrious DXpeditioners will accompany the DXpedition," said Barry. Cross your fingers!!

Future DX Activity

* R1ANZ will be activated in July-September by Valetin RU1ZC from the Russian Mirny base. QSL to home call.

* GU/PA3GIO will be active from the Isle of Man on 5-17 July on SSB only. QSL to home call.

* There are unconfirmed rumors that Scarborough Reef, now a new country for DXCC, will be activated in October this year.

* Kin-Men Island (Quemoy AS-102) will be active from 26 to 29 July with the call BO0K and BO0KS. QSL via BV2KI.

* Frank DL5PV/HI7 is active on 17, 20 and 30 metres. QSL via home call.

* Jaan SM0OEK, who is now active as 9M2JJ, is thinking about going to Pulau Layang, one of the Spratly Islands claimed by Malaysia.

* Bill VK4FW reported that Lionel VK6LA was active from Cocos-Keeling as from 1 June 1996 for about 3-4 weeks. The TE33 Yagi which VK9CT used was left behind for Lionel, who will make additional dipoles for the low bands QSL to VK6LA.

* Felix DL8OBC and Matthias DL4OCL will be active from Gozo Island from 22 July to 9 August, using the callsigns 9H3UD and 9H3UF. QSLs to their home call.

* There will be a number of French and German amateurs operating from Lichtenstein with the HB0 prefix from 13 to 27 July.

* The JA1UT/JA3UB group is planning another visit to Palestine in late June, early July.

* Kyoko is back in Nepal until July using the callsign 9N1KY.

* DA4RG is currently staying in the Falklands using the call VP8BPX. QSL via the Bureau to DA4RG or direct to GW8VHI.

* SV1CID and SV1DPL will be active on the traditional bands from Crete SV9 and a variety of islands in the Aegean Sea.

* DL4XS, DL6ET and DL3KDV will be active from 22 August to 4 September on all bands from Comoros, D6.

* JG8NQJ/JD1 will be active for three months from Minami Torishima starting 15 July.

* John NL7TB has reported that the DXpedition to Barren Island will start on 4 July for four days. This will be new IOTA reference number.

Interesting QSOs and QSL Information

* VK9WG - Graham - 14227 - SSB - 0617 - Apr (E). QSL via the Bureau or to VK5GW G J Whiteside, 33 Maud St, Unley, SA, 5061.

* V44BK - Karl - 7189 - SSB - 0737 - Apr (E). QSL to Karl D Sage, PO Box 549, Charlestown, Nevis Isl, Carribbean.

* FT5WE - Stan - 14164 - SSB - 0526 - Apr (E). QSL to F5GTW Claude Touyeras, 23 Rue des Chardonnais, Cite de la Diete, F-86130, Jaunay Clan, France.

* 3DA0AC - Horace - 14164 - SSB - 0521 - May (E). QSL to Horace F Long, PO Box 107, Mbabane, Swaziland, Africa.

* R1FJX/FJL - 7003 - CW - 1345 - May (E). QSL to collection point, DF7RX Bernhard Steibl, Kehlheimwinzer Str 40, D-93309, Kehlheim, Germany.

* V33BB - Tom - 7190 - SSB - 0704 - May (E). QSL to The Manager, Box 326, Monkey Town, Belize.

* 7Q7DC - Don - 14162 - 0550 - May (E). QSL via WA6IJX, Robert A Cerasuolo, PO Box 685, Holbrok, AZ-86025, USA.

* C91CB - Dan - 14170 - SSB - 0537 - May (E). QSL to Dan Swedberg Box 4161, Maputo, Mozambique, Africa.

* ZS8IR - Chris - 14185 - SSB- 0728 - May (E). QSL via ZS6EZ, Chris R Burger, PO Box 4485, Pretoria, 0001, Republic of South Africa.

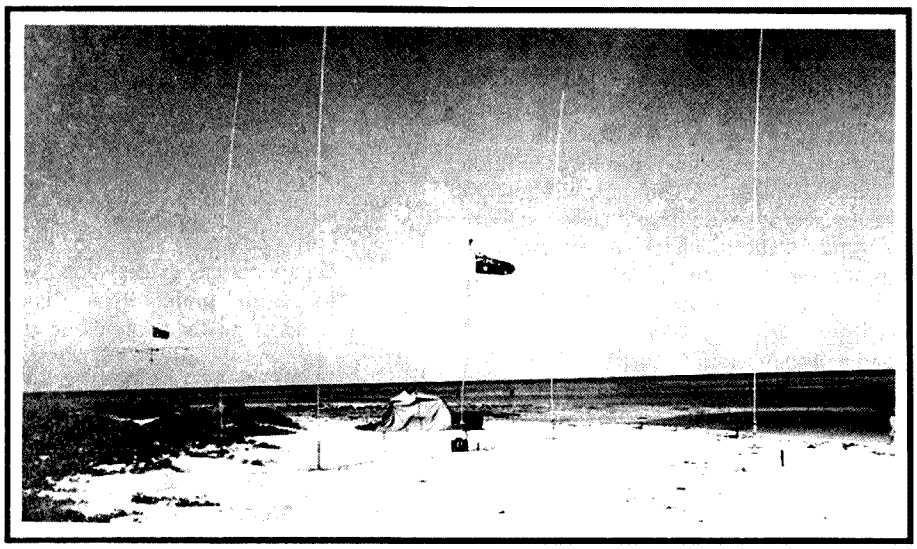
* V63NN - 14006 - CW - 2358 - May (E). QSL via JA7FWR Hiromi Hatazawa, 3-4-27, Chuu, Dohri, Morioka, Iwate 020, Japan.

* PJ2MI - Jose - 7190 - SSB - 0705 - May(E). QSL to J Cyntje, Daphneweg 31, Curacao, Netherland Antilles, South America.

* FT5WF - Jack - 14164 - SSB - 0548 - May(E). QSL via F51ZK Andre Loiseau, Ecole De Garrabet, F-09400, Garrabet, France.

From Here, There and Everywhere

* Bill VK4FW, who is the Secretary/Manager of his Oceania DX Group, reports, on his return from Cocos-Keeling, that the group made approximately 11,200 QSOs on all bands except 160 m. Conditions were not ideal, and there were times, due to bad propagation, that only one station was active. Bill was extremely disappointed about the overcrowding on the



Overview of VK6ISL. In the centre is Dave's tent, at left rear is Mal's tent, and in the foreground is the four element Four Square 40 m vertical array.

80 m "DX Window", which left practically no space for his activity. Bill also reports that cards which were sent to VK9CT via VK4FW/VK4CRR callbook addresses will be redirected to the ODXG PO Address and there is no need to re-QSL. Cards for the 1988 activity of AX9NKG and VK9NKG are now avaible from ODXG which has the logs. Bill also hopes to get the logs of VK0DM's 1974 Macquarie Island activity soon. The Group's new postal address is ODXG, PO Box 929, Gympie, QLD, 4570.

* The ARRL DXCC Yearbook for 1995 has arrived. Unless you are already on the Honour Roll, or unless you have increased the status of your existing award, your callsign is not in the book. Please note that the current number of countries at 30 September 1995 was 326. Here are a few interesting statistics regarding the VK callsigns. Mixed: VK5WO 361; VK6HD 351; VK2FH 335; VK3DYL 331; VK3EW 331; VK9NL 331; VK9NS 331; VK1DH 330; VK5QW 329; VK3AKK 320. Phone: VK6RU 379; VK5MS 377; VK4LC 364; VK5WO 358; VK6HD 350; VK3DYL 331; VK9NL 331; VK9NS 331; VK1ZL 329; VK3SX 328; VK2DTH 321. CW: VK6DH 331; VK9NS 331; VK9NL 330; VK1HD 258; VK1FF 147; VK4ICU 141. 160 m. VK6HD 165. 80 m. VK9NS 222. 40 m. VK9NS 276.

* The special event station celebrating the 131st anniversary of the ITU, AX2ITU, despite poor propagation and only four operators, made a total of 330 contacts on CW, SSB, 2 m FM and packet in a 24 hour activity on 17 May.

* The Japanese group, Atsu VK2BEX, Ken VK2IAZ and Chris VK2FHY made 1514 QSOs with 52 countries during their short stay on Broughton Island OC-212.

* The ARRL Awards committee has decided not to make any changes in the status of Mount Athos on the DXCC countries list.

* Frank YJ8AA, QSL Manager for Vanuatu, sent me a little note about pirate activity with the Vanuatu callsign. He says, *"As QSL Manager here in Vanuatu, I see quite a lot of cards, a lot of which I can do nothing about. If anyone worked any of the following list of stations during 1995, or so far this year, I am sorry to inform them that they are all pirates. YJ3HW, YJ1A, YJ1VL, YJ2WF, YJ3HO, YJ7KM, YJ8A, YJ8DA and YJ9ALS. For a lot of YJ0s, we have no QSL routes as they were visiting yachts, and never worked stations ashore. Most of the cards came from VK and referred to a CW contact."*

* Ray G3NOM, one of the operators of the October 1995 activity from Myanmar under the callsign XT1HT, was kind enough to send me a log extract of the VK and ZL callsigns worked by them. If you are in doubt as to whether you are in the log or not, drop me a note with a stamped, reply envelope and details of the QSO, and I will check the list.

* In the June issue of my column, the QSL Manager for FT5WE was shown as F5GWT. This information is incorrect and I tender my apologies all around. The correct QSL Manager is F5GTW Claude Touyeras, 23 Rue De Chardonnais, Cite de la Diete, F-86130, Jaunay Clan, France.

* The Kermadec Island activity, ZL8RI, produced a total of 33,897 QSOs, of which 41% were CW, 53% SSB, and RTTY 6%.

* The QSL Manager for the Indonesian special event station 8A5ITU is YC5BLG M Swid, Wisma Pasar Putih E 11, Tabing, Box 137, Padang, 25171, Indonesia.

* Don G3XTT reports that the provincial border lines in South Africa have been redefined. The number of current provinces is nine (old Transvaal has been divided into two parts), and it is possible that the ZS1-ZS9 prefixes will be issued to them, while all the South African Islands (Marion and Prince Edward included) should use the ZS0 prefix.

* The FCC has started issuing callsigns with the new NP3 prefix

* British Club stations in the future will be allowed to use special 1x1 and 2x1 callsigns in certain international contests from this year. Fifty two callsigns are available each year from G*6A-Z and M*6A-Z. The first contest in which these callsigns will appear, will be the IARU Championships on 13-14 July.

* Steve Salmon AA6LF has been operating as VK4ALF from a number of Queensland Islands. QSL via AA6BB.

* The Tunisian station 3V8BB is allowed to operate with 100 watts only, on CW, RTTY and SSB, and only on the following bands 10, 15, 20, 40, 80 and 160 metres.

* Rudi DK7NP has announced the birth of the German DX Foundation (GDXF) which has been established by a group of 12 German DXers. Further information from Rudi, who is the secretary of the Foundation.

QSLs Received

9Q2L (PA3DMH); T77BL (T70A); 4X/3000/4X1BD (4X1BD); BV9P (4w KU9C); XR0Y (3w WA3HUP); ZL9GD (10w op); XY1HT (4w G3NOM).

Thank You

Many thanks to all those who supply me with news and other information. Special thanks go to VK2XH, VK2IAZ, VK2KFU, VK2TJF, VK4FW, VK5WO, VK6LC, YJ8AA, ARRL DX Desk, and the publications *QRZ DX, The DX Bulletin, The DX News Sheet, The DX News Magazine, 425 DX News, and Go List QSL Managers List.*

PO Box 93, Dural NSW 2158

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Over to You – Members' Opinions

All letters from members will be considered for publication, but should be less than 300 words. The WIA accepts no responsibility for opinions expressed by correspondents.

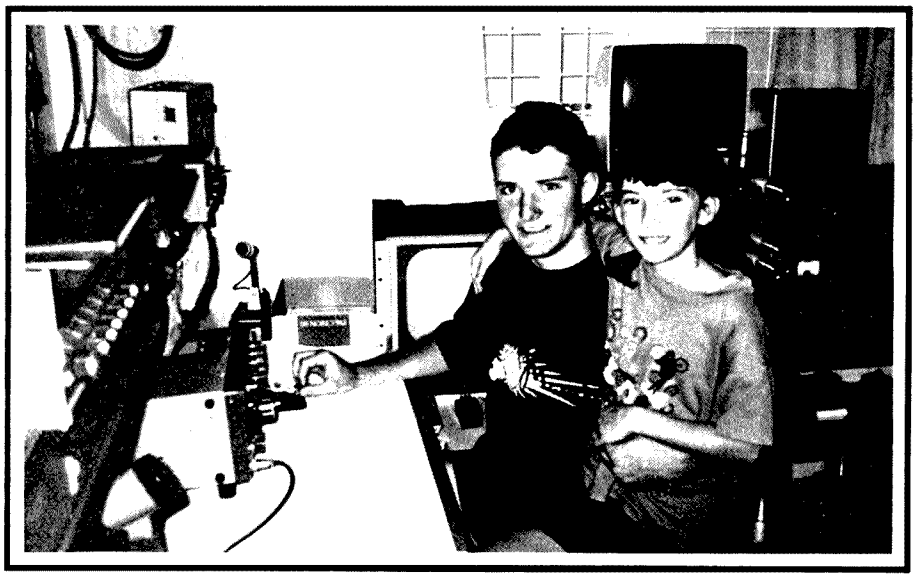
Young Achievers

Recently two young members of the Hervey Bay Amateur Radio Club sat for the CW Section of the AOCP. They decided to bypass the Novice and attempt the Unrestricted licence qualification. History can be a good teacher. They had often heard their father talk of cyclone "Tracey" and emergency communications and so an interest was kindled. Their father, John, is not and was not an amateur; however, he was involved with communications in Darwin at that devastating time in history. As a result, son Daniel, 15, and daughter Deborah, 10, decided some time ago to learn about radio and communications with an appreciation of what it could mean to them to become amateur radio operators.

For some time they had been listening to all sorts of communications on a short wave receiver and in June this year started to learn Morse code. The objective was 15 wpm, yes, 15 wpm! Under dad's supervision they dedicated themselves to about half an hour each day when all other chores like school work, etc had been completed. Everything was all systems go and in just over three months they were ready for the examinations.

For several reasons we had to change the exam date a couple of times and not until 14 October could we determine the youngsters' ability. The big day finally arrived and, at the club shack with the door closed, we started off with transmitting. In turn, each candidate pounded brass (I've heard that somewhere before!) and the tape rolled on. I looked at the other examiner, he looked at me, and at the same time we both cracked a smile. Here were two young 'uns, who had started learning in June this year, cruising along sending Morse at between 14 to 15 words per minute.

As for receiving, well, what can I say. Afterwards they both commented, "it was a bit slow". Enough said! That wonderful smile from Deborah (we nicknamed her "shorty"



The Hervey Bay "young achievers", Daniel, 15 and sister Deborah, 10.

because her head was just above desk level) and the grin from brother Daniel said it all.

We had to wait for official confirmation which came through very quickly indeed. However, we were pleased to give them both provisional passes in both transmitting and receiving. Perhaps it was natural ability, although attitude and dedication had something to do with the results; also, encouragement from mum and dad was no small contributing factor to success. If they continue to learn in the way they have started they will become very good amateur radio operators and a future in their chosen field is indeed assured. We wish them well.

Ted Watson VK4OW
Box 829 Hervey Bay QLD 4655

A Story of HF DF

The *HF DF* article by VK6HC in the March 1996 issue of *Amateur Radio* brought back some memories as I used that facility on a number of occasions. In particular, I would like to tell one story where it failed and up to six deaths could have resulted.

I was a WT/OP with No 2 Squadron at Laverton, Victoria during 1941 and our main job was to patrol Bass Strait when convoys of soldiers were leaving by ship for the Middle East. Three Lockheed Hudsons would be sent to Mallacoota airstrip (eastern Victoria), three to Mt Gambier (SA), and the section in between was covered by the Laverton base.

On this occasion I was at Mt Gambier and we patrolled Bass Strait looking for submarines or hostile ships. This was fairly boring as there was radio silence and it meant flying up and down our convoy for as long as our fuel would last, leaving sufficient to get back to base. *(Incidentally, the biggest convoy I ever saw on patrol consisted of the Queen Elizabeth, Queen Mary, Aquitania, Mauretania and the Ile de France with a tiny corvette or destroyer out in front.)*

When we reached the time limit of convoy patrol, and had been relieved by the next "kite", we turned for Mt Gambier just as a pea soup fog closed in. Skipper "Mick" asked for an HF DF bearing, and I called....and called....and called, but could not raise the HF DF station. I then took a bearing on an Adelaide commercial AM radio station and handed this to our second pilot/navigator (Kim) with an explanation about the problem with the HF DF station.

We arrived over the coast and, as Mick turned east, we narrowly missed another Hudson heading west. It was our first close call with death as we were close enough for me to recognise the pilot.

We found Mt Gambier through the fog and landed with just 15 minutes of fuel left. Our second close call.

Another Hudson came in without circling the aerodrome, landed and the motors stopped! He was out of fuel, could not even taxi to dispersal and had to be towed away. It was the craft we had missed earlier. The pilot decided we knew where we were going and turned back to our course.

An investigation revealed that "Sailor" (and he shall remain un-named), the operator on duty in the HF DF station, had gone to sleep and did not hear my calls. This would indicate that these stations should have been manned by two operators at all times, not, as was then the practice, of one on each eight hour shift.

Ed Dyring VK2ED
PO Box 3
Gosford NSW 2250

SEAnet and Beacons

SEAnet

The 24th SEAnet Convention will be held in Madras, India on 22-24 November 1996.

The brochures have finally turned up and I am sending one to you for information. Australia is frequently well represented at SEAnet Conventions and since this is the first one to be held in the Indian sub-continent the organisers are hoping for a good attendance.

Beacons

The 5-band IARU/NCDXF time-share Beacon program is proceeding well and the group in California is currently building more hardware. It is hoped to have a system up and running from VK6 before the end of this year.

The frequencies the system will use are 14.100, 18.110, 21,150, 24.930 and 28.200 MHz. LU4AA, YV5B, ZS6DN and 4X6TU are now on and may be audible in Melbourne from time to time.

David Rankin 9V1RH/VK3QV
PO Box 14
Pasir Panjang
Singapore 911121

(The SEAnet brochure may be seen at the Federal Office. Photocopies of registration forms can be provided. Ed)

Member's Opinion

I feel I must enclose a letter with my membership renewal fee this year after having attended the Victorian Division AGM for the first time in the three years since I have been a member. There are several concerns many of us share and I think WIA, its members and council should seriously address them over the next three years if amateur radio is to have a chance of surviving into the new millennium!

I am concerned about the number of hams who are not members of WIA. I think if the hobby is to survive it needs official representation and WIA's role should not be confused with that of a local radio club. Having joined the ARRL a few years ago before joining WIA and then, even more recently, renewing my RSGB membership which had lapsed since leaving the UK, I must say we are not doing enough here in VK land to plan for the future and encourage a wider membership. Let me provide more concrete proposals as I don't like moaning.

(i) The SMA licence fee, plus WIA membership, plus the cost of membership to one (preferably your local) radio club SHOULD ALL BE TIED TOGETHER in one package. I propose that the various levels of people involved should start the negotiation process. The idea is not just to

keep the cost down but to encourage active participation and, more importantly, the share of responsibilities at all levels.

(ii) That the WIA Divisional councils should invite as a matter of fact the attendance of ALL secretaries of all local radio clubs to their council meetings on a regular basis. If nothing else this ensures that council matters can be communicated down the line and that ideas, events and projects, etc can also be communicated upwards from the club membership.

(iii) I suggest the WIA should be sending older unwanted copies of *Amateur Radio* with an invitation brochure to each ham in the call book who is not a member of the WIA and inform them of the new package deal and ask them to reconsider. I understand that there were reasons why some of them have dropped out of membership but let's look at the statistics and see how many hams there are in the call book who are not WIA members.

(iv) I suggest we offer WIA scholarships and bursaries to the younger lads who have received top grades in year 12 for entry into Electrical Engineering or Physics or any discipline where wireless is a major component at university. I know the RSGB has such an award. I suggest we send to all schools, university departments, boy scouts and other youth groups a brochure about amateur radio and arrange for public demonstrations at the local club level on the proposed NATIONAL AMATEUR RADIO day.

(v) Finally we should invite professionals to be honorary members. I know that in the States they have senators, distinguished professors, and Nobel Laureates who are hams. There are many professional engineers, physicists, chemists, doctors, lawyers, etc, some of whom already are hams. Not long after I got my ticket here one of the people I spoke with on the air was a medical GP; unfortunately, as far as I know, he is not a member of any radio club or the WIA. Perhaps a brochure to the various institutes of engineers, physicists, medical associations, etc. Many of these bodies share the same problems as the WIA; not enough kids who aspire to succeed in their professions either. The support of some of these people with appropriate contacts is important to the hobby. I know that the RSGB has Prince Philip as the patron. Incidentally, regardless of one's feelings towards the monarch, he wrote an excellent foreword to the RSGB handbook as well as being for years a patron of the IERE.

I wish to present these points to all WIA members for discussion. I think as hams we have a responsibility to the hobby, to the future generations and to the wider community. Being in the educational profession myself I am aware that already too much harm has been done by governments and political parties who can see no further than three years in their policies. Can we as members of the WIA see beyond that?

Dr T C Choy VK3CCA
Senior Lecturer in Physics
Department of Physics
Monash University
Clayton VIC 3168
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Packet World

*Grant Willis VK5ZWI**

Introduction

There has been a lot of good feedback to the last few amateur *Packet World* columns and I hope that they have helped people get a better understanding of how packet radio works and a bit of an insight into some of the networking systems used on packet radio. In future columns I hope to present a "Mugs Guide" to using Rose and NET/ROM networks, including examples from real networks to help people get the most out of their local packet systems.

This month, I will take a look at what is becoming a rather popular terminal program for packet radio use called TSTHost. There are many people around the country using this program and, in my opinion, it has some features that many of the other terminal programs would do well to emulate.

TSTHost Hardware Requirements

TSTHost is written by IK1GKJ for DOS based PCs and requires a TNC capable of running the WA8DED or TF8, TF23, TF24, etc Host Mode software in the TNC. The other option for running TSTHost is to place your TNC into KISS mode, and then use another piece of driver software to convert between the Host Mode protocols that the TSTHost program wants, and the KISS protocols the TNC wants. A common piece of driver software is TFPCX. TSTHost will also work with a Baycom or similar style modem using the TFPCX driver software. I have successfully had TSTHost running on a PK87 TNC running KISS mode using the TFPCX driver software on machines ranging from an XT to a 486DX. I have also run it under Windows 3.1 successfully in a DOS Window.

TSTHost Capabilities

What are some of the things that TSTHost is capable of, you might ask? When you first start it up, you are presented with a split screen display showing two status lines on the bottom of the screen, three lines for sending text and commands, a connect channel status bar, and a monitor window.

The TSTHost program is capable of eight simultaneous multiple connects, all kept within separate windows. These windows are selected using function keys F1 through F8. Channel 8 is dual purpose, able to be used for either user initiated connections or automatic

HOST Mode

A mode where the TNC interacts more directly with the computer than the normal command mode most TNCs provide to terminal programs (command mode provides basic ASCII serial communications to any "dumb terminal program" that only knows how to talk ASCII). There is little control over the data flow between a TNC and the computer in command mode, other than the RTS/CTS/DTR lines in the RS-232 cable, or the software flow control XON/XOFF. HOST mode, on the other hand, puts the control of data to and from the TNC solely in the hands of the host computer. The host computer "polls" the TNC for each frame of data to be transferred, so that the TNC can't send or receive data to/from the main computer unless the computer tells it to. Framing and transmission control of packets in HOST mode is still controlled by the TNC, unlike KISS mode where even these functions are taken back into the PC.

KISS Mode

A mode where all the packet framing control is handled by the PC. This relegates the TNC to nothing more than an HDLC Converter and transmitter PTT controller, with all higher level AX.25 functions handled in the computer. KISS mode applications are commonly found in the TCP/IP programs such as NOS.

TSTHost Monitoring Window

```
fm VK5TTY to FBB ctl UI pid F0 len=223
223830  B     6586 KEPS @AMSAT VK4GRC 960601 2Line Orbital Elements 152.AMSAT
223831  #
223832  B     3729 NOCODE@WW PE1PTP 960601 Ban Morse! (well almost)
223833  B     3072 EME @WW IK4WLV 960601 OCEANIA EME SKED WANTED
fm VK5TTY to VK5KMG-5 ctl RR0+
fm VK5ZTV to VK5TTY ctl RR7+
fm VK5TTY to VK5KMG-5 ctl I03^ pid F0 len=030
 PLEASE NOTE FREQUENCY CHANGE
fm VK5TTY to VK5KMG-5 ctl I04^ pid F0 len=250
WIA re-broadcast on Monday nights. 7.30 pm on 3.585MHz & VK5RSV - 146.675

fm VK5TTY to VK5KMG-5 ctl I05+ pid F0 len=022
VK5TTY BBS 07:52 21>
fm VK5ZTV to VK5TTY ctl RR6+
fm VK5TTY to VK5KMG-5 ctl RR6+
```

mail forwarding. F9 will take you to the monitor only screen, so you can see what other traffic is on the channel at the same time. It is also possible to monitor channel traffic through a small five line monitor window displayed simultaneously at the top of each connect window. The F10 key toggles the user between "command" and "converse" mode. In TSTHost, "command" mode lets the user type in commands that are acted upon by TSTHost, while "converse" mode will transfer anything typed to the connection in progress on the radio channel.

The TSTHost program has true multi-tasking in-built and is able to handle multiple connections as well as mail forwarding, all simultaneously. While doing all of this, it is also able to continue monitoring the message list broadcasts that many FBB BBS system send, so that, unlike TPK, message lists are not missed while connected, forwarding or doing some other internal task etc.

The latest version, v1.42B, has full support for BBS automatic mail access and Hierarchical Addressing. This allows users to set up TSTHost to monitor the message headers broadcast by your local BBS, and then automatically select your personal messages and any bulletin categories you pick for download. TSTHost can then automatically connect to the BBS and retrieve the requested messages in a compressed mode connection, reducing the amount of time you need to be connected to the BBS to retrieve the data you want, compared with connecting using a text only based terminal program. You can send and receive both bulletins and personal messages using the program.

TSTHost also has an extensive Macro language capability, allowing users to program their own functions, which can be linked to various function key combinations. The program also allows for password protected BBS systems and has the ability to decode passwords automatically on connect if required.

One of the things that is a little disconcerting at first is the lack of detailed on-line help information. Issuing the help or ? commands only prints a list of available commands. To find out help about each command, you need to read the manual. Some commands with sub-menus (like the UList command which controls the setup of the BBS Message List Retrieval control system) will prompt you with sub-menus if you just enter the command. I recommend that people read the manual and play a bit with the program to get the feel for how the command line commands work. They are not difficult to use once you are used to them, but learning them may take a little time. There are also abbreviations for some of the commands via ALT+[letter] commands (eg the MailCopy command when displaying the message lists is also available as Alt-M).

Basic Configuration

The basic configuration file required to be set up before you put TSTHost on air is called TSTHOST.CFG. This file sets your callsign and Home BBS parameters. An example of how to set this file up using the TFPCX software and a KISS TNC is included for your reference. This is not by any means the only way to set up the program, but it is one way which I have used that works.

The key elements of the config program are the "AX25" commands, which define the radio timing parameters your station will use; the directory setups, which instruct TSTHost as to where everything is kept; and the PMS and Unproto setup section which defines your home BBS parameters (where you will send and receive automatic messages) and how to handle the unproto message lists from your home BBS station.

The configuration will depend on your local circumstances, and it is possible to set up TSTHost to access unproto lists over digipeated connections if required.

TSTHOST.CFG

```
# TSTHOST CONFIGURATION FILE EXAMPLE
# BEFORE USE, SET UP YOUR PARAMETERS
#
# setup tnc interface
#
AX25    DIGIPEAT      OFF
AX25    MAXFRAME      5
AX25    FRACK         500
AX25    VALIDCALL     OFF
AX25    MYCALL        VK5ZWI-1
AX25    RETRY         15
AX25    MONITOR       UISC
AX25    PERSIST       64
AX25    RESPTIME      200
AX25    TXDFLAY       40
AX25    UNPROTO       BEACON
AX25    USERS         8
AX25    BEACON        0
AX25    PORTCALL      7 VK5ZWI
AX25    PORTCALL      8 VK5ZWI-12
#
# setup work directory
#
USERDIR   E:\RADIO\TSTHOST\USERS
WORKDIR   E:\RADIO\TSTHOST
#
# setup pms section
#
HOMEBBS       VK5TTY
ENDMESSAGE    E:\RADIO\TSTHOST\LOGO.TXT
FTIME         30
FREVERSE      OFF
RLINE         OFF
HIERADDR      OFF
#
# setup unproto section
#
ULIST ENABLE
ULIST AUTOSELECT+VK5ZWI+WIA+@ADELAN
ULIST TIME 30
ULIST PMSG ON
ULIST QUERY
#
# other setup
#
AUTOYAPP ON
LOG OFF
SCREENSAVE 5
MPERM ON
```

To start running TSTHost, you need to use a number of command line switches to tell the program what type of TNC it is working to. These are spelt out in the documentation. An example of a batch file I use on my own station to work TSTHOST with TFPCX in 43 line VGA mode is given elsewhere in this column.

There are a number of other configuration files that the user should also familiarise themselves with. These are TSTHOST.CRN, which controls the timed execution of various commands (like controlling the times when the operator will accept page requests from remote users); TSTHOST.SYS which controls what access levels remote users can

TST.BAT used by VK5ZWI:

```
rem TST.BAT file for TSTHost in KISS mode via
rem the TFPCX driver.
rem
rem Load TFPCX
tfpcx -PKISS2 -B9600
rem
rem Load tsthost with TFPCX on Interupt 253
tsthost /T /I253 /VGA
rem
rem When closing TSTHost, unload TFPCX driver
tfpcx -u
rem end
```

have to your PC; TSTHOST.PSW which sets up your password access requirements for BBS stations; and TSTHOST.SHD which defines what commands are sent to your TNC program when you exit TSTHost.

Operating the TSTHost PMS

Some tips for new users of TSTHost trying to find their way around the program in the PMS area might be useful. Once you have the BBS Message Header capturing working, you are going to want to view the headers and tag or un-tag messages you want to download. The method of doing this is to hit "Alt-F6", which will bring up the message header listing. You can then move around the list using the up and down arrow keys as well as "page up" and "page down". To select or un-select a particular message, just press the space bar.

To list and read messages that have been captured, the commands are similar to those on the BBS stations. Typing "LM" on a channel in TSTHost command mode will bring up a list of messages that have been downloaded addressed to you. Typing "L" will bring up a list of all messages that have been downloaded. Positioning the highlighted bar over a message and hitting enter will allow you to read that message, and "Alt-K" will kill the message once read.

Another useful tip for managing your PMS system is to use the TSTHOST.CRN file to perform a mail clean-up every hour using the UPdatedms command. This way you can prevent the PMS from filling up your hard disk with all the messages you download.

One other tip that gets people caught is how to talk to someone keyboard to keyboard who connects to your station. Normally, when you connect to someone running TSTHost you are automatically given access to their PMS system. The user who connected can then use the T command (T for Talk) and page the local operator to come to the keyboard (this makes your PC sound some chimes). For the local operator to actually start a conversation, they must switch to the channel that the user connected to, and then with TSTHost in command mode type "TALK<Enter>". You will then by-pass the PMS and be able to have a keyboard conversation. Once you have finished your conversation, you can go back to command mode and type "PMS<Enter>" to return the remote user to your PMS.

Finally, a fairly important tip for the program. If you are using the unproto list features of the software, always shut the program down by typing "exit<enter>" in command mode. The reason for this is that the software doesn't automatically write the most recently received BBS Message List headers immediately to disk. If you shut down by some other means (eg, the reset button on your PC) you will loose the headers you have captured, and if you have already downloaded some messages from the headers you had captured, you might download the same message twice from the BBS!

Other Features of TSTHost

TSTHost has many other features as well. It is possible to run local "server" programs (similar to the REQFIL and REQDIR servers found on full BBS stations) as well as user accessible programs through "PG" commands (see the manuals for more details on these). These types of functions are very similar to those found on the FBB BBS systems.

Another popular function has been the ability for users to have 7-Plus ASCII encoded binary files automatically decoded by TSTHost when they are downloaded. Overall, TSTHost is packed with features that make it quite a nice terminal program to use on the current packet radio network architecture. If you want a copy of the TSTHost program, try contacting your local friends, or otherwise look on one of the major amateur radio telephone BBS systems or on the Internet in ftp.funet.fi in the hamradio area. Unfortunately, I don't have the time to assist in distribution of the software but, as it is freeware to amateur radio operators, there are many places where it can be obtained.

Conclusion

TSTHost is, in my opinion, one of the better terminal programs around at present. Its ability to use native host mode gives it multi-tasking capabilities I have, to date, only seen in the major BBS programs like F6FBB and AA4RE. Terminal programs are, however, an area that very much depends on personal preference and everyone should use programs that they are happy and confident with. I hope that this month's column has given at least some of you some ideas to go away and try.

Next month, I will take a look at some ways to navigate a NET/ROM network.

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Silent Keys

Due to space demands obituaries should be no longer than 200 words.

The WIA regrets to announce the recent passing of:-

E L J (Blue)	AKED	VK2AEU
H (Harry)	CAPSEY	VK2OQ
G W (Gordon)	DENNIS	VK3TF
W J (John)	MATTHEWS	VK3WJ
R (Rex)	SHILTON	VK4CAG
R G (Ron)	WRIGHT	VK4WRG
A G	LATHWELL	VK6AL
N F (Norm)	ODGERS	VK6NF

Harry Capsey VK2OQ (Ocean Queen)

Harry Capsey was born in England in 1906, came to Australia with his family in 1914 and lived in the Redfern Newtown Area. His father returned to England and enlisted in the Armed forces in World War I. During this period his mother bought a place in Brighton. In 1944 Harry married and in 1947 he and his wife moved to Chester Hill. Harry lived a very active life, designing and building most of his amateur equipment.

He was well known on the air as "two Ocean Queen" and respected for his knowledge of amateur radio. He worked in AWA Radio Communications and played a major role in transmitting the first two-way radio signal across Sydney Harbour. During the 1939-1945 World War, he was involved in teaching the civilian forces the use of Morse code. His other hobbies were photography and printing in water colours.

He was a French polisher by trade and all his home brew gear finished up being french polished. Harry and his wife travelled extensively in Australia and in later years his wife drove the car and Harry was the radio operator. He received his amateur licence in 1939 and after the war was very active on the HF bands. He later developed a love of 2 m.

He was active until his death, using an FT7 transceiver and a long wire, as well as 2 m. He passed away on 27 April in Nepean Hospital. Harry VK2OQ will be sadly missed on the air. **H R Chapman VK2BHC**

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Spotlight on SWLing

*Robin L Harwood VK7RH**

On the 19th of this month, the Centenary Olympic Games will be commencing at Atlanta, Georgia and continuing until 4 August. As you would be aware, there will be extensive coverage of this sporting event and shortwave broadcasters have also scheduled programming live from Atlanta. The BBC World Service, which probably has the biggest worldwide audience, will have their own studio facilities in Atlanta sending out live programming plus frequent updates. The VOA will also be doing likewise, although it is on their home turf. So, expect saturation coverage on shortwave of the 25th Olympiad.

Also this month, the first of the two major political conventions, where candidates are chosen to run for the US presidency and the party platform is enunciated. Previous conventions were very interesting to listen to but, as the major American domestic networks have cut back their coverage, it is not possible to get an in-depth look at what is happening, particularly as the candidates for the top job have already been decided prior to the event. However, the VOA in Washington remains the only source of live coverage of the complete Conventions, which they will be doing in English and other language blocks.

At the end of May, Israel also elected a new leader in Benjamin Netanyahu, whose political philosophies were different from that of Shimon Peres, the previous incumbent. The major difference was in relation to the Middle East peace process and there has been considerable worldwide debate as to what is going to happen next. I, along with thousands of shortwave listeners, have tried to hear Kol Israel in Jerusalem with their 7 am (0400z) English news bulletin but they have made an extremely bad frequency selection. 9435 kHz is a mess as the VOA is also broadcasting there at the same time from Kavala in Greece. They are in Farsi, which is the lingua franca of Iran.

The parallel channel for the morning news was 7460 kHz but it, too, suffered severe side-splatter from Radio Norway/Denmark five kilohertz up. However, they have since moved to 7520 kHz because of the QRM from Kol Israel. I believe that there is a frequency to Australasia higher up but I have not found it yet, as Jerusalem's morning news gives a good insight into what is happening within Israel.

There was speculation in a recent *Sydney Morning Herald* that serious consideration was being given to axing Radio Australia as part of the budgetary cost-cutting moves within the ABC. Nothing further was heard about this, although I believe that 15 staff at the ABC external service were made redundant as part of the announced restructuring in the Corporation. Just a few months back, Radio Canada International was looking at also closing down permanently, yet, as a result of the domestic and worldwide outcry from its loyal listeners, funding has been found to continue for another 12 months.

However, its future is not completely assured, according to an e-mail I received directly from RCI in Montreal. I quote from it: "*The (Canadian) government has not guaranteed any long term funding, has not authorized a separate budget nor has it really committed Canada to having a permanent international radio service.*"

There is an ad hoc group known as The Coalition to Restore Full RCI Funding which is drawn from RCI staff and others outside, wanting a clear statement from the government as to the future of Canada's external voice, with a separate protected budget, to guarantee on-going funding. The e-mail continues: "*We feel the service should be restored to at least its 1990/91 levels, bringing back language sections such as the German and Japanese services, and restoring targeted English and French programming for different geographic areas such as Europe, Africa, Asia, etc.*" These proposals are not catered for in the present funding package.

A similar situation could arise here in Australia, with the Federal Government seeking to cut back on the budget deficit and prune perceived waste and inefficiency in the public sector. Already RA's Carnarvon relay site in WA has permanently closed and the senders re-located to Darwin and Shepparton. RA has a significant impact in the Pacific and in SE Asia, while the audience has diminished in Europe and North America. However, if the English programming was completely axed, I would expect that there would be an outcry, particularly from the expatriate community, who are already dissatisfied with the coverage of home news and sport, particularly in the Old World. A criticism I have heard is that RA's news and current affairs is heavily biased in favour of Asia and the Pacific.

And while we are on cutbacks, news has just come to hand that South Africa is also to end its broadcasts on shortwave under the "Channel Africa" format. The only external service from South Africa solely targeted that continent. The parent organisation, the SABC, is looking to see if it is viable to re-introduce broadcasts on shortwave to other regions or scrap it altogether. Shortwave relays of the domestic networks will continue but are not often heard here.

Just to correct one minor typographical error in last month's issue, the correct address of the Southern Cross DX Club is GPO Box 1487, Adelaide SA 5001. Well, that is all for now. Hope that your winter listening is rewarding.

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QSLs from the WIA Collection

Ken Matchett VK3TL Honorary Curator WIA QSL Collection*

The value of first hand original documentation can never be over-estimated. We have all been aware of errors in articles, particularly those that refer to the dates of past events. The reason is that a high percentage of the reference material used in the compilation of the articles has itself been written not from original sources but from other articles. This is understandable, since researching of original sources takes an appreciable time. The WIA Collection, in its own way, is a very valuable source of historical data from the field of amateur radio, in particular the history of DXing. DXing, as we know, does not interest everyone (there are many other aspects of amateur radio), but it is, nevertheless, an important one. Not only do our QSL cards give first-hand information on DX communication since the early 20s, but the information given about the equipment used is of particular interest to the radio historian.

Most readers will be aware of possibly the most significant event in the field of amateur radio communication, that is the two-way radio contact between Leon Deloy of France, F8AB, and Fred Schnell and John Reinartz, IXAM, on the night of 27 November 1923. This was the first trans-Atlantic QSO by amateur stations and it opened up the world to long distance communication. Our collection is indeed very fortunate to possess one of Deloy's own QSL cards signed by him for a QSO with the famous English experimenter W E F (Bill) Corsham G2UV only a few months after that historic event. As if this were not enough, the collection has both a signed QSL of Bill Corsham's and one from Reinartz himself (1-XAM/1QP). These extremely valuable cards were donated to the collection by Bill Hall VK2XT of Toronto, NSW. Bill Corsham G2UV was a winner in the trans-Atlantic tests of 1921 from Britain, and became a radio enthusiast as early as 1913.

On 19 October 1924 the first two-way radio contact on the amateur bands took place between New Zealand and Great Britain. The NZ operator was Frank Bell Z4AA of Dunedin and he contacted Cecil Goyder G2SZ of London. Our collection contains a QSL of Z4AA dated 17 February 1923, not long before this historic contact, and another one dated 15 November 1924, which was one month later. On Bell's 1924 QSL he states that he was the first NZ station to contact Australia and the first Australasian station to QSO North America and Europe. He used a 90 foot vertical cage antenna with a small fan counterpoise. The collection contains one of Goyder's QSLs on which he mentions the success of this station in the old 200 metre tests of 1923-4. It will be seen that, as well as a record of radio contact throughout the world in the early days of radio, the QSL cards themselves give a fine record of the antennas, equipment and power used in establishing such contacts. It is fascinating to look back and find details of spark gaps, early detectors, headphones and antennas as well as modulation, amplification and oscillator details.

The oldest QSL in the collection is that of 9DBU, which is hand-written and dated 20 May 1921, originating from Eden, Illinois. A typical station of the time might use a De Forest tuner, Baldwin phones and a 600 ohm loud speaker horn, the transmitter a Thor 1 kW with Spark Gap as on a QSL of 6IG from Arizona.

In the large Commemorative and Special Issue section of the collection may be found thousands of QSLs that commemorate many of the historic events that have taken place in many countries. Space will not permit mention of more than just a few: VI88ACT (Australia's Bicentenary), GB3BBC (50th anniversary of the BBC), TM6JUN from France (celebrating the June 1944 Normandy landing), RG6C from the former USSR (celebrating Yuri Gagarin's epic space journey), W200RR (celebrating the Bicentennial of the American Constitution), and VI50PEACE (Australia's celebration of the end of World War 2 fifty years ago).

Changes in a country's callsign prefix will often reflect important changes in its political status, the most important being the gaining of independence from colonial rule. Such countries gave up their old prefixes for new ones allotted by the ITU. The long list includes Nauru (VK9 to C21), Sri Lanka (Ceylon VS7 to Sri Lanka 4S7), British Guiana (VP3) to Guyana (8R1), and so on.

The collection also contains a splendid pre-World War 2 QSL collection. It is interesting to note the changes in callsigns introduced throughout the years. Some of our earliest QSL cards indicate simply the initials of the operator. Cards of the mid-1920s show one or two letters that served to identify the country of origin. Examples are: C3CH (China), X9A (Mexico), Z4AR (NZ), and D4BEC (Germany). Still later, QSL cards show what was the "intermediate", a precursor of the modern system of prefix allocation introduced in 1929. These intermediates, introduced in 1927, consisted of two letters, one being the continent indicator, the other a letter representing a particular country. Examples are: OA6DA (Australia), EG2BCQ (England), NC2BE (Canada), and SB2AR (Brazil). Such QSLs are becoming extremely rare.

The collection lacks a QSL from Guglielmo Marconi but, no doubt, one did exist at one time in the form of a letter which confirmed his successful transmissions. We do, however, have the original QSL cards of several inventors, including those of Loren G (Windy) Windom W8GZ. His single feeder Hertz antenna became one of the most popular in the world. Reg Varney's QSL is here too; his G5RV was another successful antenna type. The attractive QSL of Carl E Mosley K0AXS/W0FQY, inventor of the famous trap antenna, the TA33, and that of Captain "Dick" Bird of G4ZU fame also find honoured places. Apart from the original QSL cards, several hundred QSLs commemorate the pioneer work of such men as Marconi, Ohm, Morse, Yagi, Hertz, Popov, Oersted and Siemens.

The QSL cards of our own inventors and experimenters are not lacking. The list is a long one, but one can mention Max Howden (3BQ) who won, using a home-built receiver, the trans-Pacific Tests of May 1923. Ross Hull (3JU) is said to be the first amateur to hear signals from the USA and was a pioneer in the VHF-UHF field as well as being the technical editor of the prestigious *QST* before his tragic death in September 1938. The QSLs of Alf Traeger 5AX, inventor of the pedal-wireless, are here as is the early QSL card with the callsign 8AB-8AC issued to the Australian Inland Mission. Vernon Kerr's signature appears on one of the collection's Flying Doctor's QSLs, VK8XT. He was the Assistant Station Operator at Cloncurry at the time. Early broadcasters are represented too. Charles Maclurcan VK2CM commenced transmitting in the days of spark from the roof of the Wentworth Hotel in Sydney. He used to broadcast music and entertainment on the commercial bands. Alf Maddick A3EF was also a successful broadcaster on Sunday afternoons and evenings as were a few present day members of the RAOTC.

A Campbell Drury's QSL VK3ACD was the first ever issued from Heard Island (April 1948). Wal Hannan's QSL VK2AXH is amongst the collection. He was the operator who made the first radio contact from Antarctica. The list goes on and on, but mention should be made of the surprising number of QSL cards issued from clubs before World War 2. Callsigns OA3MR

(Malvern), A3BC (Brighton 1926), 3XC (Xavier College 1926), 3RI (Railway Institute), A-3CR (Coburg 1925), are here, to name just a few.

There are, in the collection, a number of callsigns which may be unfamiliar, even to old-timers. Lay Cranch was issued with the one-letter suffix call VK3T. He never did have a QSL card of this call, but we do possess the original licence. The unusual Australia prefix VH3UX (later VK3UX) was an experimental station at Black Rock before the war.

Present day experimenters such as John Adcock AX3T and Dennis Sillett VL3Y have donated some of their unusual QSLs to the collection.

The above account has dealt with mainly the historical aspect of the QSL card, for therein probably lies its greatest value. However, it should be realised that the collection contains thousands of QSL cards of a thematic and pictorial nature, as well as rare DX QSL cards, many from famous DXpeditioners.

There are also other collections, including callsign prefixes (arguably the world's largest collection), DOK numbers, IOTA, US counties, NZ counties and branches, pre-war shortwave listeners and commercial station QSL cards, as well as an Australian pre-war and post-war collection containing the QSL cards of this country's active radio amateurs.

In closing, I would like to see more use made of the collection by writers of radio history. Photostat copies are available which are suitable for publication. Parts of the collection have been displayed publicly and any WIA member is welcome to inspect the collection by prior arrangement. I wish to thank all those old-timers who have done their share in saving something for the future.

The WIA would like to thank the following for their recent kind contribution to the collection: Robin VK6LK, Ivor VK3XB, Eric VK4XN, Keven 2E1AIU, Jim VK9NS, "Snow" VK3MR, Steve G0UIH, Jack VK3EK (ex VK3NOG), Mike VK6HD, Paul VK2KVY, Brian VK4LV, Tad VK3UX, Ossie VK3AHK, and Sydney VK6HE.

Also the friends and relatives of the following SKs: Bob Rowland VK3GR (courtesy of Stan VK3SE), A E (Bas) Carlyle VK3AUN, L R (Len) McIntyre VK3XF, Edgar Nicholls VK7RY (courtesy of Tom VK7BT), and George Baker VK2CGB

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Repeater Link

*Will McGhie VK6UU**

CTCSS Encoder

Following on from last month's *Repeater Link* on CTCSS, here is a circuit for a CTCSS encoder. I have the design for two encoders, one as featured this month, and an alternate design for next month.

I have played around with various low frequency oscillators in an attempt to produce a small, frequency stable and pure sine wave result. However, it is surprisingly difficult to produce a frequency stable design, due mainly to finding a temperature stable capacitor in the 1 µF range. The old green cap is fairly good but a bit large.

MKT

Along came the MKT range of capacitors available from many of the regular outlets. I obtained mine from Dick Smith Electronics. Placing a digital capacitance meter on a 1.5 µF MKT showed no significant change in capacitance after removing it from the freezer and heating it up to over 50° C using a hair dryer. These capacitors are a plastic dielectric type with very low leakage and about half the size of the old green cap. All round, a very good non-electrolytic capacitor.

The NE567

With an easily available capacitor with all the right requirements, now came the search for an oscillator design. I have used the NE567 frequency decoder chip as a CTCSS decoder and wondered how stable the internal oscillator is. Logic indicated it must be a stable design as this internal oscillator is the reference for decoding the incoming CTCSS tone. Why not use the decoder chip as an encoder? The internal oscillator is available on pins 5 and 6. Most of the NE567 would not be used, but one eight pin chip and a few components could be a simple CTCSS encoder.

Square Triangle

One small problem with the NE567 is that the oscillator signal on pins 5 and 6 is not a sine wave. Pin 5 is square wave and pin 6 is a triangular wave. A sine wave is essential for CTCSS encoding to prevent harmonics from being heard on the encoded audio. The oscillator signal would have to be filtered to produce a sine wave output. A narrow band-pass filter would limit the range over which the oscillator could be easily used. I decided to use a low pass filter, simply a three stage resistor capacitor filter.

NE567 Description

For those not familiar with the NE567, some explanation. The chip is a phase lock loop design. An internal oscillator is phase and frequency compared to the incoming CTCSS signal. If the CTCSS signal is within about a cycle or two, phase lock is obtained and the logic output on pin three goes from high to low. This logic output can then be used to un-mute the audio in your FM receiver or open a CTCSS repeater. The lock-up time and bandwidth is set by the values of C1 and C2 respectively. Lock-up time involves the VCO DC loop feedback path. The bigger the capacitor the longer the lock-up delay and the more reliable the decoder is. Bandwidth means how close the incoming CTCSS tone has to be to the internal oscillator frequency. The bigger the capacitor the narrower the bandwidth. However, all this is only background information and has little to do with the oscillator as used in this circuit.

The Circuit

With reference to the circuit diagram (Fig 1), the NE567 is connected as if used as a decoder, except for the input pin 3 and the logic output pin 8. The 20 k MT (multi turn) pot adjusts the frequency of the oscillator. This pot, in conjunction with the 1.5 µF MKT capacitor, determines the frequency of operation. The NE567 requires a regulated supply of five volts and the 78L05 is used to provide this. The oscillator output is taken from pin 6 which is the triangular output. This output has less harmonics than the square wave and therefore requires less filtering to produce a sine wave. The triangular wave form is then fed to the three stage low pass filter. The resulting output from this filter is a good sine wave.

The single transistor amplifier is required due to the loss in the three stage low pass filter. The input impedance of this amplifier is required to be high, and this is achieved by not bypassing the emitter resistor and a high value (10 M) bias resistor. Due to this high impedance input, any DC leakage through C9 upsets the operation of the transistor amplifier. Ordinary electrolytics will not work in this part of the circuit. Use an MKT capacitor as shown. The amplifier lifts the level to about two volts peak to peak at 123 Hz.

The output level of the transistor amplifier varies depending on the frequency that is applied to the three stage low pass filter. The

higher the frequency the smaller the output from the filter and hence the amplifier. This, however, is offset by the characteristics of the phase modulator in the FM transmitter. Higher frequency tones require less level to produce the same deviation as a lower tone. If your repeater uses direct frequency modulation then this offset is not the case, but the level output should be enough for most situations. If more level is required, simply add an extra stage of amplification after the output level control.

Note the transistor amplifier uses the 12 volt rail rather than the five volt regulated rail. This was done in order to provide slightly greater output from the amplifier.

Frequency Stability

The circuit as shown was designed to operate at 123 Hz to give about two volts peak to peak output. It can be adjusted to any CTCSS tone between 67 Hz and 250 Hz. The circuit board was placed in the freezer and dropped down to -10° C. The frozen board was then removed, power applied and a frequency counter connected. As the board rose to room temperature there was no change in the frequency of operation. The board was then slowly heated with a hair drier up to 50° C. There was also no change in the frequency of operation. My frequency counter can read to within 0.1 of a cycle. Allowing for the odd change of the last digit, the oscillator appears to be stable to within 0.1 of a cycle between below freezing and 50° C.

Where to Use

With few repeaters requiring a CTCSS signal for normal input operation, the circuit is presented in the hope of encouraging repeater managers to install CTCSS encode on their repeaters. This then allows users that are equipped with CTCSS decode to use this mode.

Many, if not most, two metre repeaters use the Philips FM828 as the basis for the repeater design. Where to inject the CTCSS tone into the repeater's transmitter depends on the exact design of the individual repeater. If the repeater uses the standard FM828 exciter board setup and the phase modulator, the CTCSS tone can be injected at P5 on the exciter board. An 18 k building out resistor is required to prevent loading of this part of the audio circuit. That is, from the 100 k output level control on the CTCSS board, place an 18 k resistor between the output wiper and P5 on the FM828 exciter board.

Set Up

The required deviation of the CTCSS tone on the repeater's transmission should be one tenth of the repeater's peak deviation. So, in a 5 kHz deviation system, the CTCSS tone should FM modulate the transmitter to 500 Hz deviation. Setting this up with limited equipment can be difficult. If all else fails, wind the level up from zero while listening on a hand-held or mobile that is in the CTCSS decode mode, until the CTCSS mute opens on the receiver. Perhaps wind the level up a little more to allow for less sensitive CTCSS decoders in other radios. If the CTCSS tone can be heard at an objectionable level on the repeater's transmission, the level is either too high or contains harmonics of the CTCSS tone.

Different Design

Next month a different design for a CTCSS encoder. The circuit is the standard phase shift oscillator and offers some interesting variations on the old design.

21 Waterloo Crescent, Lesmurdie 6076
VK6UU @ VK6BBR

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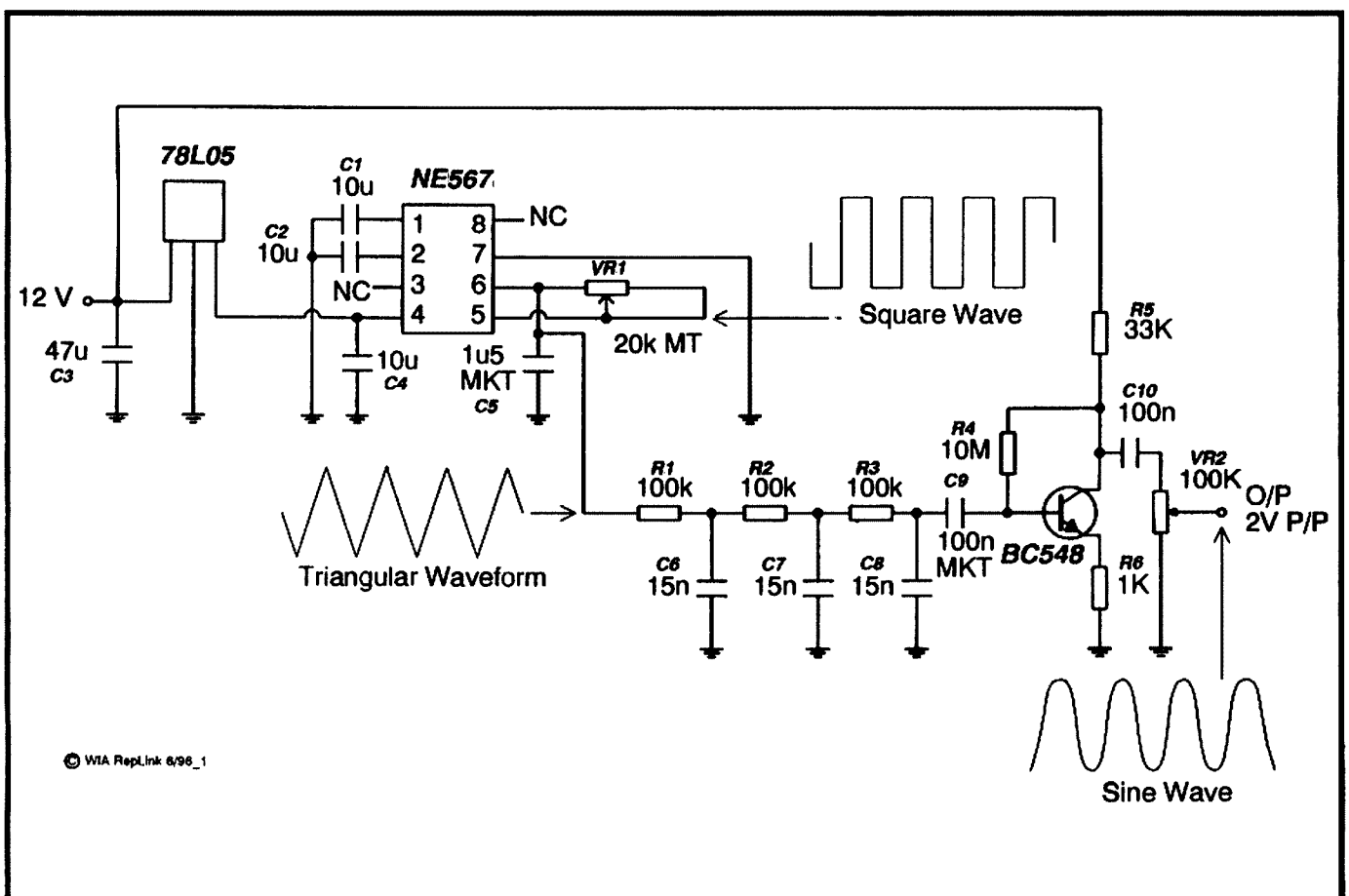

Figure 1 – CTCSS Tone Encoder

VHF/UHF – An Expanding World

*Eric Jamieson VK5LP**

All times are UTC.

Carnarvon OTC Dish

From Carnarvon, David VK6ID advises that the old OTC dish has been given to the town for tourism purposes.

The Shire President's husband, **Wally VK6MN** and David would like to see a VHF/UHF "get-together" at Carnarvon in 1997 to use the dish for amateur radio purposes, plus any other appropriate amateur activities. I will be discussing the matter with David but, in the meantime, any suggestions regarding what form the gathering might take could be faxed or written to me for inclusion in any discussions.

On-the-Air

Ron VK3AFW writes that winter might be approaching but the tropo has not yet disappeared. On 144 MHz – 5/5: VK7XR to VK2TWR 5x3, distance about 600 km. 8/5: VK3TMP to VK3AMH and VK5ACY. 15/5: 2212 VK3AFW to VK7XR 5x4. 16/5: 1320 VK2TWR to VK7XR 5x4 and then on 432 same stations at 5x6; 2212 on 144 VK3AFW to VK7XR 5x2. 19/5: VK7XR to VK2TWR, VK3ZQB, VK5NC and VK5DK.

Alan Johnson VK2DXE from Pyrmont, Sydney reports reasonable success from Sydney. His location is one km west of the city centre and not the best for VHF operation; however, using a 13 element K1FO Yagi to a pair of 4CX250Bs on 144 MHz, he has worked VK1, 2, 3, 4, 5, 7, ZL and FK8.

Alan said: *The Eta Aquarids meteor shower, which peaked 4 and 5 May local, created some excitement in Sydney due to the peak falling on a weekend and the best time for north/south paths coinciding with the regular weekend aircraft enhancement activity. I believe that Ross VK2DVZ worked VK3AUU and VK3AMZ on both mornings by quick action during good meteor bursts, and then VK3BRZ on 5/5. I worked VK3AMZ at 2240 on 5/5 at 5x3. It was interesting to hear so many stations from the south talking at the same time – it was a matter of grabbing the strongest signal.*

A sked with Joe **VK7JG** on 3/5 at 2230 resulted in signals both ways but failure to complete. They finally completed a two-way contact at 2205 on 4/5, using a 50 second burst to produce signals 5x3/4. Alan believes this to be the first VK2 to VK7 two metre contact via meteors and would like to think it is the forerunner to increased interest in this mode.

Mike VK2FLR confirms the above information and adds that he was confined to listening to Alan VK2DXE work stations, plus the Mount Gambier beacon on 144.550 MHz, which produced some solid bursts on the Sunday morning.

Mike again makes a plea for participation from Adelaide: *The excuse that the Adelaide Hills are in the way for Adelaide-Sydney paths does not wash with meteor scatter. Since the optimum take-off angle is nine degrees, simple trigonometery tells us that to get over a (say) 1000 metre obstruction for a nine degree angle, you need only to be 6.3 km away. If you can work Sydney on Es, you can do it on meteors. So over to the Adelaide gang.*

A letter from **Joe VK7JG** (he said the last one was five years ago!) also confirms the meteor contacts and he was particularly pleased to work Alan VK2DXE for the first VK7 to VK2 meteor contact. Joe said he has listened many times when VK3s are working VK2 via aircraft enhancement, but has heard no signals.

Joe needs to work VK6 to complete WAS on two metres. The recent contacts to Perth from Victoria and South Australia did not extend to Tasmania. He uses an Icom two metre base rig with a Mutek front end, 15 element quad Yagi at 14 metres and a masthead amplifier. A conduction cooled 8873 triode linear runs about 400 watts input.

Alan VK2DXE now has a copy of the meteor scatter prediction software from **Rod VK4KZR**, and is happy for amateurs to contact him by phone on 02 552 2950 to arrange skeds using meteor propagation; this is being actively pursued by Mike VK2FLR and himself, but they would like to be joined by others around the country.

Charlie VK3BRZ from Lara writes that, despite the approach of winter, the south-east of Australia has not gone into hibernation. Experience over the past 15 years has taught him that good tropo conditions can be expected in April/May. He uses the Channel 0 sound carrier from Wagga TV as an indicator, it always being audible at his QTH.

On the evening of 8/5 John VK2KKZ (ex-VK2YEZ) at Griffith was 5x9 on two metres and worked by stations including VK3XPD, VK3TMP, VK3KLO, VK3KWA, and himself. Signals were almost as strong on 70 cm so, rather than waste an opening they chatted until one am.

At 1100 on Tuesday 14/5 a phone call from **Mark VK2EMA** at Tottenham, central NSW, revealed he was hearing their beacon. Contacts were 5x1/2 on 144. Another try at 1230 found signals at 5x4, but no success on 70 cm.

For the remainder of the week they kept morning and evening skeds, working each other with signals 5x1/5 over the 700 km all-land path. They plan to keep skeds several times a week to test the path for conditions with or without tropo enhancement. Despite several airfields on the path, Charlie does not believe their contacts are being influenced by aircraft enhancement. Due to the absence of operators, they cannot prove how far further north the ducts extend. Similar improved conditions should appear during August and September.

General News

The following points of interest are from *Internet Six News* which is updated daily. Due to geographic isolation and, therefore, unfortunate limitations of the VK5 BBS system, I do not have direct access to this information but, thanks to the kindness and interest of John VK4FNQ in Townsville, I receive the information via a computer disk, allowing me to select those items of general interest to southern hemisphere operators.

Georgia Expedition (4L) on 50 MHz

This was to take place from 14 June to 26 June 1996 in Grid LN21. It is mentioned here as it is a country not normally open to 50 MHz operation due to cable television on Channel R1.

After long preparation, a group of Dutch radio amateurs (most of them members of the UKSMG) will activate the Republic of Georgia during the coming Es season; the prefix is 4L (suffix kept secret to keep pirates away). The main independent station will be continuously on the air with 1 kW ERP, located some 70 km NW of the capital of Tbilisi (Tiflis). During lack of propagation, a beacon will be active on 50.123 MHz. The ARRL has announced this as a new DXCC country.

Lord Howe Island

On Lord Howe Island, VK9YQS QF98 is active from 2200z daily using 180 watts and a ground plane. Doug will QSL direct via Doug Speedy, Lord Howe Island NSW 2989. He is QRV until September 1996 and then hopes for VK0 Macquarie Island.

Life Member

From the May-June issue of the *Geelong Amateur Radio Club Journal*, comes advice that **Chas Gnaccarini VK3BRZ** was awarded Life Membership at their recent AGM and will be presented with his medallion at the June meeting.

Part of the accompanying citation drew the attention of members to the many years of dedicated service given by Chas to amateur radio and the GARC, based upon the philosophy that knowledge acquired should be knowledge shared. This was put into practice when Chas offered to assist in the AOCP classes, act as an invigilator, and conduct AOCP exams on behalf of the WIA.

I would like to add my personal congratulations for a well deserved award and thank Chas for the contributions, spread over many years, that he has made for inclusion in my monthly columns.

Beacons

A fax from **Chris Schulz VK8KCS**, Secretary of the Alice Springs Amateur Radio Club, advises that the Alice Springs beacon VK8RAS is now operating on 50.047 and 144.485 MHz using 20 watts CW ident and 1/4 wave vertical antenna to each beacon. The equipment is located at Radio 8HA studios, 8 km south of Alice Springs.

All six VK5 beacons, as detailed in the February issue, are now operating. **David VK5KK** says work is proceeding on beacons for 3.4 and 5.6 GHz. When completed, this will be the most comprehensive beacon installation, from the one position, in Australia, possibly anywhere! Later, a 24 GHz beacon is a possibility.

North America

Emil Pocock W3EP, writing *The World Above 50 MHz* for June *QST*, heads his column *The Transatlantic Season*, in which he refers to the unprecedented 32 days of 50 MHz Es propagation between North America and Europe during June and July 1995, with path distances commonly exceeding 4000 km.

Whilst there is no way to tell if 1996 will be as good as, or better than, 1995, many stations will be on the alert for contacts across "the pond".

Emil writes: *It does not take a super station to work Europeans on 50 MHz, even from the centre of the country. Many 10 watt stations with small Yagis on both sides of the Atlantic made the grade last year. By far the biggest problem was QRM, especially within the 50.100 to 50.125 DX window. Stations in the Mid-western US, as well as in Central and Eastern Europe, had trouble making contacts due to crowding near the lower portion of the band. Weak signals often hampered efforts as well. The best advice, leading stations on both sides of the Atlantic give, is to use CW and spread out.*

North American stations would do better by giving the DX calling frequency, 50.100 MHz, a wide berth at all times. Leave the calling frequency clear for DX stations to call CQ. If you actually hear a new DX station on 50.110 then, by all means, answer if you wish, but then clear out quickly and give others a chance. Resist the temptation to call CQ yourself on 50.110, even when the band seems dead. You may hear nothing and assume the frequency is unoccupied, but there are always plenty of stations listening for weak signals. Your CQ can ruin the chances for many others.

If the band is dead, try calling CQ on CW around 50.100 MHz or on SSB just below 50.125. DX stations have the same problems we do: crowding around the DX calling frequency. They will find you much easier and faster if you are in the clear. Once it is obvious the band is open, spread out even further. CW stations can go down to 50.080 before they seriously interfere with beacons. Both CW and SSB stations have several hundreds of kHz above 50.125. The European calling frequency is 50.200 MHz and Europeans can commonly be found considerably higher than that. Spread out!

The above is also good advice for VK and ZL stations and we would do well to heed it. There is still little response to my previous suggestion to use 50.130 MHz as our main calling frequency, especially during Es contacts. Don't you like the idea?

I note, also, that there is increased interest towards the Brendan Trophies, being offered for the first transatlantic contact between North America and Europe on 144 MHz using terrestrial modes of propagation, probably Es or tropospheric ducting. A few Atlantic-facing two metre beacons are already operating from the eastern sectors of the continent and others will follow. I expect that when the opening does eventuate, as is so often the case, many stations will make the crossing on the same day.

This leads me to query why central and western VK find it so difficult to work New Zealand on two metres. During our last Es season ZLs worked many VK4s, plus stations in VK1, VK2, VK3 and a lone VK7, but no VK5s, VK6s or VK8s.

I ran a few distance checks through the computer and found Perth to Auckland at 5483 km, Christchurch 5191 and New Plymouth on the west coast of the North Island at 5417 km. Distances from Albany are about 350 km shorter in each case. Adelaide to Auckland is about 3255 km, Christchurch 3086 km and New Plymouth 3231 km.

The distances from ZL to Perth are certainly greater by about 1000 km than those across the Atlantic, while those to Adelaide are about 1000 km shorter than the Atlantic crossing! The existing VK5 to ZL two metre record was set on 15/1/86 when VK5ZEE worked ZL1HH for a distance of 3458.8 km. The distance is greater than to Adelaide because I believe VK5ZEE was located well north of Adelaide near Port Augusta or Woomera.

If we are to work VK5-ZL again then we need to stimulate some interest. But a contact between VK6 and ZL, particularly between Perth and ZL, would set the world talking! Dedication at both ends will be needed for it to happen but, if it is going to happen by Es, it will need to be done in the next year or two while in the low part between cycles when Es seems to be at its best.

Good tropo paths between Perth and ZL may be hampered by the large land mass of Tasmania being in the way, but it would be a person lacking in wisdom to say the path will never be bridged! Never is a long time.

Closure

My packet directory seems to be sadly lacking in file entries since it was established. I would welcome information directed to my callsign as it seems to arrive here, while info on VHFSIX, VHFNET and 50 MHz fails to arrive!

Closing with two thoughts for the month:

1. The natural flights of the human mind are not from pleasure to pleasure but from hope to hope, and

2. The trouble with the public debt is that private individuals have to pay for it.

73 from The Voice by the Lake.

**PO Box 169, Meningie SA 5264*
Fax: (085) 751 043
Packet: VK5LP@VK5WI.#ADL.#SA.AUS.OC

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VK QSL BUREAUX

The official list of VK QSL Bureaux. All are Inwards and Outwards unless otherwise stated.

VK1		GPO Box 600 CANBERRA ACT 2601
VK2		PO Box 73 TERALBA NSW 2284
VK3	Inwards	Box 757G, GPO MELBOURNE VIC 3001
	Outwards	40G Victory Blvd ASHBURTON VIC 3147
VK4		GPO Box 638 BRISBANE QLD 4001
VK5		PO Box 10092 Gouger St ADELAIDE SA 5001
VK6		GPO Box F319 PERTH WA 6001
VK7		GPO Box 371D HOBART TAS 7001
VK8		C/o H G Andersson VK8HA Box 619 HUMPTY DOO NT 0836
VK9/VK0		C/o Neil Penfold VK6NE 2 Moss Court KINGSLEY WA 6026

■ Audio

Some Thoughts on "Ham Band" Audio

Felix Scerri VK4FUQ has some suggestions about the quality of transmitted audio heard on the amateur bands.*

People who know me will probably know of my almost obsessive interest in audio and the subject of high fidelity. "What's that got to do with ham radio?" you may ask. Well, actually, quite a lot.

Listening around the HF, and even the VHF ham allocations, I get the impression that the general standard of audio transmitted is not as good as it should be. By "not as good", I mean such things as light sounding audio, the result of insufficient audio drive, lack of clarity, overdrive distortion, and various degrees of RF feedback and power supply "FMing". They are all, unfortunately, common, at least in my experience.

I believe that the "black box" nature of equipment today has a lot to do with this as, these days, it is simply a matter of "turn it on and talk". A shame, I think. Many amateurs would say "readable five audio" is good enough. However, I don't agree.

In my experience there is nothing as readable and non-fatiguing as a well modulated signal from a good quality audio program source, regardless of transmitted audio bandwidth. My own set-up is an example of this. On HF I use a Shure SM-58 vocal performance dynamic microphone (originally part of my home studio), with an audio pre-amp of my own design working into a stock standard IC-735, with audio levels adjusted for optimum modulation with my voice. I'm consistently told it sounds magnificent. Yes, it does present a silly level of overkill, but it does, in the end, illustrate the point.

For those who do not wish to go this far, yet still aspire to good transmitted audio, I'd like to offer this advice. "Listen!" The "black box" mentality has meant that very few of today's amateurs actually listen to their own transmitted audio, as was once quite common in the earlier days of extensive "home-brewing".

If you have a separate station receiver, then I suggest you use it. In my own shack, my trusty old FRG-7 serves this purpose. Don some headphones and have a good, critical listen.

You may be shocked, or pleased. Experiment with such things as microphone gain adjustment, microphone position, effect of speech processing, even different microphones! Such close field testing should easily reveal any serious problems such as RF feedback or "FMing".

Adjustment of sideband carrier oscillators may be necessary if something is seriously amiss here, although I feel that most modern transceivers are okay in this respect.

Beware of such things as back panel "tone" controls. My IC-735 has one, which was factory set at full treble cut. It took me quite a while to work that one out!

Enlisting the assistance of a nearby amateur with a similar interest is a good idea. If you persevere, I am sure you will find the efforts definitely worthwhile. You might actually enjoy the investigations or, even worse, you may even become an audio fanatic like me!

**9 Garbutt Street, Ingham QLD 4850*

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Pounding Brass

*Stephen P Smith VK2SPS**

Golden Section Morse Keys

To conclude this series, I present the last of the Dr Jim Lycett PhD, G0MSZ, technical drawings in relation to his Golden Section Morse keys. Refer to page 47 of the May 1996 issue of *Amateur Radio* for the parts list referenced to the circled numbers on this technical drawing.

I would appreciate any feedback about construction of one or both types of Dr Lycett's Morse keys.

In coming issues we will look at Bencher Paddles, the new QRP Plus Tx/Rx from Index Labs and, to conclude, the new CD-Rom from the RSGB entitled Instant Morse.

**PO Box 361, Mona Vale NSW 2103*

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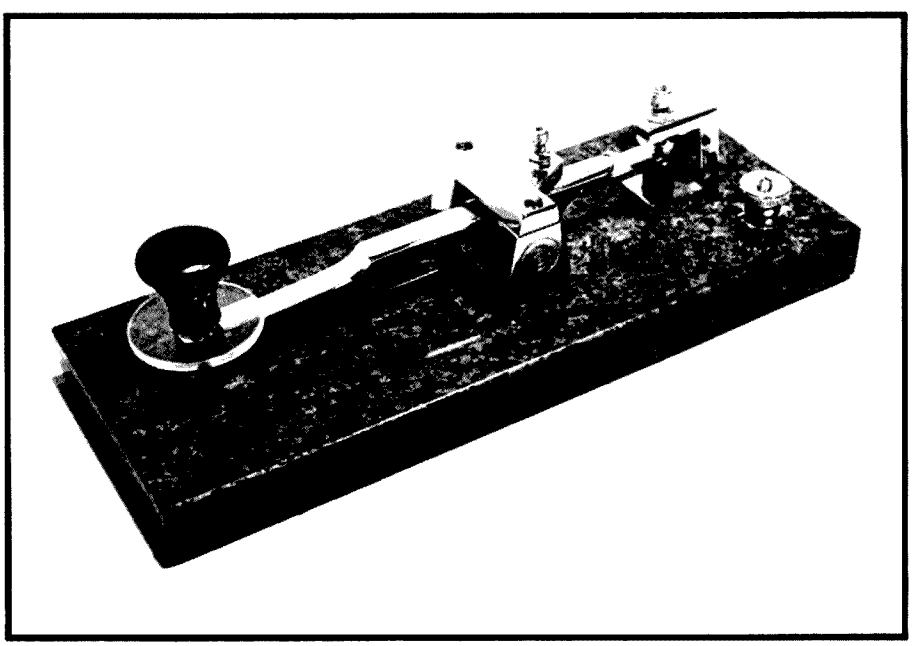
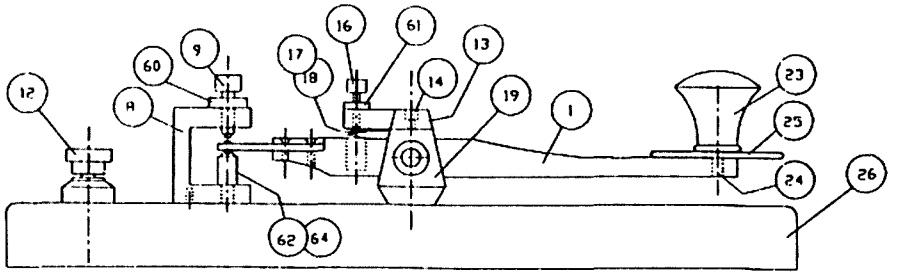
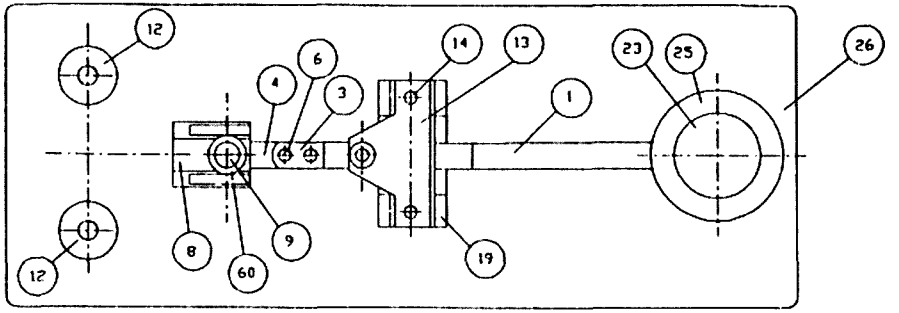
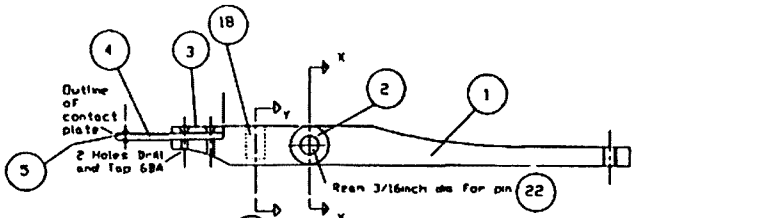
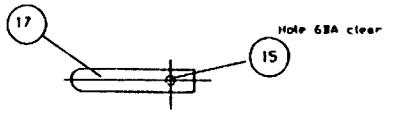




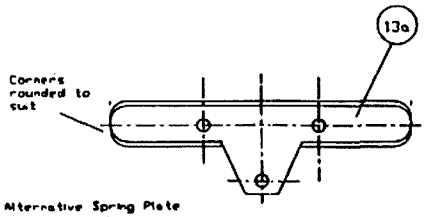




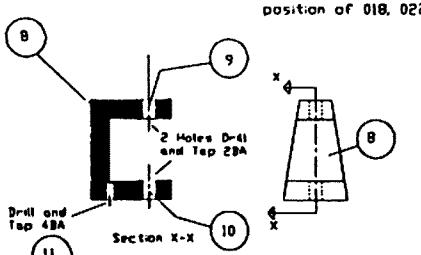
Arm't and Details of Arm Assembly
material : Brass
Quantity : 1
(items 001 to 007, + position of 018, 022)



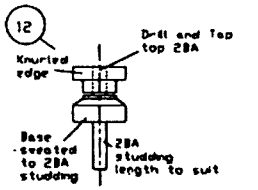
Detail of Leaf Spring
material Spring Steel
Quantity : 1
(items 015, 017)



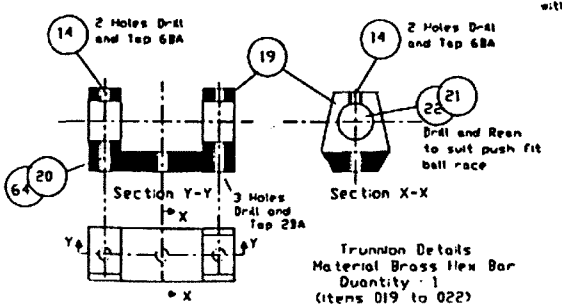
Alternative Spring Plate with McElroy Influence for carrying



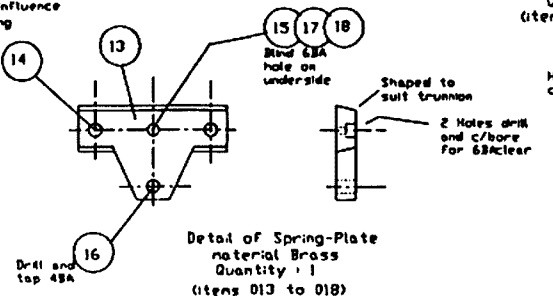
Contact Caliper
Material Brass
Quantity : 1
(items 008 to 011)



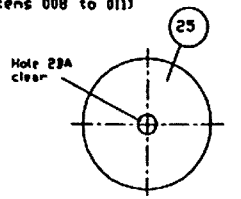
Terminal Posts
material Brass
Quantity : 2
(item 012)



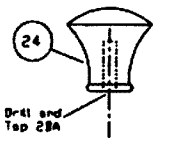
Trunnion Details
Material Brass Hex Bar
Quantity : 1
(items 019 to 022)



Detail of Spring-Plate
material Brass
Quantity : 1
(items 013 to 018)



Finger Plate
Material 25 thick Perspex
(item 025)



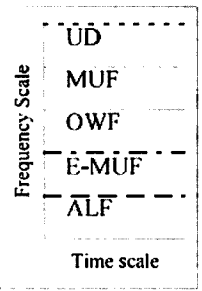
Turned Knob
25mm dia plastic
(item 024)

Golden Section Morse key – assembly details.

HF PREDICTIONS

Evan Jarman VK3ANI

T Index: 8



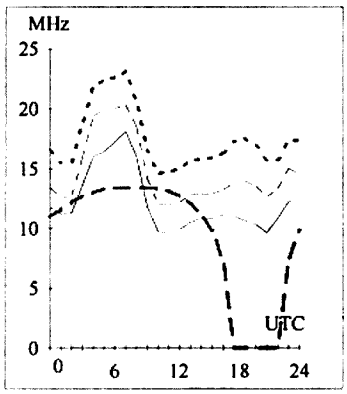
These graphs show the predicted diurnal variation in key frequencies for the nominated circuits. They also indicate a possibility of communication (percentage).

The frequencies identified in the legend are:-

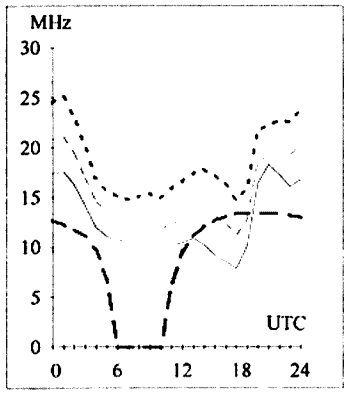
Upper Decile (10%)
Maximum Useable Frequency (50%)
E layer MUF
Optimum Working Frequency (90%)
Absorption Limiting Frequency

The predictions were made by one of the Ionospheric Prediction Service Stand Alone Prediction Systems. The T index used is shown above the legend. The Australian terminal azimuth (degrees), path length (kilometres) and propagation modes are also given for each circuit. ar

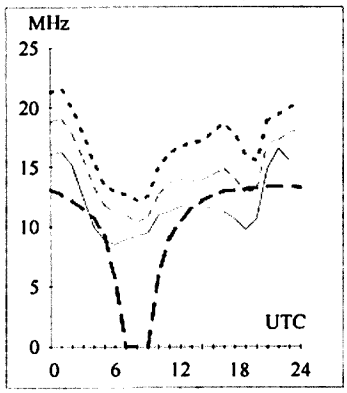
Adelaide-Oslo 294
First 0-5 Short 15632 km



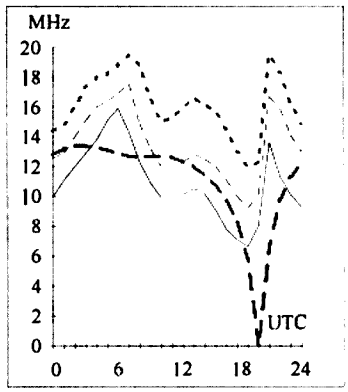
Brisbane-Atlanta 68
First 0-5 Short 14544 km



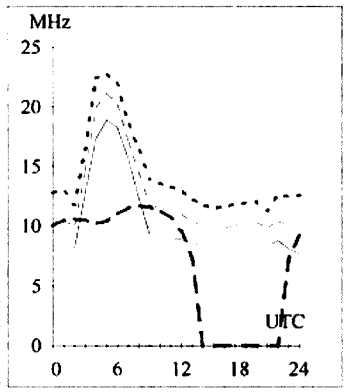
Adelaide-Ottawa 58
First 0-5 Short 16901 km



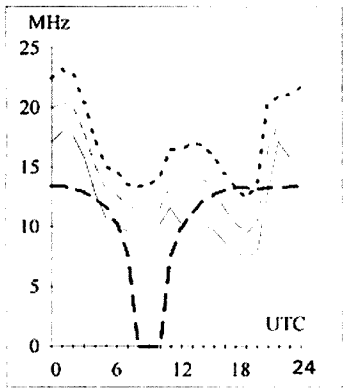
Brisbane-London 327
First 0-5 Short 16526 km



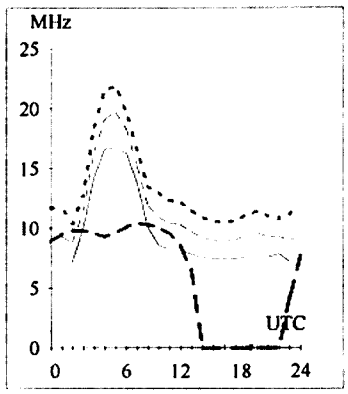
Canberra-Harare 239
Second 4F 3-4 4E 0 Short 11222 km



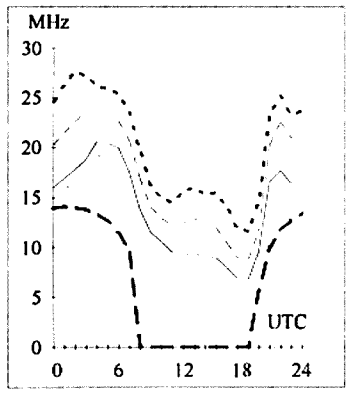
Darwin-Atlanta 50
First 0-5 Short 15737 km



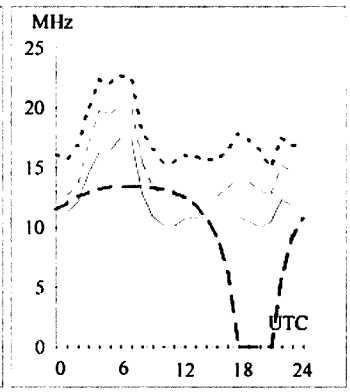
Adelaide-Pretoria 238
Second 4F 4-6 4E 0 Short 10065 km



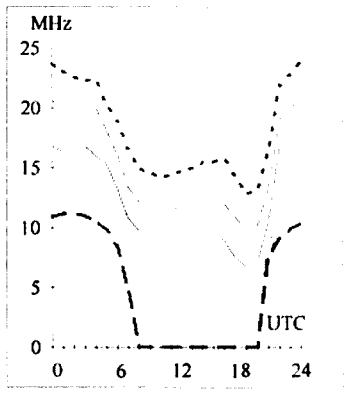
Brisbane-Tokyo 348
First 2F 0-3 2E 0 Short 7159 km



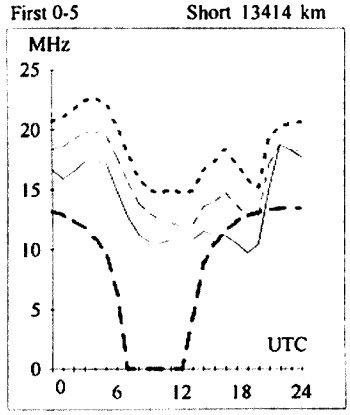
Canberra-Rome 295
First 0-5 Short 16217 km



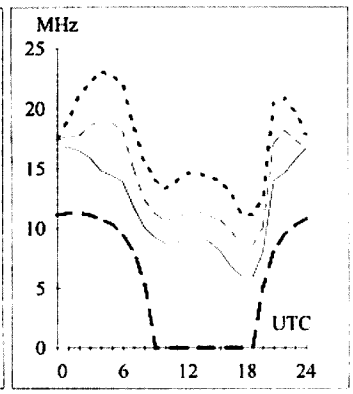
Darwin-Auckland 130
First 2F 4-6 2E 0 Short 5135 km



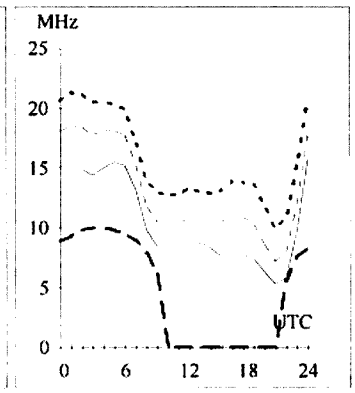
Adelaide-Seattle 51
First 0-5 Short 13414 km



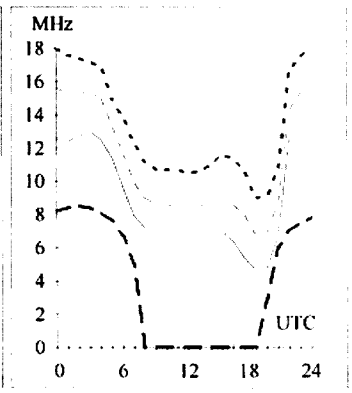
Brisbane-Tokyo 348
Second 3F 6-11 3E 0 Short 7159 km



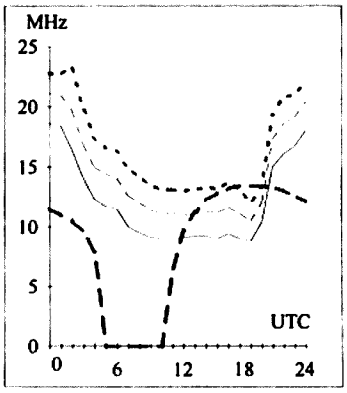
Canberra-Singapore 301
Second 3F 8-11 3E 0 Short 6211 km



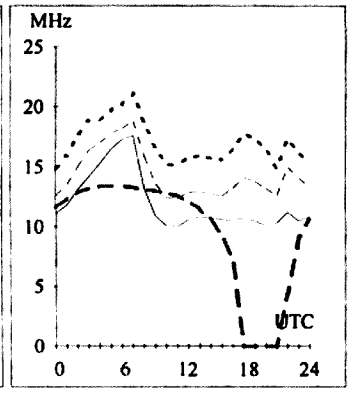
Darwin-Auckland 130
Second 3F11-14 3E2 Short 5135 km



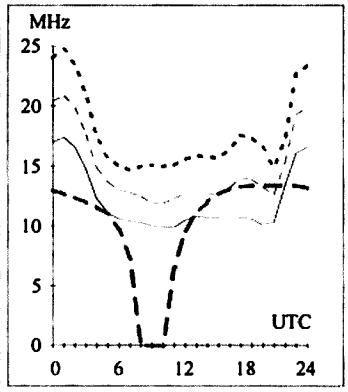
Hobart-Atlanta 85
First 0-5 Short 15461 km



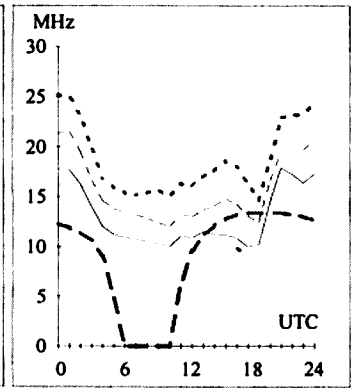
Melbourne-Berlin 310
First 0-5 Short 15973 km



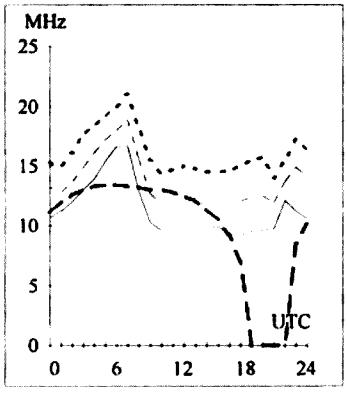
Perth-Atlanta 78
First 0-5 Short 18113 km



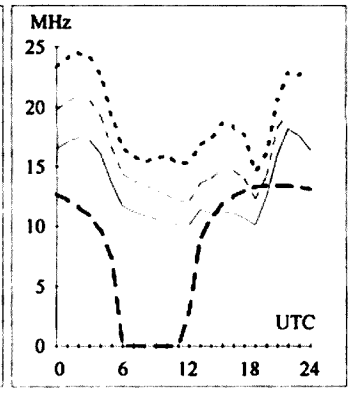
Sydney-Atlanta 74
First 0-5 Short 14946 km



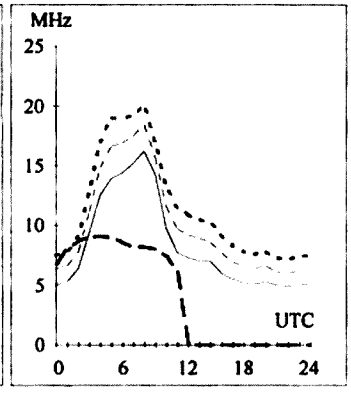
Hobart-London 303
First 0-5 Short 17404 km



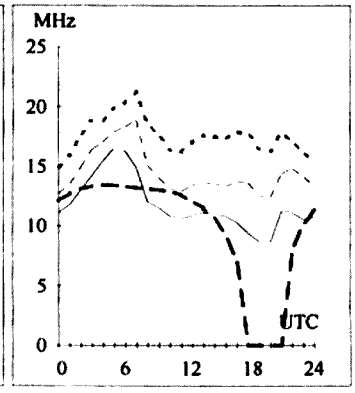
Melbourne-Denver 65
First 0-5 Short 14104 km



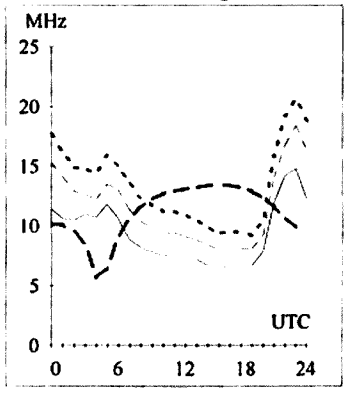
Perth-Marion Island 231
Second 3F 6-8 3E 0 Short 6679 km



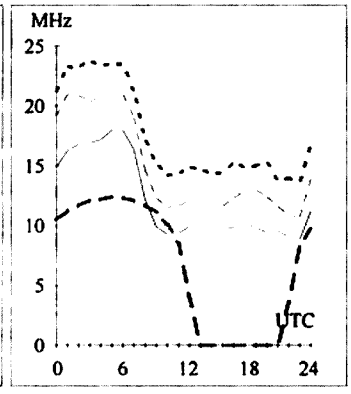
Sydney-Prague 311
First 0-5 Short 16075 km



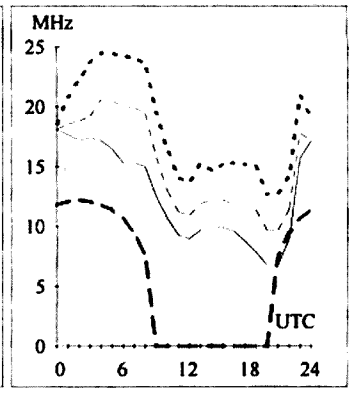
Hobart-London 123
First 0-5 Long 22620 km



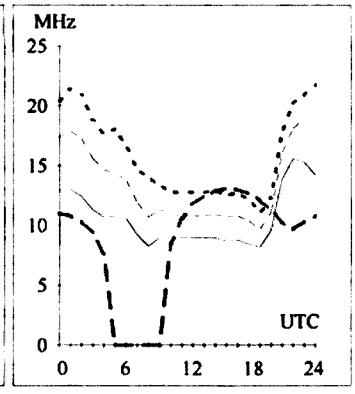
Melbourne-Lahore 306
Second 4F 4-8 4E 0 Short 10635 km



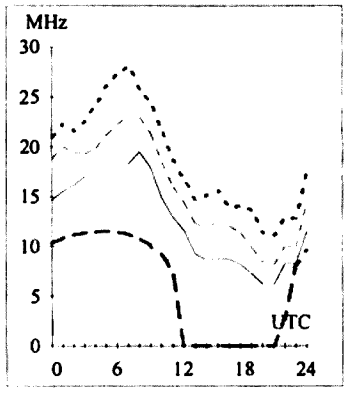
Perth-Tokyo 20
Second 3F 4-9 3E 0 Short 7923 km



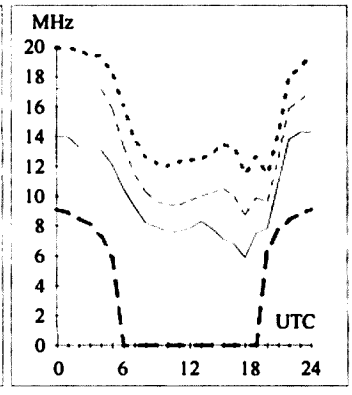
Sydney-Surinam 133
First 0-5 Short 15906 km



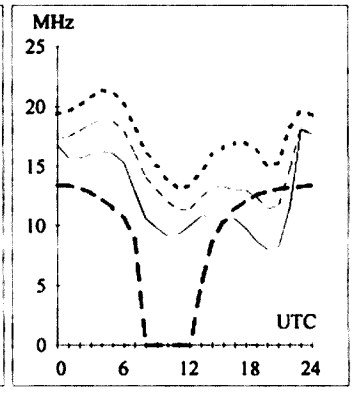
Darwin-New Delhi 309
Second 3F 5-12 3E 0 Short 7347 km



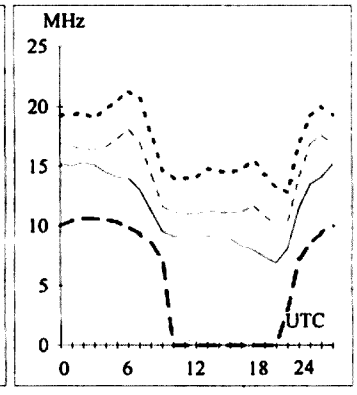
Melbourne-Suva 65
Second 2F 9-11 2E 0 Short 3913 km



Perth-Vancouver 50
First 0-5 Short 14824 km



Sydney-Vladivostock 346
Second 4F 7-12 4E 0 Short 8785 km



HAMADS

TRADE ADS

• **AMIDON FERROMAGNETIC CORES:** For all RF applications. Send business size SASE for data/price to RJ & US Imports, PO Box 431, Kiama NSW 2533 (no enquiries at office please ... 14 Boanyo Ave Kiama). Agencies at: Geoff Wood Electronics, Sydney: Webb Electronics, Albury: Assoc TV Service, Hobart: Truscotts Electronic World, Melbourne and Mildura: Alpha Tango Products, Perth: Haven Electronics, Nowra: and WIA Equipment Supplies, Adelaide.

• **WEATHER FAX programs** for IBM XT/ATs *** "RADFAX2" $35.00, is a high resolution shortwave weatherfax, Morse and RTTY receiving program. Suitable for CGA, EGA, VGA and Hercules cards (state which). Needs SSB HF radio and RADFAX decoder. *** "SATFAX" $45.00, is a NOAA, Meteor and GMS weather satellite picture receiving program. Needs EGA or VGA & WEATHER FAX PC card, + 137 MHz Receiver. *** "MAXISAT" $75-00 is similar to SATFAX but needs 2 MB of expanded memory (EMS 3.6 or 4.0) and 1024 x 768 SVGA card. All programs are on 5.25" or 3.5" disks (state which) plus documentation, add $3.00 postage. ONLY from M Delahuntly, 42 Villiers St, New Farm QLD 4005. Ph (07) 358 2785.

• **HAM LOG v.3.1** – Acclaimed internationally as the best IBM logging program. Review samples....AR: "Recommend it to anyone"; The Canadian Amateur: "Beyond this reviewer's ability to do it justice. I cannot find anything to improve on. A breakthrough of computer technology". ARA: "Brilliant". Simple to use with full help, the professional HAM LOG is immensely popular (now in its 5th year), with many useful, superb features. Just $59 (+ $5 P & P), with a 90 page manual. Special 5 hour Internet offer. Demos, brochures available. Robin Gandevia VK2VN (02) 369 2008 BH fax (02) 369 3069. Internet address rhg@ozemail.com.au.

• **Kantronics KPC-3 packet controllers**, new, some slightly used. $150 – $200. Ph Adrian (064) 525 555 (W). Smart Radio Systems P/L.

• For all radio amateurs. **The Electronic Data Book for Homebrewers and QRPers.** 1996. Editors Paul Harden NA5N and Richard High W0HEP. $25.00 (plus $4.00 P&P within Australia). VK5AKZ Secretary, CW Operators QRP Club, 41 Tobruk Ave, St Mary's SA 5042.

FOR SALE NSW

The ultimate big beam rotator, **prop pitch motor** in A1 condition, $350 ono; Complete set of **Hustler whip mobile ant** 3.5/7/14/21/28 MHz resonators, A1 condition, $300 ono. Art VK2AS (02) 416 7784.

Kenwood TS440S/AT xcvr A1 cond, $1,500 ono; Telex Hy-gain model **TH3JR-S** 10/15/20 m, one year old, $500. Peter VK2FFA phone (043) 24 4160 or fax (043) 23 2724.

Yaesu FT-901DM Tx/Rx comes complete with all cables, YD-148 base mike, manuals etc. Condition good, some mods carried out from CQ magazine. Asking $750 ono. Steve VK2SPS (02) 9999 2933 after 6.00 pm.

Collins S-Line Tx and Rx, includes manuals, spares, VOX, good condition; Two **Altos 3068 computers**, 4 Mb RAM, 300 Mb HDD each, system V Unix, all manuals. Adrian VK2ALF (064) 52 5555.

Icom IC-730 HF transceiver with mike, cables and manual, $625; **Yaesu FT-50** HF transceiver with FV-50B VFO cables, circuit, spare valves, $150 (brother to FT-200). Bob VK2CAN QTHR (02) 416 3727.

Fluke 207-3 VLF receiver – Comparator, $375; **Lavoie AN/URM81** 100 to 500 MHz frequency meter with transit case, $225; **Teac R-310** professional stereo r-r tapedeck, $450. All have documentation. I may haggle. Brian VK2GCE QTHR (02) 545 2650.

FOR SALE VIC

Tribander beam (USA built), $100; **Prop pitch rotator**, $85; Tubular welded cantilever **tower**, 50ft, with winch, free to be removed from site. Deceased estate Cohuna. Phone (054) 56 2989.

TE-23-M Min-beam Yagi antenna for 10, 15 & 20 metres and a **KR-400** rotator. Seen working if required. Instruction manuals for both, will not split, $500. A good buy. H. Lonsdale VK3DND QTHR.

Radio Amateur World Callbook on CD-Rom, all US and Int'l calls, $35. Damien VK3CD (054) 27 3121.

FOR SALE QLD

Icom IC-701 100 w 160 m to 10 m rig in good condition, manual, plus circuit supplied, also included is a 20 A power supply, $780 the lot. Licensed amateurs only. Chris VK4DCB (07) 5543 6053.

Yaesu FT-101ZD with manual mike boxes gc, $450; **RCA 833A** unused with connectors, $100; Offers for 2000+, mainly unboxed, **octal, miniature valves,** audio, receiving. Catalogue 85 c stamp. Hadgraft, 17 Paxton St, Holland Park Qld 4121 (07) 3397 3751 AH.

Deceased Estate VK4ADZ. HF transceiver; **Kenwood TS520S**, matching **Kenwood ATU**, microphone and 4 new spare finals. All in excellent, like new condition with manuals, $400 or ono. Keith VK4APQ (071) 52 7482.

Brains & Brawn! **Yaesu FT-767 & FL-7000.** All options fitted. **SP-767** phone patch speaker, FIF232 I/face, service manuals, vgc, $4995. Eddie VK4EET QTHR (07) 3801 3200 voice/fax. callsave@gil.com.au Internet.

HF SSB t'cvr, **PCM SSB102**, up to 10 channels, 100 W pep, $75; **Antenna mount** heavy duty mobile type with spring, $45 or base only $30. Eric VK4NEF QTHR (07) 3395 5327.

FOR SALE WA

Icom IC-720A HF transceiver, gen coverage, with AM and CF filter, manual s/n 10851, $650; **Yaesu YS-2000** peak reading wattmeter SWR, for 200, 1000, 2000 watts, 1.8-60MHz, solid metal box, to be connected to power outlet, s/n OE030990 gc, $130; Morse tutor **Datong model** D70, $150 ono. Emanuel VK6NEB (09) 276 2207.

FOR SALE TAS

Kenwood TS-850SAT t/ceiver, **SP31** ext speaker, near new; **Icom FL102** AM filter suit IC760, IC761, IC765, IC575; **Kenwood YK885-1** 2.4 kHz filter for TS450, 690, 850, 950. Above new condition. Will accept offers. Allen VK7KAN (003) 27 1171.

WANTED NSW

Mecograph or the **McDonald Pendograph** or any unusual Australia keys or jiggers. Pay top dollar for any of the above. Steve VK2SPS (02) 9999 2933 after 6.00 pm.

WANTED VIC

2C39 Tx tubes. Also **811A. Command Tx** any freq but unmod. **Bowden cables** for Command RX and mounting rack. VK3IZ, 22 Hugh St, Metung Vic. (051) 56 2053.

WANTED QLD

Any condition **Geloso AM transmitter**, will pay top money. Ray VK4RH (07) 3299 3819.

Heathkit 6 m amplifier, Heathkit **2 m all-mode transceiver**, Heathkit **SB200** amplifier, Heathkit **VHF SWR-power meter**, Heathkit **HF SWR-power meter**, Heathkit rotary **coax switch**, Heathkit **HW16, HW101, DX40, DX60** transmitter/transceiver for operational Heathkit Museum. Contact "Doc" VK4CMY PO Box 24, Dalveen Qld 4374 or phone (076) 85 2167 before 8pm please. Vietnam Veterans Wireless Group.

WANTED SA

Still looking for **Gonset GSB-100 Tx h/book and/or circuit**. Copies OK, please check your files. Also wanted **Bowden cables** for Bendix MN-26C receiver, Eddystone 888 receiver. A Gluis VK5AAQ QTHR (08) 322 1010 AH.

Copies of manuals for Uniden 20/20 and Kenwood TS-820 transceivers. Also wanted **PTT Dynamic mic 50 k for Yaesu FT200**. Geoff VK5NDX QTHR (08) 296 7496.

WANTED WA

Technical information diagrams or charts for **Royce 40 chan UHF mobile CB radio model AUS-100**. Ron VK6FD QTHR (09) 362 1170.

MISCELLANEOUS

• THE WIA QSL Collection (now Federal) requires **QSLs**. All types welcome especially rare DX pictorial cards special issue. Please contact Hon. Curator Ken Matchett VK3TL, 4 Sunrise Hill Road, Montrose Vic 3765, Tel (03) 728 5350.

ar

Editor's Comment

Continued from page 2

World War II jeep. Harry is the only Queensland veteran of the 1915 Gallipoli campaign and there are only about three survivors left in the other States. Oddly enough, it was Harry's first ANZAC Day march; and he doesn't look a day older than when he appeared on our front cover for his 100th birthday in December 1991.

At that time we inquired whether Harry could be the oldest licensed amateur in the world, and no one seemed disposed to contest it. Subsequently, an amateur centenarian "signed-off" (in Vermont, I think) who would have been Harry's only competition for the title of "World's Oldest Amateur". See you in the next ANZAC Day march, Harry? Maybe with a hand-held? Thanks to Fred Lubach VK4RF for sending in the Courier-Mail picture.

Since amateurs only form one thousandth of the population in general, these three examples of newsworthy people are probably well ahead of statistical expectations. 73 to you all!

Bill Rice VK3ABP
Editor
ar

WIA MORSE PRACTICE TRANSMISSIONS

VK2BWI	Nightly at 2000 local on 3550 kHz
VK2RCW	Continuous on 3699 kHz and 144.950 MHz 5 wpm, 8 wpm, 12 wpm
VK3COD	Nightly (weekdays) at 1030 UTC on 28.340 MHz and 147.425 MHz
VK3RCW	Continuous on 144.975 MHz, 5 wpm, 10 wpm
VK4WIT	Monday at 0930 UTC on 3535 kHz
VK4WCH	Wednesday at 1000 UTC on 3535 kHz
VK4AV	Thursday at 0930 UTC on 3535 kHz
VK4WIS	Sunday at 0930 UTC on 3535 kHz
VK5AWI	Nightly at 2030 local on 3550 kHz
VK5RCW	Continuous on 144.975 MHz, 5 wpm to 12 wpm
VK6RCW	Continuous on 147.375 MHz, 4 wpm to 11 wpm
VK6WIA	Nightly at 1930 local on 146.700 MHz and nightly (except Saturday) at 1200 UTC on 3.555 MHz

Hamads

Please Note: If you are advertising items For Sale and Wanted please use a separate form for each. Include all details: eg Name, Address, Telephone Number (and STD code), on both form. Please print copy for your Hamad as clearly as possible.
* Eight lines per issue free to all WIA members, ninth line for name and address Commercial rates apply for non-members. Please enclose a mailing label from this magazine with your Hamad.
* Deceased Estates: The full Hamad will appear in AR, even if the ad is not fully radio equipment.
* Copy typed or in block letters to PO Box 2175, Caulfield Junction, Vic 3161, by the deadlines as indicated on page 1 of each issue.
* QTHR means address is correct as set out in the WIA current Call Book.
* WIA policy recommends that Hamads include the serial numb,er of all equipment offered for sale.
* Please enclose a self addressed stamped envelope if an acknowledgement is required that the Hamad has been received.

Ordinary Hamads submitted from members who are deemed to be in 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: $25.00 for four lines, plus $2.25 per line (or part thereof) Minimum charge – $25.00 pre-payable.

State: .....

Not for publication: ❑ Miscellaneous ❑ For Sale ❑ Wanted

Name: ..... Call Sign: ..... Address: .....

WIA Divisions

The WIA consists of seven autonomous State Divisions. Each member of the WIA is a member of a Division, usually in their residential State or Territory, and each Division looks after amateur radio affairs within its area.

	Division Address	Officers			Weekly News Broadcasts		1996 Fees
VK1	ACT Division GPO Box 600 Canberra ACT 2601	President Secretary Treasurer	Philip Rayner John Woolner Bernie Copier	VK1PJ VK1ZAO VK1KOX	3.570 MHz LSB, 146.900 MHz FM each Sunday evening commencing at 8.00 pm local time. The broadcast text is available on packet, on internet aus.radio.amateur.misc newsgroup, and on the VK1 Home Page http://email.nla.gov.au/~cmakin/wiaact.html	(F) (G) (S) (X)	$70.00 $56.00 $42.00
VK2	NSW Division 109 Wigram St Parramatta NSW (PO Box 1066 Parramatta 2124 Phone (02) 689 2417 Freecall 1800 817 644 Fax (02) 633 1525	President Secretary Treasurer (Office hours Web:http://sydney.dialix.ozau/~wiansw e-mail address: wiansw@sydney.dialix.oz.au	Michael Corbin Eric Fossey Eric Van De Wayer Mon-Sat 11.00-14.00 Mon 1900-2100)	VK2YC VK2EFY VK2KUR	From VK2WI 1.845, 3.595, 7.146*, 10.125, 24.950, 28.320, 29.120, 52.120, 52.525, 144.150, 147.000, 438.525, 1281.750 (* morning only) with relays to some of 14.160, 18.120, 21.170, 584.750 ATV sound. Many country regions relay on 2 m or 70 cm repeaters. Sunday 1000 and 1930. Highlights included in VK2AWX Newcastle news, Monday 1930 on 3.593 plus 10 m, 2 m, 70 cm, 23 cm. The broadcast text is available on the Internet newsgroup *aus.radio.amateur.misc*, and on packet radio.	(F) (G) (S) (X)	$88.75 $53.40 $38.76
VK3	Victorian Division 40G Victory Boulevard Ashburton Vic 3147 Phone (03) 9885 9261 Fax (03) 9885 9298	President Secretary Treasurer (Office hours	Jim Linton Barry Wilton Rob Hailey Tue & Thur 0830-1530)	VK3PC VK3XV VK3NC	VK3BWI broadcasts on the 1st and 3rd Sunday of the month, starts 10.30 am. Primary frequencies 1.840 AM, 3.615 LSB, 7.085 LSB, and FM(R)s 146.700 Mt Dandenong, 147.250 Mt Macedon, 147.225 Mt Baw Baw, and 2 m FM(R)s VK3RMA, VK3RSH and VK3ROW. 70 cm FM(R)s VK3ROU and VK3RGL. Major news under call VK3WI on Victorian packet BBS.	(F) (G) (S) (X)	$72.00 $58.00 $44.00
VK4	Queensland Division GPO Box 638 Brisbane OLD 4001 Phone (074) 96 4714	President Secretary Treasurer	Geoff Sanders John Stevens John Presotto	VK4KEL VK4AFS VK4WX	1.825 MHz SSB, 3.605 MHz SSB, 7.118 MHz SSB, 14.342 MHz SSB, 28.400 MHz SSB, 29.220 MHz FM, 52.525 MHz FM, 146.700 MHz FM, 147.000 MHz FM, 438.525 MHz (Brisbane only), regional VHF/UHF repeaters at 0900 hrs Sunday. Repeated on 3.605 MHz SSB & 147.000 MHz FM, regional VHF/UHF repeaters at 1930 hrs EAST Monday. Broadcast news in text form on packet under WIAQ@VKNET.	(F) (G) (S) (X)	$72.00 $58.00 $44.00
VK5	South Australian Division 34 West Thebarton Rd Thebarton SA 5031 (GPO Box 1234 Adelaide SA 5001) Phone (08) 352 3428	President Secretary Treasurer	Garry Herden Maurie Hooper Charles McEachern	VK5ZK VK5EA VK5KDK	1827 kHz AM, 3.550 MHz LSB, 7.095 AM, 14.175 USB, 28.470 USB, 53.100 FM, 147.000 FM Adelaide, 146.700 FM Mid North, 146.800 FM Mildura, 146.825 FM Barossa Valley, 146.900 FM South East, 146.925 FM Central North, 147.825 FM Gawler, 438.425 FM Barossa Valley, 438.475 FM Adelaide North, ATV Ch 35 579.250 Adelaide. (NT) 3.555 USB, 7.065 USB, 10.125 USB, 146.700 FM, 0900 hrs Sunday	(F) (G) (S) (X)	$72.00 $58.00 $44.00
VK6	West Australian Division PO Box 10 West Perth WA 6872 Phone (09) 351 8873	President Secretary Treasurer	Cliff Bastin Mark Bastin Bruce Hedland-Thomas	VK6LZ VK6OO	146.700 FM(R) Perth, at 0930 hrs Sunday, relayed on 1.825, 3.560, 7.075, 14.116, 14.175, 21.185, 29.680 FM, 50.150 and 438.525 MHz. Country relays 3.582, 147.350(R) Busselton and 146.900(R) Mt William (Bunbury). Broadcast repeated on 146.700 at 1900 hrs Sunday, relayed on 1.865, 3.563 and 438.525 MHz; country relays on 146.350 and 146.900 MHz.	(F) (G) (S) (X)	$60.75 $48.60 $32.75
VK7	Tasmanian Division 5 Helen Street Newstead TAS 7250 Phone (003) 44 2324	President Secretary Treasurer	Andrew Dixon Robin Harwood Terry Ives	VK7GL VK7RH VK7ZTI	146.700 MHz FM (VK7RHT) at 0930 hrs Sunday relayed on 147.000 (VK7RAA), 146.725 (VK7RNE), 146.625 (VK7RMD), 3.570, 7.090, 14.130, 52.100, 144.150 (Hobart) Repeated Tues 3.590 at 1930 hrs.	(F) (G) (S) (X)	$72.00 $58.00 $44.00
VK8	(Northern Territory is part of the VK5 Division and relays broadcasts from VK5 as shown received on 14 or 28 MHz).						

Note: All times are local. All frequencies MHz.

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Amateur Radio

August 1996
Volume 64 No 8

Journal of the Wireless Institute of Australia

Full of the latest amateur radio news, information and technical articles including...

- Ron Fisher VK3OM's in-depth review of the all-new Yaesu FT-1000MP all mode HF transceiver
- VHF guru Emil Pocock W3EP's explanation of long-distance VHF ducting opportunities from Australia
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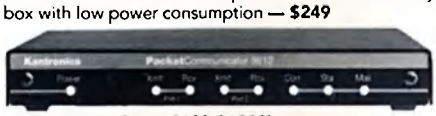

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Amateur Radio

Journal of the Wireless Institute of Australia

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CONTENTS

Cover

The exciting new HF transceiver from Yaesu, the FT-1000MP. A full equipment review commences on page 7 of this issue.

BACK ISSUES

Available, only until stocks are exhausted, at $4.00 each (including postage within Australia) to members.

PHOTOSTAT COPIES

When back issues are no longer available, photocopies of articles are available to members at $2.50 each (plus $2.00 for each additional issue in which the article appears).

The opinions expressed in this publication do not necessarily reflect the official view of the WIA, and the WIA cannot be held responsible for incorrect information published.

Amateur Radio Service

A radiocommunication service for the purpose of self-training,intercommunication and technical investigation carried out by amateurs, that is, by duly authorised persons interested in radio technique solely with a personal aim and without pecuniary interest.

Wireless Institute of Australia

The world's first and oldest National Radio Society
Founded 1910

Representing the Australian Amateur Radio Service - Member of the International Amateur Radio Union
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Editor's Comment

On Safari Again

Regular readers of this little blurb, usually on page 2, will remember that your Editor and his XYL Margaret usually seem to set off somewhere north and warmer at about this time of year. The incentive is even stronger this winter; the Melbourne forecast as I write on 23 June is for four days of showers and maximum temperatures of about 14 degrees!

We also have another incentive. If you read my editorial for last November (Springs and Timing) you will remember that we set out to enjoy the warm artesian waters of Dalhousie Springs in far north VK5, and didn't make it! Our caravan broke a spring. This time, hopefully, we'll get there. But, beforehand, we propose to follow Burke and Wills via Tibooburra to the Cooper. Then to Innamincka, down the Strzelecki and up to Oodnadatta.

By the time this appears in print, we will be back home, but the August deadline is 8 July, on which day we might be somewhere near Marree. I hope to have heard from some of you on the Travellers' Net during the journey and maybe met a few of you here and there. We may even have a story worth writing by then!

Bill Rice VK3ABP
Editor

CONTRIBUTIONS TO *AMATEUR RADIO*

Amateur Radio is a forum for WIA members' amateur radio technical experiments, experiences, opinions and news. Manuscripts with drawings and/or photos are always welcome and will be considered for possible publication. Articles on computer disk are especially welcome. The WIA cannot assume responsibility for loss or damage to any material. *"How to Write for Amateur Radio"* was published in the August 1992 issue of *Amateur Radio*. A photocopy is available on receipt of a stamped, self addressed envelope.

■ WIA News

Roger Harrison VK2ZRH, Federal Media Liaison Officer

Minister Agrees to Meet With WIA About Licensing Submission

The Minister for Communications and the Arts, Senator Richard Alston, has agreed to meet with the WIA to discuss the Institute's submission on amateur radio licensing.

In March, the WIA Federal President, Neil Penfold VK6NE, wrote to the new Minister for Communications and the Arts, Senator Richard Alston, seeking a meeting at the earliest available opportunity, to establish a relationship, to determine the Government's position and to outline the main thrust of the submission and how the Amateur Radio Service in Australia would be better licensed at lower cost to the Government.

He reminded the Minister that a copy of the exposure draft had been sent to him in February and that last year Senator Alston wrote to the then-WIA Vice President, Roger Harrison VK2ZRH, and had issued a press release supporting objections to the proposed licence fees increase and acknowledging that radio amateurs were of value to the community.

In his letter to the minister, Neil Penfold concluded with: *"Once the consultative process within the amateur radio community concludes and our final submission is completed, we will be seeking a further meeting to present it, later in the year."*

The Minister replied, in a letter dated 18 June, agreeing to a meeting later in the year. Senator Alston said: *"In the circumstances, and given my other commitments at this time, it would be preferable to meet later in the year when the consultative process within the amateur radio community has concluded and the WIA submission is finalised."*

The Minister concluded with: *"I look forward to receiving the submission."*

Neither the Minister, nor his advisers, have set for the WIA a prescription for the form or the length of the submission on amateur radio licensing.

Collation and consideration of comment received by the WIA is presently being carried out, with drafting of the final submission for consideration by the Divisions and Federal Council to be completed by October when the WIA Federal Council next meets. The WIA has obtained copies of a variety of submissions to different Ministers, parliamentary committees and inquiries presented by a number of lobby groups and representative associations over the past few years, including submissions made as recently as June. These are additional to examples previously held by the WIA or obtained last year and used in the course of developing the Exposure Draft on amateur licensing.

It is intended to present the WIA's completed submission on amateur licensing to Senator Alston in November.

Winner Drawn for the 1995-96 Membership Campaign

The prize winner in the WIA's 1995-96 Membership Recruitment and Retention Campaign was drawn on Tuesday, 2 July, by the managing director of the prize sponsor, Icom Australia, Mr Kiyoshi Fukushima VK3BZX.

The lucky winner of the Icom IC-706 transceiver is George Bromley VK1KGJ, a member of the ACT Division of the WIA. George is 74 years of age, has been a member of the Institute since 1979, and his only HF rig is an ageing "classic" transceiver, which "no longer works as well as it once did," he said.

The prize-drawing ceremony was held at a meeting of the Moorabbin and District Radio Club in Victoria, before an audience of some 50 members. The Icom IC-706 rig was presented to George VK1KGJ at the ACT Division meeting in late July.

The WIA congratulates Mr Bromley and extends grateful thanks to Icom Australia for their support for the 1995-96 Membership Campaign in donating the Icom IC-706 transceiver.

Tariffs: President Calls for Letter Campaign to Pariiamentarians

With the passage of new Customs legislation in late June which applies a duty of 3% to consumer and other goods, imported amateur radio equipment which was previously exempt will cost more from 15 July.

The WIA Federal President, Neil Penfold VK6NE, has written on behalf of the Institute to the Minister responsible for Customs, Geoff Prosser, and the Shadow Minister, Senator Chris Schacht, protesting the imposition of this new duty and has called on WIA members and other amateurs to write to parliamentarians and protest about it also.

The original Tariff Concession Orders (TCOs) applying to amateur radio equipment were arranged in conjunction with the WIA and have been operating since at least 1988. The WIA provides a service to importers to certify that equipment intended for import under the TCOs meets the necessary Customs requirements.

From information obtained by the WIA, applicable TCOs include TC 8609802, for transmitters and transceivers covering the 1.8 MHz through 1260 MHz bands, TC 9510289, for transmitters or transceivers covering the 1.8 MHz through 2400 MHz bands, TC 8533720 for RF linear power amplifiers, and TC 8534864, for RF preamplifiers.

The WIA Federal President, Neil Penfold VK6NE, wrote in May to the Minister for Industry, Science and Tourism, John Moore, who earlier announced the foreshadowed changes to tariff legislation. The President sought clarification of the position regarding amateur radio equipment and the announced tariff concession changes, and argued that the duty concession on amateur radio equipment was of considerable value to the amateur radio community while revenue foregone in maintaining the duty-free TCOs was comparatively small.

The Institute had received no reply by the second week in July.

In his two-page letter, the President outlined the ways in which radio amateurs contribute to the community, arguing that: *"Radio amateurs are . . . of definite value to the Australian community and the re-application of tariffs to imported amateur radio transmitting equipment would strike at the amenity of Australia's radio amateurs and their value to the community, and would represent a tax on knowledge gained through self-education.*

The amateur's common interest with all other amateurs in the world is . . . interest in the radio art, and by . . . intercommunication, knowledge is exchanged and expanded. The knowledge and the experience of communications, and the existence of the equipment that the amateur uses, provide a valuable resource that in many countries cannot be found in any other service."

WIA President Neil Penfold, in calling for amateurs to write letters of

TARIFFS: PROTEST TO PARLIAMENTARIANS

Write to your local member, the Minister, Shadow Minister and your state's senators, protesting the imposition of the new 3% duty on imported amateur equipment. Be forceful, but *be polite*. You might include some or all of the following points in your letter, in any order you wish, or in support of the points you personally choose to make.

- Commercially manufactured amateur radio transmitting equipment has been imported into Australia under tariff concession orders for many years. Prescribed equipment is not manufactured here so there is no local industry to protect. Other countries have similar tariff conditions.
- Amateur radio is formally recognised by the International Telecommunications service, pursued by people who have an interest in communications solely as a personal aim and without pecuniary interest. Self-education in communications techniques and technology is fundamental to amateur radio, providing a basic education in communications for many who would not otherwise acquire that knowledge.
- The basic desire to study radio communications techniques with the opportunity for practical applications leads to: (i) the acquisition of experience and skill in communications techniques and operating; (ii) interchange of information with others having similar interests; (iii) furtherance of the unique ability of the radio amateur to promote international goodwill; (iv) contribution to scientific research by participation in programs organised on a national or international basis, and (v) participation in communications systems including emergency communications by both training and assistance when required.
- The most important features of the Amateur Service are:

(1) it makes unique provision for advancing an individual's skills in both the technical and operating phases of the art, thus helping to provide a reservoir in the community of trained operators, technicians and electronics experts. It also provides an avenue for further investigation for those already in these fields;

(2) it has a unique ability to enhance international goodwill;

(3) it is a voluntary, non-commercial service.

Write to:

The Minister for Small Business and Consumer Affairs and Minister Responsible for Customs
The Hon. Geoff Prosser MP
23 Spencer St
BUNBURY WA 6230

The Shadow Minister for Small Business, and Consumer Affairs and Customs
Senator Chris Schacht
Shop 2,
59 Main North Rd
MEDINDIE GARDENS SA 5081

The address of your local member and state's senators can be obtained from any office of the Australian Electoral Commission in your state.

protest to parliamentarians, suggests writing to not only your local member, but also to the Minister responsible for Customs, Geoff Prosser, the Shadow Minister, Senator Chris Schacht, the leader of the Democrats, Senator Cheryl Kernot, and your state's senators. The accompanying panel provides points you can include in your letter, where to find the address of your local member and state's senators, and where to write to the Minister and Shadow Minister.

This matter is important because amendments to the legislation passed by the Parliament on 28 June give the Minister discretionary powers which he may use to continue duty exemption for amateur radio equipment. Parliament is in recess until 20 August. The opposition and minor parties in the Senate were reported to have all described the new 3% tariff, as a tax by stealth by the government, and that it broke an election promise of no new taxes.

The WIA views the imposition of this new tax, coming on top of last year's rise in amateur licence fees, as another unwarranted burden on a service which is of value to the community.

AX Prefix for the Year 2000

The "Sydney 2000 Olympics" special call sign, AX2OOO (Oh-Oh-Oh, not triple-zero), which has been granted to the Westlakes Amateur Radio Club in NSW, will now be able to be used from six months before the Olympics opening ceremony to one month after the closing ceremony, following successful negotiations between the WIA and the SMA in late June.

The SMA had previously told Westlakes that it could only be used for one month before and after the games.

In addition, the SMA Liaison Team negotiated permission for all Australian amateurs to use the AX prefix for the same period; that is, from six months before the games' opening ceremony, to one month after the closing ceremony.

Multi-year Licence Fees

A *WIA News* item circulated in May and published in the June issue of *Amateur Radio* magazine on fees for multi-year licences, was incorrect in that payment by instalment is not available to amateur licensees.

Multi-year amateur licence fees can only be paid up-front. Commercial and public sector licensees holding apparatus licences are able to pay multi-year licence fees by instalment.

At a meeting between the WIA and the SMA held in Canberra on Friday, 28 June, the WIA raised the matter as a number of members had found they could not make instalment payments. The SMA explained the arrangements implemented for multi-year licence payments for amateur licensees.

Amateurs can now pay their licence fees up to five years in advance, for which a discount of $11 per year for each additional year over and above the first year, is available. That is, to pay two years in advance, the fee is $91, a saving of $11 on twice the present yearly fee of $51. For three years, the fee is $131, a saving of $22; for four years, the fee is $171, a saving of $33, while for five years, the fee is $211, a saving of $44.

When the SMA next sends an "Offer to Renew" your licence, if you want to take advantage of the savings offered by a multi-year licence, notify your local SMA office.

Success for Region 3 Direction Finding Championships

Teams from 11 countries, including Australia, fielded a total of almost 60 competitors in the Second Region 3 Amateur Radio Direction Finding (ARDF) Championships, held in Townsville over 15-20 July.

ARDF is growing in importance around the world, particularly in the Asia-Pacific region. Australia won the privilege of hosting the Second Region 3 ARDF Championships at the International Amateur Radio Union (IARU) Region 3 Conference held in Singapore in September 1994. Last month's event was organised by the WIA's ARDF Coordinator, Wally Watkins VK4DO, and hosted by the Townsville Amateur Radio Club. A special event call sign, VI4RDF, was issued by the SMA for the occasion. The Championships were opened by the local member for the electorate of Herbert in North Queensland, Peter Lindsay VK4TO.

ARDF is like an amalgam of cross-country orienteering and amateur radio fox hunting. A number of transmitters are placed at intervals along a course. They turn on and off in a timed sequence. Bands used are 80 m and 2 m. Contestants compete in small teams. They travel on foot and have to find the transmitters and complete the course in a given time. ARDF is an activity for young and old alike. Only simple, handheld equipment is used by competitors. In Townsville, competitors participated in four team "grades" – seniors, juniors, women and old timers. Competitors were accommodated at the James Cook University in Townsville.

Competitors for this year's ARDF Championships came from as far away as Bulgaria, Khazakstan and the USA. The Japanese Amateur Radio League (JARL) sent 26 competitors, the greatest number from any of the amateur societies sponsoring competitors to the Championships. The American Radio Relay League (ARRL) sponsored one, as did the Bulgarian Federation of Radio Amateurs (BRFA), and the Polish

national amateur club (PZK). The Chinese Radio Sports Association (CRSA) sponsored ten people, while the Korean Amateur Radio League (KARL) sponsored 16. The New Zealand Amateur Radio Transmitters (NZART) sponsored 11, while the Khazakstan Amateur Radio Club (KARC) sponsored four. Thirteen attended from the WIA, including President, Neil Penfold, VK6NE, and South Australian Division Federal Councillor, Grant Willis VK5ZWI.

The Secretary of the Radio Amateur Society of Thailand (RAST), Thida HS1ASC, attended as an observer, as did Sangat 9M2SS from the Malaysian Amateur Radio Transmitters Society (MARTS), who is also a Director of the IARU Region 3 Association.

The new Secretary General of the CRSA, Chen Ping BA1HAM, who is also Chairman of the IARU Region 3 ARDF Committee, attended as the guest of the Townsville Amateur Radio Club.

Chen Ping organised the 1st Region 3 ARDF Championships which were held in China in 1993. Interviewed by *WIA News* when he arrived in Sydney on his flight from China, Chen revealed that he had first become involved in ARDF as a university student in Beijing, organising inter-university team competitions during 1963-64. Previously employed as a computer engineer with a petroleum company, since 1991 Chen has worked for the Chinese sports ministry administration in Beijing as a dedicated promoter of amateur radio which is seen as important to the country's development.

Before 1992, only club stations were permitted in China. Chen said, *"In 1992 we pursued the government to lift the ban on home stations. There was, and is, still some conservatism in China. The thought was that amateur radio home stations were somehow connected with spying."*

"We pushed some leaders," he said. *"There have been many changes at the political level in China, and many technical people have come to power. When proposals to allow home stations for radio amateurs were put, these people said 'why not?'*

In 1992, there was a big meeting with the sports ministry and the radio regulatory commission of China, and the result was that after 1992, China began to have home stations."

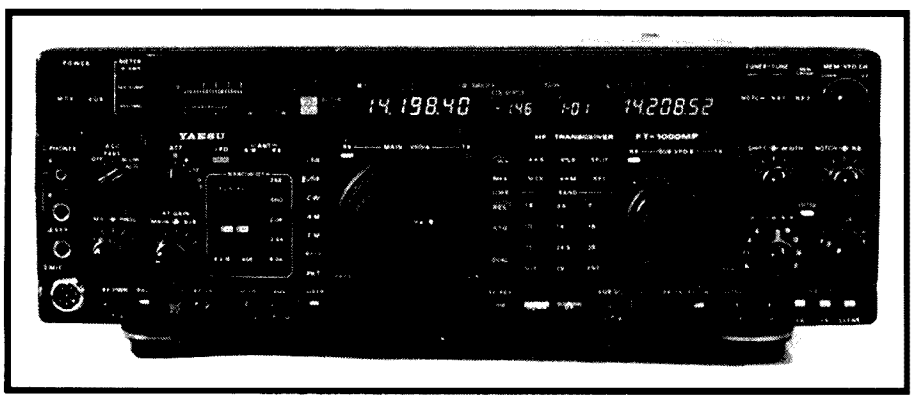
Chen said there were now around 1000 home stations in China and the Chinese Radio Sports Association has some 6000 members. *"China is so large, it is hard to establish training classes and get clubs started."* However, he said there were now more than 100 club stations established. Amateur radio is particularly promoted in schools in China, using ARDF as an activity, he revealed.

Chen Ping arrived in Australia on the morning of 9 July and headed straight for North Queensland to meet up with ARDF Championships organiser, Wally Watkins VK4DO. The Townsville Amateur Radio Club is "sister club" with the Jiangsu Radio Sports Association of Nanjing.

■ Equipment Review

The Yaesu FT-1000MP All Mode HF Transceiver

*Reviewed by Ron Fisher VK3OM**



FT-1000MP

It's not often that a new updated model transceiver is introduced to the market at a price significantly lower than the unit it replaces. Actually, the original FT-1000 will continue in production but it is very unlikely that the Australian distributors Dick Smith Electronics will continue to stock it.

At $4495, the new FT-1000MP is the best value in amateur equipment we have seen for many years. I appreciate that this price will put it beyond the reach of most amateurs but, for the facilities that it offers, it is without doubt the price leader in top shelf transceivers. For the impecunious, just wait a few years and even the new FT-1000MP will become second hand.

The FT-1000MP competes directly with the IC-775DSP and, to a lesser extent, with the Kenwood TS-870. I say this because I believe that Kenwood might soon release a new top line transceiver to replace the aging TS-950SDX, perhaps the TS-960? If this happens, this new model would probably be more competitive against the FT-1000MP than the existing TS-870.

The new FT-1000MP is, of course, a brand new model that is very different in concept and facilities from the old FT-1000. The "MP", Yaesu state, is in memory of their founder, Sako Hasegawa JA1MP. You even get a copy of his QSL card included with your new FT-1000MP.

FT-1000MP Features and Facilities

The FT-1000MP incorporates everything you would expect in a top line transceiver. Let's run through the facilities offered. Firstly, it is fully self-contained with an inbuilt AC power supply. However, it is possible to operate it from a 12 volt DC power source if required. Although not available in Australia at the moment, the FT-1000MP can be purchased overseas less the inbuilt AC supply at a somewhat lower price. I feel that Dick Smith's policy of initially selling the AC version only is the correct way to go.

Naturally, the FT-1000MP sports two receivers that can be used at the same time. Unlike the earlier FT-1000, which could have an optional receiver bandpass filter unit to allow the second receiver to operate with any split compared to the main receiver, the FT-1000MP's second receiver can only operate within the front-end range of the first receiver, usually about one MHz wide. Each receiver can operate with independent mode selection which allows the possibility of diversity reception.

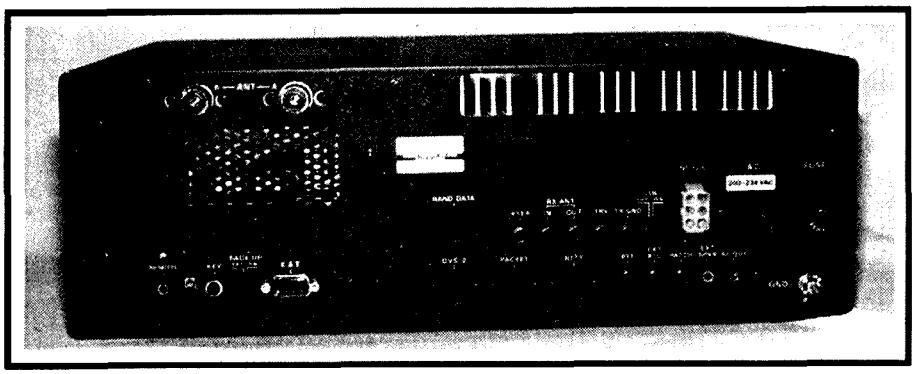
The receivers have independent audio gain controls and each has its own S meter. The received audio can be fed independently to each half of a pair of stereo headphones but there is only one speaker output which gives a mix of both sides. The FT-1000MP will operate on all normally used modes which include USB/LSB, CW, AM, FM, RTTY and Packet and can be remote controlled from your computer.

Of course, the transceiver has digital signal processing (DSP) included. Yaesu call their system "Enhanced Digital Signal Processing" (EDSP). As with other current transceiver designs, the DSP operates at the very low IF frequency of 11 kHz but, as distinct from some others, Yaesu do provide good conventional filters at the higher IFs, including a Collins Mechanical filter at 455 kHz. The history and basic operation of mechanical filters was discussed in last month's review of the Yaesu FT-900.

DSP is available on both receive and transmit. In the receive mode it is used for noise and heterodyne reduction and also for bandpass shaping. In the transmit mode the transmitted response is adjustable over very wide parameters as we will see later.

The FT-1000MP is slightly smaller and much lighter than the FT-1000. The reduction in weight from 25.5 kg down to 15 kg is explained by Yaesu reducing the RF power output of the new transceiver down to a nominal 100 watts as compared to 200 watts for the FT-1000. Also, the power supply is now a switched-mode system as against the transformer type of the FT-1000. Perhaps 100 watts output is more appropriate to today's needs than 200 watts. I would guess that many prospective owners of the FT-1000MP will have a linear amplifier and the 100 watt output is an ideal level for most linears.

It was said, when the original FT-1000 came out, that 200 watts output would eliminate the need for an amplifier. Well,



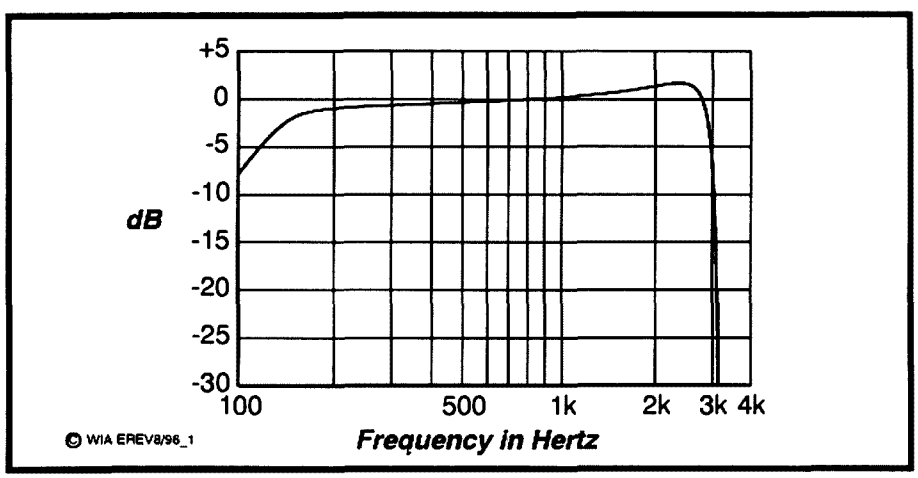
Uncluttered rear panel of the FT-1000MP. Note the two antenna connectors and the CAT input socket.

maybe yes, but try telling the big DXers that one.

The tuning system on the FT-1000MP is one of the most flexible yet encountered on an HF transceiver. Let's look at the variety of methods of getting around the bands that are available to the operator. The two tuning controls are both very smooth to use. The main control knob has a finger hole which will be appreciated by many operators. The tuning rate for each control is selectable over a very wide range. Steps as small as 0.625 Hz and as large as 20 Hz can be selected via the Menu (more about this later). Next is the new "Shuttle Jog Tuning" knob. This is mounted at the rear of the main tuning knob and is spring loaded at the centre point. As the knob is turned to either left or right the tuning starts to scan up or down with the scan speed increasing the further the knob is held over. It's an easy way to zip up and down the band.

Of course, there are all the usual ways to select a particular frequency. To name a few, you have direct access to any amateur band via the "Band" buttons to the right of the main tuning control; you have the "Up/Down" buttons to step up and down the general coverage bands in selectable segments plus, of course, the superb memory facilities; and there is the "VFO CH" control in the top right hand corner for stepping through the bands in small selectable steps. This control is also used to select memory channels when the transceiver is in the memory mode.

The display on the FT-1000MP is, without doubt, the most comprehensive ever seen on an amateur transceiver. Let's look at what it will tell you. As mentioned earlier, there is a separate S meter for each receiver. The main receiver S meter is also used to display several transmitter functions which include power output, ALC, SWR, speech compression, microphone input level, final amplifier collector current and DC voltage. The frequency and mode of each receiver is shown with the frequency displayed to 10 Hz resolution. The RIT and XIT also have 10 Hz resolution and you can offset to +/- 9.99 kHz.



Graph 1 – FT-1000MP transmit response, power output 20 W at 1 kHz, no compression, measured at 14.2 MHz.

FT-1000MP On The Air

The first thing that strikes you at switch-on is the display. Our review transceiver had the display illumination selected to high and it really looked like a cross between Luna Park and Las Vegas. Unfortunately, the whole display could be seen clearly, even the parts you didn't want to see. Rather confusing to say the least. With the illumination switched to low, (you only have two choices) things were much better, although I later noted that the brightness took a minute or so to come up to full intensity after initial switch-on.

Listening to the receiver before connecting the antenna I was astounded at the low internal noise level. At normal listening level the background noise was almost inaudible. There is a choice of two antenna inputs plus the option of a separate receiver antenna. This could be very useful for 160 metre operators who prefer, perhaps, a loop antenna for low noise and directional reception.

I soon found that the FT-1000MP is a complicated transceiver to drive and a full study of the instruction manual is very necessary if you want to make full use of the facilities available. The crux of this is mastering the menu system. There are eighty different functions that can be set to suit your own requirements. I've already mentioned one, the display illumination. Probably the main functions you will be looking for are the tuning step settings and the DSP parameters. You will need to keep your instruction book handy when starting out on this.

There is a lift-out sheet which gives all the menu settings on it with room to add your own notes. The trouble is that the display tells you what is happening, but in its own particular hieroglyphics. Without the manual you might find it difficult to work out where you are. You might find it difficult even with the manual in front of you! Most of the 80 menu items are either set-and-forget, or simply left on the default setting; but you will have fun going through them.

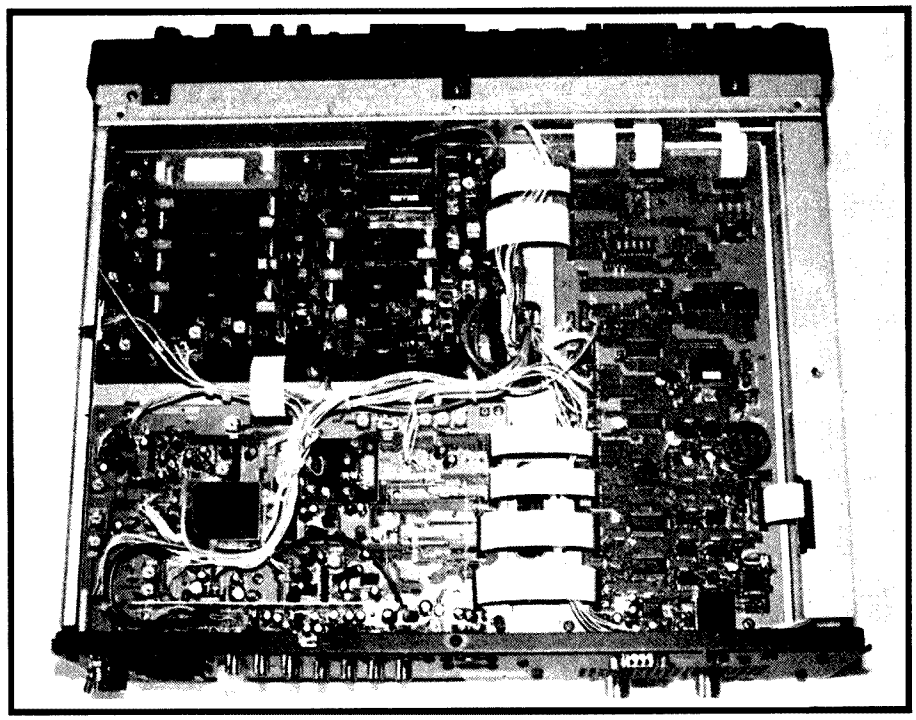
The first thing I changed was the

tuning speed and I set this to the slowest setting of 0.625 Hz per step. This gives an actual tuning rate of just over 300 Hz per knob revolution. Now this is perhaps too slow for normal tuning around, but a push of the "Fast" button speeds this up to about 3 kHz per revolution, an ideal combination for me. The tuning controls are very smooth but I would prefer a bit less tension in the centring spring of the Shuttle Jog tuning control.

The choice of selectivity options on the FT-1000MP is amazing. The shift/width controls do an excellent job. They are somewhat different in action from the SSB slope tuning on Kenwood transceivers but the overall effect is much the same. Normal setting is with both control pointers vertical. The width control increases selectivity at either the high or the low end of the selectivity curve depending on which way you turn the knob. The shift control will then place the resultant band-width selected just where you want it in the overall bandpass. Very handy to reduce QRM on either the high or low side of the signal.

The DSP contour control can also select various selectivity options. Through the menu system the operator can select the high and low cut-off frequencies. These work very well, but they are not readily changed. If you decide a different cut-off frequency is needed, you have to go back into the menu and then make your change. By the time you have done this it might be too late.

The FT-1000MP comes complete with a high quality 500 Hz CW filter which can be backed up with an optional "Collins" mechanical filter. The EDSP filtering can be also programmed to give excellent CW selectivity. To back all this up there is an excellent tunable notch filter which can reduce a heterodyne by up to 30 dB. The tunable notch can be used in any mode of reception. If this won't remove interference then it's over to the EDSP. Here there are three options. Firstly, for SSB reception the automatic notch filter will take out multiple heterodynes like magic. Unfortunately, you cannot use this for CW or digital modes as it would probably remove the signal you want in addition to the one you don't want.



Bottom view of the FT-1000MP with the case removed. The Collins 455 kHz SSB filter is in the top left hand corner of the chassis.

There are four positions of noise reduction. I have to admit that for SSB reception I could not find a situation where there was any improvement in readability using any of them. However, I am "cursed" with a very quiet location which makes evaluation of noise reduction systems difficult. I found the normal FT-1000MP noise blanker to be very effective. It has a selectable wide and narrow setting and is adjustable for level but, like many noise blankers, adjustment of the level control is critical to avoid cross modulation and other undesirable effects on the received signal. The two buttons that control the blanker and button for the notch filter have small green LED indicators built-in to indicate when they are selected. There are no cross modulation problems with the DSP noise reduction in use.

The AGC is controlled by a four position switch selecting either AGC off, fast, slow and auto. The auto position selects the appropriate delay times to suit the mode selected. A very handy feature if you like mode hopping.

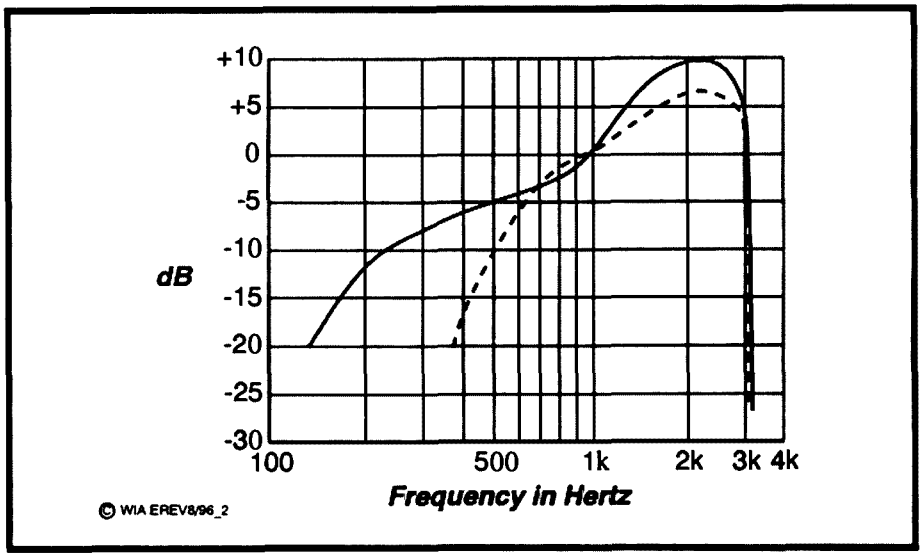
FT-1000MP On Test

There were a few things I wanted to test on the FT-1000MP, in particular the audio frequency response on SSB transmit with the EDSP selected. The results were quite amazing as we shall later see. However, first off the transmit power output on each band was checked with the following results. Current drain was not measured as a separate item this time as I felt it unlikely that many owners would use the transceiver from a separate supply.

Band	Power output
1.8 MHz	110 watts
3.6 MHz	105 watts
7.1 MHz	105 watts
10.1 MHz	102 watts
14.2 MHz	100 watts
18.1 MHz	100 watts
1.1 MHz	100 watts
24.5 MHz	100 watts
28.5 MHz	97 watts
29.5 MHz	97 watts.

Power output was measured in the CW mode. PEP output when using SSB was about 5% higher when measured on an oscilloscope. FM power output on 29.5 MHz was essentially the same as the CW output. AM power output should be limited to 25 watts to allow 100% modulation. With the power control at minimum the average power output on all modes was about one watt which should please the QRP operators.

Next on the list was a test to estimate transmitter intermodulation distortion.



Graph 2 – FT-1000MP transmit response, power output 10 W at 1 kHz, EDSP selected, measured at 14.2 MHz. Continuous line is EDSP 1; the broken line is EDSP 2.

One thing to take into account with the FT-1000MP is that the transmitter final stage runs with twelve volts rather than the higher voltage of some other top-line transceivers. The FT-1000, for instance, runs its final amplifier at 30 volts which will produce somewhat lower intermod distortion than the average 12 volt powered transceiver. My test showed intermod distortion on 14.2 MHz of -22 dB relative to just over 100 watts output. This is about average for a 12 volt powered transceiver but well below the figure obtained for the TS-870S a few months ago.

Finally, power output was checked through the automatic antenna tuner. With a simulated 3:1 SWR the loss on 14 MHz measured about seven watts.

The most interesting parts of the transmitter tests were the overall audio response with and without the EDSP. The response without the EDSP requires little comment except to note its smooth wide characteristic. The instruction book gives very little indication on what to expect when you select one of the four EDSP settings via the menu. They state that you can compensate for any voice or microphone. There must be some funny microphones and voices out there. A quick look at the curves will tell the story. On-air tests showed that most preferred the EDSP switched out but a few thought that position one of the EDSP could add a bit of bite to the audio under poor conditions. Take your pick. Incidentally, I later noted that Yaesu publish response curves for the transmit EDSP in their advertising brochure for the FT-1000MP but not in the instruction book. I wonder why?

My on-air tests were carried out using the supplied MH-31B8 hand microphone. This is the same type as supplied with the FT-900 except that this one is fitted with a standard eight pin metal connector in place of the plastic telephone type. Again I found that listeners usually preferred that the tone switch on the back of the microphone be set to position two. I was unable to test any other microphones with the FT-1000MP but I would have liked to try out the matching, elegant looking desk microphone type MD-100A8X.

Finally I checked the carrier and sideband suppression. Carrier suppression is rated as better than -40 dB. I estimate that our review transceiver was in excess of -50 dB. Sideband suppression measurement was limited by the intermodulation distortion but it appeared to meet the specified -50 dB without too much trouble.

Receiver Tests

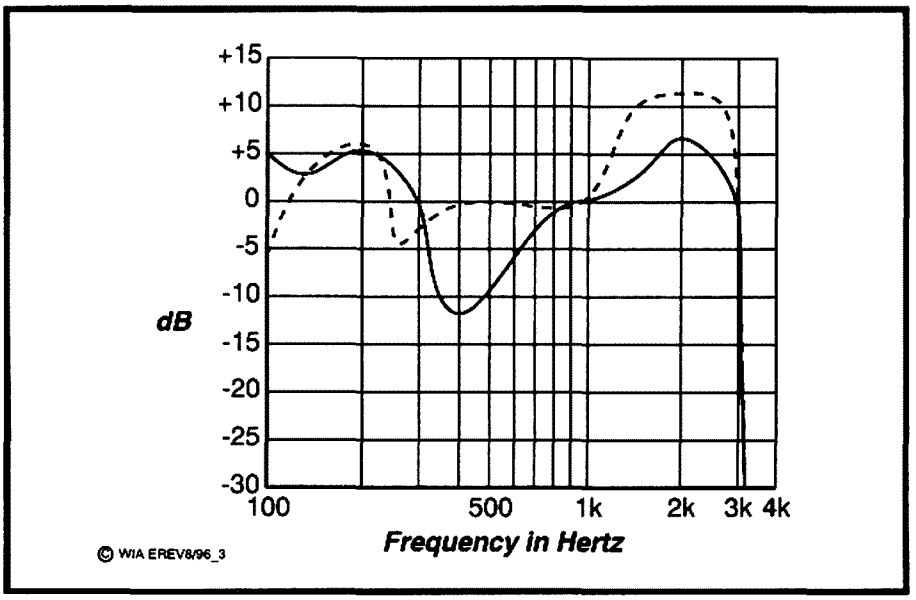
As usual the first receiver test was to check the S meter calibration. It seems that the days of moving coil meters in amateur transceivers is just about over. Like it or not, it seems we are stuck with bargraph metering. No doubt, they do have their advantages. In the case of the FT-1000MP you can monitor at least three different functions at the same time but perhaps not with the accuracy of an analogue meter. Within the limits of reading the FT-1000MP S meter here is what I found. Measurements were taken at 14.2 MHz with the attenuator off and the preamplifier on.

Reading	Voltage
SI	2.5 µV
S3	3.1 µV
S5	5.0 µV
S7	6.3 µV
S9	20.0 µV
S9+20 dB	250 µV
S9+40 dB	3.1 mV
S9+60 dB	0.035 volt.

The S meter reading for S9 varied somewhat from band to band. The lower bands required more input, the higher bands less. 160 metres required 70 µV for S9, while 10 metres only required 10 µV. As seems to be the standard these days, the front end attenuator gives 6, 12 and 18 dB loss. Again I ask manufacturers to consider adding an extra position to give 24 dB attenuation which I feel is necessary for meaningful antenna gain measurements. I wonder how many amateurs use their attenuators for this purpose anyway?

Received frequency response for SSB was essentially the same as the transmit response (see Graph 1). It is certainly very flat and smooth which shows up as excellent receive audio quality. Frequency response for AM reception was also very acceptable.

Although the top response is a little restricted, the general sound on AM is very good. I should also mention that the quality from the internal speaker is very much better than average. Receiver audio output was checked into a four ohm load as specified and was taken from the external 3.5 mm speaker output socket. Maximum audio power output was 3.9 watts at 30% distortion. At the specified output of 1.5 watts the distortion had dropped to only 1%, considerably better than the 10% quoted in the specifications. At 200 milliwatts this had reduced to an excellent 0.6% distortion. For comparison, the old FT-101B has around 8% distortion at the



Graph 3 – FT-1000MP transmit response, power output 10 W at 1 kHz, EDSP selected, measured at 14.2 MHz. Continuous line is EDSP 3; the broken line is EDSP 4.

same power level. Things have come a long way over the years.

Receiver sensitivity was measured at 14.2 MHz with the preamp in. The specified sensitivity for SSB and CW is 0.25 µV for 10 dB signal to noise ratio. I measured 12 dB s/n at 0.25 µV, just a shade better than the specification. Signals of less than 0.1 µV were clearly detectable even with strong local signals close by.

FT-1000MP Instruction Manual

The FT-1000MP instruction manual is, overall, an excellent publication. It contains all the information you will ever need in sorting out the operation of the transceiver. In particular, the section on the operation of the menu system is very well done. A separate lift-out sheet which you can keep on the desk for reference gives all the menu information. Very handy. Again, like the FT-900 instruction manual, I would like to see a better quality cover to give the book better durability.

Now to my usual grouch about instruction books, the lack of technical information. The strange thing is that a good part of this information is available in the elaborate advertising brochure which you can obtain free from your local distributor. As most of the information is already set up, why not include it in the instruction manual?

FT-1000MP Conclusion

Perhaps you can tell from the above that I am enthusiastic about the FT-1000MP. The price alone makes it a superb buy and the features that it offers could cost you at least 50% more in some other transceivers. It has almost everything. Well, almost. There is one thing missing. Strangely, there is no voice frequency read-out. Bad luck if you are sight impaired. Actually, come to think of it, the original FT-1000 didn't have provision for one either.

Another small niggle is the lack of a separate speaker output for each receiver. If I was fortunate enough to be able to purchase an FT-1000MP, I think I would like to have a speaker on each side for each receiver. Separate outputs are available for head phones, why not speakers? However, I have no hesitation in giving the FT-1000MP my highest recommendation. My thanks to Dick Smith Electronics for the loan of our review transceiver.

The FT-1000MP is currently priced at $4495. A range of matching accessories is also available. Contact your nearest Dick Smith store.

**24 Sugarloaf Road, Beaconsfield Upper VIC 3808*

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■ VHF/UHF Propagation

Long-Distance VHF Ducting Opportunities from Australia

*Emil Pocock W3EP**

Every summer for the past two decades, dozens of 4000 km contacts have been completed between Hawaii and California on 144 through 5760 MHz. This is well beyond the normal distance for VHF and UHF communication, yet even low-powered FM stations have made the grade. These contacts are made possible by a reliable tropospheric duct, a kind of natural waveguide in the lower atmosphere, that forms predictably each year between the Hawaiian Islands and the West Coast of North America. Although this is perhaps the most famous of the oceanic ducts, similar conditions exist over all the world's sub-tropical oceans, including those adjacent to Australia. It seems likely that future records will not be made from California or Hawaii, but rather over the Indian or Atlantic oceans.

Australian-born Ross Hull, writing in a 1935 *QST* article, provided one of the first explanations of how conditions in the troposphere, the lowest weather-producing region of the atmosphere, could support long-distance VHF radio propagation. Experiences over the following decade suggested that the potential for transoceanic ducting might be quite extensive. Military radar operators in the Indian and Pacific oceans observed echoes from 2500 km and farther using 144-MHz equipment during World War II. In October 1945, W5GSG/KH6 heard a 127 MHz air controller on Christmas Island, 1600 km from Hawaii. Other long-distance VHF communications were also reported in amateur publications during the 1940s (Ref 1).

Professionals began studying this phenomenon over the Atlantic and Pacific oceans during the 1950s using airborne instruments and VHF ground stations. The resulting scientific articles provided the first descriptions of the trade-wind duct, as these studies called the unusual upper-air conditions that supported long-distance VHF communication over the semitropical oceans (Ref 2). By the mid-1950s, John Chambers KH6UK and Ralph Thomas W6NLZ were planning to span the even longer path between Hawaii and California on 144 MHz using a tropospheric duct they were confident existed over the eastern Pacific.

The Historic Hawaii-California Path

On 8 July 1957, after more than a year of tests, KH6UK and W6NLZ finally made a historic 144 MHz contact. The pair repeated the feat two years later on 220 MHz, but few others seemed interested in duplicating this pioneering work. A breakthrough came during July 1973, when dozens of two-metre operators unexpectedly made several hundred QSOs between Hawaii and California, primarily through a Hawaiian FM repeater at 2440 metres elevation (Ref 3). In the years that followed, the reliable Hawaiian duct has provided countless contacts between the islands and California. Paul Lieb KH6HME and Louis Anciaux WB6NMT completed the first 432 MHz contact over this path in July 1979, and the most optimistic operators assumed that making it on even higher bands was just a matter of time. Indeed it was. By August 1995, Hawaii had been linked to the American mainland as high as 5760 MHz (see Table 1).

North American operators now look forward to several days' worth of long-distance VHF and UHF ducting conditions to Hawaii every summer. The most productive months are July and August, but the duct has been observed often enough as late as December. It rarely appears during the first half of the year (Ref 4). This predictable cycle of duct formation corresponds closely to the annual movement of a semi-permanent region of high atmospheric pressure in the eastern Pacific, known as the Hawaiian High.

During July and August, the centre of the Hawaiian High is usually situated close to 40 degrees north latitude. Ducting paths commonly form on the equatorial side of the centre of high pressure, as shown in Figure 1.

During September and October, the high weakens as it migrates southward. It lies at its most southerly extent around 30 degrees north latitude in January. It then begins a northward migration during March and April to complete an

Table 1
Record Tropo Contacts

Band (MHz)	*Date*	*Stations*	*Distance (km)*
144	1995 June 30	KH6HME—W7FI	4333
220	1989 July 15	KH6HME—XE2/N6XQ	4142
432	1989 July 15	KH6HME—XE2/N6XQ	4142
902	1994 July 13	KH6HME—N6XQ	4061
1296	1989 July 15	KH6HME— XE2/N6XQ	4142
2304	1994 July 14	KH6HME—N6CA	3973
3456	1991 July 28	KH6HME—N6CA	3973
5760	1991 July 29	KH6HME—N6CA	3973
10 GHz	1994 Dec 30	VK6KZ—VK5NY	1991

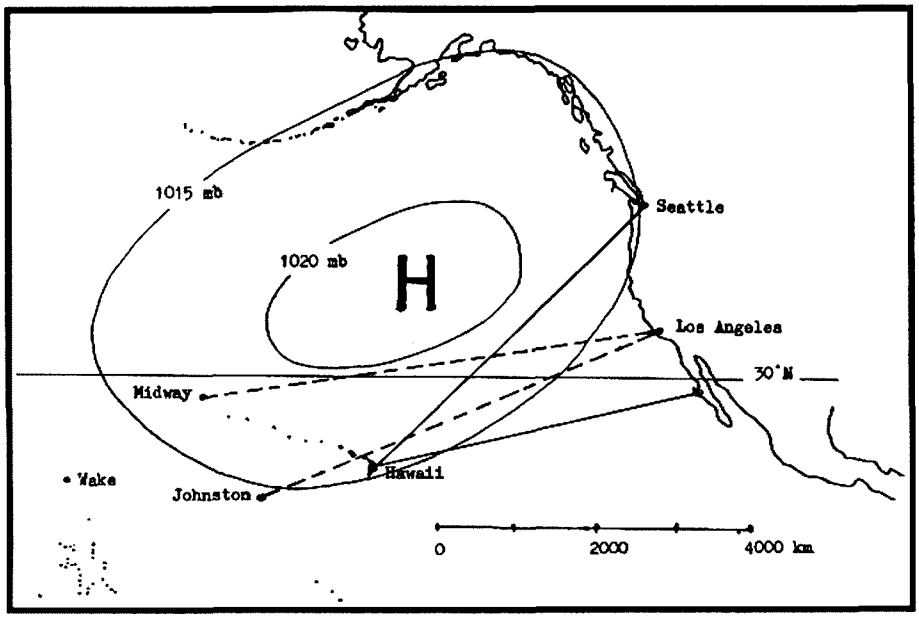

Figure 1 – Mean location of the Hawaiian High and sea-level pressure (mb) during July and August. Solid lines indicate observed 144 MHz ducting paths. Dotted lines show possible 144 MHz ducting paths.

annual cycle. This process is duplicated in other subtropical regions, most notably in the southern hemisphere over the Indian Ocean. The reasons why large high-pressure regions migrate during the course of the year and the mechanism by which they create stable long-distance tropospheric ducts are related phenomena.

Ducts, Temperature Inversions, and Subsidence

Temperature inversions form under several different weather conditions, but they are most commonly associated with subsidence. When air is forced downward through the troposphere, it is compressed by the increasing atmospheric pressure. Because the temperature of a volume of compressed air rises, subsiding air is warmed. This warming is a source of upper-air temperature inversions and, ultimately, of ducting conditions. Subsiding air is usually much drier than the surrounding air as well, because it originated as much cooler air higher in the atmosphere. Cool air can hold very little moisture and none is added as it subsides. Thus the air in temperature inversions caused by subsidence is both warmer and drier than the air below, ideal for ducting.

Large-scale subsidence is one of the characteristics of atmospheric high-pressure regions, or anticyclones. The air within warm-weather anticyclones descends through the atmosphere from 10,000 metres and higher. The descending air is compressed, heated, and dried. Several layers of distinct temperature inversions may appear from several thousand metres altitude to near the Earth's surface, although the lowest inversion is usually the most useful for ducting. The weather directly under high-pressure is generally clear, warm, and dry, with light and variable breezes. The descending air eventually flows out over the surface of the Earth, making anticyclones inherently expanding systems. Coriolis and centrifugal forces derived from the Earth's rotation, along with frictional forces along the Earth's surface, turn this flow in a counter-clockwise direction in the southern hemisphere, creating a steady breeze around the outer portions of the anticyclone (Ref 5).

Anticyclone Formation and Global Atmospheric Circulation

Large semi-permanent regions of high pressure, such as the Hawaiian High and the similar Réunion High over the Indian Ocean, are sustained by global air circulation patterns. The Earth's surface is generally warmest over the equatorial regions. Surface heating causes massive air currents to rise into the troposphere, creating a belt of low pressure near the equator. This rising equatorial air spreads north and south, gradually cools, and sinks around 30 degrees from the equator, forming two globe-encircling subtropical anticyclone belts. It is here that great transoceanic ducts commonly form. These generally calm regions are also known as the horse latitudes, so named because sailors on becalmed sailing ships were sometimes forced to throw horses and cattle overboard for lack of feed and water. Over much of the

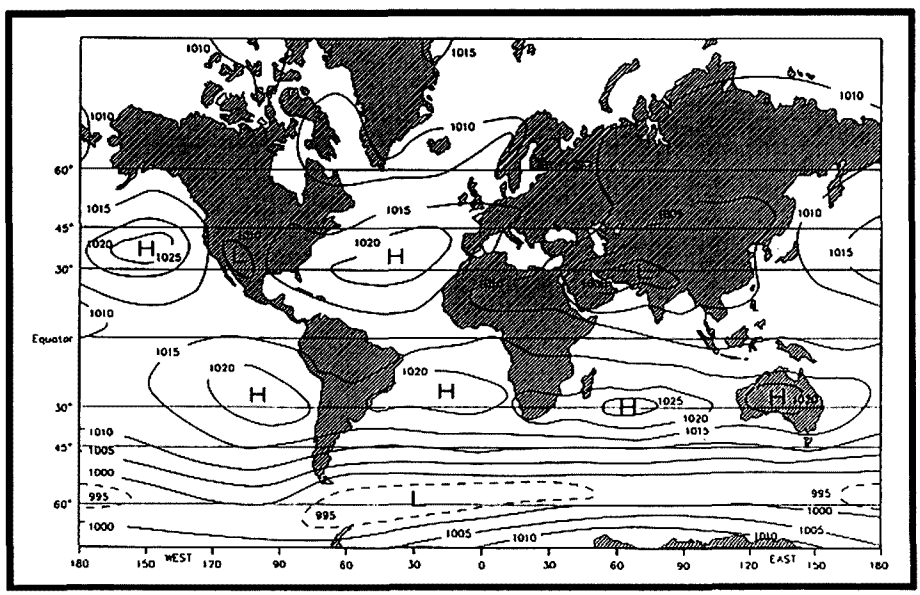

Figure 2 – Mean sea-level atmospheric pressure (mb) over the Earth during July. Adopted from P Tchernia, "Descriptive Regional Oceanography" (Oxford: Pergamon, 1980), plate 3.

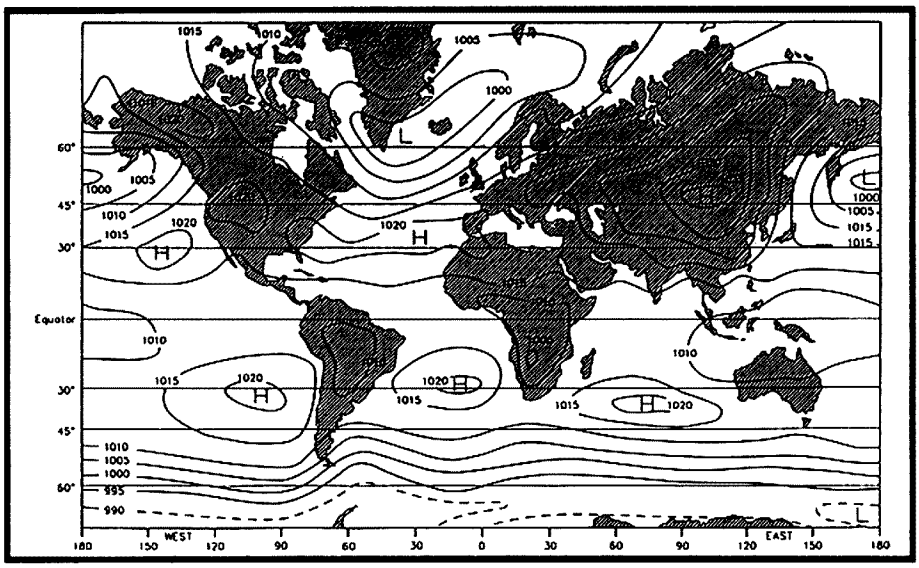

Figure 3 – Mean sea-level pressure (mb) over the Earth during January. Adopted from Tchernia, plate 2.

land area at the same latitudes, subsiding warm, dry, air creates the world's great deserts, such as those of interior Australia.

The upper-atmospheric circulation and associated surface features, including the sub-tropical anti-cyclones, migrate north and south due to the Earth's variable tilt in relation to the sun. The Earth's angle to the sun varies over a 47 degree range during the course of a year. The position of the upper-air circulation cells shift accordingly and pull the sub-tropical anti-cyclones over a 10 to 15 degree range annually. The mean pressure, total area, and northerly extent of the anti-cyclone belts are generally greatest in July (Ref 6). Compare Figures 2 and 3.

Although the model of atmospheric circulation suggests high pressure would appear as a continuous belt at about 30 degrees north and south latitude, the belt is actually broken into separate anti-cyclonic systems. Surface heating over the continental land masses partially counters the effects of subsidence, leaving the most prominent semi-permanent high-pressure regions over the oceans. Just two semi-permanent anticyclones form in the northern hemisphere, the Pacific Hawaiian High and the Atlantic Bermuda-Azores High. Three separate highs appear in the southern hemisphere over the Pacific, Atlantic, and Indian oceans, in addition to the exceptional continental high over Australia in winter. The Réunion High over the Indian Ocean is most notable. Each has the potential to support long-distance ducting conditions at VHF and higher.

Australia and the Réunion High

The most spectacular long-distance tropospheric ducting contacts in Australia so far have been in the 2000 km range across the Great Australian Bight. The recent 10 GHz world record of 1911 km, made by Wally Howse VK6KZ and Robert Bowman VK5NY on 30 December 1994, attests to the generally favourable ducting conditions that are present over the area in summer. Nevertheless, the future for this path is limited. Distances could be extended a few hundred more kilometres from Tasmania, but that would just about exhaust the potential of trans-Bight paths. In contrast, the possibilities from Australia over the western Pacific and the Indian oceans are much greater.

VHF contacts via tropospheric ducting have been reported occasionally from the east coast to New Zealand and other nearby islands, but these paths have not approached the distances achieved by the Americans. This could be explained in part by Figures 2 and 3, which suggest that the belt of semi-tropical high pressure is generally weak between Australia and the mid-Pacific. Thus the potential for world record-breaking paths in the western Pacific appear less likely than elsewhere. Even so, ducting paths might be possible as far as Tonga (3300 km) or even further. An entirely different situation exists off the west coast, where the Réunion High dominates the southern Indian Ocean and might offer some very exciting possibilities.

The Réunion High sprawls between Australia and South Africa, as shown in Figure 4. It appears to reach its greatest strength in July and August, although it is not clear if winter is the most favourable time for duct formation. In any event, the strongest ducts would likely form to the north of the high pressure centre. Reliable VHF paths probably occur between South Africa and various mid-Indian Ocean islands, such as Réunion, Mauritius, and Rodrigues. The distance from Port Elizabeth to Rodrigues is about 4100 km, or about the same as the current world records made between Hawaii and North America. Longer contacts, such as Réunion to north-western Australia (about 9950 km) or entirely across the Indian Ocean (over 11,000 km) appear fantastic, yet they may be worth attempting in a series of progressive trials from the South African side.

The main problem from the Australian end is the absence of islands at intermediate distances to the west. Cocos is probably too far north and Amsterdam Island too far south to be within a duct formed under the Réunion High. The closest islands in favourable locations are those in the Rodrigues group, 5150 km from the nearest point on the western Australian coast. One problem is that it is unlikely there are any permanent VHF operators on Rodrigues to participate in trans-oceanic tests. Maritime mobile operations or expeditions, perhaps attached to low-band DX groups, might provide the needed opportunities to test the potential of ducting over the Indian Ocean.

Possibilities in Other Parts of the World

VHF contacts sustained by the Réunion High have the potential for yielding the ultimate tropospheric ducting distance records, but practical difficulties of establishing VHF operations in favourable locations may delay realising these goals. It does not

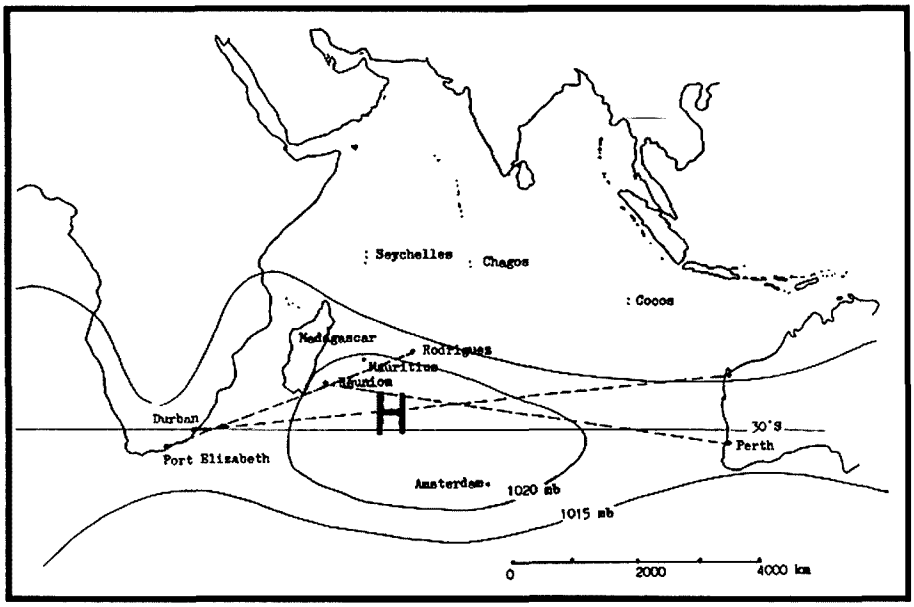

Figure 4 – Mean location of the Réunion High and sea-level pressure (mb) during August and September. Dotted lines suggest possible 144 MHz ducting paths.

seem likely that the distances over the eastern Pacific will be extended dramatically. The North American side is limited by a nearly continuous range of coastal mountains, which rise higher than the normal elevation of the duct. The western end could possibly be stretched to the outer Hawaiian islands as far as Midway (5475 km from Los Angeles) or possibly to Johnston Island (5600 km) if there were VHF operators at these locations. A California to Wake Island contact (7375 km) appears to be a remote possibility.

Similar conditions over the north Atlantic Ocean, sustained by the Bermuda-Azores High, may yield record-breaking results much sooner. The most likely transatlantic paths lie between the Caribbean and the southern United States on the western side and southern Europe and North Africa to the east. These end points are generally well populated with serious VHF stations and preparations are already under way to test the possibilities. The distances involved are in the 6000 to 7000 km range, much further than those achieved in the eastern Pacific, but within practical reach. The announcement of the Brendan Trophies for the first 144-MHz transatlantic contact using terrestrial means of propagation may accelerate the search for a tropo-ducting path across the Atlantic (Ref 7).

No doubt avid VHF operators will be pushing toward the limits in the eastern Pacific and Atlantic oceans in the coming years, but there is no reason why distance records have to remain in the northern hemisphere. Although VHF activity levels may be lower in the Indian Ocean region than elsewhere in the world, the regions adjacent to Australian coasts may have the highest potential for the ultimate tropospheric ducting records.

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1. Ross A Hull, "Air-Mass Conditions and the Bending of Ultra-High Frequency Waves", QST (June 1935), 13-18, 74, 76. See also Ed Tilton, "World Above 50 Mc. [112 and 127-MHz Ducting in the Pacific]", QST (Jan 1946), 53; and Ed Tilton, "Commercials Steal Our Thunder – Airline Ops Work 1000 Miles on 130.7 Mc", QST (July 1948), 66.

2. D L Ringwalt and F C MacDonald, "Elevated Duct Propagation in the Tradewinds", IRE Transactions on Antennas and Propagation (July 1961), 377-83; and N W Guinard, J Ransone, D Randall, C Purves, and P Watkins, "Propagation Through an Elevated Duct: Tradewinds III," IEEE Transactions on Antennas and Propagation (July 1964), 479-90.

3. For details of these achievements, see Ed Tilton, "World Above 50 Mc [KH6UK – W6NLZ 144-MHz Contact]", QST (Sept 1957), 62-63; Ed Tilton, "World Above 50 Mc [KH6UK-W6NLZ 220-MHz Contact]", QST (Aug 1959), 68; and Bill Smith, "California-Hawaii Bridged on 146 and 432", QST (Sept 1973), 102; and Bill Smith, "Transpacific VHF Duct Propagation", QST (Nov 1973), 100-02.

4. These conclusions are based on the observations of Robert J Cooke, W6PJA, made between 1979 and 1986.

5. For more detailed discussion of duct formation, see Emil Pocock, "Transoceanic Ducting at VHF and Above", QST (March 1996), 41-46. For general background, see B R Bean and E J Dutton. Radio Meteorology (Washington: Government Printing Office, 1966).

6. P Tchernia, Descriptive Regional Oceanography (Oxford: Pergamon, 1980) and National Oceanic and Atmospheric Administration, National Climatic Data Center, Monthly Climatic Data for the World.

7. 'Announcing the Transatlantic 2 m Challenge: The Brendan Trophies", Radio Communications 71 (June 1995), 13; and Geoffrey H Grayer, "How to Win the Brendan Trophies", Radio Communications 71 (June 1995), 14-17.

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WIA News

Future of the Amateur Service Study

Details were given in July's *WIA News* of the International Amateur Radio Union's (IARU) moves to look into the future of the Amateur Service in preparation for consideration of the International Radio Regulations concerning amateur radio at the 1999 World Radio Conference (WRC-99).

WIA members wanting to read and comment on the IARU's paper on this issue are asked to contact their Division for a copy of the paper. All WIA Divisions have a copy of the paper, but only the larger Divisions have copying facilities. If a copy is difficult to obtain, contact the WIA Media Liaison Officer, VK2ZRH, at LMB 888, Woollahra 2025.

■ Antennas

An Optimised Sloper for 80 Metres

Felix Scerri VK4FUQ suggests a sloper with an elevated radial as a good 80 m antenna for restricted areas.*

The full size half wave dipole is perhaps the standard antenna for 80 metres; however, its considerable length of around 40.26 metres (132 feet) rules it out of a lot of domestic situations. A trapped vertical or similar antenna is a practical alternative, but these antennas are generally a long way down on a dipole in performance. If one has the space for at least half the required space for a half wave dipole, then this sloper is worth considering.

I don't claim any originality for this antenna. It simply consists of a sloping quarter wave radiator worked against a single resonant radial.

The sloping radiator is an interesting antenna as it exhibits characteristics (depending on the slope angle) intermediate between true verticals and horizontal wires, and also has some directivity in the slope direction. Being a quarter wave radiator, it requires some sort of counterpoise. This is the purpose of the single quarter wave radial.

Much has been written on the subject of earthing and counterpoises for vertical antennas, with the general conclusion that reduced ground losses require very extensive earth systems. My work with this antenna leads me to differ somewhat. I believe that a simple resonant radial, as long as it is elevated, can be enough.

The elevated radial is the key to success. In fact, it was staggering to note during tests, the effect on both transmit and receive of varying the height of the radial. With the radial resting on the ground the results were very poor. When the radial was raised 1.5 to 2.4 metres (5 to 8 feet) above the ground, the difference was amazing. I compared both a folded quarter wave and a single wire radiator and obtained similar results.

My preference would be to use the folded section, as this results in improved efficiency through the impedance step-up action of the folded section. In operation, as noted earlier, some directivity in the slope direction is apparent but, overall, the pattern seems generally quite omni-directional, and signal levels are comparable to full size dipoles.

Direct coax feed can be used, but a tuner is probably necessary, as the termination resistance is likely not to be 50 ohms. Open wire line with a 4:1 balun is also an option.

In conclusion, I must say that the elevated radial is the key to good performance with this antenna. So, if you can manage a 19.8 m (65 feet) sloper, the associated elevated radial and a 10.6 m (35 feet) pole, then give this antenna a go.

**9 Garbutt Street, Ingham QLD 4850*

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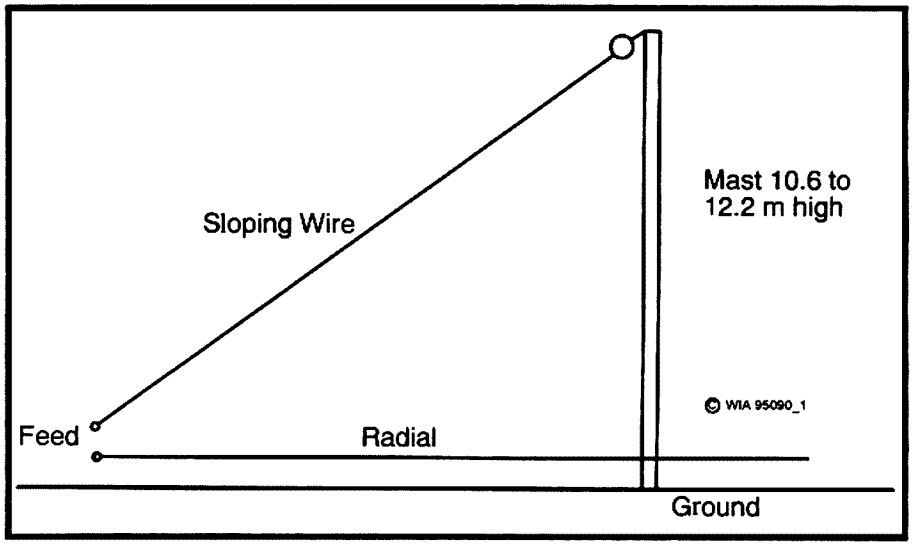

An optimised sloper for 80 metres. The radiator and the radial are a quarter of a wavelength long. The length in metres = 71.37/Freq in MHz. The length in feet = 234/Freq in MHz. The radial should be 1.5 to 2.4 m (5 to 8 feet) above the ground and immediately underneath the radiator. Use good quality insulators at the top of the mast.

WIA News

New Licence Conditions

Changes to the Radiocommunications Act Regulations made last year have led to a new Determination of amateur licence conditions, finalised by the SMA last September, a copy of which was sent to the WIA in June. These new licence conditions cover various aspects of amateur station operation, including station control and content of transmissions, and are intended to replace the conditions spelled out in the SMA document on amateur regulations, RIB 71.

At the WIA-SMA meeting at the end of June, the SMA indicated that a new RIB 71 is being prepared and it is anticipated that it will be published towards the end of this year.

The new licence conditions are to be used by the WIA to prepare updated regulations exam questions for the amateur licence exams.

Technical Abstracts

*Gil Sones VK3AUI**

Comparison of 2 Metre Handhelds

Two metre handheld radios, which have only been around for approximately 20 years, are becoming smaller and more sophisticated. The KEN KP202 which was, for many VK amateurs, their first handheld, only offered around 1.5 watts and five or six channels. Now, most handhelds cover the whole band and are capable of 5 watts with an accessory battery pack. One reviewed below is very tiny and uses two AA cells to give over 200 mW. Here, size has been traded for power and the Standard C-108A is truly palm-size.

In May 1996 *QST*, Glen Swanson KB1GW reviewed the offerings of the major manufacturers in the USA. Seven handhelds were reviewed and compared. The ARRL, which published *QST*, buys all review items just like any other ham so that average radios are reviewed.

The results are presented in Table 1. Some of the makes and models may not be as available in Australia as in the USA, but they are all from manufacturers who are distributed here although some have less prominence than others. The Standard C-108A is a tiny palm-size transceiver which uses a couple of AA cells for power. It is the smallest of the group and is aimed at a niche market. The Standard C-178A has a low power 432 MHz capability but is not truly a dual-bander.

Table 1 Two Metre Handheld Radios

Radio		ICOM ICT22A	KENWOOD TH22AT	YAESU FT10R	YAESU FT11R
Sensitivity dBm for 12 dB SINAD		-123	-123	-123	-122.5
Two Tone 3rd Order IMD Dynamic Range 20 kHz Offset dB		61	76	75	63
10 MHz Offset dB		80	83	78	74
Adjacent Channel Rejection dB 20 kHz Offset		60	59	67	69
IF Rejection dB		115	112	120	98
Image Rejection dB		69	85	80	61
Mute Sens dBm		-124	-126	-127	-127
AF O/P mW/8 ohm		211	281	328	151
Current Drain Rx mA (Squelched)		150	45	50	140
Tx		1400 (@13.8V)	1300	1200	1500
Tx Output Power Watts	High	5.0	5.0	2.7	2.0
	Med		0.4	0.9	1.8
	Low	0.4	0.05	0.12	0.45
Tx/Rx Turnaround Time m/S		90	100	60	250
Rx/Tx Turnaround Time m/S		125	48	35	95

Radio			ALINCO DJ91	STANDARD C108A	STANDARD C178AR
Sensitivity dBm for 12 dB SINAD		144 MHz	-122	-122	-123
		432 MHz			-122
Two Tone 3rd Order IMD Dynamic Range 20 kHz Offset dB		144 MHz	58	63	66
		432 MHz			68
10 MHz Offset	dB	144 MHz	65	66	76
		432 MHz			70
Adjacent Channel Rejection dB 20 kHz Offset		144 MHz	57	60	60
		432 MHz			58
IF Rejection	dB	144 MHz	90	95	79
		432 MHz			85
Image Rejection	dB	144 MHz	65	67	78
		432 MHz			20
Mute Sens dBm		144 MHz	-129	-126	-132
		432 MHz			-128

Conversion Chart

A very useful chart appeared in CQ DL for October 1995 which allows easy conversion between power, dBm, voltage in 50 ohms, and dBμV in 50 Ohms as well as giving S units and the thermal noise level at 25 degrees Celsius for various bandwidths. The chart was presented by Prof Dr Hans-Hellmuth Cuno DL2CH. It is a most useful chart and is reproduced as Table 2.

Continued over page

Table 1 *(continued)*

Radio		ALINCO DJ91	STANDARD C108A	STANDARD C178AR
AF O/P	mW/8 ohm	151	88	263
Current Drain mA	Rx (Squelched)	50	40	50
	Tx	1000 (@13.8V)	210 (2xAA)	900
Tx Output Power Watts	144 MHz High	2.0	0.29	3.2
	Med			2.5/0.4
	Low	0.5		0.074
	432 MHz			0.05
Tx/Rx Turnaround Time m/S		136	65	60
Rx/Tx Turnaround Time m/S		72	60	55

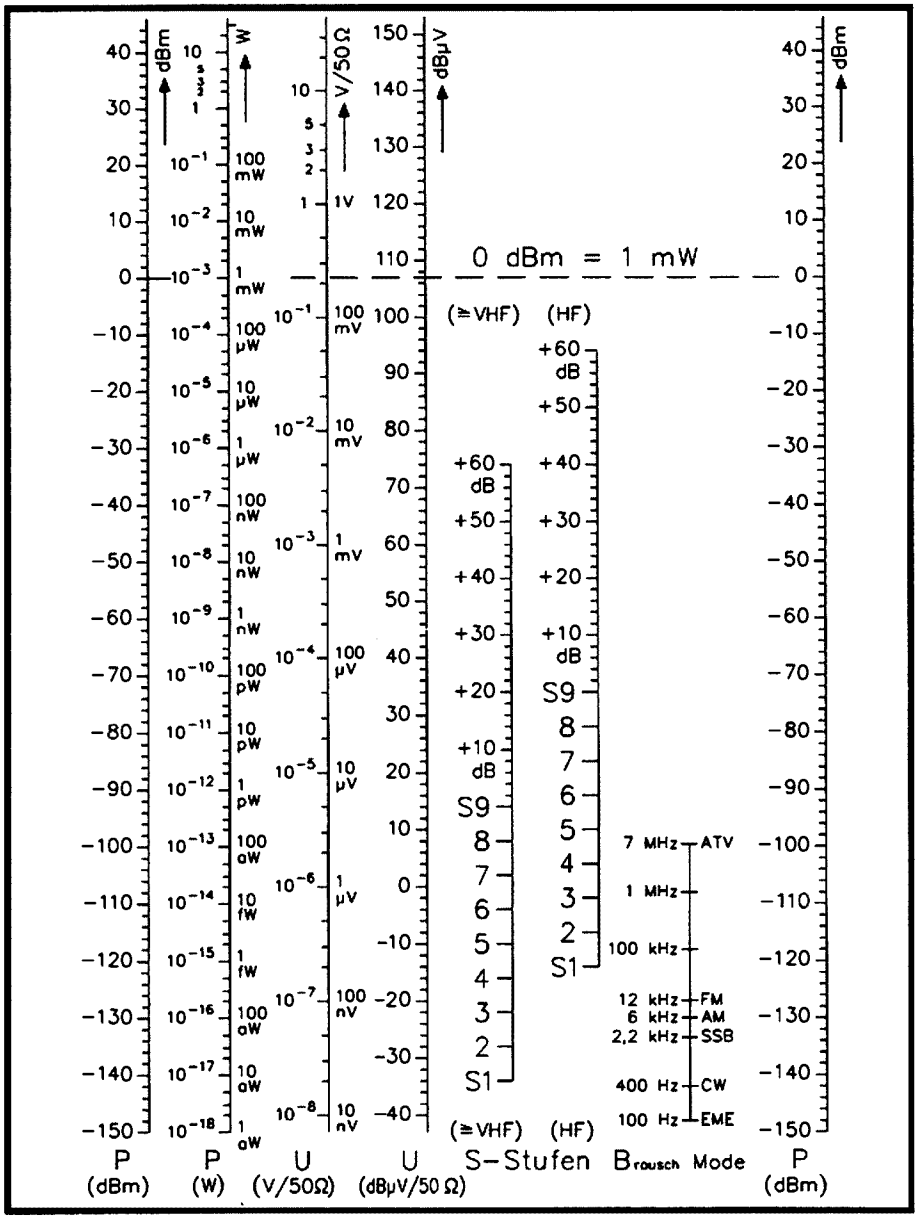

Table 2

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WIA News

Good Publicity for Amateur Radio

Gladesville Amateur Radio Club (GARC) in Sydney scored some publicity mileage for amateur radio with an article on the club's specialty – amateur television – in the 21 June 1996 issue of *Uniken*, the University of NSW's fortnightly newspaper.

The story, headed "Science stories on 'kitchen' TV", filled three-quarters of page 6, right in the middle-spread of the newspaper. The story outlined the club's history of television transmissions, which for more than ten years have emanated from the "studio" in the kitchen at the home of club President, Keith Cunliffe VK2ZZO. *Uniken's* reporter outlined the sort of material put to air, which has included reports of scientific and technological developments, as well as the club's "mainstay", the popular theory lectures by Ron Bertrand.

Uniken's reporter went on to detail how, over the years a number of club members had become engrossed by the technology and went on to careers as engineers and in commercial television.

Meanwhile, the Institute of Radio and Electronics Engineers' (IREE) magazine, *Monitor*, Volume 21 No 1 for 1996, received in June, has two articles on amateur radio events. The first covers IREE activities in Hobart last December, celebrating Radio Foundation Day. The article details how Richard Rogers VK7RO of the WIA successfully attempted contact with Joe Craig, of the Newfoundland Radio Amateurs Club, operating VOINA at St John's, Newfoundland on Canada's west coast.

The second article, by Professor Paul Edwards of the University of Canberra's Electronics Engineering and Applied Physics faculty, tells how the WIA ACT Division made successful moonbounce contacts to commemorate the IREE Marconi Day last December, using the 10 metre diameter dish facility of the University's Advanced Telecommunications Research Centre.

■ Antennas

Random Radiators

*with Ron Cook VK3AFW and Ron Fisher VK3OM**

This month a few helpful hints on installing coax connectors, plus an interesting design for a compact HF antenna and a really cheap QRP RF power meter.

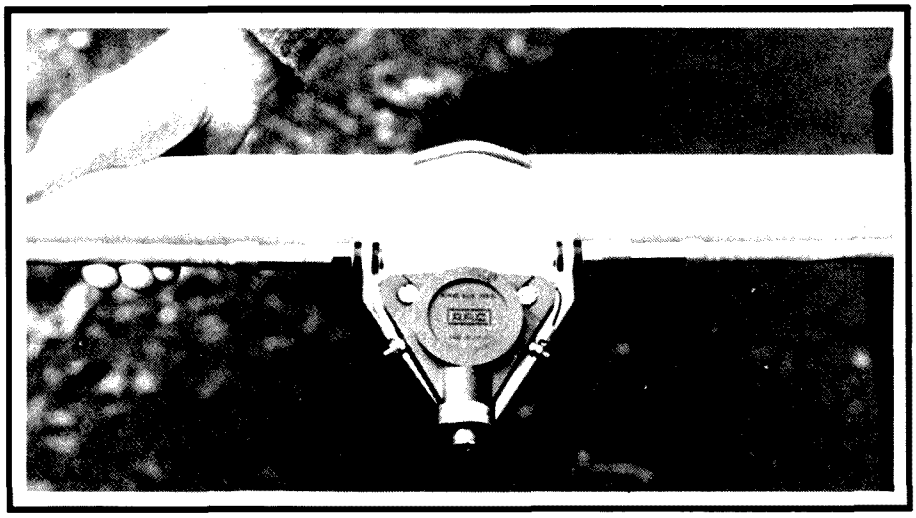
Compact HF Antenna

But first, let's look at a cheap and effective antenna for any HF band. The antenna described was built for 40 metres but the design is easily adapted for any frequency. It was actually built up nearly ten years ago and I intended to write it up at the time but, as often happens, something got in the way and the whole thing was forgotten. I was reminded of it again by an article in February 1995 *QST* which rediscovered my idea. A quick search through my photographic archives produced the original photos taken at the time. So here it is, an antenna very suitable for use at any location with limited real estate. It is compact and light enough to put it up and pull it down in a minute or so. Your neighbours will never know that it was there. OK, so what is it?

It is very simple; two mobile whips mounted end to end to form a dipole. Just purchase, or make up (we hope our readers come into the latter classification) a pair of whips for your preferred band and mount them to a wooden support as shown in the illustrations and you will be in business. A single U-bolt is more than adequate to attach the antenna to a pipe or wooden mast. I used a 1:1 balun to provide a balanced feed to the antennas from 50 ohm coax. The type shown in the photo could be substituted with a six turn coil of coaxial cable about 12 cm in diameter which would probably do the same job.

You will, of course, need to prune the antennas to give a low SWR at your preferred operating frequency. One small problem with a set-up like this is that you must expect a fairly limited bandwidth on 80 and 40 metres, although an ATU might well extend this somewhat. On the higher bands, where the whips become relatively longer in terms of wavelength, the bandwidth will, of course, be better. So, how did the antenna work out?

At the time I did comparison tests with a full size 40 metre dipole at something over twice the height and found that it was, in general, about two S points up on the short dipole. If the short dipole had been mounted higher, I am sure the difference would have been much less. Also, there is one thing you can do with this antenna that might be a bit difficult with a full size antenna. You can rotate it and it does have a worthwhile front (or back) to side ratio.



A close-up of the two mobile whips mounted to a wooden support and connected to the 1:1 balun. The U-bolt should be quite adequate to attach this compact HF antenna to a pipe or wooden mast.

Some time ago we discussed the performance of mobile antennas mounted on vehicles in this column but I cannot recall looking at mobile whips used as fixed station antennas. There is no doubt that they are a very effective alternative when it is impossible to put up a full-size antenna. To prove this point, we are keeping in regular contact on 20 metres with our friend Ira WA2OAX who is located in the centre of Manhattan living in an apartment. He is using a mobile whip antenna mounted on his balcony rail and working his fair share of DX. Tests have shown that his signal is not too far behind stations using three and four element tri-band beams (but remember what we said about tri-band beams a few months ago!). But also, don't forget that we are right at the bottom of the current sun spot cycle and many amateurs are convinced that 20 metres is dead and working DX is supposed to be impossible.

Problems With Coaxial Connectors

Over the years I have seen some unbelievable attempts at terminating coax cable to standard PL-259 connectors. I almost wish I had kept a few that I could now photograph and show how NOT to do it. Many amateurs have developed their own ways of terminating connectors over the years; if you are happy with the results your method is achieving, then stick with it.

However, a few thoughts might come in handy. The first thing is, of course, to have the correct connector to suit the type of coaxial cable you are using. Ninety nine times out of a hundred this will be either RG-58 or RG-8/213 type cable. Connectors are commonly available for each type but adaptors can be fitted into the larger sized ones to fit the smaller cable. It's on this subject that I noted a letter in *QST* a few months ago that makes interesting reading.

The compact HF directional antenna up in the air and working.

particularly in regard to the technique of fitting large sized connectors to RG-58 type cable using adaptors.

The author is Steve Katz WB2WIK/6 who is Vice President of Engineering, S&S Cable Co. It sounds as if he should know what to do. Let me precis a few of the important points.

"Silver plated reducers UG-175 and UG-176 were developed about 40 years ago specifically to not require that the braid of the cable they are reducing be soldered to them. Rather than resulting in a "better" connection, soldering is likely to damage the coaxial cable. Normal coax cables used by amateurs have a maximum operating temperature of 90° C. Above this temperature the jacket and dielectric will melt and lose the properties required for good coaxial cable. If you solder to the adaptor the temperature of the coax will rise to that of molten solder, approximately 230° C, not a very good idea. To correctly install the reducers, fold the braid back over the reducer, screw the reducer into the PL-259 body and then solder the braid to the body of the connector very rapidly through the four holes in the PL-259 body".

Now, this is where the problem comes in. I suspect that many of the atrocious attempts I mentioned earlier were made with soldering irons far too small. It is suggested that you use, *"An old fashioned large iron-tip soldering iron such as a Weller SP120"*. Also, *"The trick of soldering PL-259s with or without a reducer is to do the job with sufficient heat to make the solder reflow in less than one second. Although this raises the cable's dielectric temperature to slightly above its 90° C rating, it will do so very briefly, usually not long enough to cause damage"*.

So, there you are; bring out the old plumber's electric iron and produce professional connections. The minimum-sized iron that I use is an old "Scope", but it is essential that the bit is clean and not pitted. I also cover the cable end of the connector and the first two or three cm of the cable with shrink plastic. This helps to weather proof the whole thing and stop moisture getting in. Good luck with better connections.

A Cheap QRP RF Power Meter

No, this won't take the place of your commercial $300 super power meter. I found it in a little known (in Australia) American magazine called *Worldradio*, which is probably better known for Kurt N Sterba's light-hearted antenna articles.

The power meter uses one of those battery testers included with Duracell alkaline batteries. The author, Mike Greenfield N9JIY, found that the tester had a resistance of 4.5 ohms. With 1.5 volts across this the indicator goes to about half scale. Mike wired the tester in series with a 50 ohm dummy load and carried out a few tests. Firstly, the battery tester is capable of handling about 0.5 watt which gives the meter an upper limit of just above six watts. You will probably need a calibrated watt meter to calibrate the scale on your new meter. It will probably read PEP quite well for SSB. Let us know how you go.

That's all for this month, so its goodbye from him and goodbye from me.

The two Rons.

*C/o PO Box 2175, Caulfield Junction, VIC 3161

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WIA News

New WIA Members

The WIA bids a warm welcome to the following new members who were entered into the WIA Membership Register during the month of June 1996.

L21020	MR T N GOODWORTH
L30935	MR A J CALWAY
L30936	MR P SLEEP
L50346	MR H P JOLLY
L50347	MR F HOUSE
L50348	MR J E DAVIES
VK1JA	MR J A HEWSON
VK2BOW	MR J R WATSON
VK2BRZ	MR S J RIGNEY
VK2CJP	MR P H COCHRANE
VK2FHN	MR P MILLER
VK2JFE	MR J F ENTWISTLE
VK2NU	MR G R WALLNER
VK2TIK	MR T M LEE
VK2TJO	MR M J HOWELLS
VK2US	MR K J BELL
VK3FKD	MR K DA SILVA
VK3MAN	MR R SHEPHERD
VK3ZVU	MR Z SVALBE
VK5NMW	MR M R WILLIAMS
VK5PEH	MR R GILL
VK5TAF	MR N R TOMKINS
VK5YH	MR C HAGOORT
VK6NGZ	MR L A TODD
VK6NTN	MR A S KING
VK6YKD	MR K H DIRKSEN
VK8KG	MR K J GLASSON

■ Computers

Getting on the Net

Will McGhie VK6UU leaves his beloved repeaters for a moment and tells of the fun he had connecting to the Internet.*

You might wonder what my experience of getting on the Internet has to do with amateur voice repeaters? The answer is very little, but the story needs to be told, and it may well serve as a help to those of you who are making the move and connecting to the Internet.

Big Mistake

I bought another computer, as the 386 was too slow for many applications, and the new Pentium 100 was all ready to connect to the Internet. I had been looking forward to getting on the Internet for some while. So, with the introduction of an Internet e-mail address for *Amateur Radio* magazine columnists, now was the time to make the move. I signed up with a local Internet service provider for an attractive price. Once the account was set up, next came obtaining the software and setting it up.

The service provider offered to install and set up the software for a small fee. However, my thoughts were, why wait? Why not download the software from a local BBS and have my system up and running that night? Big mistake!!!

The Modem

The first difficulty I found was with the modem. On opening the handbook, out fell a page of text headed "For Australia and New Zealand". This was initialisation details for the modem. The string of letters and numbers sets up the modem for the Australian telephone standard. I loaded the software that came with the modem, and proceeded to type in this long line of initialisation numbers and letters into the box provided. The trouble was that not all the numbers and letters would fit. Once the box was full it would not accept any extra information. What to do with the remaining numbers?

Experimentation eventually showed that not all the numbers and letters are essential and I settled for ATX3. This all took several hours, so the first night of being on the net was not to be. Why the software supplied with the modem would not allow all the initialisation setup to be typed in remains a mystery to me.

The Software

Next came loading *Netscape*, the web browsing software, and *Trumpet Windsock*, the software for dialling. At this point, much of what I had to do was a mystery. I knew enough to be able to have a go but, as it turned out, I was a long way from being anywhere near close. I could dial my service provider but that was it. Nothing happened beyond my phone call being acknowledged by the BBS computer.

Help

Help was required and I gathered all the hardware together and headed to an amateur friend, Greg VK6YEI. Greg's knowledge of computers and getting on the Internet is streets ahead of mine. Greg and I had communicated over the phone in an attempt to sort out the problems but to no avail. It is very difficult to sort out computer problems over the phone!

My attempts at setting up the software were a real mess, and it was decided to use the *Windows 95* software installed on my computer instead. *Windows 95* and the *Windows 95 Plus* pack come with all the software required for the Internet. In order to speed the installation up, we networked my computer and Greg's computer together. After a couple of hours all the software required for the Internet was up and running on my computer. I headed off home.

Networking

As the hour was late I did not turn on my computer until the next day. The computer booted up, but the mouse, even though it could move, would not click on any buttons. The computer would not work in the *Windows 95* operating system. To cut short a long, frustrating, trying-to-find-out-what-was-wrong story, it was discovered that, while the two computers were networked, the installation of the Internet software and configuring the *Windows 95 Plus* pack had not gone as it should. While networked, what was not correct on my computer simply bypassed the problem and used Greg's computer to solve the problem. As soon as the two computers were disconnected from each other, my computer did not work. This had not been tried on the night of the installation. The more I investigated my computer the more problems I found.

Format C:

My computer was by now in a real state of falling apart. So much did not work or worked in strange ways. I decided to start again from scratch and did a reformat C. *Windows 95* and the *Plus* pack were now re-installed on a blank one-gigabyte hard drive.

Windows 95

With the operating software re-installed, Greg talked me through the configuration of the *Windows 95* operating system and the *Plus* pack for Internet operation. It did not work. Once again, to cut several hours down to a few lines, when I had done the reinstalling of *Windows 95* I had not installed the TCP/IP software in *Windows 95*. Even though the *Windows Explorer* net browser requires to be ticked to allow use of the TCP/IP mode, and I had done this, it did not say "you have not installed TCP/IP". This problem sorted out, next came the dial-up script. This script, which is a simple text file, is required to interface with the individual service provider. *Windows 95* provides the software called an Internet jump starter kit. I had not installed this as well, so, under Greg's instruction, I installed this software. However, even though *Windows 95* said it was installed, it was not. The installation is simple in *Windows 95*, simply select install new software from the CD ROM, click on the required tick box and away it goes. *Windows 95* would go through the initialisation process, but the software would not install.

Elton John

It was back to Greg's to sort the problem out yet again. Even with Greg's knowledge of computers we could not install the Internet jump starter kit. *Windows 95* would say it had installed the software even if you replaced the *95* CD with an Elton John music CD! We could not sort out the problem.

A Small Bug

The next day a phone call to Microsoft confirmed that, if you had the OEM version of *Windows 95*, the Internet jump starter kit would not install! I had the OEM version. The bug with the software could be fixed by deleting a file and allowing the *Plus* pack to install the correct file. Finally, armed with this knowledge, installation of the jump starter kit was achieved. This then brought up the Internet scripting icon in *Windows 95*.

However, even with all the software now installed correctly, conflict occurred with the *Windows 95 Microsoft Network*. This software allows connection to this alternate network. It appears to conflict with installation of Internet software. Deleting the Microsoft network software fixed the problem.

Networked Again

I had left my computer at Greg's place, and returned that night to see it all working. At last, stand alone, my computer was on the net!

Greg then asked, "Would you like the latest version of *Netscape 3*?". "Sure would," I replied. This version of Netscape is about six megabytes, so it was either zip the file over on several disks, or network the computers together. We networked the computers again, using Interlink. The networking did not work. It had worked before but refused to work this time.

Two hours later we discovered, instead of connecting the two computers together via the parallel ports, we had connected Greg's computer into my scanner port. My printer parallel port and my scanner port both use the same sex 25 D connectors. A simple mistake, but we had wasted two hours.

Now, with the computers correctly connected together, the network software would still not work! The scanner port is a plug-in board which also supplies power to the scanner. You guessed it, Greg's parallel port had been fried! This problem aside, *Netscape 3* was copied over using floppy disks. *Netscape 3* was successfully installed and tested. After five weeks of frustration all appeared to be working.

Five Weeks

A lot was learned over these five weeks. Perhaps having your service provider install the software was the best lesson learned, but I did learn a lot about setting up a computer using *Windows 95* for the Internet.

Not knowing what software was required for the Internet does make the process very difficult. My understanding is you require four basic software components. They are, a net browser, TCP/IP, scripter, and dialler. Failure to have these basic elements installed, and set up correctly, results in the system not working.

Is it just me, or are instruction manuals for computers and computer software written in such a way as to be difficult and misleading? It is almost as if the instructions are written to overload you with detail but not tell you the basic, most important bits. I have read many articles on the Internet but have not been lucky enough to come across one that puts all these basic elements into perspective. If you don't know what is required when setting up software on your computer you have no chance of being successful.

I hope some of these ramblings will be of use to some of you, not the least making you aware of the difficulty of setting up *Windows 95 Explorer* to run on the Internet. Several aspects of the problems I had still remain a mystery, but it is running, thanks to Greg VK6YEI. Without his considerable help I would have given up long ago and had the service provider install the software.

Fantastic!

As a footnote, my early experience of the Internet is fantastic. I had seen it briefly before, but now, with time to look around and learn, it really is something. For example, I have been listening to broadcast radio stations live from all around the world (that's right, live!) while roaming through the most incredible amount of information, all displayed with the most colourful presentation. As at the time of writing I have not yet connected to amateur radio repeaters that are on the net. Yes, you can connect to amateur repeaters and talk via the Internet to these systems. I have the software, downloaded from the Internet, but not the time to try it out as yet.

**21 Waterloo Crescent, Lesmurdie 6076*
VK6UU @ VK6BBR
will@vale.faroc.com.au
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VK QSL BUREAUX

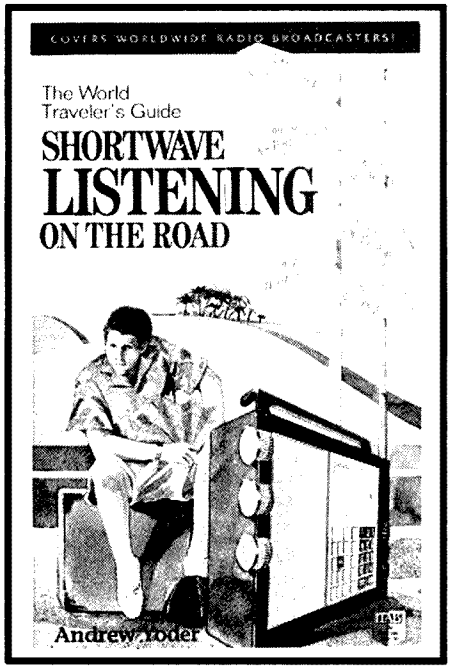
The official list of VK QSL Bureaux. All are Inwards and Outwards unless otherwise stated.

VK1		GPO Box 600 CANBERRA ACT 2601
VK2		PO Box 73 TERALBA NSW 2284
VK3	Inwards	Box 757G, GPO MELBOURNE VIC 3001
	Outwards	40G Victory Blvd ASHBURTON VIC 3147
VK4		GPO Box 638 BRISBANE QLD 4001
VK5		PO Box 10092 Gouger St ADELAIDE SA 5001
VK6		GPO Box F319 PERTH WA 6001
VK7		GPO Box 371D HOBART TAS 7001
VK8		C/o H G Andersson VK8HA Box 619 HUMPTY DOO NT 0836
VK9/VK0		C/o Neil Penfold VK6NE 2 Moss Court KINGSLEY WA 6026

■ Book Review

The World Traveler's Guide Shortwave Listening on the Road

Publisher: *TAB Books Division of McGraw-Hill*
Author: *Andrew Yoder*
Reviewed by: *Danny Vits VK3JDV*



Listening to shortwave broadcast stations on HF is still as popular as ever, despite the instant access information facilities on TV, computer infonets, BBSs, satellites, etc. Somehow, it gives the feeling of greater immediacy and reliability, and is apparently unaffected by the need to return high ratings.

Many amateurs in the past, and still some today, had their first introduction to the world of HF by turning the dial on the shortwave bands. This is made a lot easier today as most HF transceivers now incorporate a general coverage receiver.

The World Traveler's Guide – Shortwave Listening on the Road is not aimed at the radio amateur, but at anyone with an interest in listening to broadcast stations world-wide. In particular, it is for those travelling abroad wishing to stay in touch with home, or who are keen to explore other points of view.

The book offers a brief description of propagation, followed by a brief, but excellent, review of currently available, mostly portable, equipment. It even includes a review of equipment available for the shortwave-listening motorist.

Then follows a comprehensive listing of shortwave broadcasts in English, beginning with Albania and ending with Zimbabwe, including newcomers such as Moldova and Tajikistan. This section, which includes times and frequencies, is the core of the book, which is well worth buying for this feature alone. Although a lot of this information dates fairly quickly, it is surprising how many countries "adopt" certain frequencies. I have been listening to the BBC on 6195 kHz for as long as I care to remember.

Various appendices offer additional useful information such as comprehensive standard and summer time charts, line phase and voltages for countries around the world and, finally, a long listing of world-wide BBSs.

All in all, good value at the RRP price of $24.95. **ar**

■ History

A Visit to Newt W1BCR

George Cranby VK3GI remembers a meeting 33 years ago with a well-known ham of the day.*

The year was 1963 and my call had, one year previously, been changed from VK7GC to VK3GI. I was in the USA on business and had to spend about three weeks in Bristol, Rhode Island, the nearest biggish town to Newt's QTH. Having worked him from VK7 and VK3 many times, I called him on the 'phone and was promptly invited for a bite and a chat.

Despite having been given what appeared to be a very detailed route description, it took me some time to find Newt's QTH. The house in which he, a bachelor, lived all by himself, stood on top of a cliff overlooking, in a westerly aspect, the sea about 60 m below. A large telegraph pole stood next to the house and two further poles were positioned in the shallow water below. These poles carried an inclined V-beam with, if memory serves me right, about 150 m of wire (could have been more) in each arm and pointing directly to Australia.

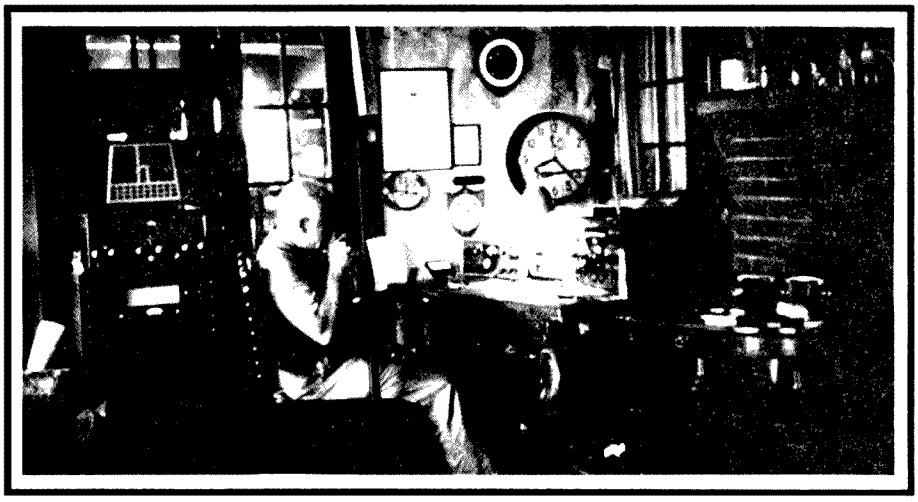
The house, as can be expected from an elderly bachelor, was thoroughly untidy, full of all manner of things such as chairs, tables, saucepans and crockery. The main and well set up items, however, were pieces of radio gear.

They comprised, among others, two complete sets of Collins gear, a Viking "Valiant" (anyone remember that) plus, in an adjacent room, a linear amplifier which Newt was not disposed to display. From the size of the visible parts, and the glow of the filaments, one could only deduce that the legal power limit was of no concern to Newt!

After a wondrous meal of perfectly cooked monster steak, salad and hash brown potatoes (then only known to people who had been to the USA – delicious), followed by strawberries and cream and big cups of coffee, we settled down to some operating.

In full accordance with Murphy's law the air was dead; we heard one weak Australian station, but no go. However, Newt eventually managed to hook up with an amateur on board a US aircraft carrier.

Now, Newt had been very popular with the Navy, having been their mainstay for third party traffic during the war (Newt had



The late Newt W1BCR in his shack.

been ineligible for war service due to some respiratory difficulty). After the war he had been presented with a gold pass giving him access to Navy Officers' messes all around the globe.

He asked the ham, a young sub-lieutenant, the name of his commanding officer, which turned out to be an Admiral Bill Collins. "Get me Bill to the mike", Newt demanded. One could almost hear the poor fellow on the other end shake in his boots. No, he couldn't possibly disturb the Admiral, who was having dinner! So Newt said,"just tell him that uncle Newt wants to talk to him". Two minutes later Admiral Bill Collins was on the mike!

After a little chat and the exchange of some pleasantries, he asked Newt to pass on some messages to his (the Admiral's) wife with details of his ETA home. After a ten minute chat, the Admiral returned to his dinner.

Talking to Newt of his early days in ham radio, it emerged that the origin of his oversize V-beam was a bet. Long before the war Newt said to a ham friend that one of these days he would talk to Australia, wherever that was, and his friend bet him that he couldn't. Newt, of course, eventually won the bet by constructing his enormous V-beam directed towards Australia. As old-timers will remember, he knew most Australian callsigns and names by heart.

Newt was a very lonely man and I guess that ham radio gave him the friends and human contacts that were missing from his life. I am happy to have been one of them.

PO Box 22, Woodend VIC 3442

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■ Try This

Use of IC-735 HF Transceiver for QRP Operation

Simon Buxton VK2EII describes a neat outboard unit to enable QRP operation.*

Others may be interested in this simple project to use an IC-735 or IC-731 HF transceiver for QRP work, as it took a fair amount of investigation to find out what to do and then make it work.

These rigs normally operate with a power output in the range of 10 to 100 watts which is controlled by means of a slider on the front panel. There is also an internal switch which halves the power output. I had heard of these rigs being used for QRP and, after enquiries to ICOM Australia and other sources who could offer no help beyond what was in the manual, I was finally advised by ICOM support in the US via the Compuserve network, what to do.

They suggested using the external ALC connection on the ACC(2) socket at the rear of the set where a voltage from -4 to 0 volts would control output from zero to the power level set on the front panel. ACC(2) is a 7 pin socket used to connect to an automatic ATU (the 8 pin ACC(1) socket could also be used as it contains similar connections but note that the pins are different).

My first attempt at this, using only a potentiometer across an external battery, gave only full power or nothing. A later attempt got it right. The voltage controlling the power is very sensitive and on my IC-731, only a small change of 0.1 volt or so in the region of 1.5 volts changes the output from zero to the set amount.

The circuit is shown in Figure 1. A value of three volts seems adequate to supply the voltage (as polarity is reversed, the internal supply cannot readily be used), whilst the 12 k resistors allow the 5 k linear potentiometer to operate over only a small voltage range. You may need to experiment with the resistor values to ensure that the potentiometer covers the control range required for your rig.

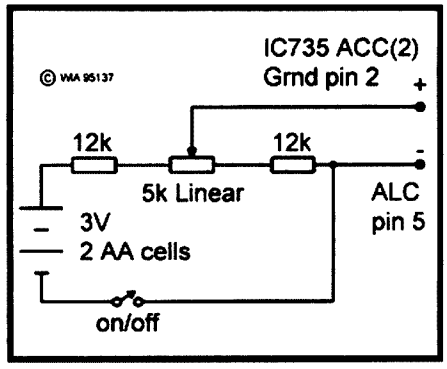

Figure 1 – Circuit of the outboard unit used to enable QRP operation of the IC-731 and IC-735 transceivers.

This circuit allows smooth control of power from 0 to 10 watts, with the front panel setting at minimum power. The output power can be read from either the P/O range on the rig's meter or from an external SWR/PWR meter in the antenna lead.

The unit may be built into a small PCB box and left connected to the rear socket, switching it on as required.

**104 Cameron Street, Edgecliff NSW 2027*

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ALARA

Sally Grattidge VK4SHE, ALARA Publicity Officer*

ALARAMeet

YLs from all States, and several countries, are on the road heading for Perth for the big get-together on 28 and 29 September. If you find yourself in the area at this time, or make a last minute decision to be there, don't forget to contact Bev VK6DE. Most of the activities have been booked ahead, but there may be some you can join at short notice; there will certainly be opportunities for you to meet those attending, and that is really what it is all about. Watch for cars flying black and gold ribbons and be sure to give them a wave.

New Subscriber

Graham VK4BB who will now be able to keep the VK4 news broadcast well informed of ALARA's activities.

Novice Contest

Bev VK4NBC, previous winner of the WIA VK Novice Contest, had a go again this year making a respectable 171 contacts, but missed out on first prize. Well done, Bev. I wonder how many other YLs were there or, like me, do they find out about contests after the event. No excuse, as they are well publicised in *Amateur Radio.*

DRLs

The District Radio Ladies are active as usual in the Rockhampton area and enjoyed a hot dish night on 8 June. Robyn VK4RL keeps the group together and involved, showing what can be done by one enthusiastic person and a small band of willing helpers. This group has its own T shirt, badge and net (first Thursday of the month at 8.30 pm local time on 3565 kHz).

Activity Days

The sixth of each month is a YL Activity Day, and YLs are invited to listen on the hour or call CQ YL on 14.288, 21.188 and 28.588 MHz. When first learning about ALARA, I listened and called a few times without much luck, and then forgot about it. I wonder if other YLs have done the same. As conditions improve, perhaps we should make an effort to revive the Activity Days. Listen and call on the frequencies to see who is there. Maybe a group could choose a time and band and have a monthly sched on the sixth of each month, inviting other YLs to join them, as checking the bands every hour can be tedious and it is easy to miss someone else doing the same.

Ooops!

While writing this, it occurred to me that ALARA's birthday must be fairly soon. It is, that is it was at the time, but by the time you read this the event will have passed. The official birthday is 26 July with a birthday net on the nearest Saturday - so next month I should be able to tell you about the net.

No News is Good News?

Maybe, but it makes for a very boring column. Something must be happening out there of interest to radio YLs, so please let me know about it via the above address or packet radio. Anything of interest to YLs will be most welcome - it does not have to relate to ALARA.

**C/o PO Woodstock, QLD 4816*
Tel: 077 788 642

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AMSAT Australia

*Bill Magnusson VK3JT**

National co-ordinator
Graham Ratcliff VK5AGR
Packet: VK5AGR@VK5WI
AMSAT Australia net:
Control station VK5AGR
Bulletin normally commences at 1000 UTC, or 0900 UTC on Sunday evening depending on daylight saving and propagation. Check-ins commence 15 minutes prior to the bulletin.

Frequencies (again depending on propagation conditions):

Primary 7.064 MHz (usually during summer).

Secondary 3.685 MHz (usually during winter).

Frequencies +/- QRM.

AMSAT Australia newsletter and software service
The newsletter is published monthly by Graham VK5AGR. Subscription is $30 for Australia, $35 for New Zealand and $40 for other countries by AIR MAIL. It is payable to AMSAT Australia addressed as follows:

AMSAT Australia
GPO Box 2141
Adelaide SA 5001

Six Monthly Amateur Radio Satellite Frequency and Mode Update

Here is a list of current amateur radio satellite frequencies and modes. Again I have kept the list minimal by (1) removing all reference to satellites that are defunct and (2) listing only the mode A transponders on the three most popular Russian RS satellites.

The full transponder list for the RS satellites is long and somewhat repetitive. If you are an RS satellite buff you can refer to the January 1995 column for full details of all the transponder frequencies and modes for that series.

Preliminary Keps for Phase 3D

This set of keps was published in the *AMSAT Journal* Vol 19/2. It relates to the position of Phase 3D immediately after the second motor firing to insert it into its (almost) final orbit. Please note that after this firing its inclination will drift slightly north to finally rest at 63.43 degrees. At this inclination the final motor firing will take place to stabilise the satellite in that orbit.

Phase 3D will have a 47,000 km by 4,000 km orbit resulting in a 3x2 repetition rate. It will do one revolution each 18 hours or three revs in two days. The orbits should follow this pattern very closely. Place these keps into your tracking program to get an idea of the orbit and the communication potential of Phase 3D.

Satellite:	AMSAT P3D
Catalog number:	99934
Epoch time:	96 260.25523447
Element set:	3
Inclination:	60.0203 deg
RAAN:	342.7876 deg
Eccentricity:	0.6752895
Arg of Perigee:	180.1221 deg
Mean Anomaly:	179.5089 deg
Mean Motion:	1.51063968 rev/day
Decay Rate:	2.00000e-008 rev/day/day
Epoc rev:	2

**RMB 1627, Milawa VIC 3678*
CompuServe: 100352,3065
Internet: 100352.3065@compuserve.com
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Satellite	Uplink (MHz)	Downlink (MHz)
OSCAR 10 (AO-10)		
General Beacon (Carrier only)		145.808 (approx)
Mode B (SSB,CW-Inverting)	435.030-435.180	145.825-145.975
Do NOT use the transponder if the beacon signal is "FM-ing" due to poor sun angles. This satellite is no longer under ground control.		
OSCAR 11 UoSAT-2 (UO-11)		
Beacon (1200 AFSK,FM) telemetry/bulletin		145.826
Beacon (1200 AFSK,FM)		435.025
Beacon (1200 AFSK,FM)		2401.500
Radio Sputnik 10 (RS-10)		
Mode A (SSB,CW-Inverting)	145.86-145.90	29.360-29.400
Beacon/Robot (CW)		29.357
Beacon/Robot (CW)		29.403
Robot Mode A (CW)	145.82	29.357 or 29.403
Radio Sputnik 12 (RS-12)		
Mode A (SSB,CW-Inverting)	145.91-145.95	29.410-29.450
Beacon/Robot (CW)		29.408
Beacon/Robot (CW)		29.454
Robot Mode A (CW)	145.831/.840	29.408 or 29.454
AMSAT-OSCAR-13 (AO-13)		
General beacon (400b PSK, CW, RTTY)		145.812
Engineering Beacon (400b PSK MA 0 to MA 40)		145.985
Mode B (SSB,CW-Inverting)	435.420-435.570	145.825-145.975
Mode S (SSB,CW,FM)	435.601-435.639	2400.711-2400.747
Mode S Beacon (PSK)	2400.664	
Radio Sputnik 15 (RS-15)		
Mode A (SSB,CW non-invert)	145.858-145.898	29.354-29.394
Beacon (CW)		29.352.5
AMSAT-OSCAR-16 (AO-16) Callsign = PACSAT		
Mode J (1200 BPSK BBS,FM-SSB)	145.90/92/94/96	437.025 or 437.050
Mode S (1200 BPSK BBS,FM-SSB)		2401.1 or 2401.1428
AMSAT-OSCAR-17 (DO-17) (Dove)		
Beacon 1 (1200 bps AFSK,Digital Voice,FM)		145.82516
Beacon 2 (1200 bps AFSK,Digital Voice,FM)		145.82438
Beacon 3 (1200 BFSK,Digital Voice,SSB)	2401.2205	
AMSAT-OSCAR-18 (WO-18) (Webersat)		
Mode J (1200 BPSK,RC,SSB)	144.30-144.50	437.075 or 437.10
ATV (TV,AM)	1265.000	
AMSAT-OSCAR-19 (LO-19) Callsign = LUSAT		
(1200 PSK,FM-SSB)	145.84/.86/.88/.90	437.15355 or 437.1258
FUJI-OSCAR-20 (JAS-1b) (FO-20) Callsign = 8J1JBS		
Beacon JA (CW,Analog)		435.795
Mode JA (SSB,CW)	145.90-146.00	435.80-435.90
Beacon JD (CW)		435.910
Mode JD (1200 BPSK,FM-SSB)	145.85/.87/.89/.91	435.910
UoSAT-OSCAR-22 (UO-22)	**Broadcast Callsign**	**= UoSAT5-11**
	BBS Callsign	**= UoSAT5-12**
Mode JD (9600 Baud FSK,FM)	145.90/.975	435.120
KITSAT-OSCAR-23 (KO-23)	**Broadcast Callsign**	**= HL01-11**
	BBS Callsign	**= HL01-12**
Mode JD (9600 Baud FSK,FM)	145.85/.90	435.175
KITSAT-OSCAR-25 (KO-25)	**Broadcast Callsign**	**= HL02-11**
	BBS Callsign	**= HL02-12**
Mode JD (9600 Baud FSK,FM)	145.870	436.500
ITAMSAT-OSCAR-26 (IO-26)	**Callsign = ITMSAT**	
Mode JD 1200 baud PSK	145.875	435.867
	145.900	435.822

As always, the list is as accurate as I can determine at the time of writing. Please let me know of any errors or omissions.

Awards

*John Kelleher VK3DP - Federal Awards Manager**

A high percentage of my active "customers" have realised DXCC totals in excess of 275 "countries". Talk around the bands has been about the bottom of the current cycle 22, and if it will ever improve. Those last 30 odd DXCC countries are the most elusive, probably because the core of DXpeditioners are of the opinion that, under the present ionospheric conditions, such expeditions would be dismal failures.

From the pages of the latest DXCC yearbook, here is a list of the 45 most wanted "countries".

1. P5 North Korea.
2. E3 Eritrea
3. VK0 Heard Island.
4. 7O Yemen
5. A5 Bhutan
6. Z3 Macedonia
7. 5A Libya
8. VU Andaman & Nicobar Islands.
9. T9 Bosnia & Herzegovina.
10. FR/T Tromelin Island.
11. OK Czech Republic.
12. VK0 Macquarie Island.
13. SV/A Mount Athos.
14. ZL8 Kermadec Island.
15. OM Slovak Republic.
16. FR/G Glorioso Island.
17. VU Laccadive Islands.
18. 3V8 Tunisia.
19. ZS8MI Prince Edward & Marion Islands.
20. ZL9 Auckland & Campbell Islands.
21. 3B7 Agalega & St Brandon Islands.
22. 3Y Bouvet Island.
23. FR/J Juan de Nova, Europa.
24. FT5W Crozet Island.
25. FT5Z Amsterdam & St. Paul Islands.
26. TN Congo.
27. VP8 South Georgia Island.
28. TT Chad.
29. 3C0 Pagalu Island (Annobon).
30. FT5X Kerguelen Island.
31. PY0 St Peter & Paul Rocks.
32. 9U Burundi.
33. XW Laos.
34. XZ Burma (Myanmar).
35. PY0 Trinidade & Martin Vaz Islands.
36. HK0 Malpelo Islands.
37. 9A Croatia.
38. ST0 South Sudan.
39. S5 Slovenia.
40. T31 Central Kiribati.
41. KH5K Kingman Reef.
42. 3D2 Conway Reef.
43. 5R8 Madagascar.
44. S2 Bangladesh.
45. VP8 South Orkney Islands.

This list does continue on to the 100 most wanted countries, but space precludes total publication. This list, however, should only serve as a guide to those who are interested. A quick survey of the above list shows that the "most wanted" are predominantly islands and, as such, will require the services of DXpeditionary groups.

The Bulgarian Federation of Radio Amateurs (BFRA) provides an interesting Awards program of six attractive certificates which are available to all amateurs throughout the world for two-way contacts or SWL reports on CW, SSB/AM, or mixed. Applications should take the form of a GCR list, verified by two licensed amateurs or local Club authorities, specifying stations worked, date, time (UTC), band and mode, together with a fee of 10 IRCs, or equivalent, to: BFRA Award Manager, PO Box 830, 1000 Sofia, Bulgaria.

Republic of Bulgaria Award

For this certificate, QSOs/SWL reports after 1 January 1965 are valid. Applicants from DX countries will be required to make 20 QSOs with different LZ stations, 10 with LZ1/3/5 and 10 with LZ2/4/6 irrespective of the band worked.

The Five Band LZ Award

QSOs/SWL reports after 1 January 1979 are valid. A total of 10 QSOs is required. One QSO with LZ1/3/5, and one QSO with LZ2/4/6 on all bands (3.5, 7, 14, 21 and 28 MHz).

The W 100 LZ Award

QSOs/SWL reports after 1 January 1979 are valid. 100 QSOs with different LZ stations during one calender year are required.

The W 28 Z ITU Award

QSOs/SWL reports after 1 January 1979 are valid. Confirmed contacts/reports with the following countries from ITU Zone 28 are required: DL, HA, HB9, HB0, HV, I, IS0, LZ, OE, OK, OM, SP, SV, SV5, SV9, SY/A, S5, TK, T7, T9, YO, YU, ZA, Z3, 9A, 9H and 4UHTU.

The award will be issued in three classes: Class 1, 28 QSOs with different stations in 20 countries; Class 2, 28 QSOs with different stations in 16 countries; and Class 3, 28 QSOs with different stations in 10 countries. In addition, five QSOs with different LZ stations are required for each class.

The Black Sea Award

QSOs/SWL reports after 1 January 1979 are valid. 60 QSOs/SWL reports with different amateur stations located in countries bordering the Black Sea are required. An additional condition is that a minimum of one QSO/SWL report is required with each of the following countries: LZ, TA, YO, UA6, and US.

The Sofia Award

QSOs/SWL reports after 1 January 1979 are valid. 100 points for contacts with amateur stations situated in Sofia, the capital city of Bulgaria, are required. Calculation of the points should be made from the following table:

For applicants from	3.5	7	14	21	28
Europe:	2	2	1	2	2
Other continents:	15	5	1	2	3

Each station may be worked/reported once per band irrespective of the mode.

Now, a little gem I found amongst the archives. One to paste on the wall when G land is again heard.

Radio Club of Thanet - The Seaweed Award

This award is available to all amateurs and SWLs on any band or mode. Six points are required, two points for G2IC and one point for Seaweed members, from the following: G0OPL, G4GUD, G4RNJ, G4PTE, G4SBD, G0ABY, G0AHA, G0CBY, G0CEY, G0CTQ, G0FTB, G0HWG, G0JIF, G0IQW and G0NVC. The fee is one pound sterling, or five IRCs, or $6.00, plus a large SAE for DX applicants.

The Radio Club of Thanet conducts nets during the English summer at 0800z and winter 0900z on 28.845 MHz. Also the first Friday in the month at 1400z on 7.070 MHz and the third Friday at 1400z on 28.445 MHz. The Awards Manager is G0CBY QTHR.

Small, Simple, Powerful

"... a great little radio." R&C June 96

The exciting new FT-51R is Yaesu's third generation 2m/70cm dual-band FM hand-held, with more features and even easier operation than ever before, and all in a size that fits comfortably into the palm of your hand. Its tough polycarbonate front panel and diecast rear casing combines cellular styling with professional grade ruggedness for reliable everyday use, while its new dual-processor design provides really useful new functions such as a Spectrum Scope and scrolling Help messages.

Measuring just 123 x 57 x 26.5mm (H.W.D), the FT-51R provides 2m/70cm Amateur transmit coverage, plus extended receiver coverage of 110-180MHz and 420-470MHz, with selectable AM for Airband reception. The FT-51's two receivers allow flexible VHF+VHF, UHF+UHF, or VHF+UHF operation, while the efficient FET technology provides 2.0W RF output on 2m and 1.5W output on 70cm from the supplied 4.8V 600mA/H Nicad battery pack. Up to 5 selectable Tx power levels are available (including an economy 20mW level), with 5W RF output available when using an optional 9.6V battery pack or mobile power adaptor.

To find local activity easily, the FT-51R's "Spectrum Scope" provides a visual indication of nearby busy frequencies, so you can keep an eye on whether a repeater or simplex channel may be in use. The Spectrum Scope can also be used in memory mode, and will even give an indication of signal strength. In addition to twin VFOs per band, the FT-51R also provides up to 120 memory channels, and alpha-numeric names (eg. repeater locations or callsigns) can be stored instead of a frequency if required.

For very straightforward operation the FT-51R provides scrolling User Help text messages that guide you through most function settings, as well as a selectable Auto Repeater Offset function to suit the Australian band plans. Other features include a range of battery life extenders (Auto battery saver, TX Save and Auto Power Off), CTCSS encode and decode, extensive DTMF-based selective paging, seven selectable frequency Step sizes, and an LCD voltmeter so you can monitor battery performance under load and estimate remaining battery life.

The FT-51R is supplied with a 600mA/H Nicad pack, AC charger, belt-clip, and an efficient hand-held antenna. To learn more about this exciting new transceiver, why not ask for a copy of our colour brochure and 8-page colour Product News booklet, or visit your local Ham store for a demonstration.
Cat D-3622

FT-51R shown actual size

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WIA DXCC

Phone

Honour Roll

Callsign	Countries
VK5MS	328/381
VK5WO	328/360
VK6LK	328/352
VK3QI	328/341
VK4OH	328/334
VK5QW	328/333
VK3DYL	327/332
VK6RU	326/380
VK4KS	326/372
VK4LC	326/372
VK6HD	326/350
VK4RF	326/344
VK3AKK	326/337
VK1ZL	326/331
VK2FGI	326/331
VK5XN	325/345
VK4UA	325/338
VK5EE	322/327
VK6NE	321/336
VK3AMK	319/337
VK2AVZ	318/326
VK3YJ	318/323
VK3CSR	317/325
VK3OT	315/327
VK2DEJ	315/320

General Listing

VK7BC	314/323
VK4AAR	314/317
VK6AJW	312/317
VK6VS	312/315
VK6PY	307/312
VK5WV	306/325
VK3RF	304/311
VK6RO	302/307
VK3JI	298/312
VK4DP	294/305
VK2WU	292/296
VK4BG	287/302
VK3CYL	283/290
VK3DU	282/290
VK5OU	281/286
VK4OD	276/279
VK3VU	272/275
VK3GI	264/267
VK3VQ	259/276
ZS6IR	259/262
VK3DP	252/255
VK4QO	251/255
VK2PU	244/247
VK6YF	238/241
VK2CKW	234/237
PS7AB	233/237
VK4SJ	231/
VK4CY	227/228
VK3DS	226/336
VK2ETM	226/227
VK5IE	219/221
VK5BO	218/222
VK3CIM	218/221
VK3UY	217/217
VK6APW	216/217
VK3DD	214/217
VK4ICU	211/213
VK4XJ	204/216
VK3DVT	201/203
ON6DP	200/202
VK4KRP	199/201
VK2VFT	198/201
VK4DDJ	198/198
VK4LV	194/196
VK4AU	190/190
VK6BQN	186/190
VK4BAY	177/179
KA1TFU	176/179
WA1MKS	171/
VK7TS	170/171
VK2BQS	162/165
VK4IL	161/
VK2NO	157/
VK4IT	153/154
VK4CHB	152/153
7J1AAL	149/150
VK4ARB	149/150
VK4DMP	147/148
VK3DNC	141/142
VK3DQ	141/
VK2SPS	139/141
VK6LC	139/140
VK2EQ	139/
VK6LG	135/135
TI2YLL	129/
VK4EJ	125/127
LU5EWO	125/
SM6PRX	122/126
VK3TI	122/125
VK7WD	115/116
VK3BRZ	114/116
VK4VIS	113/115
VK4NJQ	111/115
VK6NV	111/113
VK5GZ	108/110
VK4LW	105/
VK5UO	104/106
N4JED	104/105
VK3EHP	103/105
JN6MIC	103/104
VK4BJE	102/104
JH3OHO	101/103
VK2CMV	100/102
VK5CJE	100/102
VK6APH	100/101

CW

Honour Roll

Callsign	Countries
VK3QI	328/339
VK6HD	324/344
VK3XB	315/349

General Listing

VK5WO	307/322
VK4RF	306/332
VK3KS	301/328
VK6RU	275/319
VK3JI	267/291
VK3AKK	267/272
VK3DQ	245/
VK4LV	233/240
VK3DP	232/235
VK7BC	230/239
VK2CWS	222/224
VK4DA	221/223
VK3CIM	212/213
VK4DP	205/216
VK4OD	192/195
VK6PY	191/194
VK6MK	188/190
VK4ICU	183/
VK5GZ	172/174
VK6HW	166/169
VK4CY	165/
VK5BO	159/184
VK3DNC	154/157
VK5UO	154/155
VK4XJ	150/163
VK4UA	143/155
EA6AAK	138/
VK7DQ	137/138
VK4KS	126/134
VK7TS	125/
VK4AAR	124/126
VK2TB	123/125
VK3AGW	119/120
VK4CMY	117/119
VK5BWW	110/111
VK5QJ	107/109
VK2FYM	106/108
VK8KV	102/103
VK2CXC	101/103

Open

Honour Roll

Callsign	Countries
VK5WO	328/364
VK3QI	328/342
VK5QW	328/332
VK6RU	326/380
VK4KS	326/372
VK4RF	326/361
VK6HD	326/351
VK3AKK	326/337
VK4UA	325/340
VK3JA	324/371
VK3AMK	322/340
VK7BC	319/327
VK3OT	318/330
VK3XB	317/346

General Listing

VK4AAR	314/317
VK3JI	311/339
VK4DP	310/323
VK6PY	309/316
VK6RO	308/313
VK3DP	299/302
VK4BG	294/312
VK4OD	287/290
VK3CYL	283/290
VK3VQ	274/291
VK4CY	272/275
VK3UY	272/274
VK5BO	264/301
VK3DQ	262/
TF5BW	260/264
VK3CIM	252/255
VK4LV	251/258
VK2ETM	239/240
VK5UO	238/241
VK4ICU	238/240
VK4XJ	233/249
VK2CWS	228/230
VK6APW	223/224
VK4DA	222/224
WA5VGI	216/218
VK2VFT	202/205
VK7TS	201/202
VK6MK	194/196
VK3DNC	185/187
VK5GZ	182/184
VK2BQS	176/179
PR7CPK	174/175
VK6NV	165/166
VK4CHB	160/162
VK2NO	158/
VK2CXC	150/152
VK6LC	142/144
VK2SPS	140/142
VK4NJQ	133/139
VK4EZ	129/138
YB8GH	127/129
VK7HV	114/117
VK5BWW	111/112
VE7BS	106/107
VK3COR	102/104
VK3VB	102/104
SM7WF	101/

RTTY

Callsign	Countries
VK3EBP	210/212
VK2BQS	115/117

**PO Box 2175 Caulfield Junction 3161*

ar

Contests

*Peter Nesbit VK3APN - Federal Contest Coordinator**

Contest Calendar Aug – Oct 96

Aug 3	Waitakere 80 m CW Sprint	(June 96)
Aug 3	West Australian Annual Contest (CW)	(June 96)
Aug 3/4	YO DX Contest	
Aug 10/11	Worked All Europe (CW)	(July 96)
Aug 17/18	Remembrance Day Contest	(July 96)
Aug 17/18	Keyman's Club of Japan (CW)	(July 96)
Sep 1	Bulgarian DX Contest	
Sep 1	Panama Anniversary Contest (SSB)	
Sep 7/8	All Asia DX Contest (Phone)	(May 96)
Sep 14/15	Worked All Europe (Phone)	(July 96)
Sep 21/22	SAC DX (CW)	
Sep 28/29	SAC DX (Phone)	
Sep 28/29	CQ-WW RTTY DX Contest	
Oct 5/6	VK/ZL/Oceania DX Contest (Phone)	
Oct 6	RSGB 21/28 MHz Contest (Phone)	
Oct 12/13	VK/ZL/Oceania DX Contest (CW)	
Oct 19/20	Worked All Germany Contest (Mixed)	
Oct 20	RSGB 21/28 MHz Contest (CW)	
Oct 26/27	CQ-WW DX Contest (Phone)	

Having purchased a modem and engaged an ISP (Internet Service Provider) a couple of months ago, I've had the opportunity to observe the net close hand.

One notices several parallels with amateur radio. For example, the trials and tribulations of getting the hardware and software to work properly are reminiscent of getting a new rig and antenna up and running. Another is the huge variety of sites, and the range of information available on them. With a click of the mouse, you're in Brazil, Finland, or wherever. It's all so effortless, a bit like a really good opening on 20 or 15 m.

You lose all track of time searching, reading, and downloading information. Before you know it, your daily quota is up, and "click" goes the modem as the ISP kicks you off line. This enforced "QRT" is probably just as well, otherwise you could easily be there half the day, without even realising it. Once again, a bit like ham radio!

One of the net's finest features is, of course, e-mail. This does away with all that printing of letters and envelopes, rushing to the post office in your lunch break, spending money on stamps, and worrying about mailing delays. You simply type the message, click on send, and it's on the other side of the world in a matter of minutes. It's so easy it's disgraceful!

Having used the net many times now, there is no doubt in my mind that it represents a serious, albeit manageable, threat to our hobby. The means of communication are not that dissimilar, and there is a tangible feeling of achievement as bit by bit, one establishes a reliable and efficient setup, and learns the basics of net navigation.

The areas where the two mediums differ is, unfortunately, to our detriment. To get on the net, you don't need to: pass an exam, pay licence fees, buy expensive and highly specialised equipment, worry about antenna permits, erect antennas, try not to fall off the tower, put up with atmospherics and the vagaries of propagation, deal with cranky neighbours and TVI, and have a nervous attack whenever there's a windstorm. It's easier to justify the purchase of a computer and modem to the rest of the family, especially as such items can be used by them at any time, whereas an amateur station can't. To top it off, a computer even uses less electricity (although the way computers are going, that advantage may soon evaporate)!

As amateurs, we need to think long and hard about how to keep others in the fold, and to attract outsiders who might stray our way. It's going to be an uphill battle, but I don't think lowering the standards is the way to go, as some people would have us believe. We need to let the net surfers know that there is another communications medium out there which is much more personal, more highly skilled, and far more exclusive: amateur radio.

One very good way is to advertise our presence on the net at every opportunity, and it is pleasing to note many good amateur radio sites springing up. A couple of WIA divisions already have web pages, and of course there are many overseas ones as well, including those of RSGB, ARRL, CQ, and many others. Two very popular sites (for contesting and DX) are *cq-contest-request@tgv.com*, which is an e-mail reflector, and *contesting.com* which is some sort of communal home page, which I have yet to fully figure out.

I'm sure there are many other good sites as well, and would be pleased to hear of any you have discovered, especially those where one can post contest rules and downlòad results (and not just for US contests)! On the other hand, if you're new to the net, try sending an e-mail message to *cq-contest-request@tgv.com* containing the word *subscribe*. Then, sit back and watch all the messages pour in. It's like a big round table with several discussion threads; fascinating!

Finally, good luck in the RD Contest this month, and may your team win!

Thanks this month to VK1PJ, OE4BKU, OH6YF, and CQ. Until next month, good contesting!

73s, Peter VK3APN

Bulgarian DX CW Contest

1 September, 0000-2400z Sun

This contest runs on the first Sunday of September each year on 80-10 m, CW only. Exchange RST plus ITU zone (P2 = 51, VK4/8 = 55, VK6 = 58, VK1/2/3/5/7 = 59). Score six points for each QSO with an LZ, three points for each QSO outside your WAC continent with a non-LZ, and one point for each QSO within your WAC continent. SWLs score three points if both exchange numbers are copied, and one point if only one exchange number is copied. Multiplier equals the total ITU zones worked on each band. The final score equals the total QSO points (all bands) times the total multiplier (all bands). Send logs postmarked within 30 days (1 Oct) to: Central Radio Club, Box 830, 1000 Sofia, Bulgaria.

Panama Anniversary Contest (SSB)

1 September, 0000-2359z Sun

The Panama Radio Club invites all radio amateurs to participate in their 25th annual contest. The only category is single operator, SSB, all band 40/20/15 m. Exchange RS plus serial number. Score two points for QSOs with HP stations, and one for others. The multiplier is the total DXCC countries worked on all bands. Certificates of participation will be sent to all amateurs working 10 or more HP stations, upon receipt of three IRCs, and a plaque to the highest scoring station in each continent. Send log postmarked by 29 November to: Radio Club Panama Contest, Box 10745, Panama 4, Panama.

Scandinavian Activity Contest

21/22 September (CW), 28/29 September (Phone); 1500z Sat – 1800z Sun

The CW and phone sections of this contest run on the 3rd and 4th full weekends of September respectively, each year. The object is for amateurs worldwide to contact as many stations in

Scandinavia as possible, on 80-10 m (no WARC bands). Scandinavian prefixes are LA/LB/LG (Norway); JW; JX; OF/ OG/OH/OI (Finland); OF0/OG0/OH0 (Aaland Isl); OJ0 (Market Reef); OX; OY; OZ; SI/SJ/SK/SL/SM/7S/8S (Sweden); and TF.

Categories (all band only) are single operator; single operator QRP (max 10 W I/P); multi-operator single transmitter; and SWL. Exchange RS(T) plus serial number starting at 001. For each QSO, score one point on 20, 15 and 10 m, and three points on 40 and 80 m. The multiplier is the number of call areas (0-9), not prefixes, for each Scandinavian country worked on each band. Portable stations without a district number count as area 0, eg G3XYZ/LA counts as LA0. OH0 and OJ0 are separate call areas. The final score is total QSO points (all bands) times total multiplier (all bands).

Use standard format for logs and summary sheets. Show duplicate QSOs with 0 points. Dupe sheets are required for 200+ QSOs. Forward separate logs for CW and phone sections. Logs on DOS disk are welcome, and must be in ASCII, one QSO per row, and labelled with the call, contest name, section/s, and contest date. Include an SASE if you want your disk returned. Summary sheet must be on paper. The mailing address alternates between EDR (Denmark), SRAL (Finland), SSA (Sweden), and NRRL (Norway) in that order. For 1996, send logs postmarked by 31 Oct to: SSA HF Contest Manager, Jan-Eric Rehn SM3CER, Lisataet 18, S-863 00 Sundsbruk, Sweden. Comprehensive awards to top scoring stations.

CQ-WW RTTY DX Contest

28/29 September, 0000z Sat – 2400z Sun

In this contest, the object is to contact as many stations worldwide as possible using digital modes (Baudot, ASCII, AMTOR (FEC & ARQ), packet on 80-10 m (no unattended operation or operation through gateways or digipeaters), etc. Note new rule: all stations may now operate for the full 48 hours.

Categories are: Single operator unassisted, single and multiband; Single operator assisted, all band; Multi-operator single Tx, all band ("10 minute" rule applies to this category EXCEPT that one – and only one – other band may be used during the 10 minute period, if – and only if – the station worked is a new multiplier); Multi-operator multi Tx, all band. Single operator entrants can enter the low power section (up to 150 W) or high power (more than 150 W).

Stations may be contacted only once per band, regardless of the mode used. Send RST plus CQ zone; W/VE will send RST, state or area, and CQ zone. Count one point for each QSO with stations in your own country, two points for each QSO outside your country but inside the same WAC continent, and three points for each QSO with stations outside your continent. On each band, the multiplier equals the sum of US states (max 48) and Canadian areas (max 13) *PLUS* DXCC countries (including W and VE) *PLUS* CQ zones (max 40). Note: KL7 and KH6 are claimable as country multipliers only, not state multipliers. Canadian areas are VO1, VO2, VE1 (NB), VE1 (NS), VE1 (PEI), VE2, VE3, VE4, VE5, VE6, VE7, VE8 and VY. The final score equals total QSO points times total multiplier from all bands.

Submit a single summary sheet including scoring calculations for all bands, plus for each band a separate log, duplicate check list, and multiplier check sheet. Send logs postmarked by 1 December to: Roy Gould KT1N, CQ WW RTTY Contest Director, Box DX, Stow, MA 01775, USA (Box "DX" is not a misprint!) A comprehensive range of plaques and certificates is offered.

Results of 1994 CQ-WW Phone DX Contest

(call/band/score/QSOs/zones/countries)

High Power:					
VK5GN *	A	2,066,038	2067	110	237
VK3TZ *	A	1,133,328	1068	116	220
VK2XT	A	123,414	295	46	88
VK2ARJ*	21	248,084	792	29	80
VK5OE	14	3,268	33	17	21
VK3AKK*	7	201,977	629	32	77
Low Power:					
VK3PU *	A	305,136	531	70	138
VK3DXI	A	99,040	224	55	105
VK2SXX	A	32,490	137	39	51
VK4ICU	28	20,938	130	20	38
VK8BE	28	2,616	109	8	16
VK2AYD*	21	105,120	412	28	62
VK4OD	21	4,840	43	13	27
VK3SM	14	9,328	77	21	32
Single Op Assisted:					
VK2VM	A	23,718	127	23	44
Multi Op Single Tx:					
VK1DX	*	1,758,200	2107	100	198
VK4MZ	*	1,288,803	1310	114	239
VK4SSB		849,285	1248	84	159
P20WW	*	2,462,528	2441	107	246

Results of 1994 CQ-WW RTTY DX Contest

(section/score/QSOs/mult):

VK6HD *	SOA	288,756	426	234
VK5GN	SOA	82,062	201	141
VK3DXI	SOA	48,450	168	102
VK8BE	SO14	768	16	16
VK2BQS	SO14	702	16	18
VK6GOM *	MO	170,262	367	162

(ops VK6GOM, VK6APW and VK6ZH)

Results of 1996 John Moyle Field Day Contest

Presented by Phil Rayner, VK1PJ

I am pleased to report that the President's Trophy, awarded to the single portable operator with the highest CW score, goes to VK4EMM John Loftus, who achieved a score of 290 points in the six hour CW HF, portable section. Well done John!

I would like to thank the following home stations for taking part in the contest, which is very much appreciated by all the portable operators who put a lot of effort into their operations. Thanks to VK2RJ, VK3ALD, VK4AJH, VK4EJ, VK4EWR and VK4SL.

The results are shown in the table below. Stations with an asterisk next to their score have been awarded a certificate. It was quite difficult selecting the certificate winners, as I am not a believer in awarding certificates to everyone, and had to come up with a formula which was fair but also provided some degree of performance indication. After many trials I selected a simple approach. Considering the operating conditions and number of participants, I set a benchmark of 10 points per hour (because I operated with VK1ACA, I had first hand experience of what was reasonable). This meant that not only did stations have to achieve one of the top three positions in their section, but they also had to achieve a minimum of 60 or 240 points, in the six and 24 hour sections respectively. This meant that I was unable to award certificates for all sections. My approach was fairly liberal, however, and I would appreciate any constructive feedback from participants.

Six Hour Results:

Columns: 1. Callsign
2. Multi/Single
3. Mode (All, Phone, CW)
4. Band (All, HF, VHF)
5. Score

VK4XY	Mult	All	HF	316	*
VK2HZ	Mult	All	HF	182	*
VK2FRE	Mult	Phone	All	924	*
VK4YH	Mult	Phone	All	644	*
VK2BOR	Mult	Phone	All	20	
VK5ARC	Mult	Phone	HF	304	*
VK3SAA	Mult	Phone	VHF	1310	*
VK3JMD	Mult	Phone	VHF	922	*
VK4WIZ	Mult	Phone	VHF	792	*
VK5CC	Sngl	All	All	14	
VK2DXV	Sngl	All	VHF	36	
VK4EMM	Sngl	CW	HF	290	* Trophy
VK4OE	Sngl	Phone	All	1070	*
VK2BGF	Sngl	Phone	All	124	*
VK3KTO	Sngl	Phone	VHF	466	*
VK2ANK	Sngl	Phone	VHF	300	*
24 Hour Results					
VK4WIS	Mult	All	All	2142	*
VK4WIP	Mult	All	All	1832	*
VK6ANC	Mult	All	All	1780	*
VK1ACA	Mult	All	HF	772	*
VK4CHB	Mult	All	HF	444	*
VK4WIT	Mult	All	HF	150	
VK3ER	Mult	Phone	All	3480	*
VK3APC	Mult	Phone	All	2050	*
VK3FRC	Mult	Phone	All	564	*
VK2FFG	Mult	Phone	All	314	*
VK4WIE	Mult	Phone	VHF	4854	*
VK4FW	Sngl	CW	HF	179	
VK5AFO	Sngl	Phone	All	342	*
VK1GL	Sngl	Phone	All	340	*
VK4EV	Sngl	Phone	HF	98	
VK5BW	Sngl	Phone	VHF	1992	*

Thanks to those who sent their logs on floppy disk, which really made things a lot easier. Although a couple of paper logs this year were a bit untidy and spattered with coffee, overall they were a big improvement from the ones I received when I first started managing this contest.

This year I went out with the crew at VK1ACA. Saturday was miserable, with horizontal rain and very strong winds. We could do no more than sit in the cars and wait. However, we eventually had to get out and set up, amidst accusations of "whose @&*! idea was this" etc, with everyone claiming that someone else was to blame. Although we were in Canberra, even all the "hot air" there did not protect us! Luckily, from what I hear, not everyone

had it as bad. For instance, when the VK4s say it is raining, it only does so because they "need it"!

Rule Changes for Next Year

Next year (15/16 March 1997), the following changes will take effect until propagation and participation improves:

1. The 24 hour and six hour sections will be replaced by a single 12 hour section, commencing at 0900 UTC on Saturday evening, and finishing at 2100 hours UTC on Sunday morning.

2. Multi-operator stations will automatically be classed as all band, all mode. The single operator sections will remain unchanged.

1996 VK/ZL/Oceania DX Contest

This contest takes place each year on the 1st and 2nd full weekends of October (Phone and CW sections respectively). For 1996, the dates will be:

Phone: 5/6 October 1996, 1000 UTC Saturday to 1000 UTC Sunday

CW: 12/13 October 1996, 1000 UTC Saturday to 1000 UTC Sunday

Object: The object is for stations throughout the world to contact as many stations as possible in VK, ZL and Oceania (WAC boundaries apply), on 80, 40, 20, 15 and 10 m. Contacts between different countries in Oceania are permitted, but contacts within the same country are not permitted. Note that 160 m contacts are no longer valid for this contest.

Categories: Single operator all band; multi-operator all band; and SWL. Single operator stations are where one person performs all operating, logging, and spotting functions.

Exchange: RS(T) plus a three or four digit number starting at 001 and incrementing by one for each contact.

Multiplier: On each band this is the number of prefixes worked on that band. A "prefix" is the letter/numeral combination forming either the first part of the callsign, or else the normal country identifier for stations using their home callsign in another DXCC country. For example: W8, AG8, HG7, HG73 are all separate prefixes. The prefix for both N8ABC/KH9 and KH9/N8ABC is KH9. Portable designators without numbers are assumed to have zero after the letter prefix, eg N8ABC/PA becomes N8ABC/PA. Any calls without numbers are assumed to have a zero after the first two letters, eg RAEM becomes RAEM. Suffixes indicating maritime mobile, mobile, portable, alternate location, and licence class do not count as prefixes (eg /MM, /M, /P, /A, /E).

Scoring: For each contact score 10 points on 80 m; five points on 40 m; one point on 20 m; two points on 15 m; and three points on 10 m. The final score will be the total QSO points multiplied by the total number of prefixes worked. The same prefix can be claimed on different bands.

Logs: Use a separate log for each band, with times in UTC. Show new prefix multipliers the first time they are worked. Logs should be checked for duplicates, correct points, and multipliers. Logs should be accompanied by a list of prefixes worked on each band, and a summary sheet showing callsign, name, address, category, number of valid QSOs, points and multipliers on each band, claimed score, and a signed declaration that contest rules and radio regulations were observed. Logs may also be submitted on DOS disk in ASCII format, although the summary sheet must be on paper. Comments and interesting anecdotes are invited.

SWL Logs: SWL logs should show date/time, the callsign of the station heard, the callsign of the station being worked, RS(T) and serial number sent by the heard station, points claimed, and new multipliers.

Log Submission: The mailing address alternates between NZART and WIA. For 1996, send logs postmarked within six weeks (25 November) to: John Litten ZL1AAS, Onemana Post, Whangamata, New Zealand. Overseas entrants please use airmail.

Awards: Special certificates will be awarded to the top scorers in each category, in each continent, country, and VK, ZL, and JA call area. Where justified, single band awards may also be made at the discretion of the Contest Manager.

The CW entrant with the highest score will be awarded the Frank Hine VK2QL Memorial Trophy, and receive an attractive wall plaque in permanent recognition of his or her achievement.

Disqualification: Entrants may be disqualified for taking credit for excessive duplicates, unconfirmed QSOs or other scoring discrepancies, or unsporting conduct. In matters of dispute, the Contest Manager's decision will be final.

*PO Box 2175, Caulfield Junction, VIC 3175
pmesbit@melbpc.org.au

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Divisional Notes

Forward Bias - VK1 Notes

Peter Parker VK1PK

Remembrance Day Contest

VK1 showed its strength last year when we claimed the RD Contest trophy from the Victorians. This year's challenge is to keep the trophy in Canberra, a task not made any easier by the new rules. The contest, which contains sections for both HF and VHF/UHF operating, takes place on the weekend of 17 and 18 August. The rules were published on page 33 of last month's *Amateur Radio.*

1996 Technical Symposium

Mike VK1KCK, the organiser of this year's Canberra Amateur Packet Radio Group Technical Symposium, reports that the event will most likely occur on either 23 or 30 November. Mike invites those who wish to speak or present a paper to get in touch with him. You can phone Mike on 292 0053, or send a packet message to VK1KCK @ VK1KCM.

VK1 Award for SWLs

Did you know that the VK1 Award also has a receiving section? The requirements are similar to the transmitting section, in that you must log at least 20 different VK1 stations. However, when filling in your logbook, please make sure that you also log the station with whom the VK1 station was in contact.

The VK1 Award net can be heard on 3.570 MHz after the end of the 8 pm Sunday broadcast relay and call-backs.

Asset Register Update

The VK1 Committee is currently updating the Divisional asset register. The serial and model numbers of equipment owned by the Division is required. If you have a piece of equipment belonging to the VK1 Division, please get in touch with our president Phil VK1PJ. Phil can be reached on 292 3260.

Membership Secretary Appointed

At Monday's Divisional committee meeting, Hugh Blemings VK1YYZ volunteered as Membership Secretary. If you want more information about the advantages of Divisional membership, or would like to join the Division, please contact Hugh. His phone number is 254 7855.

VK1AJM Wins SWR Bridge

To promote greater attendances at Divisional meetings, the VK1 committee has decided to run raffles for those attending. The first such raffle occurred at the June meeting. At 50 cents per ticket (5 for $2), tickets sold quickly. The prize was a Midland SWR/power meter. Though initially won by Chris VK1DO, he generously donated the prize back to the Division, and a second draw was held. Congratulations to John VK1AJM, who had the lucky ticket, and won the meter. More raffles, some with larger prizes, will be held at future meetings.

Those at June's meeting also heard a presentation by Chris VK1DO on the Division's efforts during the John Moyle Field Day held back in March. Apart from the slide show, the audience also went home with some thoughts on operating fresh in their minds.

Again the Division made available a set of large spools for storing portable antennas. These proved very popular.

VK180 Receiver Project

All fifteen receiver kits produced have now been sold, with interest being expressed from as far away as New Zealand. The Division has decided to go ahead with the production of a second batch of short-form kits. Subject to component availability, kits may be available by the time you read this. Keep listening to the VK1WI bulletin for the latest on this project.

Sly Fox Keeps Hunters at Bay

The first foxhunt in VK1 for some time was held over the Queen's Birthday long weekend in June. Organised by Bernie VK1KIP, it is hoped that the event will lead to a revival of interest in foxhunting amongst Canberra amateurs. Hunters set off from the Griffin Centre at 11 am. Despite the favourable weather, it took the first team about two hours to find the fox, which was located on Davidson Trig Point, some 7 km south of the starting venue. However, to prevent the hunt extending into its third hour, the fox graciously gave some (truthful) clues to the hounds.

Those participating learnt the following: reflections from buildings and hills can foil the hounds; the fox's transmitting power was not necessarily constant; foxes may lie; the polarisation of the fox's antenna may not be constant; the fox may wiggle the transmit antenna to produce flutter; there may be more than one fox transmitter; the fox may operate SSB and Morse in addition to FM; hiding amongst rocks distorts the fox's antenna's radiation pattern; the fox may only be accessible on foot; and signals at the bases of hills (even when quite close to the fox) can be very weak, especially where the hillside blocks the direct path between transmitter and receiver.

The hunt was eventually won by the VK1KNP team. The Division is planning future fox hunts. While rumour has it that they will be somewhat easier than June's event, readers should appreciate that nothing can be ruled out at this stage.

VK2 Notes

Richard Murnane VK2SKY

Dural Update

The Dural station committee met recently to discuss plans to upgrade the Divisional broadcast facilities. The new committee comprises John Hams VK2JH, Committee Chairman; Dave Horsfall VK2KFU, Station Engineer; and Tim Mills VK2ZTM, Committee Secretary.

The Divisional two metre repeater experienced rather severe interference recently; this was reportedly caused by intermodulation from a new service that had just been installed on the big tower. By the time you read this, the problem will have been resolved.

News Submissions

As I mentioned in an earlier VK2 Notes column, I am taking over the position of Broadcast Officer from Michael Corbin VK2YC. The practical upshot of this is that you should no longer direct facsimile news items to Mike's personal fax, but rather to the Divisional Office on (02) 633 1525.

In addition, the address for submitting news items via packet has changed. It is now *BCAST@VK2WI.NSW.AUS.OC*, as it was getting impractical to filter out all the bulletins addressed to NEWS that were not related to the VK2WI broadcast.

News items, of course, may still be submitted via electronic mail to *wiansw@sydney.dialix.oz.au*, and by means of Australia Post. The Friday deadline still applies, so please make sure you get your news items in on time to avoid disappointment.

Affiliated Clubs Net

A net for clubs affiliated to the Division has been established; it takes place each week after the Sunday evening broadcast on the VK2WI 80 m broadcast frequency of 3.595 MHz LSB. Club representatives are encouraged to join the net to discuss issues of interest. See you there!

Thought for the Month

The secret of being a bore is to tell everything – *Voltaire, Sept Discours, 1738.*

VK3 Notes

Don Jackson VK3DBB

With all the hustle and bustle of the WIA Victoria Council elections now over, the Council has settled down to work with attention being given to matters raised at the Annual General Meeting, and getting on with a multitude of routine issues.

Steve VK3HK is working towards revitalising our broadcasts, with the aim of going to air twice a month and, hopefully, weekly. But he will need lots of assistance from our clubs and members with news to put to air. Give him the support to provide the service wanted by so many of our members. To aid dissemination of news and information, our packet news under the callsign of VK3WI will be regularly updated.

In response to a motion passed at the AGM, Jerry VK3MQ is gathering facts on a possible relocation of the WIA Victoria Office, to determine if there is a location that is more central to the bulk of the Division's members. Information is being sought from many areas, and his report will have regard also to the economic viability of an office relocation.

On the WIA Federal front, your Division, with several others, expressed deep concern at the Federal body's budget which, following a loss of $18,000 last year, forecasts a further loss of $18,000 this year. Whilst reserves are enough to cover this loss, we feel that to continue on a loss basis will spell disaster for the organisation very shortly. We have not yet received any written response to our objections to the budget, and the situation is exacerbated by the fact that, at the time of writing, the VK4 Division has refused to pay its agreed amount of annual subscription. We will keep you informed of what transpires.

On the technical side, WIA Victoria is negotiating with various clubs, relevant authorities and other bodies towards improvement of repeater facilities at three sites. These are in the Horsham, and South and West Gippsland areas and, if as successful as anticipated at this stage, two metre users in these parts of the state will be afforded much superior coverage than ever before. Negotiations are well advanced, and full details will be made available as soon as possible. The Mount Macedon two metre repeater VK3RMM is suffering from a sticking relay problem which will be attended to as soon as weather permits.

Congratulations are due to Rob VK3NC, the Divisional Treasurer, and his wife Julie on the birth of their first child, Nicola. Well done! Under Rob's sound guidance, the Division's financial situation has continued to improve, and we know his enthusiasm augurs well for the future of his family.

On a less happy note, the Council is extremely disappointed at the continuing level of deliberate and divisive mis-information being disseminated on air each Sunday. Most of the statements and allegations being made have no basis in truth and are seen to be a deliberate and determined effort to disrupt the Division. The Councillors will not become publicly involved in defending these vindictively malicious attacks on their personal integrity as it only denigrates the hobby. Members are free to personally contact the Secretary, Barry VK3XV, to discuss these, or any other matters, as they so desire – that's what the Secretary is for!

VK6 Notes

John R Morgan VK6NT

Divisional GM

Due to bad weather, only 18 members attended for the June AGM which, due to the lack of a quorum, became an informal get-together.

General Meetings are held on the third Tuesday of each month in the Board Room, 3rd Floor, CWA House, 1174 Hay Street, West Perth, commencing at 8 pm. There is no meeting in December. All interested persons (members and non-members, licensed or listener) will be made welcome. Free coffee and biscuits are available.

NAOCP Morse Class

After only 14 study sessions, the seven participants in the Morse section of the Division's current NAOCP course finally went "on air" for the first time on Wednesday, 3 July 1996. There were some antenna problems at the VK6GGA station where the classes are held, but a long 80 m QSO was managed with Eric VK6BJW in Kenwick.

For the next few months members are asked to listen for, and work, VK6GGA on Wednesday evenings, between 1800 and 1930 hrs local time, near 3.527 MHz, using between three and five words per minute.

WA Repeater Group

On Saturday, 29 June 1996, in wet and windy weather, a working-party visited the Tic Hill site (VK6RTH, 146.800 MHz and 438.225 MHz). The primary purpose of the visit was to install two new 70 W solar panels, following last year's vandalism, in order to enable all the site's transmitters to operate at

full power. The secondary purpose was to replace the 70 cm repeater equipment. Both tasks were successful. The participants were Dennis VK6LD, Cliff VK6LZ, Chris VK6KCH, Ralph VK6KRB, Will VK6UU and John VK6NT. Special thanks go to Mac VK6MM for donating the panels.

WARG invites you to take part in its informative and entertaining VHF net, held every Sunday morning, commencing at 10.30 am. Listen for VK6RRG on the Lesmurdie repeater (VK6RLM, 146.750 MHz). Meetings are held at the Scout Hall on the corner of Gibbs Street and Welshpool Road, East Cannington, on the first Monday of every month, starting at about 7.30 pm. The odd-numbered months are General Meetings, and the even-numbered months are Technical Meetings.

If You Have Material ...

Material for inclusion in this column may be sent to VK6NT @ VK6ZSE.#PER.# WA.AUS.OC, or to PO Box 169, Kalamunda WA 6076, or via telephone on (09) 291-8275.

"QRM" News from the Tasmanian Division

Robin L Harwood VK7RH

August is Remembrance Day Contest month and your Division is hoping that there will be a good turnout of VK7s participating this year. It is now 51 years since World War II concluded, yet the memories from it are still quite strong. Please make the attempt, turn on your rigs and give out some numbers on 17-18 August. Details are on page 33 of the July issue of this magazine.

Don't forget that VK7WI will not be heard on 18 August at its usual time, but will be broadcast at 1715 EAST on Saturday, 17 August. This broadcast will include the Remembrance Day opening address and will also allow a 15 minute silence period as a mark of respect to those amateurs who made the Supreme Sacrifice.

The Southern Branch has been busily planning foxhunts around the Domain, including one on 80 metres. I believe that Richard VK7RO has been constructing the fox. Also, I believe that several excursions are being planned by the Southern Branch secretary, John VK7RT. Further details at Branch meetings and on VK7WI.

The Northern Branch are also planning an Activity Day at Scout Island on Sunday, 11 August 10 am. It will be a practical demonstration on the erection of portable antennas. Again, details will be on VK7WI.

The planned Divisional Council Meeting, originally scheduled for June, had to be postponed due to unforeseen circumstances. Details of the 13 July meeting in Launceston will appear in the September issue of *Amateur Radio*.

Monthly meetings for the month of August will be: Southern Branch on Wednesday, 7 August at 2000 hours at the Domain Activity Centre; Northwestern Branch, at Penguin High School on Tuesday, 13 August at 1945 hours; and Northern Branch on Wednesday, 14 August at St Patrick's College, Prospect at 1930 hours.

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WIA News

No Immediate Threat to Bands from US Satellite Users' Proposal

A proposal in May from the Mobile Satellite Service users to a Federal Communications Commission committee preparing draft US proposals for the 1997 World Radio Conference (WRC-97) that sought a "shopping list" of frequency bands, including the two metre and 70 centimetre amateur bands, drew fire from the American Radio Relay League (ARRL) who orchestrated a barrage of protest letters to the committee (see *WIA News*, July *Amateur Radio* magazine).

This issue has given rise to the apparent belief being circulated among Australian amateurs that our 2 m and 70 cm bands are under immediate threat. According to the WIA's representative on the Spectrum Management Agency's International Radiocommunications Advisory Council (IRAC), Dr David Wardlaw VK3ADW, the proposal is a US domestic issue and offers no immediate threat to Australian amateur allocations.

The WIA has been aware of the proposal, and the ARRL's actions, since it arose some months ago. David Wardlaw contacted the general manager of the ARRL, David Sumner K1ZZ, and received information from him. Subsequently, David Wardlaw raised the Australian amateur radio community's concern at an IRAC meeting.

US embassies around the world wrote to each country's regulatory authorities, canvassing replies on usage of the bands included in the mobile satellite service proposals. The 70 cm amateur band was then no longer on the list. In Australia, the matter was dealt with by the SMA in consultation with the IRAC. For inclusion in the SMA's reply to the US embassy, the WIA pointed out to the IRAC that, in Australia, 144-148 MHz is a primary allocation to the Amateur Service in the Australian Radiofrequency Spectrum Plan (the "law" on spectrum allocation in Australia) and widely used, many operators worked with weak signals down to the noise floor, and there were well-established repeater and beacon networks throughout the country.

David Wardlaw told *WIA News* that currently no satellite users in Australia had foreshadowed any proposals for frequency bands below 1 GHz. The proposed frequency bands in the American submission are purely a US domestic shopping list, he said. American literature on LEO mobile satellites circulating in Australia includes such proposed frequency bands, which may be misunderstood to be actual allocations.

Present mobile satellite band allocations below 1 GHz are 137-138 MHz, 148-150.5 MHz, and 400.15-401 MHz. Mobile satellite users were not satisfied with the allocations they gained at WARC-92, some of which are shared with land-based services, and having been unsuccessful in getting further bands at WRC-95, are looking for more allocations below 1 GHz from the WRC-97 conference.

Mobile satellite users first have to get their proposals through the US Informal Working Group (IWG-2A) which is considering US proposals concerning mobile satellite service allocations below 1 GHz in the lead up to WRC-97. The ARRL is represented on IWG-2A. After any proposal leaves IWG-2A, it has to pass through several other committees before getting to WRC-97 as a US proposal. If successful, any proposal then has to pass through the committee and plenary session processes at WRC-97. Even if successful there, there is then an essential notification and coordination procedure with the ITU. Administrations in each of the 160 ITU member countries then have four months to determine if other services in their country are affected and if frequency coordination is required.

In preparation for WRC-97, sharing studies covering proposed bands are to be done by ITU study groups to determine where and how possible new allocations may affect existing bands and services using them. David Wardlaw said there is a long way between a proposal raised in the US, with a shopping list of frequency bands, and any possible new allocation which may affect amateur bands in Australia.

Education Notes

Brenda M Edmonds VK3KT Federal Education Coordinator*

Some months ago I wrote about the International Council for Amateur Radio in Education (ICARE) which was formed in Europe last year. This group aims to interest schools and students in amateur radio, and to share ideas between amateurs using radio in schools. Their second conference has just been held in Germany, and I am looking forward to receiving a copy of the Proceedings.

I would like to be able to contribute ideas from Australia, but have very little information to pass on apart from the few well-known examples. From the work overseas, amateur radio is being used in conjunction with language, geography and mathematics classes as well as science and as a recreational activity. As far as I know, the recreational interest has been the main thrust in Australian schools with amateur radio clubs. The main problems, of course, are the need for a licensed operator to run the station and the difficulty of arranging a regular time-slot.

The average age of entry into amateur radio in Australia is about 40 years. Despite the growing student interest in the Internet, many of us feel that there is still a role for amateur radio in the schools. It may be more productive to move into the primary school level rather than the traditional secondary level approach.

I would be interested to hear from readers with ideas on possible ways to interest the schools or the students. I would also like to hear from amateurs who have the time or resources to assist a school with setting up and operating. I have access through ICARE to material on establishing SSTV in schools and using it for student contact for anyone who can use it.

Although I still have some contacts with science and the Victorian Science Teachers Association, I have no channel to any other subject societies. Are there any amateurs teaching in other disciplines who can introduce me to these societies or arrange for some publicity material to reach the society magazines?

Another possibility which has been suggested is that we try to introduce Amateur Radio Direction Finding (ARDF) into the schools as a sport. Many schools already have orienteering as part of Outdoor Activities or Physical Education. ARDF would be a logical next step. How do we go about publicising it?

Over the next few months I intend to make a concerted effort to find which licensed schools are active and the uses to which radio is being put. I would be very pleased to hear from anyone who is actively involved with a school club, or who is prepared to become involved. All information is welcome. As you know, I believe in saving effort by sharing ideas.

**PO Box 445, Blackburn VIC 3130*

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Club Corner

Wagga Amateur Radio Club Inc

The Wagga Amateur Radio Club held its AGM on 28 June and the following positions were filled: President, John Eyles VK2YW; Vice President, John Roy VK2HJR; Secretary/Treasurer, Don Butler VK2MDB; and Publicity Officer, Paul Maloney VK2KVY. The committee now consists of Mike McDonnel VK2DAI, Bob Law VK2MRL, Alan Wheaten VK2KAW, and Lee Rainbird VK2LRR.

The repeater committee is made up of Mike VK2DAI, Bob VK2MRL, Sid VK2SW, Doug VK2ZMP and Doug Gilson. The packet BBS is operated and maintained by Alan VK2KAW. VK2CSU is maintained by John VK2YW.

Other office-bearers include the Awards Manager, James Jessiman VK2MLV at PO Box 294, Wagga NSW 2650; Education Officer, Dave Ashley VK2NK with the help of John VK2YW; and the QRM Editorial team of Paul VK2KVY, Greg VK2KGO, and John VK2HJR.

Club meetings are held on the last Friday of the month at the SES building in Fernleigh Rd at 1945hrs. All are welcome.

Travellers passing through our area can contact members via the club repeater on channel 6750. We anticipate that our 70 cm repeater will be up and running in the very near future on 438.675 MHz. Also, the Club conducts a Wagga Awards Net on Tuesday evenings at 8 pm on 3605 kHz. Again, all are welcome, as they are at the Wagga Net which runs on 7165 kHz on Sundays at 12 noon.

Paul VK2KVY
Publicity Officer.

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How's DX

*Stephen Pall VK2PS**

We often hear comments that QSL Managers are either slow in replying or do not reply at all, especially from those countries where the mail system is not secure.

There is also quite a lot of loose talk that QSL Managers are money-hungry and, heaven forbid, even make money out of QSLing. One has to consider the realities of modern life. Some politician said some time ago that "there is no such thing as a free lunch". If one wants a special, reasonably quick delivery service compared to the QSL bureau system which takes on average one to two years, one has to pay for it. I do not think that we amateurs mind this as long as the service operates satisfactorily.

It is therefore refreshing to read a press release issued by the well-known German QSL manager Rolf DL6ZFG on this subject. Rolf said:

a. He is quitting as QSL manager as from 1 January 1997.

b. Until that date he will reply to all the QSL requests which he receives.

c. He is unable to reply to QSL cards sent via the bureau system because DARC, the German amateur organisation which runs the QSL Bureau, will not deliver non-member cards. Whilst Rolf is a member of the DARC, all his "clients", mostly from the former Soviet countries (now CIS), are not.

d. Financially it is not possible for him to pay for the printing of QSL cards and to pay also the individual membership fees to DARC for his clients.

e. After January 1997 he cannot continue even with direct QSLing because, due to the high postal charges in Germany, direct QSLing amateurs, who must include return postage with their requests, might think that he is performing the service for money.

Rolf's situation is understandable. To post an overseas airmail letter from Germany now costs DM3.00, just slightly over two "green stamps". The German post office gives only DM2.00 for one IRC, therefore it is necessary to send two IRCs as return postage from Germany. In addition, the German postal rates are scheduled for a further rise from 1 September.

In contrast to Rolf, I had an "interesting" experience the other day. One American amateur from Albuquerque, New Mexico, sent me a "not-requested" card for a QSO. He enclosed a reply envelope with a 32 cent USA stamp on it, which is the internal postage rate in the USA. Not wanting to be rude, I replied by air-mail, sending him back the reply envelope and explaining to him that we are an independent country.

CONGO – TN7OT

During 1995 the DX bands were buzzing. Congo TN7 was on the air with a lady operator named Hazel. Not much was known of her, except that she caused a huge pile-up every time she appeared on the bands. After five months of activity, her radio broke down and could not be fixed locally. She returned to her home in Alaska in March this year, and she started QSLing. She sent me her card, some photos and an interesting letter about her activity in the middle of Africa near the Equator on the Zaire border.

Here is the letter, not from a sophisticated well equipped and experienced DXpeditioner, but from a lady radio amateur of mature age who gave many amateurs around the world the opportunity to work a rare DX country. Her equipment? A tiny 100 W transmitter and the proverbial "piece of string", a wire antenna.

But let's read Hazel's story: *"My husband and I are retired and went to the Republic of Congo for the year of 1995 to assist some missionary friends there. We were in the jungle at Impfondo. Since there was no communication I took my radio to be able to contact family and friends at home in Alaska*

Hazel TN7OT operating from Impfondo, Republic of Congo.

My radio was new and I had never made a DX contact, but as soon as I tried to call CQ Alaska, the airwaves were completely jammed. I didn't know what to do. I kept trying to get Alaska, and talking to hundreds of people, but no one could help me to get Alaska. Finally, in August, five months later, I contacted WL7MA. My radio is a Kenwood TS-50S. Easy to carry in a camera case along with an MFJ Versa II tuner. I used two six volt batteries for a power supply. They were charged by a solar panel. I had a wire between a coconut palm tree and a mango tree, with TV twinlead tuned to 20 m. I had a keyer to tune up. I made 918 QSOs from 6 March to 9 September. My radio quit working in October. I couldn't get it fixed there. I think that being close to the Equator gave me good propagation. I had QSOs with 47 states in America, most of Canada, Central and South America, Europe, Asia, Japan and the Pacific islands.

I have 18 QSL cards from Australia and two from New Zealand. It was hard work; and only one contact with Alaska. It is very difficult to get a licence in the Republic of Congo. It takes a long time and a lot of money. The country does not really encourage or welcome amateurs. It doesn't even understand what amateur radio is. I was not issued a callsign. I was told to use whatever call I wanted to. I was also told that there were two other amateur radio people in Congo, but I never did locate them.

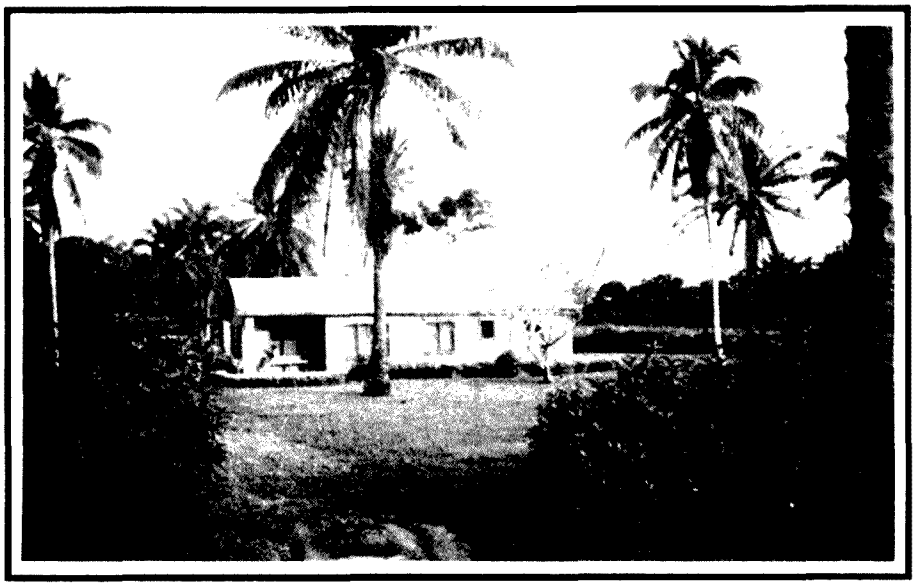
The jungle where we lived was beautiful and the people were very friendly although poor and mostly uneducated. Many young men wanted to learn English and would come for tutoring. During the period of influence of the former Soviet Union, English was forbidden and Russian was taught.

It was a pleasure to reach VK-land and ZL as well. I am now home and will try to get on the air again soon."

Incidentally, Hazel's card depicts a local "Loch Ness" type legendary semi-aquatic reptile said to be living in local rivers and swamps. It is a QSL card worth having.

Clipperton Islands – FOOX?

It has been many years since there was activity from this French territory in the Pacific Ocean, southwest of Mexico (10° 17′ North, 109° 13′ West). Jay WA2FIJ is planning a DXpedition for February and March 1997. He is looking for a boat (or two) whose owner(s) would like to go to Clipperton, or who may be passing the island and would be willing to stop for seven to 10 days, and then drop the team off in Mexico (or Costa Rica). He plans to have the first YL operator on the island and the first use of a quad/tower combination on the island (if the boat can handle the tower). Jay is confident



Hazel TN7OT's house at Impfondo. Note the wire antenna between the trees, which has been highlighted in the photograph.

he can obtain the necessary paperwork but he needs a guaranteed commitment from the boat(s) so he can start the "ball rolling".

There are three levels of documentation necessary: permission for the specific named boat to be in French waters; permission to be on the land; and the actual amateur licence to operate. Are there any takers, or do you know somebody who might be able to help?

Tunisia - 3V8BB

The only licensed Tunisian station, 3V8BB, is on the air from time to time, depending on the local and foreign visiting operators. Amateur radio activity has been sporadic since Tunisia gained independence from France in 1956. Up to 1963 the French military controlled amateur radio activities. Until about 1985 only two stations were active and accepted for DXCC, 3V8AA and 3V8PS.

On 6 September 1994 the Ministry of Communications authorised the establishment of a club station in the Institut Superior de la Jeunesse in Bir-El-Bey, a Higher Business School for Youth and Culture. Bir-El-Bey is a locality on the Tunisian coast, 30 km south of Tunis, the capital city. The first activity from the club was on 19 November 1994 by JH2CFD and a group of Japanese amateurs who established the station and started operating under the callsign 3V8BB. Osamu JI1HUC, a great supporter of the Club and a frequent operator, had been in residence in Tunis for three years as a member of a Japanese overseas volunteer program. His term of duty expired in March this year.

Because there were many overseas visiting amateurs, with their own individual QSL routes, there is some confusion as to who operated when, and where should the QSL go? Here is a schedule which might help you: 14-29 Jan 1995 via JF2EZA; 29 Apr – 5 May 1995 via YT1AD; 24 – 29 July 1995 via YT1AD; 10 – 18 Aug 1995 via YT1AD; 14 – 31 Oct 1995 via G0UCT; 25 – 26 Nov 1995 via DL2OBF; 13 – 21 Jan 1996 via F2KN; 1 – 10 Mar 1996 via DL8HYK; 23 – 24 Mar 1996 via DF2UU; 28 Mar – 2 Apr 1996 via YT1AD; 3 – 12 Apr 1996 via OKDXF; and 14 – 24 Apr 1996 via AA6BB.

3V8BB is authorised to operate on the 160, 80, 40, 20, 15, 10, and 2 m bands and the 70 cm band in all modes with a maximum power of 100 watts.

Sable Island - CY0AA

This activity started on 18 June and Mike VE9AA was the first arrival on the island. The second group of operators, WA8JOC and W9OEH, arrived on 24 June. The three stations were operating until the morning of 3 July local time. The group did not run lists or take part in nets, preference was for individual contacts. The station was heard in Australia and there were a few SSB and CW contacts with them on 20 and 40 metres.

Direct QSLing is preferred as bureau cards will have a lower priority. Donations are still welcomed as the expenses have exceeded original estimates. Any funds will be graciously accepted by either VE9AA or WA8JOC. QSLs for the HF contacts go to WD8SDL Roger H Mayer, 5639 Monica Ct, Cincinnati, OH-45238, USA.

Scholl Island - VK6ISL - OC-140

Mal VK6LC and Terry VK6VS were active from Scholl Island from 23 June to 6 July 1996. Scholl Island is near Montebello Islands in the Indian Ocean, north west of Western Australia, located at 115° 52′ and 20° 56′. The island is one of the eight Passage islands which are in the area.

The two operators were supported from the mainland with transport, equipment and other facilities by Dave VK6DLB, Michael VK6BHY and Steve VK6PA.

After a slow beginning the arrival of the phased vertical array for 20 metres speeded up the QSO rate considerably.

I had a short contact with Mal before they left the island. According to Mal, the biggest problems which they faced on the island were the weather and propagation. Out of the two weeks spent on the island, their productive operational time was approximately only five days. The rest of the time was spent in tents, or looking after the tents, on rain and windstorm days, or fishing when there was no propagation at all.

Openings on the bands were unpredictable. Propagation on 15 metres was very poor, with no openings to Europe and only a few contacts with Canada. 20 metres was open for short periods, 40 to 70 minutes on long path to Europe, but then there was one night when the short path was open to Europe for 2 1/2 hours. 40 metres had good openings to Africa, America and Europe but, on one occasion, 15 and 20 metres closed completely for three days during which time only a few contacts were made.

During the daytime horizontal polarisation was the favourite, but in the evenings and nights vertical polarisation had an advantage. The new phased vertical arrays on 40 and 20 metres proved beyond doubt that these are the antennas for future DXpeditions where space allows setting them up.

Here are a few approximate statistics. The total number of QSOs was around 2500, out of which 1500 were made on 20 metres and the rest on 40 metres. They worked 35 zones and 122 countries, including Macquarie Island. QSL direct only via I1HYW Gianni Varetto, PO Box 1, 10060 Pancalieri, Torino, Italy.

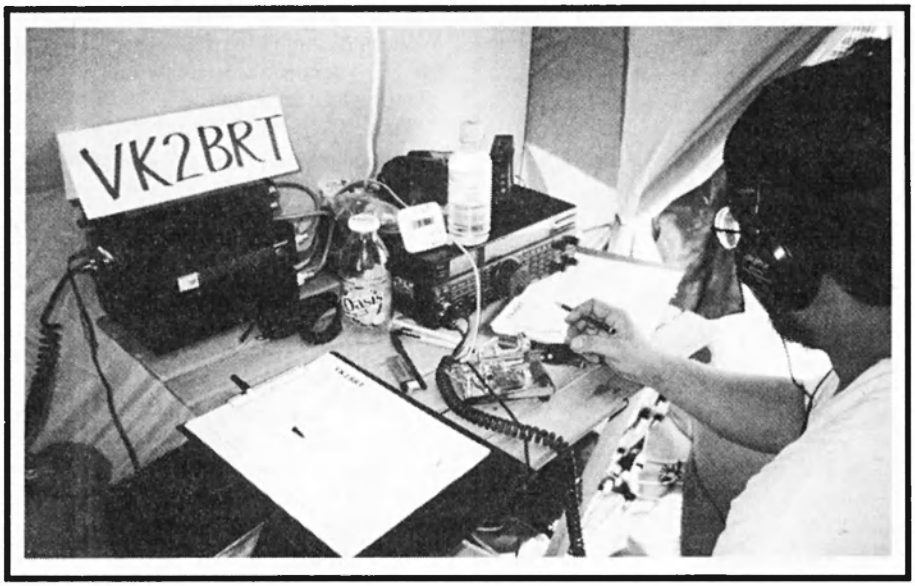
Future DX Activity

* Sam FT5WE on Crozet Island has a new vertical antenna and amplifier, and a dipole on 75 metres SSB. Sam generally prefers CW operation up five kHz from the edge of the band. He was heard in VK on 3505 kHz round 1400 UTC. On 40 metres he is usually found on 7045. QSL via F5GTW.

* A number of international operators plan to activate Midway Island KH4 in the first part of August.

* Peter ON6TT has been worked with his Ugandan callsign 5X1T. QSL via ON5NT.

* 5X4C Father Sabastiano's mission has



Broughton Island OC-212 with Atsu VK2BEX operating.

been attacked and the equipment damaged. He is now off the air.

* Dave KC0IM, the well known DXer, arrived in Guinea-Bissau J52 in July for a two year tour of duty. He will be active on 40 – 10 metres on SSB and CW, and hopes to receive the callsign of J52IM. QSLs go to KB9XN.

* JG8NQJ will return to Minami Torishima for a three months stay. He will use the /JD1 suffix after his call. QSL via JA8CJY.

* There are unconfirmed rumours, originating from Hawaii, that a number of operators are planning to be active from Palmyra/Jarvis Islands and Kingman Reef. There is also news that the new owners of Palmyra Atoll, KVR Inc of New York, want to create a nuclear waste storage facility there.

*Keep a look-out for Mario, who is active from Sri Lanka as 4S7BRG on 15, 20, 40 and 80 metres. QSL via home call HB9BRM.

* Hans KN6DI should be active from Zambia using the call 9J2DI. QSL via AA6BB.

* 5X1D is active from Uganda. QSL via SM0BFJ.

* 9Q2L Alex is now active from Zaire and he is staying for one year. QSL via PA3DMH.

* There is a rumour that Steve AA6LF will attempt to be active from Ashmore Reef, one of the most outlying islets of the Northern Territory, not far from Timor.

* Don N5OLS will be active from American Samoa for the next three years as KH8/N5OLS in all modes and on all bands. QSL via AA5BL.

* The special event call GB800SA will celebrate the establishment of the market place by Richard the Lionheart in 1196 at Stratford-on-Avon. QSL via the RSGB bureau.

* Rolf XV7SW who is working for the Swedish Embassy in Hanoi, Vietnam advised me that he is now using one kW power on the fixed frequencies of 1827, 3506, 7007, 14016, 14021, 21016, 21019, 28016 and 28019 kHz. He was a good copy on 40 metres the other week. QSL direct to Rolf T Salme, Embassy of Sweden, Box 9, Hanoi, Vietnam.

Interesting QSOs and QSL Information

* FT5XL – John – 14164 – SSB – 0534 – June (E). QSL via F5NZO Didier Bruriaud, Le Bourg, Vitry sur Loire, F-71140 Bourbon Lancy, France.

* JW5NM – Mat – 14195 – SSB – 1340 – June (E). QSL via LA5NM Mathias Bjerring, Box 498, N-9170, Longyear City, Norway.

* BY5QE – Doreen – 14200 – SSB – 1145 – June (E). QSL via PO Box 219, Fuzhou, 350002, Peoples Republic of China.

* 5N0MVE – Mark – 3799 – SSB – 2119, June (E). QSL via ON7LX C Ramon, Bruggesteenweg 77, B-8755, Riselede, Belgium.

* T20AA – Ian – 14164 – SSB – 0529 – June (E). QSL via KD4XN Wayne S Smith, 4649 Poseidon Place, Lake Worth, FL-33463, USA.

* 9M8HIM – Jonny – 14226 – SSB – 0558 – June (E). QSL via HIM, Holiday Inn, Box 2295, Miri 98008, Sarawak, East Malaysia.

* KA3HMS/KH3 – Bill – 14237 – SSB – 0623 – June (E). QSL via KA3HMS William J Maurits III, 12 Vermont Place, Belair, MD 21014, USA.

* 5V7ML – Lars – 7005 – CW – 0611 – June (E). QSL via DL7ALM Lars Mahling, Rapstedter Weg 34, D-12305, Berlin, Germany.

* 5V7MD – Dave – 14305 – SSB – 0618 – June (E). QSL via AB7BB Charles Degard Jr, 919 W Vaughn St, Tempe, AZ-85283, USA.

* 5R8EN – Gerard – 14164 – SSB – 0545 – June (E). QSL via F6AJA Jean-Michel Duthilleul, 515 Rue de Petit Hem, Bouvignies, F-59870, Marchiennes, France.

* RU1POL/0 – Alex – 14009 – CW – 1300 – June (E). QSL via UA0KCL Yuri Lobachev, Box 44, Pevek, 686610, Russia.

* CM8DC – David – 7190 – SSB – 0614 – June (E). QSL via IK0ZKK Paolo Papio Orillac, Via Flaminia Vecchia 7-01, Roma, 00191, Italy.

VK2BRT Providence Beach on Broughton Island.

From Here and There and Everywhere

* The former well-known French DXer, Jacky F2CW, has settled in New Zealand and is now active on 40 m CW as ZL3CW.

* Father Cav V63JC has retired from his mission work in the Pacific. He is now living in New York in retirement.

* Graham VK0GC has returned from Davis base in Antarctica.

* Brian VK4LV reported working FR5DT/E on 40 m at 0555 UTC with 5/6 signal reports. The operator was Thierry and QSL goes to PO Box 386, St Pierre, Reunion, 97448, France.

* The Brazilian DX-Net is now operating on 14222 kHz on Saturdays and Sundays at 1900 – 2100 UTC.

* Canadian amateurs were using special prefixes from 8 June to 8 August to mark the 100th anniversary of the Yukon gold discovery. The following prefixes were allocated: VD2, VD3, VC1, VC2, VC3, VC4, VC5, VC6, VC7, VC8, VC9, CZ5, CZ4, CK3 and CK4.

* It was reported that non-residents (visitors) of the Cyprus British Sovereign Base Area will not be permitted to operate amateur radio.

* The station with the VF6RFR callsign was heard operating from the Rotary International Convention in Calgary, Canada between 23 to 26 of June.

* 3Z0WAW is a special event station celebrating the 400th anniversary of the transfer of the Polish capital from Cracow to Warsaw. QSL to SP5PBE.

* If you hoped for early activity from North Korea P5, please be more than patient. Sanyi HA7VK, who has visited North Korea, reported that at present there is absolutely no chance of getting an amateur radio licence in North Korea.

* YM21HCS and YM22HCS were special event stations during the International Habitat Conference in Istanbul, Turkey. QSL via TA2BK.

* TM1V and TM8OV celebrated the 80th anniversary of the WW 1 Battle of Verdun. QSL via F5NPS and F5REQ respectively.

* Geraldo IK8JAF – was in Yemen 7O on business for one month and was able to activate Yemen, mostly on Thursdays and Fridays on 20 m, from 1600 UTC using the call 7O1JAF. He was also heard on 40 m. There is hope that he will return to Yemen in October. QSL via home call.

* The Norwegian QSL Bureau will not accept QSL cards for the following stations: JW0A, JW0B, JW0C, JW0D, JW0E, JW0F, JW0G, JW0H and JW0I. All these stations should be sent cards direct via the QSL manager mentioned in the QSO.

* K7U special event station celebrates the Centennial of the State of Utah. QSL via K7UOT.

* Terry Robinson G3WUX is doing it the hard way. He is a member of the Trans-Greenland Expedition. He will be on 14002 kHz and 14200 kHz running 5 watts QRP into a Windom antenna. QSL via the home call.

* EA6BH's trip to Equatorial Guinea 3C has been cancelled.

* Australian special event stations sometimes have very nicely presented QSL cards. The card from Deal Island VK7DI is one of those worth having.

* Last month I indicated that the QSL address of V33BB is Box 326 Monkey Town, Belize. Recently I heard V33BB saying that the correct box is PO Box 33. This box is also shared with V33AB who showed up on the net late in June. The 1996 International Callbook does not show the callsigns of V33BB or V33AB; neither does the June 1996 issue of the GOLIST QSL Managers list.

QSLs Received

R1FJZ/FJL (6 m – DF7RX); E21CJN (2 w – op); JG8NQJ/JD1 (3 w – JA8CJY); XV7SW (6 w – op); 3V8BB (7 m – DL2OBF); 1A0KM (6 m – IK0FVC).

Thank You

Many thanks to my helpers who supply me with the information which makes this column possible. Special thanks to VK2XH, VK2KFU, VK2TJF, VK4LV, VK5WO, VK6LC, VK6RO, VK4 SWL 40370, AL70T, XV7SW and the publications *QRZ DX, The DX Bulletin, The DX News Sheet, The DX News Magazine, 425 DX News and GOLIST QSL Managers list.*

*PO Box 93, Dural NSW 2158

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WIA News

VK Contestants in 1996 World Radiosport Team Championship

For the first time, two Australian amateurs, Martin Luther VK5GN and David Pilley VK2AYD, were among the 52 two-person teams (the "best of the best" HF operators from 30 countries around the world) competing in the 1996 World Radiosport Team Championship, WRTC-96, held in San Francisco over 13-14 July.

The Championship is a sub-competition within the larger International Amateur Radio Union (IARU) HF World Championship contest held that weekend. The WRTC-96 competitors enter the IARU contest as 52 two-person multi-operator, single-transmitter entries. The teams were selected for this competition by national amateur radio organisations, leading contest clubs and an international panel of judges. Among their ranks are the holders of world records in virtually every major HF contest.

All 52 teams operated from a location near San Francisco Bay on flat terrain in relatively close physical proximity, to minimise propagation differences. They all ran 100 watts output into almost identical antenna systems, so that they all competed on the basis of operating skill.

The WRTC stations were given distinctive "1-by-1" call signs, W6A through W6Z and K6A through K6Z, specially approved by the US regulatory authority, the Federal Communications Commission (FCC). Each team will be issuing a distinctive QSL card, and will QSL 100% via the bureau.

Novice Notes

*Peter Parker VK1PK**

Operating an HF Station – Part Two

Part One of this series covered basic HF operating procedure. This month we take a more detailed look at specific operating activities enjoyed by amateurs. There is also a chance to put what you have learned to practical use in the annual WIA Remembrance Day Contest, being held later this month.

DXing

In amateur parlance, DX means long distance, normally defined by HF operators as being outside one's continent. There are many amateurs who, after establishing a station, enjoy talking around the world. DX operators have a variety of motives; some like experimenting with antennas, while others prefer to chase various operating awards.

As well as having an efficient station, good operating skills are important for the successful DXer. These include a knowledge of radio propagation, being able to discern weak signals, a habit of listening around the band before transmitting, and a sense of timing when calling another station. Clear pronunciation, the use of standard phonetics on SSB, and steady sending on Morse are the hallmarks of the good operator.

Active DXers place great importance on contacting remote, obscure islands. Sometimes, groups of DXers may organise special voyages (called DXpeditions) to such islands, so that other amateurs may work them. These DXpeditions are very costly, and organisers often solicit donations from amateurs and commercial sponsors.

When a signal from a DXpedition is heard, there are often many stations trying to make contact. Quite appropriately, this wall of QRM is called a "dogpile". DXpedition stations may operate "split-frequency". This means that you listen on one frequency and transmit on another. For this reason, serious DXers use transceivers with dual VFOs.

Being able to be heard by a DX station is a matter of strategy and timing; the station might have a particular pattern of operating that you can exploit. When called by a DX station, make the contact brief, as you would in a contest, as many others may be waiting for their turn.

The impression gained so far is that the DXer is a rather competitive, solitary operator. This is not always so; some DXers hunt in packs. Several nets for amateurs who enjoy working DX, exist on the bands. In addition, groups of DXers in some cities have set up early-warning systems called DX clusters. This is essentially a special packet radio link between DXers. Their function is to alert all suitably equipped stations that a sought after station has appeared on the band. Thus, instead of spending time tuning around, one can switch off, watch TV, and only fire up the rig when a rare station comes on.

Contests

A contest is an organised event where the aim is to make the most number of contacts within a given period. Apart from being an exciting and absorbing activity in its own right, contesting allows you to test the efficiency of your station, together with operating skills. With there being many stations on the air at the one time, a contest is an ideal opportunity to have contacts with various countries or call areas so that you can work towards many of the awards on offer.

While most major contests run for 24 hours, some short contests ("sprints" or "scrambles") run for only an hour or two. These short contests have simple rules, and are good fun.

Contest contacts are much shorter than most other amateur radio contacts; all you need to exchange with the other station is a five or six digit number, consisting of a signal report followed by a serial number starting at 001. This serial number increases by one for every contact you make, thus you might send 57003 to the third station you work in a contest. The object is to make as many contacts as possible within the contest period.

The following is a typical example of an SSB contest exchange between VK1AA and VK6AA.

(VK1AA): CQ CQ CQ RD CONTEST, THIS IS VK1AA. *(VK1AA seeking a contest contact)*

(VK6AA): VK6AA *(VK6AA responds)*

(VK1AA): VK6AA, THIS IS VK1AA. MY NUMBER TO YOU IS 57011. *(VK6AA's signal is 5/7 and VK6AA is VK1AA's eleventh contact in the contest)*

(VK6AA): THANK YOU FOR THE 57011. MY NUMBER TO YOU IS 58001. *(VK1AA's signal is 5/8 and this contact is VK6AA's first in the contest)*

(VK1AA): 58001 RECEIVED. 73 AND GOOD LUCK IN THE CONTEST. *(Contest contact ended successfully and both stations enter the contact in their logs. VK1AA continues calling CQ, while VK6AA looks for other stations calling CQ)*

On CW, the procedure is similar, except there is a heavy use of abbreviations to save time (see Part One). Very often, nines are sent as "N", and zeroes as "T". Thus, the first station you work might receive a "5NNTT1" number from you, which is the equivalent of a 59001 report on phone.

To formally enter a contest, a log of all contacts must be submitted. A sample log sheet, suitable for most contests, is shown in Figure 1. Normally, a front summary sheet, which shows your name, callsign, total score and declaration that you operated ethically is stapled to the front of the log; the format for this is generally specified in the contest rules. The major WIA-sponsored Australian

Name.....
Callsign.....
Contest.....

Date	UTC	Band	Mode	Callsign	RST No sent	RST No rec	Points

Figure 1 – Sample Contest Log Sheet. This log sheet is typical only, but should be acceptable for most contests. Read the rules applicable to the particular contest for more information.

contests are: Remembrance Day Contest (August), VK-ZL-Oceania DX Contest (October), Ross Hull VHF/UHF Contest (December/January), VHF/UHF Field Day (January), John Moyle Field Day (March), and VK Novice Contest (June).

Certificates are awarded to contest place-getters. Up-to-date information on these and other contests can be found elsewhere in this magazine. Of particular note is the WIA Remembrance Day Contest, on the weekend of August 17/18. The full rules appeared on page 33 of last month's *Amateur Radio*. This is Australia's most popular contest, and the Contest Manager would be glad to receive a log from you.

Awards

An award is a certificate received for having contacted a specified number of stations in a certain geographic area, or on a particular mode. They range from the local club award to the internationally-recognised, and from the easy to the almost impossible. The most well-known international award is the DXCC (DX Century Club), issued to those amateurs who have proved that they have contacted at least 100 countries. Another award gaining prominence is the "Islands of The Air" (IOTA) award for contacting a specified number of islands.

The WIA has its own awards program, with certificates issued free to members. WIA awards available include: WIA DXCC, Worked All VK Call Areas (WAVCA) Awards (VHF and HF), Worked All States (VHF), Australian VHF Century Club, WIA Antarctic Award, and WIA Grid Square Award

Refer to the *1996 Australian Callbook* for further information on the above awards. Those interested in collecting awards should maintain a log of stations worked. Note that QSL cards are required to show proof of having worked a station; log entries alone are not sufficient.

QSLing

A long-standing tradition has been to exchange QSL cards after the completion of a contact. The practice comes from the days when working DX (usually with low power and home made equipment) was much more of an achievement than it is today. Many overseas stations tend to be almost obsessed with QSLing, to the point that they ask for a card even if filling in and sending the card takes longer than the original two-minute contact. In contrast, many VKs are more laid back, only sending cards for the more memorable contacts. It may be for this reason that we have the reputation of being bad QSLers.

Nevertheless, QSLing is almost mandatory for those who aspire to collect awards, which normally require cards to show evidence of contacts claimed. Also, the new amateur will often want to decorate the shack with cards received from distant countries. After a wall has been "wallpapered", the novelty often wears off, with many an amateur storing cards in shoe boxes in a seldom-opened cupboard.

Every amateur should have a stack of their own QSL cards, even if they are only sent infrequently. Cards should be of postcard size, and include your callsign, address and (preferably) your Maidenhead grid square locator number. It should include spaces for the callsign worked, UTC date and time, signal report, band, and mode used. Spaces on the card for your equipment, antenna and power output are also desirable. Figure 2 shows a typical commercially-printed QSL card.

There are two ways of sending cards. They may be posted via the normal mail system. While fast, it is expensive. Fortunately, the WIA and its sister societies have established QSL bureaus for use by members. These bureaus send and receive QSL cards in bulk, so postage costs are reduced. Though sending cards "via the bureau" is slower than QSLing "direct", the money saved is considerable, particularly if you are an avid DXer.

QSL Bureaus consist of two sections; Inwards and Outwards. The Inwards section receives cards from overseas and interstate, and distributes them to members, while Outwards accepts cards from you and forwards them to bureaus in other states/countries.

You can collect cards that have arrived for you from your Divisional Office, or WIA or club meetings. Alternatively, you can have your cards mailed to you by sending a SASE to the QSL Bureau Manager. QSL Bureau procedures vary slightly between states; some Divisions may charge a nominal sum per card sent, while others charge nothing. Addresses for QSL bureaus are listed periodically in this magazine, and in the WIA Callbook *(Reference Two)*.

QRP

QRP operation is the use of low transmit power. Its adherents gain a special pleasure from working across the country or across the world with a couple of watts of power. QRP, defined as the use of five watts or less on CW, and ten or less on SSB, is ideal for portable operation, where lightweight transmitting equipment must be used. In addition, the low-cost and simplicity of QRP equipment makes building one's own transceiver a practical proposition, particularly for CW operation.

Practically the full range of operating activities, such as DXing, contesting and VHF operation, can be done with QRP. An efficient antenna and good operating skills are required for maximum success. Ownership of special equipment is not required; QRP can be obtained from many 100 watt transceivers that have an external ALC socket.

QRP in Australia is promoted by the CW Operators' QRP Club, which publishes a quarterly magazine, runs nets and sponsors contests for QRP operators. Those seeking further information on QRP should obtain a copy of April 1995 *Amateur Radio (Reference 1)*.

Conclusion

This short series has, I hope, given you a better knowledge of HF operation. As well as reading about it, the best way to learn is by listening and operating yourself. The appearance of this column has been timed to coincide with the Remembrance Day Contest, to maximise this opportunity.

References

1. Lewis M, QRP – The Crest of the Radio Wave, Amateur Radio, April 1995

2. 1996 WIA Callbook

**7/1 Garran Place, Garran ACT 2605*
VK1PK @ VK1KCM.ACT.AUS.OC

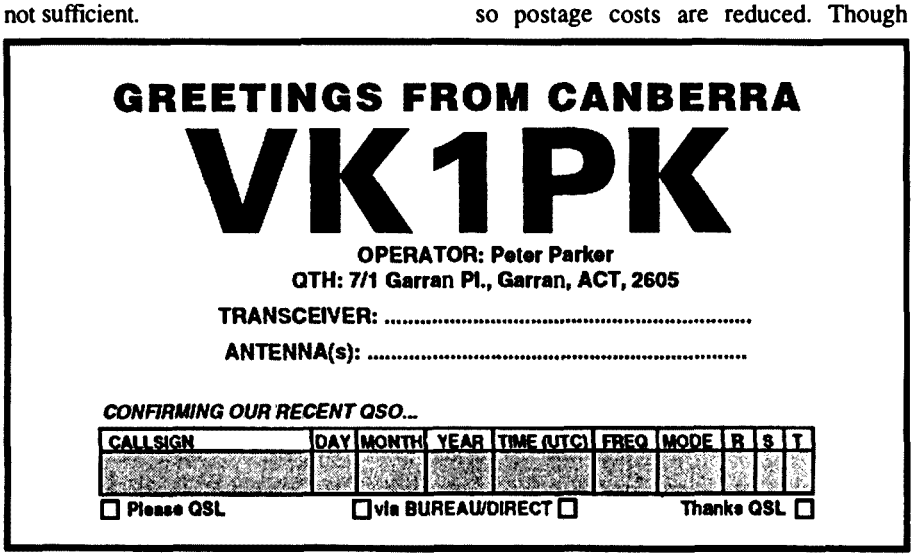

Figure 2 – A typical commercially-printed QSL card

Packet World

*Grant Willis VK5ZWI**

Introduction

Welcome to this month's *Packet World* column. Over the past few issues we have looked at packet radio and what makes up packets. One of the services mentioned in that series was called "NET/ROM".

NET/ROM is a packet radio "networking" tool, which enables packet stations to be linked together using an intelligent system so that multiple hop connections can be established on a reliable basis, much more reliable in fact than digipeating. NET/ROM achieves its connection reliability by using AX.25 (basic packet protocol) acknowledgments and retries on each leg of the connection, rather than end to end over the entire connection as would have been the case with normal digipeating.

NET/ROM – A Brief Overview

One of the traits of larger packet radio networks is that it can become difficult to figure out how to connect from station A to station B via stations C, D, E, F, G, etc. There is also a problem in large networks of how to automatically teach stations how to correctly route packets from A to B via C, D, E, F, G, etc. NET/ROM overcomes this by sending out "routing broadcasts" periodically, which other NET/ROM nodes listen to.

In these broadcasts (or beacons) the nodes transmit information about all other NET/ROM nodes they have heard and also nodes that the adjacent nodes have heard. Each broadcast assigns a quality to each broadcasted node record which is decreased the further away you are (in numbers of hops) from the original node. Using these quality numbers, coupled with the adjacent node lists, a node is able to determine the most direct path between A and B, and find alternate routes in the event of a link failure. A more detailed look at the structure of the NET/ROM protocol will appear in a future edition of *Packet World.*

How is a NET/ROM Node Labelled?

NET/ROM nodes have two forms of identification. The first (and most obvious) is the Node's callsign. This is the callsign people should connect to access their local NET/ROM network. Many NET/ROM nodes use an SSID (Station System ID Number), for example "VK5TTY-2", "VK4RZB-8", etc.

The second form of identification, only used internally within the NET/ROM network, is the NET/ROM Node Alias. This alias is a six character label that often will give some indication of the area or type of service the node provides. Some examples include "ADLSBB" (Adelaide Southern BBS), "MELAUS" (Melbourne Australia), "WILL2" (Mt William Port 2), etc. When you issue connects within a NET/ROM network, you can use either the callsign of the distant node, or the alias in the internal network connect command.

How Do You Use a NET/ROM Node?

NET/ROM is relatively easy to use, once you are familiar with the concepts. The following examples were recorded "off air" from the NET/ROM network in Adelaide. It should be noted that different NET/ROM software packages will quite often have slightly different commands, but most are very similar. The software used on the Adelaide system was written by John G8BPQ.

The example sequence starts with my station sitting on 144.900 MHz in Adelaide, which gives me access to the VK5TTY-2 NET/ROM node.

I will indicate commands I typed in at my Keyboard with the string "<**" next to them.

Step 1 – Connect to your local NET/ROM Node – Making an UPLINK connection.

I connect here to my local NET/ROM node and issue the "?" command to request a command list. This is a good step if you are connecting to a NET/ROM node for the first time.

*cmd:C VK5TTY-2 <**
**** CONNECTED to VK5TTY-2*
Welcome to the VK5TTY Packet Switch, Adelaide's South LAN Network Node.
Type ? for list of available commands.
*? <**
ADLS2:VK5TTY-2} BBS CONNECT BYE INFO NODES PORTS ROUTES USERS MHEARD

Step 2 – The INFO command

Many NET/ROM switches have a small text area stored in them to tell you a little about the switch. You can use the INFO command on a G8BPQ NET/ROM switch (and others) to get this text message.

*INFO <**
ADLS2:VK5TTY-2} VK5TTY-2 Adelaide South LAN Packet Switch
There are several services available on VK5TTY. For BBS access you connect to VK5TTY on either 144.900 or 439.050 or connect to ADLS2 and then type C ADLSBB. To use TCP/IP on VK5TTY you can use VK5TTY-1 [44.136.175.1]

This is the response to the Info command. It returns a short piece of text telling you about the switch.

Step 3 – The USERS command

The USERS command will print out a list of what stations are connected to the local switch, and where their connections are going. It also, in this case, prints out the node software version.

*USERS <**
ADLS2:VK5TTY-2} G8BPQ Network System V4.06a (120)
Uplink 1(VK5ABS) <-->
Host01(ADLSBB:VK5TTY)
Uplink 1(VK5ZCF) <-->
Host02(ADLSBB:VK5TTY)
Uplink 1(VK5ZWI)

The USERS command (can be abbreviated to U) lists all the users linked to the switch you are currently linked to (can be your local switch or a remote switch you have connected to). The components of information shown here are:

Uplink 1(VK5ABS) Tells you that VK5ABS has connected to the VK5TTY system on PORT 1 (144.900).

<--> Tells you that the connection is working. The other possibility is <~~> which means the link is being set up.

Host01(ADLSBB:VK5TTY) Tells you that the station is linked via the switch to the VK5TTY BBS. Any link made to "Host" is a connection to another task within the same computer as the switch.

Step 4 – The PORTS command

When there is a NET/ROM node with more than one radio attached to it, (usually in the case of G8BPQ switches, or NOS based NET/ROM switches), you may also need to know what radio ports are available for some commands. In the case of G8BPQ, the "Downlink" connect request will require you to tell the switch which radio port you want to issue your connection on. The port number is also useful in the MHEARD command.

*PORTS <**
ADLS2:VK5TTY-2} Ports:
1 144.900 ADELAN South Users
2 439.050 ADELAN Backbone
3 TCP/IP Link & Network Port

The ports command lists each radio and

internal port that is available. In G8BPQ, each port has a number, while in other systems the ports may have short text based labels such as "pbbs" or "ax0" for example.

Step 5 – The NODES command

The NODES command is the first step to exploring your local NET/ROM network beyond your local switch. This command lists all other known nodes with their callsign and their alias. Depending on how big your local network is, and how your local SysOp has chosen to set up his node, you can have very long nodes lists or very short ones. When there are large numbers of nodes, it is possible that there may be quite a few which are either very, very slow (depending on how many hops away they are), or some you simply cannot connect to (either because the only link to them has failed or because the routes are congested). When you begin to explore a NET/ROM network, don't expect all the links to work all of the time.

*NODES <***
ADLS2:VK5TTY-2} Nodes:
ADL7BB:VK5EX ADL7GW:VK5EX-2 ADLC2:VK5WI-2
ADLCBB:VK5WI ADLCIP:VK5WI-11 ADLIP:VK5XXX-11
ADLN2:VK5LZ-2 ADLNBB:VK5LZ ADLSAT:VK5ZK-2
ADLSBB:VK5TTY ADLSGW:VK5ZK ADLSIP:VK5TTY-11

The NODES command (can be abbreviated to N) lists all the available NETROM Network stations. These are other Nodes that you can link to from this node to get access to other remote BBS systems and to link to users on other frequencies.

Step 6 – Connecting to a distant Node – Making a CROSSLINK Connection

At this point I decided I wanted to link to the VK5LZ-2 NETROM switch. VK5LZ-2 is on another radio channel. Since the connect is to another NET/ROM node, I don't need to tell my local node (VK5TTY-2) what port to make the connection on since, for connections between nodes, NET/ROM is able to automatically select the right port, based on the nodes broadcasts received earlier.

To make the connection I entered the CONNECT command as follows:

*CONNECT VK5LZ-2 <***
ADLS2:VK5TTY-2} Connected to ADLN2:VK5LZ-2
Welcome to VK5LZ's Packet Switch,
Adelaide North LAN Network Node.
VK5 14.109 Oceania HF Network Gateway
Type ? for list of available commands.

When the link is complete, switch ADLS2:VK5TTY-2 will tell me that I am connected to VK5LZ-2 and then VK5LZ-2 sends its sign-on banner. Not all nodes send a banner; it will depend on software types and configurations. It sometimes will take a little while to make this link depending on how busy the intermediate links are.

Step 7 – Exploring a distant Node

The commands on VK5LZ-2 are the same as on VK5TTY, so we kept exploring. To see what radio ports are available on VK5LZ-2 I entered the PORTS command again.

*PORTS <***
ADLN2:VK5LZ-2} Ports:
1 144.800 ADELAN North Users
2 439.050 ADELAN Backbone
3 14.109 Oceania HF Network

Now, if I wanted to see what stations are available on each frequency, I can use the MHEARD command. To use this command I type "MH x" where I substitute a Port Number for X. Some examples are shown below. Note that the times given were in UTC.

*MH 1 <***
ADLN2:VK5LZ-2} Heard List for Port 1
VK5ATB 23:47:09
VK5ZLJ 23:41:23
VK5FI 23:37:41
VK5ZSV 23:32:44
VK5ZAR-1 23:20:15

Step 8 – Making a DOWNLINK connection

After I received the heard list, I decided I wanted to connect to VK5ATB – a NON NODE station who was using 144.800 (remember that my own station is still on 144.900). To connect to a NON NODE station I have to put the PORT NUMBER between my C command and the callsign of the station I want to connect to. If the station is no longer on air, I get the message "Failure with ***" sent to me. If the station is there, I get a "Connected to ***" type message, following which I am able to directly exchange commands with the distant station. In the example below, the path to VK5ATB failed, but the path to VK5ZAR worked and I was connected to VK5ZAR's PMS station.

*C 1 VK5ATB <***
ADLN2:VK5LZ-2} Failure with VK5ATB
*C 2 VK5ZAR-1 <***
ADLC2:VK5WI-2} Connected to VK5ZAR-1
Logged on to VK5ZAR's Personal Message System
WHEN CONNECTED PLEASE LEAVE A MESSAGE – END WITH CTL-Z OR /EX
CMD(B/H/J/K/KM/L/M/R/S/SR/V/?)>

Using a NET/ROM Node – Summary

Using a NET/ROM node is relatively easy. To make a connection across the network to another station, you simply need to remember three basic steps. Firstly, UPLINK or connect to your local node. Secondly, CROSSLINK connect to the distant node where you want to ultimately downlink from, and then thirdly, DOWNLINK to the station you want to connect to. The last step of "DOWNLINKing" is not required if you are connecting to a NET/ROM node that provides a service like a BBS or NOS station directly.

This has been a very simplified view of how to use a NET/ROM network. Hopefully I have given you enough to give it a try and experiment for yourself. One thing everyone should remember is that if you get lost wondering around a NET/ROM network, you can always force your own packet station to disconnect from your local node, and in doing so, your local node will close all other connections you have set up.

Who Should Run a NET/ROM Node?

If you have a look on some regions nodes tables, you may find many NET/ROM nodes listed that don't provide any benefit to the network. NET/ROM works best when there are not too many poor quality "alternate routes" available.

This means that the stations who should use NET/ROM software and enable NET/ROM routing and broadcasting, should really only be those stations providing paths between frequencies, major network services (such as full BBS stations), or network repeater stations. Individual private stations are best not using NET/ROM, as it can have an adverse affect on the packet system through too many nodes being broadcasted, too many alternate routes being available and, when links fail, the increased possibility of routing problems caused by alternate routes which really were not able to be used for traffic.

If you are going to run a NET/ROM node, talk to your local packet SysOps first and see if it is really going to benefit your local area. If not, then disable the NET/ROM function. NET/ROM does add 20 bytes of overhead to every packet you transmit, limiting maximum packet sizes from 256 bytes to 236 bytes; so, using it to access your local BBS or node only contributes unwarranted congestion to your local system. If in doubt, don't enable NET/ROM!

Conclusion

There are many more commands and useful tricks in navigating a NET/ROM network. If you want to find out more, contact your local packet radio club or local system operator. They should be able to tell you a little bit more about your local system.

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Spotlight on SWLing

*Robin L Harwood VK7RH**

I have been listening on shortwave since the mid-fifties and have heard how congested the bands became, particularly at the peak of the Cold War. The allocated broadcasting segments were crowded with stations, all trying to get their programming across the ever-increasing electronic counter measures drowning them out. Broadcasters countered by placing extra channels which further impinged on other stations. It usually was a case of the strongest signals prevailing. In the late eighties, a significant decision was made in the Kremlin to abandon jamming of foreign broadcasts in the languages of the USSR and its allied nations. The result of this was less congestion on shortwave.

This was an important time historically, as we now know, for the political situation within Eastern Europe irrevocably altered. There was now a single German state with its capital in Berlin. The nation of Czechoslovakia split into two and Yugoslavia also disintegrated into warring states and chaos. In August 1991, the USSR ceased to exist and each republic became a sovereign state, commencing with the Baltic states of Lithuania, Estonia and Latvia.

The usage of shortwave broadcasting into these regions was now made somewhat redundant by the placement of programming over domestic AM and FM networks. The clandestine US-backed "Radio Free Europe/Radio Liberty" which was the primary target of the jammers, also relocated from Munich to Prague. They established their own broadcasting network, although its influence has waned mainly due to the growth of a strong and independent commercial structure within the former Soviet bloc. There were also changes to the American external broadcasting structure which further diminished their powers.

There has also been a technological revolution which contributed to less congestion. The 1993 WARC meeting in Spain decided that Morse Code was no longer a requirement for maritime communications and it has since been rapidly disappearing. One of my favourite haunts has been between 8.2 to 8.7 MHz which, in its heyday, was extremely congested and active. Have you listened down there lately? You will be surprised at the number of stations who have already departed. The Royal Australian Navy has permanently closed VHP/VIX at Belconnen on 8478 kHz. They have also delisted Morse as a requirement for their signallers. VIS26 was another easy catch on 8521 kHz and that has now gone, although VIP in Perth is infrequently there. Coastal stations, such as ZLB in Awarua (NZ) on 8504 kHz have gone QRT. 9VG (Singapore), VPS/VRN (Hong Kong), GKA (Portishead), and most of the commercial Japanese stations (JOR, JCS, etc) no longer employ CW yet are still using SITOR on HF. However, the Americans are still there and picking up most of the commercial traffic on CW.

The SITOR mode is still popular on HF with some of the existing players, such as VIP, still operationally active. An American commercial outlet, Globe Wireless, has established a chain of remotely operated stations in Sweden, the US, Newfoundland, New Zealand and the Philippines, all controlled from Palo Alto, California (ZLA is near Lake Taupo but is unmanned).

Although the increasing trend towards INMARSAT makes HF redundant, there are still some nations and/or operators who economically prefer using an HF based service. Also, there is a trend away from HF Seaphone to INMARSAT, although it is still available despite the number of users having markedly decreased.

In last month's column, I did mention that the South African "Channel Africa" shortwave service was threatened by budgetary cutbacks. Thete was an outcry from its loyal listeners, as well as from African governments, which led to the decision being reversed; South Africa will continue to have an external voice on shortwave. It is one of the very few external shortwave stations on the continent capable of broadcasting to a wider audience. Will we see the re-introduction of services beyond Africa? I certainly hope so.

Also, programming on the BBC World Service could be significantly re-organised, if a proposal is adopted to restructure the BBC. It would mean that production of all programming, that is on radio and television, would be done independently from the organisation, presumably by contract or tender. Whether these proposals are implemented will depend on legislation in the UK Parliament.

I notice that the Voice of Russia now has its own Web page on the Internet. It can be found at *http://www.vor.ru*. It has the latest World Service information and programming information in English. Most of the major stations, and some of the minor outlets, have either their own Web pages or an e-mail address. Look for Thorsten Koch's Internet Guide to International Broadcasters at *http://www.informatik.uni-oldenburg.de/~thkoch/* or on *rec.radio.shortwave*.

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Ionospheric Update

*Evan Jarman VK3ANI**

Solar Activity

Solar activity during the last quarter was at very low levels and continuing to decline. The Ionospheric Prediction Service reported a M3.6 solar flare observed at 0446 UTC on 22 April with an associated minor shortwave fade-out over Australia. The monthly sunspot number for May was 5.6, the lowest seen on this cycle. Four more reverse polarity sunspots were observed indicating the upcoming cycle 23.

Ionospheric Activity

There were no significant ionospheric depressions during the last quarter.

T Index

The Ionospheric Prediction Service did not revise the T index values during the last quarter. The graph of values shown last quarter still applies (*Amateur Radio*, May 1996, page 47). This month's HF predictions show the T index, averaged over the month, has started to increase.

Information via Internet

The Ionospheric Prediction Service has established a large collection of information pages on the Web. The IPS information and educational pages contain information about the sun, the effects of space weather on a range of systems, and a range of more general topics. Also included is more current data from the IPS monitoring network.

The IPS pages are a valuable source of material for those wanting to learn more. The material can be accessed on the Web as *http://www.ips.gov.au/papers*. For those on the Internet and interested in propagation, this is a good place to start surfing.

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Pounding Brass

*Stephen P Smith VK2SPS**

Contests

The weekend of 15-16 June 96 saw the running of the VK Novice and CW Operators QRP contests. It was an exciting evening with many contacts made. The standard of operation from Novices during the contests was extremely high and the number on frequency was very pleasing. I would like to say well done to all who participated in the events. Results of the contests will appear at a later date.

A reminder for the evening of 3 August when the West Australian Annual CW Contest will be held; I'll be on frequency, so give me a call. For the computer orientated, and those of you who have access to the Internet, I'm compiling a list of Morse related subjects which I hope to finalise soon.

Feedback

Last month I concluded the series on a Key Construction project. I would appreciate any feedback in relation to this project, especially any difficulties you may have encountered and overcome, so I can pass on this information to other readers who may have encountered similar problems. Talking about key construction, you may be aware that I collect and restore telegraph keys and some of their related equipment. Perhaps readers may be interested in restoration techniques and having a go at restoring that old key stored in the garage or shed.

Key Knob Repairs

In this issue we will look at knobs and thumb pieces for both manual and semi-automatic keys. In coming issues I will continue with wood and metal bases and conclude with mechanical restoration.

The following techniques are for the Bakelite variety of knobs and thumb pieces, usually a dull black as found on older keys and jiggers.

Keys produced today typically use perspex or plastic and are best repaired using a plastic solvent-based cement. This technique can also be used to fill small chips or gouges in old pump knobs.

Method

The method of repair is to use a mixture of clear, two part (resin and hardener) epoxy which has been darkened with a small amount of lampblack or ebony dust. The ebony dust can be obtained from firms which sell supplies to stringed instrument makers and inlayers.

Materials Required

Epoxy, lampblack or ebony dust, waxed paper, two small wooden boards (to hold thumbpieces together) and a small bench vice.

Procedures

(1) The two pieces of wood are used to clamp the thumb piece in the bench vice by placing the epoxied thumb piece between them. Before proceeding, use double sided tape to attach a piece of waxed paper to the surface of each piece of wood where it will contact the thumb piece; this will keep the thumb piece from sticking to the wood as the epoxy hardens.

(2) Mix some two-part clear epoxy with a small amount of lampblack or ebony dust. This ensures that any exposed epoxy is dull black after sanding. Take care to use only a small amount, just enough to darken the epoxy. If you don't have lampblack or ebony dust, you can use epoxy mixed with graphite. However, use extra care so that you have a minimum of exposed epoxy after drying as it will look shinier than the dull black thumb piece.

(3) Spread the epoxy mixture into the crack in the knob or thumb piece, carefully wiping off as much excess as you can.

(4) Clamp the thumb piece between the two pieces of wood in a vice, waxed paper sides against the thumb pieces and leave for a few hours.

(5) When the epoxy dries, the only thing stuck to the thumb piece will be the waxed paper, which can be carefully removed.

(6) Use fine sandpaper and a Stanley knife to remove any rough edges or any excessive epoxy. If carefully done, a repair of this nature will be almost invisible, unless some small chips have broken off around the edges of the crack. This is where the epoxy, plus ebony dust, mixture will pay off, because it will fill in the chipped areas and, when roughed up with sandpaper, will look like the original product.

From time to time I'll introduce different key repair techniques.

Books

Moving along, I would like to mention two new books which have just been released, "Morse Code Instruction Manual" by Robert W Betts N1KPR, and its companion book "Ham Stories" also by the same author. At the moment I'm in the process of reading them and will report my findings in a later issue. Cost is $US24.95 for the first book and $US12.95 for the second, post paid from the USA.

OHTC

I wonder how many readers are aware of the OH-Telegraph Club (OHTC)? This club was founded in June 1994 with the aim of developing and spreading QRG (High Speed) CW operation in Finland, and around the world under favourable propagation conditions.

The President of the club is Seppo Niemispelto OH6VR. The club's motto is "CW Forever". Club station OHO-9ABD can be heard on Saturdays on 14.055 MHz between 1300 and 1500 UTC. Non members are invited to call in using a telegraph speed of 30 wpm or higher using BK or full QSK.

Further information about OHTC can be obtained by writing to the secretary, Janne Karresuo OH6LBW, Timonviita 3, 60/50 Seinjaki, FINLAND.

Next Month

Next month we will look at Iambic Paddles, covering early history developments, what's on the market today, and how to use and correctly adjust them. I hope to include a photograph of my own Bencher Paddle wired for left and right hand operation via a DPDT switch.

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Repeater Link

*Will McGhie VK6UU**

CTCSS Encoder Mk2

Following on from last month's *Repeater Link* on CTCSS encoders, here is an alternate design. This encoder uses the simple phase shift oscillator design, with a small change to allow for the frequency to be varied.

Phase Shift

For those who do not understand the operation of the phase shift oscillator, here is a short description. The phase difference between the base of a transistor and the collector is 180 degrees. This means that any signal fed back to the base from the collector is negative feedback. The collector output opposes the input to the base of the transistor. In order for a circuit to oscillate, positive feedback has to be fed back to the input. The network of C1, C2, C3, R1, R2 and "R3" provide a total phase shift of 180 degrees. R3 is the input impedance of the transistor.

Each single capacitor/resistor combination produces about 60 degrees phase shift. It is possible, with no load on a capacitor, to produce 90 degrees phase shift, but some load must be placed on the capacitors in the circuit. 60 degrees phase shift is the result. The three RC combinations result in 180 degrees, and this, added to the 180 degrees between collector and base, produces positive feedback between collector and base. The circuit oscillates and the frequency of oscillation is determined by the values of C and R.

All capacitors are MKT types, and this is most important to maintain frequency stability.

Lower Distortion

The phase shift oscillator does not produce a good sine wave output. The waveform is clipped on the negative half of the cycle due to overdriving of the transistor. The amount of feedback (drive) can be reduced, resulting in a greatly improved sine wave. However, if the amount of feedback is reduced to the point where there is no clipping, the oscillator is at the point of not oscillating. Any component change due to ageing or temperature can see the oscillator not oscillating.

In the circuit a small amount of negative feedback is introduced to the circuit by R4, the 47 ohm resistor. The output waveform is improved considerably by the addition of this resistor. This resistor can be increased to a point where the oscillator output is a near perfect sine wave. However, if the temperature is lowered, the oscillator stops oscillating due to the reduction in gain of the transistor. As a compromise, 47 ohms was chosen.

To improve the output waveform further, a two stage RC lowpass filter is added between the oscillator and the emitter follower. This filter is made up by the 150 k and 2 nF combinations. The waveform looks good and contains little harmonic content.

Frequency Range

The frequency of the phase shift oscillator can be varied over a modest range. By simply varying one of the frequency determining resistors, the frequency of operation can be moved. Using the multiturn pot shown, the oscillator can tune from about 90 to 150 Hertz. Resistor R2a (3k3) prevents the 100 k multi turn pot (R2b) from going to zero and stopping oscillation. Any range can be selected simply by changing the values of the frequency determining components. This design is centred on 123 Hertz.

Output Level

Level output is about 1.5 volts peak to peak. This should be enough to drive most FM transmitters.

CTCSS has to be mixed into the audio circuit that feeds the FM modulator, close to the varicap diode. An isolating resistor needs to be added between the output level control and the FM transmitter to prevent loading down the audio circuitry.

CTCSS on Your Repeater

The two encoder circuits have been presented to encourage repeater managers to install CTCSS encode facilities on their repeaters. Users require a CTCSS decoder in their equipment in order to utilise this mode of operation.

Believe me, it is worth the effort. Your mobile will no longer be making all those noises while monitoring the local repeater.

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VK6UU @ VK6BBR

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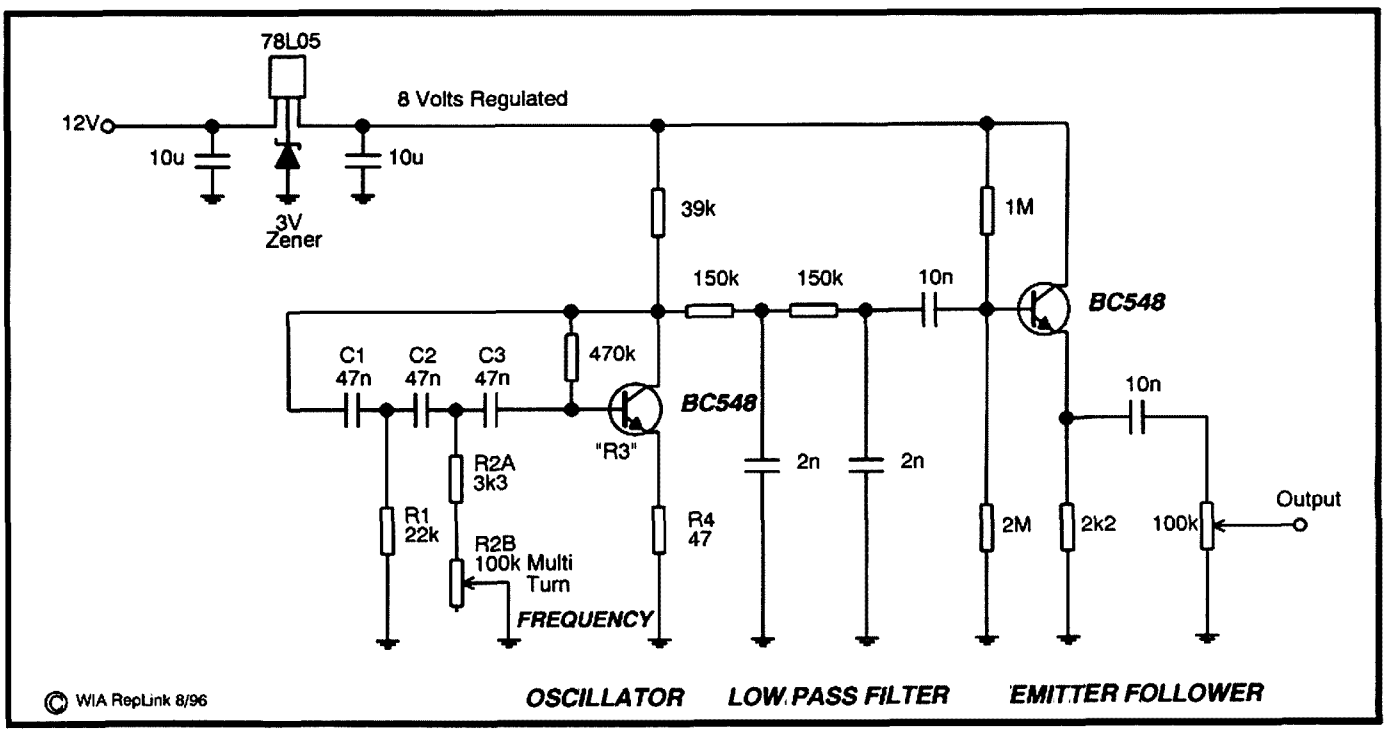


Figure 1 The alternate design CTCSS decoder.

VHF/UHF – An Expanding World

*Eric Jamieson VK5LP**

All times are UTC.

Six Metres

John VK4KK has been making intermittent contacts via Es. On 11/6 at 0100 VK4JH and 0300 0400 VK7XR. On 30/6 at 0330 he worked VK3FRJ and VK7KAD on 52.525 FM! John makes a point that stations can still be worked on 52 MHz and on 52.525 in particular. Not everyone has migrated to 50 MHz and in some cases the only equipment available is FM so the channel continues to be used.

Packet Messages

From Brisbane area, **Mick VK4JHM** reports that on 7/6 at 1045 he monitored FM operation on the 144.200 MHz secondary call channel; operating continued despite polite requests to move.

It is worth noting that this frequency has been recommended for aircraft scatter operation. Large expensive antennas with very high Q are used for these experiments. This implies that shifting frequency is out of the question. FM on the other hand has plenty of scope to move as most stations use a broad-band vertical antenna. The reason for operating on the SSB portion of the band is pager interference!

It does seem a pity that FM operation takes place so low in the band; it certainly is not in keeping with band-plan arrangements. The usual winter Es period appears to be producing a variety of signals as the next few reports indicate.

13/6: VK3RMV beacon on 50.0535 has been re-activated for the trans-Tasman mid-winter Es. Also, **Steve VK3OT** reports that: *There will be occasional tests on the proposed 50.293 beacon for next summer's South African attempt in conjunction with the new Bunbury VK6 beacon on 50.306. Power is 12 watts to a 3 dB gain vertical collinear 13 metres above a hilltop which is 330 metres above sea level, QTH QF12ah Mt Baimbridge, north of Hamilton, Victoria. Long 142° 01', lat 38° 27' South.*

From **John VK3BQS:** *It appears that the winter E season has begun. Today 29/5 at 0300, ZL Channel 1 video and audio were heard at S9+, and VK7RAE/b (on backscatter), VK4RGG/b (S9+), VK4ABP/b (in the noise). VK4 Ch 0 S9++, but VK4BRG/b was not heard. By 0400, ZL had disappeared, but VK4 TV was even stronger and VK4ABP was pinning the needle. This opening probably lasted quite awhile, as the TV was still audible at 0600. No amateur signals were heard despite several calls toward both ZL and VK4 at 0300 and 0400 hrs.*

John VK4FNQ in Townsville reports hearing: *The Alice Springs beacon VK8RAS on 50.046 on 13/5 at 0650 5x9, 0713 4x1, 0716 5x9 and 0718z nil.* [Rather up-down signals ... 5LP]. *No replies to calls on 50.110 and no other signals heard on the band. This is the first signal I have heard since 13/4.*

From **VK4IF** and the Brisbane VHF Group: *Over the last two days very strong meteor "pings" have enabled stations on 144 MHz to the south of VK4 to be received. On 3/5 (UTC) in Brisbane, VK2TWR was heard at 5x9 for 15 seconds and VK3AUU 5x5 for 5 seconds. On 4/5 (UTC) VK3AMZ was heard 5x7 for 5 seconds. These reports were the strongest heard. Many small "pings" were received between 2200 and 2230 on the specified days.*

Via the *Internet Six News* **Geoff GJ4ICD** in Jersey reports: *14/5: From 2000 to 2200 JX7DFA was up to S9 in G, GM, OZ, SM, PA0, etc but nothing in GJ.*

Leon F1HKN and Pierre F1CGQ both wish it be known that French stations can only operate from 50.200 to 51.200 MHz and ask that other stations either come up to their section or work split from below 50.200 to say 50.210. They miss many contacts due to this frequency difference. VK stations should remember this when next the band opens to Europe.

19/5: 2200: Another good morning, 4X6UJ in for an hour at S9, EH8BPX S9+, EH, CT, YU, etc, also during the afternoon the band opened to 9H, LZ, YU on 144 MHz. Opened later on six to ER5, UT3, 4X, EU6, RA3YO. G3SYC worked 7Z5OO, 2M1EJK worked K4DRY (think this was IK4DRY) and 144 MHz opened again to LZ.

20/5: Today brought results from the USA to EH8BPX, that must be one of the best distances so far this season worked at about 5000 km, 5T5BN was hrd/wkd in the UK at 3600 km, also 4X6UJ (3600 km) was pounding in for hours, JX7DFA worked in the UK and PA0....also the JW beacon was reported by G3KOX. The best news was that Finn OZ4VV heard the VE8 beacon at 2100 for 30 mins via Ae!

20/5: New beacon in Mexico: Call is XE1KK/b on 50.0225 MHz, grid EK09ik, power 20 watts, antenna omnidirectional (AR-6).

22/5: Band humming again. AM: Several stations are reporting 4X, OD5, and SV action this morning; I heard 7Z on 50.110 fast CW underneath 4Z4TT. Later (PM) the USA had a tremendous opening lasting for many hours. The "Report of the Day" goes to KP4A who it appears had a cross Atlantic contact with EH8BPX.

23/5: SPs are reporting R3VHF and EU1AA at 0700z; PM: What an opening! Double hop to 4X, 5B4, EH8, OD...etc, and on 144 MHz wkd SV0, SV2, LZ, YU, 1, Z31 during a two hour opening.

27/5: Many European signals this morning, some rare grids. PM: Hrd VE1YX wkg OK. Others were ER5DX, UX0FF, CT3FT, 5T5BN (10 W vertical), but the best was at 1654 with TR8CA at S9+ on SSB at 5,500 km (mixed mode? or ES?). OY9JD wkd ON on 144 MHz.

28/5: 50MHz open from UK between 1850 and 2200 to VE, W1/3/8. Then USA had massive opening, special calls of interest were: VP9MZ, FP5EK, KL7NO, only FP was worked in the UK.

WA1OUB's report: Prefixes (countries = 17 + FP5) and (QSO totals) in Europe: 9H1(1), CT(2), DL(3), EH(7), EH8(1), EI(2), F(2), G(31), GD(2), GI(2), GM(4), GW(5), HB9(3), I(3), OE(1), ON(1), PA(5). Heard many stations but nothing new. QSO of the day was EH8BPX to N0LL at 7300 km approx! That would have been a nice starter for the DX Challenge! Pity its not June!

VS6/VR2 Callsigns

Via the Internet, courtesy of **John VK4FNQ,** Charlie VS6XMT explains: *Thank you for your concern about our prefix matter. In fact, the Office of the Telecommunication Authority (OFTA) started to issue new call prefix (VR2) from 1993 when we renewed our licences. The early change can spread the administrative loading during the calendar year 1996 and avoid the possibility of using a VS6 call after 30 June 1997 due to human error. However, most of us are not happy about the sudden change of callsigns and requested we be permitted to use the VS6 and VR2 series of callsigns until June 1997, and it was accepted by the Authority.*

We also agreed to use one call sign only in any single transmission in order to avoid confusion. Perhaps you can hear one station in Hong Kong using VS6 in QSO with A, and later he may use VR2 to QSO with B.

When we put the beacon back on air, we (HARTS) decided to change the call prefix from VS6SIX to VR2SIX so that it can smoothly migrate to 1997. I hope the above will alleviate your concern and look forward to meeting you on the magic band. 73 Charlie VS6XMT or VR2XMT after 30 June 1997.

From John VK4FNQ: *We spent the June long weekend at a very wet Mission Beach*

where the Townsville Amateur Radio Club, Cairns Amateur Radio Club and Tablelands Electronic and Radio Club have their annual get-together.

Some winter Es around. On 10/6: 0620 heard Joe VK4JH working VK2FLI 50.120; 0647 I worked John VK2BHO 50.140 5x5 with very heavy QSB, 0658 VK2BRG 5x9, 0717 VK2RGG/b 50.058 5x2, 0725 heard VK4JH on 50.120 working VK2BRG and VK4KGP. Band closed 0750.

Meteor Showers

Data given for the maxima of the showers, the accuracy +/- 12 hours. Only showers with a rate above 25 shown. The showers last a couple of days. Data kindly provided by **OZ1FNX** and *The Observers Companion.* Perseids: August 12, meteor rate 95, peak around 0930. Geminids: December 13, meteor rate 90, peak around 1900.

Repeaters

Thanks to a new correspondent, **Andrew Miller VK5DL,** who reports that during a stay at his holiday house at Hampden near Eudunda, 120 km north east of Adelaide, on 25/26 May he was surprised to find many repeaters available. He could only use his 50 watts from the Kenwood TM-221A and a 12 element K1FO at 6 metres – no SSB at the time – and worked Mark VK2MGO via VK2RRT Boona Mount, Jack VK1JA, Mike VK1FX and Barry VK5KCX via VK1RGI Mt Ginini, Brian VK2DPG via VK2RBH Broken Hill, John VK5PO, John VK5NFJ and Barry VK5KCX via VK3RWZ Mt William.

The next morning (26/5), the following repeaters were heard. VK1RGI, VK1RTD, VK2RAO, VK2RBH, VK2RCC, VK2RCH, VK2RGF, VK2RRT, VK2RWG, VK2RWM, VK3RBA, VK3RCV, VK3RGV, VK3RLV, VK3RMA, VK3RMM, VK3RNE, VK3RSB, VK3RSH, VK3RVL and VK3RWZ. He contacted Sid VK2SW via VK2RWM at Grenfell.

That's an imposing list of 21 repeaters. Andrew commented that there seemed little activity despite the band being open over an extended area, and suggests the temporary absence of the VK5VF two metre beacon may have been a contributing factor. The most unusual part of the event was being able to access VK1RGI using his HT with a 1/4 wave antenna!

Reunion Island

Don VK6HK sent a fax with the following information: *On 16/6 during a QSO on 14 MHz with Philipe FR5DN on Reunion Island, he advised that Yvon FR1GZ had reported hearing a signal on 144.560 on 30/5 at 1000 for "two to three minutes" and again on 4/6 at 1331.*

The west facing beacon VK6RBU at Bunbury operates on 144.560 MHz and when the keying cycle of the beacon was played to FR5DN and FR1GZ on 14 MHz, Yvon confirmed that "that was the signal heard". The existence of VK6RBU had been advised to FR5DN by Bill VK6ACY, who is closely involved with the VK6RBU project.

Yvon has a nine element Yagi for two metres with a preamp. He is favourably located on the eastern side of Reunion Island FR5DN has an EME standard station on 144 MHz with 400 watts to a 4 x 17 element array, but is screened to the east by a 2400 metre volcano.

The distance involved is of the order of 6000 km, a potential world record distance for two-way tropospheric communication on two metres, if that can be achieved one can only be cautiously optimistic! Contact with FR5DN will be maintained by HF, fax and the Internet. It is expected that there will be increased attention to the path in the Spring and Autumn of 1996/7.

One would hope that, in the event of a further hearing, a tape recording will be taken so that a more positive identification can be made of the signal.

Darwin Repeaters

Rex VK8RH advises that two new repeaters are operating from Darwin with the callsign VK8RDX on 53.925 with 120 watts and 29.680 MHz with 75 watts. On 6 m operation is 123 Hz CTCSS and on 10 m carrier squelch or DTMF.

Rex also mentioned that the YB0 beacon from Jakarta in Indonesia is now on 50.043 MHz running 15 watts to an omni-directional antenna. YB0UCO is its keeper.

News from the UK

Ted Collins G4UPS writes for May: *I have recently scoured my logs for the details of the openings on six metres across the "pond" from 1983. The earliest ever opening as far as the UK is concerned was 1993, when the first opening of the Sporadic E season occurred on 5 June that year, with an opening to VE1ZZ and VE1ZDX.*

The only opening to occur without some prior warning, ie activity on 28.885 MHz or the VO1ZA beacon being heard prior to an opening, was 6 June 1988. I had an opening to SV at the time and was calling CQ on 50.110 when my calls were answered, surprisingly at 1513 by WD4KPD for the first six metre opening across the pond for that year. All other openings in other years were preceded by some obvious indicator that the band was possibly going to open.

The first 1996 UK opening was to VE1YX on 28/5. Although VE1YX had worked into Europe on 27/5, his first UK contact was at 1845 with a QSO to myself with 5x9 signals both ways. At 1852 I worked WA1OUB 559/529 for what was possibly the first W/UK contact for the new season.

The Bulgarian beacon LZ1SIX on 50.083 grid JN47se heard for the first time on 27/5.

Ted hasn't allowed the grass to grow under his feet during May. His seven page report from his log indicates contacts with the following 46 countries: 4X6, 5B4, 5T5, 9A3, 9H1, CN8, CT, DL, EH1, EH8, ES5, EU6, F, G, GB6, GW, HA, HB9, I, IS0, JX7, LA, LY, OE, OH, OI, OK, ON, OY, OZ, PA, RV3, S51, SM, SP, SV, SV9, T98, VE, W, YL, YO, YT, YU, Z32, ZB. Not a bad effort for one month!

In addition, Ted copied the following 21 beacons: CT0WW, CU3URA, EA3VHF, ES0SIX, ES6SIX, GB3BUX, GB3NHQ, HV3SJ, LZ1SIX, OH1SIX, OZ7IGY, S55ZRS, SK3SIX, SR5SIX, SR6SIX, SV1SIX, SV9SIX, VE1PZ, VO1ZA, YU1SIX, ZD8VHF.

Reading the above does make one wonder whether six metres actually closes during their summer Es season. It adds strength to the oft quoted phrase, "Six metres never closes, only the operators cease!" For those who live in Australia, to be involved in openings on the scale enjoyed in the UK and Europe, is beyond our comprehension. If only the adjacent island nations of the Pacific region were of sufficient population to support regular six metre operations, we would have a further 50 countries available for contacts; the possibilities are there but, unfortunately, it is unlikely to happen.

Six Metre DXCC Leaders

Emil Pocock W3EP, in his *The World Above 50 MHz* in *QST* for July, lists the leaders on the 50 MHz DXCC Table. The list is compiled by JA1VOK.

156 JA4MBM	131 JR2HOG
151 JA1BK	131 SM7AED
150 PA0HIP	129 9H5EE
150 GJ4ICD	127 JA1PVI
150 PY5CC	127 G3KOX
143 SV1DH	127 ON4ANT
140 JE1BMJ	127 JA1RJU
140 G3WOS	126 W5FF
136 VE1YX	126 JA3EGE
135 JA1VOK	125 JI1DLZ
133 JA6RJK	125 JI2CCF
133 JR2HCB	125 JR2AUE
133 SM7FJE	125 K1TOL
132 G0JHC	125 ON4KST
131 WA1OUB	

Emil comments: *With 50 MHz operation documented from more than 250 of the current 326 DXCC countries, the competition to be alone at the top of the countries-worked list continues. Hatsuo Yoshida JA1VOK, editor of VHF-UHF DX*

Topics in the Japanese journal Mobil Ham, has been keeping close tabs on the leaders. According to his compilation, published in April this year, 39 stations have worked at least 125 DXCC countries.

The leaders are listed in the table above. Thirteen of the above 29 are from Japan, tending to confirm their unique geographical position in that they are within range of many countries to the east, west and south of their country. They are also dedicated operators.

Closure

Closing with two thoughts for the month:

1. If you observe people long enough, you'll realize that the self-made ones have an abundance of working parts, and,

2. Agreement in principle is the politest form of disagreement.

73 from The Voice by the Lake.
**PO Box 169, Meningie SA 5264*
Fax: (085) 751 043
Packet: VK5LP@VK5WI.#ADL.#SA.AUS.OC

ar

Silent Keys

Due to space demands obituaries should be no longer than 200 words.

The WIA regrets to announce the recent passing of:-

T M	O'DONNELL MBE	VK2OD
V (Victor)	CHENNELL	VK5JH

ar

WIA News

WIA Talks with SMA Resolve Some Issues

The WIA's SMA Liaison Team met with the Spectrum Management Agency in Canberra on Friday, 28 June, for talks covering some 20 topics, resulting in the resolution of some outstanding issues and further progress on the rest.

The broad topics discussed included the WIA's proposal for expansion of the 80 metre DX window, various interference matters, technical licence specifications, the examination system and a variety of licensing issues.

The meeting was attended by WIA Federal President, Neil Penfold VK6NE, Dr David Wardlaw VK3ADW, and Roger Harrison VK2ZRH. Nine staff from the various relevant sections of the SMA attended, and the meeting was chaired by Fred Gengaroli, the manager of SMA Technical Services, Customer Services Group.

80 m DX Window Further work on the WIA's proposal to expand the 6 kHz window had been done since the draft was presented to the SMA at the previous WIA-SMA meeting on 30 November last year. This work addressed concerns expressed by the SMA last year about potential interference problems, and feedback from users of the 80 m DX window. In addition, the SMA requested further background on history and usage of the DX window.

Roger Harrison gave a presentation on the updated proposal, including results of a propagation study which showed that the interference potential between amateurs and primary licensees would be very low as it is not proposed to share the proposed expanded band during business hours. This study showed that the originally proposed time for usage by amateurs could be extended to 0830 hours local time, from 0700.

In summary, the updated 80 m DX window proposal submits that Australian amateurs be permitted to use an allocation of 3760-3900 kHz on a secondary basis, between the hours 1700-0830 local time Mondays to Thursdays, and from 1700 on Fridays through to 0830 on Mondays. In addition, the WIA proposes that Intermediate licensees get access to the expanded band and 3750-3760 kHz be permitted for amateur emergency service (WICEN) use during notified emergencies, with 3760 kHz lower sideband reserved for non-emergency nets and exercises.

Len Bray from the SMA gave a presentation which outlined the 3.5-4 MHz segment allocations in Region 3 and around the world, to put this part of the spectrum in context as to its world-wide usage. Mr Bray also provided details of usage of the 3750-3900 kHz band over some years and the trends in licensing in this sector.

As the Australian Radiofrequency Spectrum Plan is to be reviewed over coming months, with a view to publishing an updated version early next year, the next move for the WIA is to discuss the proposal at the Radiocommunications Consultative Council (RCC). David Wardlaw VK3ADW is the WIA's representative on the RCC.

Technical Licence Specifications Drafts of the Beacon and Repeater Technical Licence Specifications were sent to the WIA in June, shortly before the SMA meeting and the matter was discussed in Canberra. While several minor points were resolved, issues concerning the control of beacons and repeaters, and connection to the public telecommunications network, which have been the subject of discussion at previous WIA-SMA meetings, were again discussed at length.

The WIA proposes to seek permission for amateur stations (eg packet bulletin board system operators), as well as beacons and repeaters, to be connected to the public telecommunications network (PTN) for various purposes. This is not currently permitted. It is acknowledged, however, that the WIA considers there are "grey" areas, and packet radio "wormholes" to the Internet is one of them.

There is concern within the SMA that connection of stations to the PTN may lead to breaches of amateur licence conditions, for example, those regarding third party traffic regulations and access to the amateur bands by unauthorised persons. Control of the operation of beacons and repeaters via a telephone, or for uploading and downloading of data by the operators of these systems using a telephone connection, are areas which the WIA feels offers little or no risk, provided precautions relating to station control already in the regulations and General Licensing Conditions are observed. Likewise, with Internet packet radio wormholes there is room for discussing review of regulations in this area. These issues were discussed at length during the WIA-SMA meeting in June and the WIA has subsequently prepared and sent submissions to the SMA addressing the concerns and covering the technicalities of the issues in some detail.

In the meantime, the WIA does not condone "under the counter" station connection to the PTN on the basis that, if it's done proficiently, no one is likely to be any the wiser, and that the SMA is unlikely to take action. It should be noted that the SMA has taken action in recent times over breaches of operators' licence conditions on the 80 m DX window.

Call Signs Administration of amateur call signs, particularly the issuing of special event call signs, was discussed at length. A previous proposal by the SMA to charge $24 for issuing AX and VI prefix call signs has been withdrawn, pending further discussions. A submission to the SMA Liaison Team on special call signs from Steve Pall VK2PS provided the basis for discussion on the issue. Steve Pall's well-researched submission covered the salient aspects of special amateur call signs very cogently, well supported with many relevant local and international examples. The inclusion of previous departmental correspondence proved particularly useful.

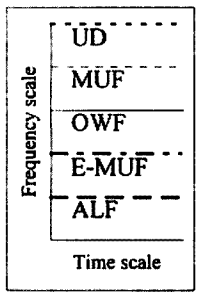
There is now greater understanding within the Canberra SMA on the call sign issue and the SMA has provided the WIA with additional information as to the issues which need to be addressed so that the situation may be improved. At the SMA's request, the WIA is now compiling a comprehensive submission covering all aspects of amateur call signs, with a view to the *Radiocommunications Assignment and Licensing Instructions*, AM2 and MS4, which affect amateur call signs, being reviewed and rewritten.

Further details on results of discussions with the SMA in June will be detailed in later *WIA News* releases.

HF Predictions

Evan Jarman VK3ANI

T Index: 9



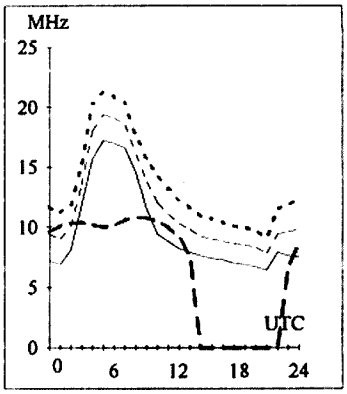
These graphs show the predicted diurnal variation in key frequencies for the nominated circuits. They also indicate a possibility of communication (percentage).

The frequencies identified in the legend are:-

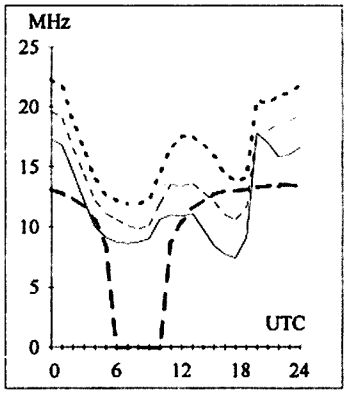
- Upper Decile (10%)
- Maximum Useable Frequency (50%)
- E layer MUF
- Optimum Working Frequency (90%)
- Absorption Limiting Frequency

The predictions were made by one of the Ionospheric Prediction Service Stand Alone Prediction Systems. The T index used is shown above the legend. The Australian terminal azimuth (degrees), path length (kilometres) and propagation modes are also given for each circuit. ar

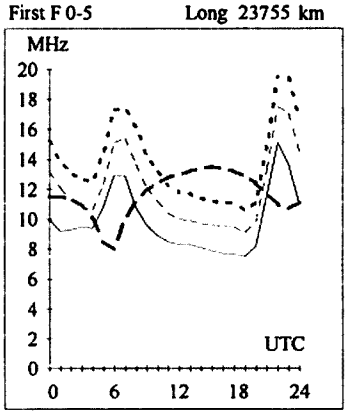
Adelaide-Johannesburg 237
Second 4F 5-6 4E 0 Short 10042 km



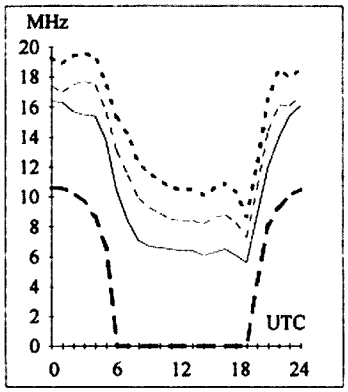
Brisbane-Boston 56
First F 0-5 Short 15722 km



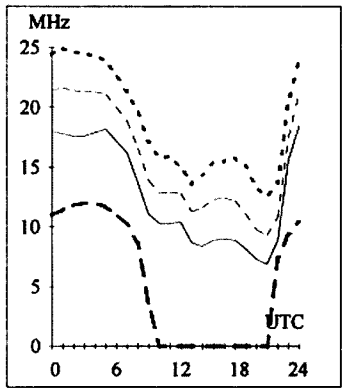
Adelaide-London 132
First F 0-5 Long 23755 km



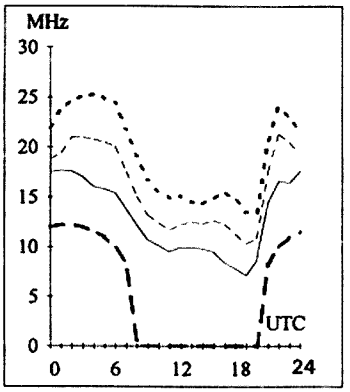
Brisbane-Christchurch 141
First 1F 5-8 1E 0 Short 2516 km



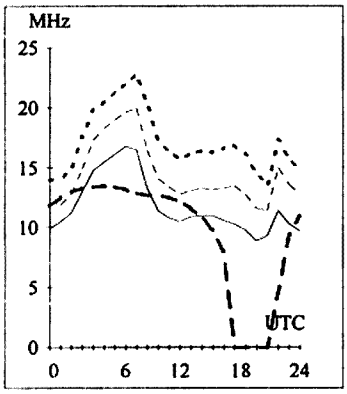
Canberra-Jakarta 297
First 2F 3-5 2E 0 Short 5398 km



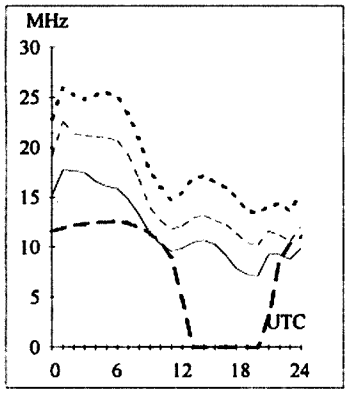
Darwin-Bangkok 310
First 2F 7-14 2E 0 Short 4435 km



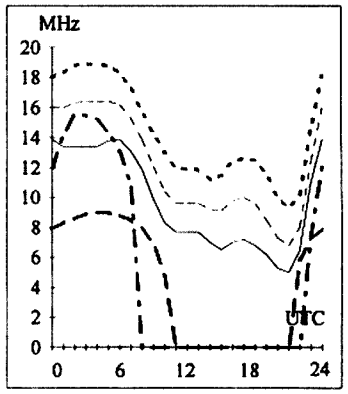
Adelaide-London 312
First F 0-5 Short 16268 km



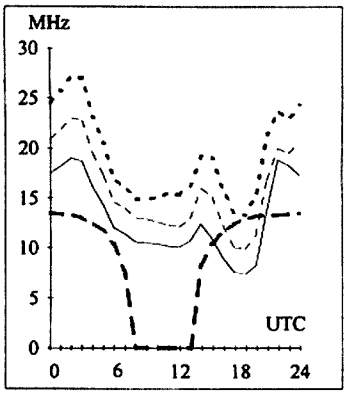
Brisbane-Karachi 294
Second 4F 3-8 4E 0 Short 10885 km



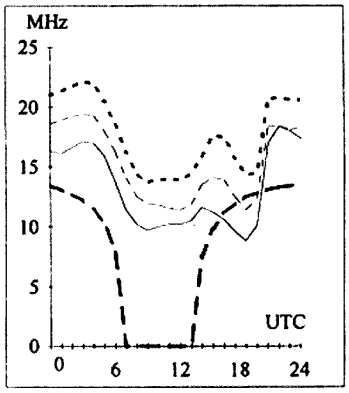
Canberra-Jakarta 297
Second 3F10-13 3E6 Short 5398 km



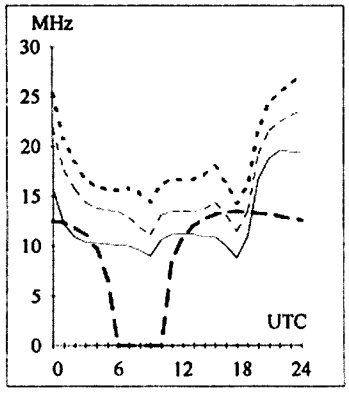
Darwin-Los Angeles 58
First F 0-5 Short 12693 km



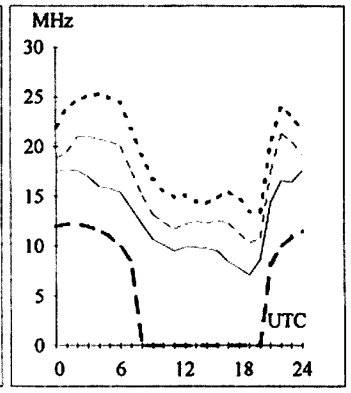
Adelaide-Vancouver 49
First F 0-5 Short 13421 km



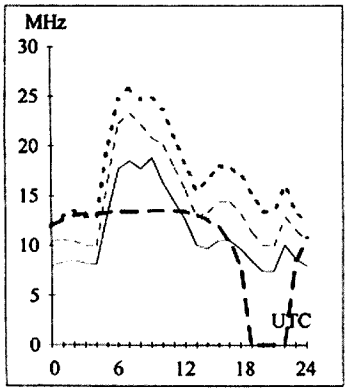
Brisbane-West Indies 93
First F 0-5 Short 15339 km



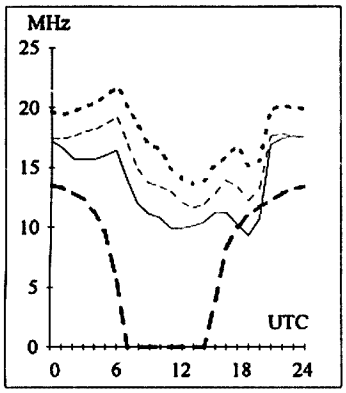
Canberra-Tokyo 352
Second 3F 4-8 3E 0 Short 7498 km



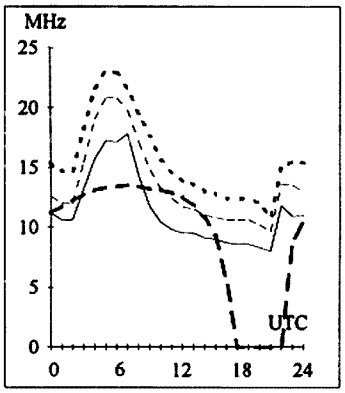
Darwin-Dakar 278
First F 0-5 Short 16578 km



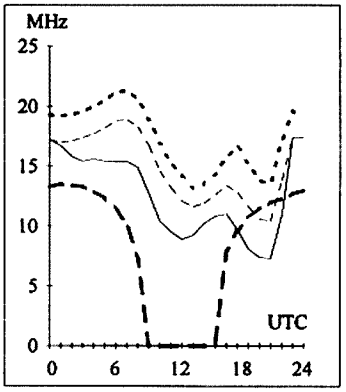
Hobart-Alaska 24
First F 0-5 Short 13052 km



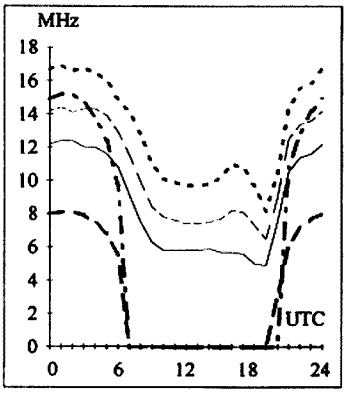
Melbourne-Athens 289
First F 0-5 Short 14949 km



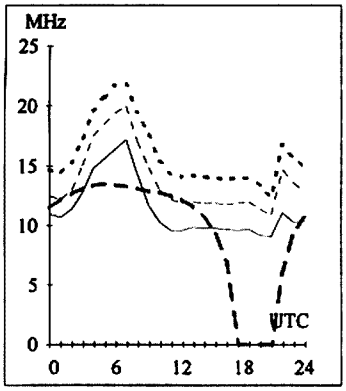
Perth-Anchorage 34
First F 0-5 Short 13298 km



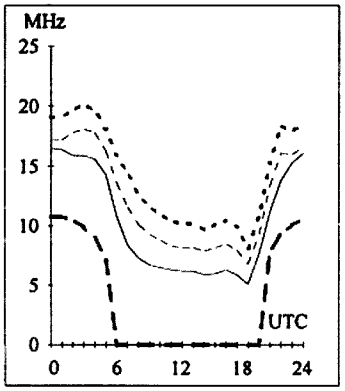
Sydney-Norfolk Island 76
First 1F 11-16 1E 8 Short 1679 km



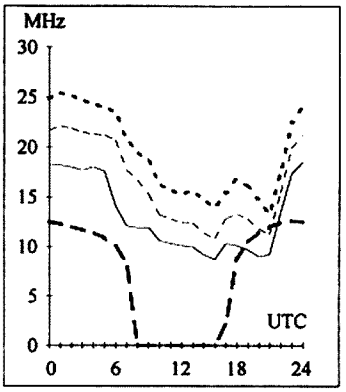
Hobart-Brusselis 301
First F 0-5 Short 17099 km



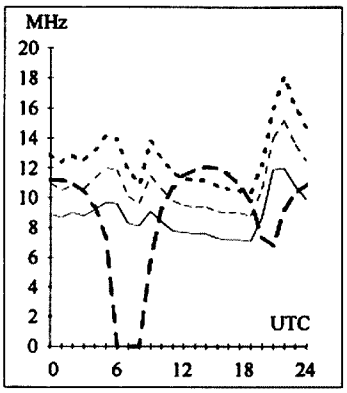
Melbourne-Auckland 97
First 1F 4-7 1E 0 Short 2622 km



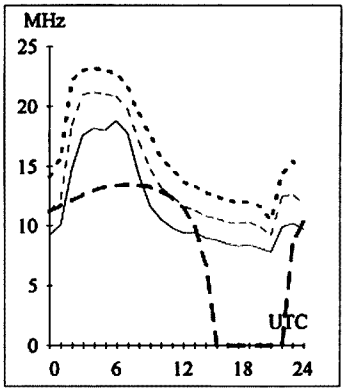
Perth-Honolulu 70
Second 3F 4-7 3E 0 Short 10906 km



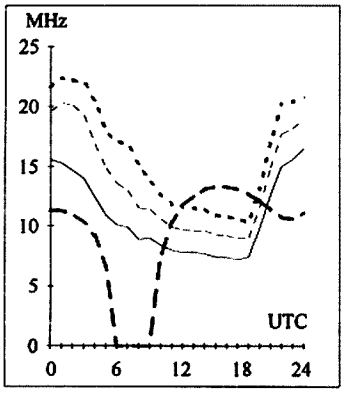
Sydney-Rio de Janeiro 164
First F 0-5 Short 13519 km



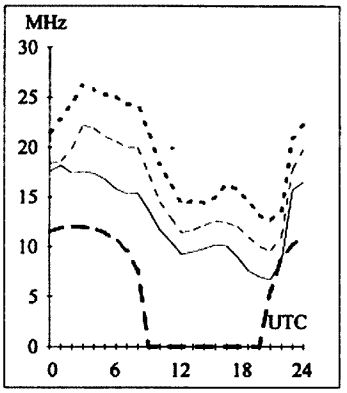
Hobart-Tel Aviv 282
First F 0-5 Short 14102 km



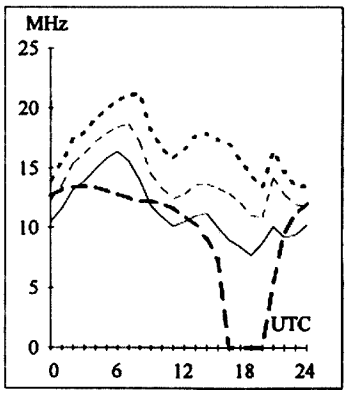
Melbourne-Trinidad 132
First F 0-5 Short 16033 km



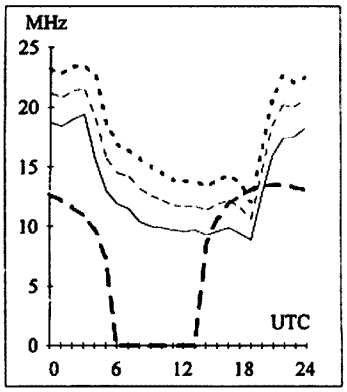
Perth-Osaka 17
Second 3F 4-9 3E 0 Short 7685 km



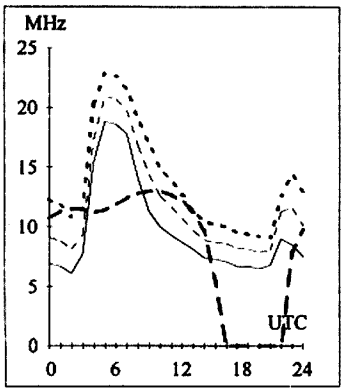
Sydney-Stockholm 324
First F 0-5 Short 15593 km



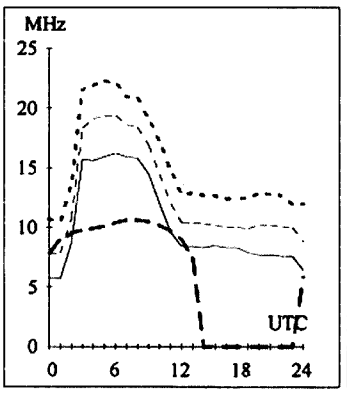
Hobart-Los Angeles 66
First F 0-5 Short 12820 km



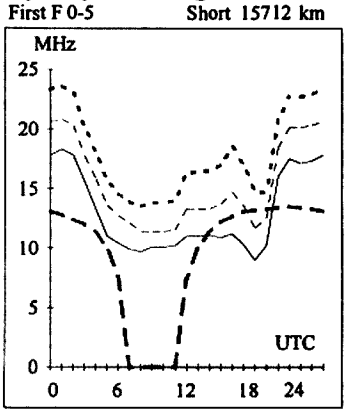
Melbourne-Kinshasa 240
First F 0-5 Short 13029 km



Perth-Nairobi 275
Second 4F 7-10 4E 0 Short 8899 km



Sydney-Washington 68
First F 0-5 Short 15712 km



HAMADS

TRADE ADS

• **AMIDON FERROMAGNETIC CORES:** For all RF applications. Send business size SASE for data/price to RJ & US Imports, PO Box 431, Kiama NSW 2533 (no enquiries at office please ... 14 Boanyo Ave Kiama). Agencies at: Geoff Wood Electronics, Sydney: Webb Electronics, Albury: Assoc TV Service, Hobart: Truscotts Electronic World, Melbourne and Mildura: Alpha Tango Products, Perth: Haven Electronics, Nowra: and WIA Equipment Supplies, Adelaide.

• **WEATHER FAX programs** for IBM XT/ATs *** "RADFAX2" $35.00, is a high resolution shortwave weatherfax, Morse and RTTY receiving program. Suitable for CGA, EGA, VGA and Hercules cards (state which). Needs SSB HF radio and RADFAX decoder. *** "SATFAX" $45.00, is a NOAA, Meteor and GMS weather satellite picture receiving program. Needs EGA or VGA & WEATHER FAX PC card, + 137 MHz Receiver. *** "MAXISAT" $75.00 is similar to SATFAX but needs 2 MB of expanded memory (EMS 3.6 or 4.0) and 1024 x 768 SVGA card. All programs are on 5.25" or 3.5" disks (state which) plus documentation, add $3.00 postage. ONLY from M Delahuntly, 42 Villiers St, New Farm QLD 4005. Ph (07) 358 2785.

• **HAM LOG v.3.1** – Acclaimed internationally as the best IBM logging program. Review samples....AR: "Recommend it to anyone"; The Canadian Amateur: "Beyond this reviewer's ability to do it justice. I cannot find anything to improve on. A breakthrough of computer technology". ARA: "Brilliant". Simple to use with full help, the professional HAM LOG is immensely popular (now in its 5th year), with many useful, superb features. Just $59 (+$5 P & P), with a 90 page manual. Special 5 hour Internet offer. Demos, brochures available. Robin Gandevia VK2VN (02) 369 2008 BH fax (02) 369 3069.

Internet address rhg@ozemail.com.au.

FOR SALE NSW

Hewlett Packard noise sources models S347A 2.6-3.95, X 347A 8.2-12.4, 349A 0.4-4GHz, $125 each; **Coupler G752D** 3.95-5.85 GHz, 20 dB, $145. Peter VK2CPK QTHR.

Yaesu FT7 Tx, PN8J.100161, $400 ono. **ATU** homebrew, $50. Box of cables, fittings, several publications. Offers, Deceased Estate Harry Capsey. Lied amats only. H Chapman (02) 644 1929.

Yaesu FT101E HF transceiver, AC/DC leads, manual, GC, $475. John VK2AKQ (02) 543 5374.

Icom 761 HF all band/mode transceiver, general coverage receiver. Advanced in-built antenna tuner. VOX operation, voice synthesiser option, all advanced functions and controls, set hardly used, s/n 03143, $2,500 ono. **Hy-gain 10-15 meter duo-band 3E beam antenna,** inst manual, very good condition, cost $450 sell, $150. Mark VK2KFI (042) 72 4760 or (0412) 42 4760.

Free **Commodore computer.** For sale: **FT-One, FT-901DM, TR-7400A, PCS-300,** 2 CB Tx, **TL-922 & FL-2100B** linears, **TH6DXX** ant, two 32 ft lattice masts, 5- band ground plane, CB ground plane, two pr tubes (**CV2245 & 572B**) still in cartons, 6 ft steel equipment rack 19" panels, **Heathkit CRO, Datong FL2** filter for CW & SSB, brand new rotator. For offers & info, Gordon VK2DGS (02) 416 1329.

Shack Clearance **Yaesu FT757GXII, Yaesu FC700** coupler, Yaesu FP757GX power supply, complete system. Will sell for $1,800. Will separate. **Emtronics 1MV3** vertical. 3 band dipole antenna free to good home. Also AR magazines back to 1990. Harry VK2MJH QTHR (02) 498 1170.

Deceased Estate of Bob Welsh VK2ERP. **Icom 735** HF txcvr, s/n 07856, $1,000; **Icom 271H** 2 m all mode, s/n 03953, $950; **Icom 471H** 70 cm all mode, s/n 01510, $950; **Yaesu FT227RB** 2 m FM, s/n 9L080138, $160; **Yaesu MMB16**, $30; **VK Power Master** 13.8 V supply, $150; **KR-400** rotator and **KR-500** elevator, $800, will separate; **WELZ SP-220** SWR meter, $100; Heavy duty spring base, $50. Prices negotiable. Randall VK2EFA QTHR (080) 87 5285.

HL-120-U 100 W out 435 MHz Tokyo High Power Labs Inc, s/n 4060 098, orig carton, manual, $435, heavy, please pick up; **PS-430** 13 V, 20 A power supply, GASFET pre-amp Rx, Kenwood, s/n 5020 696, manual, original carton, $350. H Ruckert VK2AOU QTHR.

TH3 Jnr with balun, $100. Geoff VK2EKP (02) 310 4294.

Hy-gain DB-1015 3 element 10 & 15 metre duo-band beam in good condition, $225 ono. Art VK2AS (02) 416 7784.

Kenwood TS680S, PS50, ATU230, MC60, IC02A, multi-band vertical Coman-tenna, good condition, cartons, manuals, $1,000 the lot. Rod VK2BRW QTHR (075) 524 3722.

AST premium 286 10 MHz PC/AT, 3.5" & 5.25" diskette drives, 70 Mb hard disk, EGA card, serial & parallel ports. Well-built reliable machine, one owner, original manuals & AST DOS, $250; Scanner **PRO 2022** 210 channel desktop/mobile, mains & 12 V, in original packing, as new, cost $550, sell $275. Brad VK2KQH day (02) 9906 5855 otherwise (018) 64 0377.

Oscilloscope Trio CS-1560AII, two channel, 15 MHz, in excellent condition with manual, $425. John VK2ATU (02) 792 2275.

FOR SALE VIC

Three plug in boxes, Tektronix CRO, condition unknown, free. Dual time base, 5A2ON differential amp, input box. Allen VK3SM (03) 9386 4406.

Kenwood TS520S HF tcvr, mic, manual, $400; **Kenwood TR-7730** 2 m FM tcvr, mic, manual, $140; **Yaesu FT223** 2 m 22 channel mobile FM tcvr, mic, manual, $75; **MFJ-207** HF SWR analyser, manual, $90; **Digitor** HF-VHF frequency counter, $40; **Icom IC-502** 50 MHz SSB portable tcvr, mic, manual, $130. Robin VK3TNW (03) 9729 1139.

Nally Tower 12.2 m wind up tower, engineering calcs available, $600. David VK3DJT (03) 9898 0031.

Yaesu FC102 1.2 kW ATU, gc/gwo, $350. Damien VK3CD (054) 27 3121.

FOR SALE QLD

FT101E, $350; **Telescopic tower** 75 ft+, $600; **2 m beam**, $25; **833A** and connectors, $70; 7/8" earth strap, $2 metre; 4000 valves, miniature, octal, vintage. Catalogue 0.85c. Hadgraft, 17 Paxton St, Holland Park QLD 4121 (07) 3397 3751 AH.

Kenwood TS830S transceiver, s/n 2042155, with spare finals; **AT230 ATU, SP230** speaker, manuals and accessories, all in top order in original packaging, $1,600 plus freight and insurance. VK4BNR QTHR (07) 3408 3154.

Valves for Amateurs and Restorers. Johnson square ceramic sockets, HF, VHF variable condensers, high voltage power supply components, all valves tested, some unused. Send SASE for lists. Ted VK4YG QTHR Box 245, Ravenshoe Qld 4872 (070) 97 6387.

Kenwood TS430S tcvr, HF incl WARC, CW/AM filters, workshop manual, $850; **TH3** Yagi, 20/15/10, $180. Warwick VK4NW QTHR (071) 59 2007.

Computer grade **high voltage electros** 2500 ÊF 400 volts working, $5 each; **Collins 500 kHz mechanical filters,** USB and LSB, $25 the pair. John VK4KK QTHR (07) 3269 6647.

2 m FM mobile, **Phillips FM92,** 25 watt, 99 repeater, packet, simplex & special channels, 2 scan groups, sub-audible tone encoder. C/w mtg brackets & remote control head/speaker & mic, good working condition, $190; **3 Band Dipole** ("Spider" construction), separate elements for 40 & 30 metres, C/w balun, 10 m RG58 coax & spare elements for another band, centre hub for single pole mounting, $80; **Stepped Attenuators Hewlett Packard HP355C,** 0 to 12 dB in 1 dB steps, 0.5 watt, 50 ohm, DC to 1 GHz, also RLC electronics model AT200-SR similar to HP355C, $90 each. Gary VK4AR QTHR (07) 3353 1695.

Kenwood TS120S, mobile mnt, handbook, 100 W HF, s/n 950833, $450; **Kenwood AT120,** $100; **Chirnside whips** 80, 40, 20, 15, 10, $20 each; **National RJ3150** 28 MHz 9 channels AM, $30; **Sharp** 18 channel 28 MHz SSB/AM, $30. Roger VK4CD QTHR (077) 74 0221.

FOR SALE SA

Phillips FM900 series commercial rig converted to 2 metres, 9 channels, 25 W, can be programmed for any frequencies in 2 metre band, $120 ono. Rob VK5CS (085) 68 5411.

Log periodic (8EL), RF connectors, microphones, new mic cords, antenna bases, CRO probes, 10-11 m 5 element beam, telephones, 2x100 watt baluns, Vectronics ATU 1.8-30 MHz 300 watts, top shelf ATU, from $1.00. Paul VK5MAP QTHR (086) 51 2398.

FOR SALE WA

Collectors item **Heathkit tube checker MOD TC-1** with cables and manual, $120. VK6QB (097) 52 2651.

FOR SALE TAS

Kenwood service manual, suit TS850, $30; **Icom FL102** AM filter, suit IC760, IC761, IC765, IC575, $60; **Yaesu FL2050** 2 metre linear, 70 watts output, $150. All as new, inc boxes. Allen VK7AN (003) 27 1171.

WANTED NSW

Mecrograph or The McDonald Pendograph or any unusual Australian keys or bugs. Pay top dollar for any of the above. Steve VK2SPS (02) 9999 2933 after 6pm.

External VFO for FT301, must be in good condition. Ray VK2AWQ QTHR (064) 94 1347.

AWA 11" B/W TV set, model PIP working or not, will pick up. David VK2COF (02) 498 2622.

WANTED VIC

PCB for Dick Smith 2 meter linear amp kit K6313 PCBZA1661, or kit not working; also kit or complete 70 cm linear, 23 cm linear, valve equipment also considered. Faulty or cheap Ham ? Rotator, all items to suit budget. David VK3XLD (03) 9306 3739.

WANTED QLD

Daiwa rotator control unit CR-4, DC-7055, DC-7011 or similar (faulty or working) to use with Daiwa MR-750 rotor; **Remote control heads** for AWA RT85 & Phillips FM900 series transceivers. Gary VK4AR QTHR (07) 3353 1695.

Heathkit 6 m amplifier, Heathkit 2 m all-mode transceiver, Heathkit **SB200** amplifier, Heathkit **VHF SWR-power meter**, Heathkit **HF SWR-power meter**, Heathkit rotary **coax switch**, Heathkit **HW16, HW101, DX40, DX60** transmitters/transceiver for operational Heathkit Museum. Contact "Doc" VK4CMY PO Box 24, Dalveen Qld 4374 or phone (076) 85 2167 before 8pm please. Vietnam Veterans Wireless Group.

Geloso AM HF transmitter, power supply WWII army set No. 11, handbook No. 11, will pay your price. Ray VK4FH (07) 3299 3689.

WANTED SA

Volt meter 0-20 V, 70 mm x 70 mm, must be in good condition and good working order. "Somebody must have one to sell". Paul VK5MAP QTHR (086) 51 2398.

Yaesu YO-901 multiscope monitor. Ivan VK5QV QTHR (087) 25 5514.

Digital counter card PB2086A containing 40 leg chip Yaesu 5920-0741 for FT101ZD with s/n's above (XX) 16001. Also operating details, circuits etc for Philips CRO GM5659, Osc. GM2875, Philoscope TA160. Will pay reasonable copying costs, postage. Gordon Welsh VK5KGS, Box 152, Stansbury SA 5582.

WANTED WA

B-MAC C to Ku band satellite receiver in working order. Trevor VK6ZTJ QTHR (098) 25 1008 evenings or fax (098) 25 1240.

Sell or Swap 54 feet triangular lattice antenna, climbable. Consists 2 x 15' x 12" (30 cm) and 4 x 6' x 9" (22 cm) lengths. Want 1 or 2 lengths 6 m x 6" (15 cm) Hills TV antenna masting and 6 m x 2" (50 mm) ID galv pipe. Beau VK6COP QTHR (09) 457 8179.

MISCELLANEOUS

• THE WIA QSL Collection (now Federal) requires QSLs. All types welcome especially rare DX pictorial cards special issue. Please contact Hon Curator Ken Matchett VK3TL, 4 Sunrise Hill Road, Montrose Vic 3765, Tel (03) 728 5350.

• DO YOU HAVE ANY used telephone cards or stamps lying around? If so could you please send them to the Epilepsy Association of South Australia Inc, PO Box 12, Woodville SA 5011. **ar**

WIA MORSE PRACTICE TRANSMISSIONS

VK2BWI	Nightly at 2000 local on 3550 kHz
VK2RCW	Continuous on 3699 kHz and 144.950 MHz 5 wpm, 8 wpm, 12 wpm
VK3COD	Nightly (weekdays) at 1030 UTC on 28.340 MHz and 147.425 MHz
VK3RCW	Continuous on 144.975 MHz, 5 wpm, 10 wpm
VK4WIT	Monday at 0930 UTC on 3535 kHz
VK4WCH	Wednesday at 1000 UTC on 3535 kHz
VK4AV	Thursday at 0930 UTC on 3535 kHz
VK4WIS	Sunday at 0930 UTC on 3535 kHz
VK5AWI	Nightly at 2030 local on 3550 kHz
VK5RCW	Continuous on 144.975 MHz, 5 wpm to 12 wpm
VK6RCW	Continuous on 147.375 MHz, 4 wpm to 11 wpm
VK6WIA	Nightly at 1930 local on 146.700 MHz and nightly (except Saturday) at 1200 UTC on 3.555 MHz

Hamads

Please Note: If you are advertising items For Sale and Wanted please use a separate form for each. Include all details: eg Name, Address, Telephone Number (and STD code), on both form. Please print copy for your Hamad as clearly as possible.

* Eight lines per issue free to all WIA members, ninth line for name and address Commercial rates apply for non-members. Please enclose a mailing label from this magazine with your Hamad.
* Deceased Estates: The full Hamad will appear in AR, even if the ad is not fully radio equipment.
* Copy typed or in block letters to PO Box 2175, Caulfield Junction, Vic 3161, by the deadlines as indicated on page 1 of each issue.
* QTHR means address is correct as set out in the WIA current Call Book.
* WIA policy recommends that Hamads include the serial numb,er of all equipment offered for sale.
* Please enclose a self addressed stamped envelope if an acknowledgement is required that the Hamad has been received.

Ordinary Hamads submitted from members who are deemed to be in 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: $25.00 for four lines, plus $2.25 per line (or part thereof) Minimum charge – $25.00 pre-payable.

State: .....

Not for publication: ❑ Miscellaneous ❑ For Sale ❑ Wanted

Name: ..... Call Sign: ..... Address: .....

WIA Divisions

The WIA consists of seven autonomous State Divisions. Each member of the WIA is a member of a Division, usually in their residential State or Territory, and each Division looks after amateur radio affairs within its area.

	Division Address	Officers			Weekly News Broadcasts		1996 Fees
VK1	ACT Division GPO Box 600 Canberra ACT 2601	President Secretary Treasurer	Philip Rayner John Woolner Bernie Kobler	VK1PJ VK1ZAO VK1KIP	3.570 MHz LSB, 146.950 MHz FM each Sunday evening commencing at 8.00 pm local time. The broadcast text is available on packet, on Internet aus.radio.amateur.misc newsgroup, and on the VK1 Home Page http://email.nla.gov.au/~cmakin/wiaact.html	(F) (G) (S) (X)	$70.00 $56.00 $42.00
VK2	NSW Division 109 Wigram St Parramatta NSW (PO Box 1066 Parramatta 2124 Phone (02) 689 2417 Freecall 1800 817 644 Fax (02) 633 1525	President Secretary Treasurer (Office hours Web:http://sydney.diallx.ozau/~wiansw e-mail address: wiansw@sydney.diallx.oz.au	Michael Corbin Eric Fossey Eric Van De Weyer Mon-Sat 11.00-14.00 Mon 1900-2100)	VK2YC VK2EFY VK2KUR	From VK2WI 1.845, 3.595, 7.146*, 10.125, 24.950, 28.320, 29.120, 52.120, 52.525, 144.150, 147.000, 438.525, 1281.750 (* morning only) with relays to some of 14.160, 18.120, 21.170, 584.750 ATV sound. Many country regions relay on 2 m or 70 cm repeaters. Sunday 1000 and 1930. Highlights included in VK2AWX Newcastle news, Monday 1930 on 3.593 plus 10 m, 2 m, 70 cm, 23 cm. The broadcast text is available on the Internet newsgroup *aus.radio.amateur.misc*, and on packet radio.	(F) (G) (S) (X)	$68.75 $53.40 $38.75
VK3	Victorian Division 40G Victory Boulevard Ashburton Vic 3147 Phone (03) 9885 9261 Fax (03) 9885 9298	President Secretary Treasurer (Office hours Tue & Thur 0830-1530)	Jim Linton Barry Wilton Rob Hailey	VK3PC VK3XV VK3NC	VK3BWI broadcasts on the 1st and 3rd Sunday of the month, starts 10.30 am. Primary frequencies 1.840 AM, 3.615 LSB, 7.085 LSB, and FM(R)s 146.700 Mt Dandenong, 147.250 Mt Macedon, 147.225 Mt Baw Baw, and 2 m FM(R)s VK3RMA, VK3RSH and VK3ROW. 70 cm FM(R)s VK3ROU and VK3RGL. Major news under call VK3WI on Victorian packet BBS.	(F) (G) (S) (X)	$72.00 $58.00 $44.00
VK4	Queensland Division GPO Box 638 Brisbane QLD 4001 Phone (074) 96 4714	President Secretary Treasurer	Geoff Sanders John Stevens John Presotto	VK4KEL VK4AFS VK4WX	1.825 MHz SSB, 3.605 MHz SSB, 7.118 MHz SSB, 14.342 MHz SSB, 28.400 MHz SSB, 29.220 MHz FM, 52.525 MHz FM, 146.700 MHz FM, 147.000 MHz FM, 438.525 MHz (Brisbane only), regional VHF/UHF repeaters at 0900 hrs Sunday. Repeated on 3.605 MHz SSB & 147.000 MHz FM, regional VHF/UHF repeaters at 1930 hrs EAST Monday. Broadcast news in text form on packet under WIAQ@VKNET.	(F) (G) (S) (X)	$72.00 $58.00 $44.00
VK5	South Australian Division 34 West Thebarton Rd Thebarton SA 5031 (GPO Box 1234 Adelaide SA 5001) Phone (08) 8352 3428 Fax (08) 8264 0463	President Secretary Treasurer Web: http://www.vk5wia.ampr.org/	Peter Watts Maurie Hooper Charles McEachern	VK5ZFW VK5EA VK5KDK	1827 kHz AM, 3.550 MHz LSB, 7.095 AM, 14.175 USB, 28.470 USB, 53.100 FM, 147.000 FM Adelaide, 146.700 FM Mid North, 146.800 FM Mildura, 146.825 FM Barossa Valley, 146.900 FM South East, 146.925 FM Central North, 147.825 FM Gawler, 438.425 FM Barossa Valley, 438.475 FM Adelaide North, ATV Ch 35 579.250 Adelaide. (NT) 3.555 USB, 7.065 USB, 10.125 USB, 146.700 FM, 0900 hrs Sunday. 3.585 MHz and 146.675 MHZ FM Adelaide, 1930 hrs Monday.	(F) (G) (S) (X)	$72.00 $58.00 $44.00
VK6	West Australian Division PO Box 10 West Perth WA 6872 Phone (09) 351 8873	President Secretary Treasurer	Cliff Bastin Christine Bastin Bruce Hedland-Thomas	VK6LZ VK6ZLZ VK6OO	146.700 FM(R) Perth, at 0930 hrs Sunday, relayed on 1.825, 3.560, 7.075, 14.116, 14.175, 21.185, 29.680 FM, 50.150 and 438.525 MHz. Country relays 3.582, 147.350(R) Busselton and 146.900(R) Mt William (Bunbury). Broadcast repeated on 146.700 at 1900 hrs Sunday, relayed on 1.865, 3.563 and 438.525 MHz; country relays on 146.350 and 146.900 MHz.	(F) (G) (S) (X)	$60.75 $48.60 $32.75
VK7	Tasmanian Division 5 Helm Street Newstead TAS 7250 Phone (003) 44 2324	President Secretary Treasurer	Andrew Dixon Robin Harwood Terry Ives	VK7GL VK7RH VK7ZTI	146.700 MHz FM (VK7RHT) at 0930 hrs Sunday relayed on 147.000 (VK7RAA), 146.725 (VK7RNE), 146.625 (VK7RMD), 3.570, 7.090, 14.130, 52.100, 144.150 (Hobart) Repeated Tues 3.590 at 1930 hrs.	(F) (G) (S) (X)	$72.00 $58.00 $44.00
VK8	(Northern Territory is part of the VK5 Division and relays broadcasts from VK5 as shown received on 14 or 28 MHz).						

Note: All times are local. All frequencies MHz.

Membership Grades
Full (F) Pension (G)
Needy (G) Student (S)
Non receipt of AR (X)

Three-year membership available to (F) (G) (X) grades at fee x 3 times

ADVERTISERS INDEX

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.

VICTORIAN CONSUMER AFFAIRS ACT

All advertisers are advised that advertisements containing only a PO Box number as the address cannot be accepted without the addition of the business address of the box-holder or seller of the goods.

FT-900 Deluxe HF Mobile

The Yaesu FT-900 is a revolutionary new 100W HF transceiver that answers the need for a truly practical mobile radio, but without the performance compromises of most micro-sized rigs when used in base station installations.

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Amateur Radio

September 1996
Volume 64 No 9

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Journal of the Wireless Institute of Australia

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Melbourne celebrates, and Australia can join in!

Melbourne amateurs are celebrating the commissioning of the new VK3RCC repeater on 23cm which has been sponsored by Daycom and Icom. This new set-up, which uses an Icom RP1220 repeater and operates on 1273.1MHz (20MHz offset), is located at the same central city location as the VK3RCC 70cm repeater which is also operated by the City Centre Repeater Group.

Daycom and Icom wish to thank those who have made this venture possible. The signal reports which have been received from all around the Melbourne area are testament to the skill and ability of those involved!

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CONTENTS

Cover

As you read in last month's *Amateur Radio*, the lucky winner of the WIA's 1995-96 Membership Recruitment and Retention Campaign prize of an Icom IC-706, donated by Icom Australia, was George Bromley VK1KGJ. George was presented with his transceiver at the 22 July meeting of the ACT Division of the WIA by the managing director of Icom Australia, Kiyoshi Fukushima VK3BZX. Looking on is the VK1 Federal Councillor, Richard Jenkins VK1RJ.

BACK ISSUES

Available, only until stocks are exhausted, at $4.00 each (including postage within Australia) to members.

PHOTOSTAT COPIES

When back issues are no longer available, photocopies of articles are available to members at $2.50 each (plus $2.00 for each additional issue in which the article appears).

The opinions expressed in this publication do not necessarily reflect the official view of the WIA, and the WIA cannot be held responsible for incorrect information published.

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A radiocommunication service for the purpose of self-training,intercommunication and technical investigation carried out by amateurs, that is, by duly authorised persons interested in radio technique solely with a personal aim and without pecuniary interest.

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Editor's Comment

Tying Up Loose Ends

Several items, all quite unrelated, need to be mentioned this month, hence the title. First, in July under the heading "Hams in the News" I referred to amateurs who had received the Order of Australia, being two recently from VK7 and one, five years ago, from VK5. I have now received information from Peter Brown VK4PJ about another recipient last year.

I quote from Peter. *"On Queen's Birthday 12 June 1995 at Government House Brisbane, Mr Norman Francis Wilson VK4NP was presented by the Governor of Queensland with the Member of the Order of Australia medal. This was 'for service to people with visual and learning impairments by developing a machine for converting Braille into print'."*

So there have been at least four recipients of the OAM among VK amateurs. How we failed to find out about VK4NP at the time is somewhat of a mystery, but I am glad that we can now include him in the list, and send our congratulations. Are there any others we haven't heard of, particularly from VK1, VK2, VK3 or VK6? Peter adds that the Braille machine is computer-based and patented world-wide in many languages. He also tells us that Harry Angel VK4HA is still "pretty good" at the age of 104.

A notable change of topic. There have been three resignations from the Federal Office recently. Norm Eyres VK3ZEP and Bruce Kendall VK3WL have resigned from the Publications Committee, both citing family responsibilities as the reasons for their inability to continue. We thank them both for the years of service they have given *Amateur Radio* and wish them well for the future.

The Federal Office Manager, Donna Reilly, also resigned in July mainly for personal reasons. She came to the position in mid-1993 and quickly displayed her organisational competence. We are sorry to see her go and also wish her well for the future. The vacancy was advertised in August *Amateur Radio* and applicants have until the end of September to respond.

Continued on page 55

CONTRIBUTIONS TO *AMATEUR RADIO*

Amateur Radio is a forum for WIA members' amateur radio technical experiments, experiences, opinions and news. Manuscripts with drawings and/or photos are always welcome and will be considered for possible publication. Articles on computer disk are especially welcome. The WIA cannot assume responsibility for loss or damage to any material. *"How to Write for Amateur Radio"* was published in the August 1992 issue of *Amateur Radio*. A photocopy is available on receipt of a stamped, self addressed envelope.

■ WIA News

Roger Harrison VK2ZRH, Federal Media Liaison Officer

Government Proposes Changes to Radiocommunications Act and Creation of New Regulatory Authority

On Friday, 16 August, the Minister for Communications, Senator Richard Alston, released details of sweeping changes the Government proposes to make to the Radiocommunications regulatory authority, to be called the Australian Communications Authority (ACA).

The Minister released for public comment, Exposure Draft versions of the legislation at the time of his announcement, advising that the deadline for comment was Thursday, 5 September 1996.

As the proposed changes may possibly have considerable impact on Amateur Radio in Australia, the WIA will be making a submission, fast-tracking the Submission on Amateur Licensing currently being finalised.

The full text of the Minister's 16 August statement is as follows:

Draft legislation for amending the Radiocommunications Act 1992 and the first package of draft post 1997 telecommunications legislation was today released for public comment by the Minister for Communications and the Arts, Senator Richard Alston.

Senator Alston said he expected to release further parts of the draft post 1997 legislation in the coming weeks.

"Changes to the Radiocommuncations Act 1992 are essential to provide the radiofrequency spectrum needed for future mobile communications services and will be important for increasing competition in telecommunications post 1997," Senator Alston said.

"The proposed changes would allow high demand spectrum to be allocated without prior clearance of the current licensees. They would also permit quicker allocation, while giving the current licensees an appropriate period to move to other spectrum or reach a commercial agreement to stay in that spectrum with the new licensee."

Other changes include extending the coverage of the Trade Practices Act 1974 fully to the Radiocommunications Act, and to provide for health or safety standards.

"The draft technical regulation provisions will form part of the Telecommunciations Bill 1996 and have been released to allow comment and to guide the industry in establishing its standards development, and compliance processes," Senator Alston said.

"This approach is similar to that used in Europe with emphasis on industry self-regulation. The draft Australian Communications Authority Bill would establish the Australian Communications Authority (the ACA) which would provide the necessary safeguards where self regulation is inappropriate.

"The Australian Communications Authority is to be formed by merging AUSTEL and the Spectrum Management Agency, except for the competition policy function, which will be transferred to the Australian Competition and Consumer Commission.

"Technical regulation of telecommunications and radiocommunications is to be harmonised to have similar procedures by changes to the relevant legislation.

"The proposed telecommunications technical regulation provisions would provide for mandatory standards on customer equipment and cabling to protect the health and safety of consumers and telecommunications employees, and to protect the telecommunications networks.

"Other standards would address the ability to call emergency numbers and compatibility for the standard telephone service."

Senator Alston said he had released the proposed standard carrier licence condition concerning industry development plans to reinforce the Government's commitment to Australian industry development in this important and rapidly growing industry.

"To allow all comments received to be fully considered and for the Radiocommunications Amendment Bill 1996 to be introduced as soon as possible, the closing date for comments is Thursday, 5 September 1996," Senator Alston said.

"I urge those wishing to make comments, to do so within this deadline."

To obtain copies of the draft legislations ring the Department on (06) 279 1831 or access it via Internet at *http://www.dca.gov.au* Contact: Ashley Manicaros, Minister's Office, +61 6 277 740.

[Release No. C34/961]

The first package of Exposure Drafts of the proposed legislation can be downloaded from the Internet at *ftp://www.dca.gov.au/pub/policy/tranc on2.doc* which is in Word 6 word-processor format. Be warned, it's a 141-page document in a 280 kbyte file.

HF Propagation Beacon Network Expands, Perth Beacon Arrives Soon

The latest HF beacon to go on air in the International Beacon Project series is OH2B, located near Helsinki in Finland. Operating on five bands, it transmits for 10 seconds in turn on 14,100, 18,100, 21,150, 24,930 and 28,200 kHz. On each frequency, the beacon steps through four power levels, from 100 watts, to 10 watts, then 1 watt and 100 milliwatts, before returning to 100 watts, transmitting a long dash on each.

The original network of nine beacons on 14.1 MHz has been operating for some 15 years, each transmitting in turn in a coordinated time slot. This network, with beacons located in North and South America, Africa, Europe and Asia, is being upgraded to 5-band beacons, and expanded with an additional seven beacons in new locations, including Australia and New Zealand.

The Helsinki 5-band beacon joins LU4AA in Argentina, which came on-air late last year, and YV5B in Venezuela, which began operations in February. Soon to join the network is CS3B from Madeira, off the North-West coast of Africa.

The WIA anticipates that the 5-band beacon for Australia, to be located near Perth, will be shipped here shortly. The Institute is awaiting a licence and call sign allocation from the Spectrum Management Agency. To fit in with the overall plan for the International Beacon Project to keep the call sign identification as short as possible, the WIA has applied for a single-suffix call sign from the SMA, hoping to get VK6B. Past practice has been that single-suffix call signs in the VK series have been issued to Scientific licences.

The International Amateur Radio Union (IARU) sponsors and coordinates the International Beacon Project in conjunction with the Northern Californian DX Association (NCDXA). IARU project coordinator is John G Troster W6ISQ. IARU Region 3 coordinator is Jamie Pye ZL2NN. Further details on the International Beacon Project can be found in the October and November 1994 issues of *QST*, the journal of the American Radio Relay League (ARRL).

Military Use of 2 m Averted

The WIA objected to a recent Defence Department proposal to use frequencies in the 2 m band during military exercises held in conjunction with United States forces from mid-July to the end of August, averting military use of the band which is an exclusive amateur allocation in Australia.

In early July, the WIA received a request for advice from the Spectrum Management Agency (SMA) who had been asked by the Department of Defence for clearance to use three frequencies between 144 and 148 MHz for FM transmissions in the Darwin area between 14 July and 30 August.

The WIA's view is that any use of an exclusive amateur band by other services is unacceptable, in principle and practice. This was conveyed to the SMA in the reply to their request. The Institute pointed out that there had been recent incidents of unauthorised use of exclusive amateur spectrum on 7 MHz by the Australian military (see *WIA News*, March 1996), and any further precedents for military operation within our exclusive bands would be most unwelcome.

The SMA refused the Defence Department's request.

Close cooperation between the SMA and the WIA recently has resulted in the removal of intruders to our bands and the averting of possible severe interference. Examples include the changing in operations of an ionospheric radar in Melbourne which intruded on the 160 m band, the closing down of hang glider enthusiasts using 2 m in Victoria, and having the operating frequency of a planned wind profiling radar near Wollongong in NSW changed from 49 MHz to 44 MHz, which would otherwise have meant severe interference to 50 MHz band operators in and around Wollongong and Sydney.

Amateur Assists Yacht in Distress

On Friday, 12 July, at 0730 UTC, Pat VK5LR of Victor Harbour south of Adelaide in South Australia, responded to a Mayday call on the 20 m band from an American amateur aboard a yacht in distress in the Pacific ocean near Hawaii.

The 43-ft yacht was located about 300 miles of the coast of Hawaii and was taking on water. Pat contacted the Victor Harbour Police who relayed the message to the maritime emergency centre in Canberra, who contacted the authorities in Hawaii.

Pat VK5LR monitored the frequency for a couple of hours, being joined by stations in Guam and Alaska. The outcome is not known.

Shuttle-MIR Carries Amateurs Mission This Month

The next Space Shuttle mission to carry amateur radio, STS-79, is scheduled to launch 15 September, for a nine-day flight, during which it will link up with the Russian MIR spacecraft.

STS-79 will carry the Shuttle Amateur Radio Experiment, or SAREX, operating voice on 2 m using FM. Three hams will be aboard the Shuttle: Jay Apt N5QWL, a mission specialist who has flown three times before and used amateur radio on each flight; Carl Walz KC5TIE, who flew in July 1994 and participated in SAREX on that mission; and mission specialist John Blaha KC5TZQ, who has flown four previous Shuttle missions.

During the MIR link-up, Blaha will exchange places with American astronaut Shannon Lucid who has been aboard MIR since March this year. Blaha will remain aboard MIR for the next five months.

More information about the Shuttle mission SAREX operations can be obtained from the Internet Web page *http://www.arrl.org.sarex/* provided by the American Radio Relay League (ARRL).

Amateur Band Pirate Prosecuted

An unlicensed operator found using the amateur bands in Queensland has been successfully prosecuted by the Spectrum Management Agency and recently convicted in the Queensland Magistrates Court.

The following authorised statement was released to the WIA by the Spectrum Management Agency on Friday, 16 August.

"In mid-1995, a complaint was received from amateurs living in Queensland concerning a suspected unlicensed amateur operator. These suspicions were based on observations that the person who claimed to be a visiting amateur from Victoria, in fact knew little about amateur radio or basic technical matters.

"Investigations by Agency technical officers confirmed that the person was unlicensed. A search warrant was executed which resulted in seizure of radio equipment and sufficient evidence to mount a prosecution under Section 47 of the Radiocommunications Act 1992 – unlawful possession of radiocommunication devices.

"Approximately one year after the complaint was made, the matter was heard in a Queensland Magistrates Court and resulted in the conviction of the person. A fine and costs amounting to approximately $200, or in default a short term of imprisonment, were awarded against the person. An order requiring the forfeiture of an amateur transceiver and antenna tuning unit to the Crown was also made."

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We Jumped the Gun on AX2000

Last month's *WIA News* release on the "Olympics call sign" of AX2OOO (AX2-triple-Oh), jumped the gun in relation to a decision on the WIA's request for an extension of time on usage of the call sign. The Spectrum Management Agency (SMA) has actually reserved their decision on the WIA's request for use of the call sign for six months before the Olympics opening ceremony to one month after the closing ceremony while they have discussions between the relevant bodies within the Agency. This error was not picked up when last month's *WIA News* was reviewed before being released.

In addition, to clarify the matter of who has been issued the AX2OOO call sign, it has been issued to the Federal WIA. However, the WIA is delegating the activation of this special event call sign to the initial applicant, the Westlakes Amateur Radio Club, who are to administer all aspects of the rostering of its activation, and QSLing etc. This confusion arose because not all of the relevant correspondence had been made available to everyone on the SMA Liaison Team. Steps have been taken to avoid such administrative oversights in the future.

The WIA has also requested the issue of another special event call sign from the SMA for the 2000 Olympics, AX2SYD, to operate over the same period requested for AX2OOO. The WIA has put to the SMA that these two call signs – AX2OOO and AX2SYD – would be appropriate to commemorate the Olympics, which were awarded to the City of Sydney for the year 2000. The two call signs would serve to highlight internationally the predominant associations with the next Olympics. Having two call signs would not devalue the worth of either, and would provide additional opportunities for local operators and clubs to activate a special event Olympics call sign. It is anticipated that demand would be very high. Having two special event call signs would also multiply the opportunities for the creation and promotion of awards associated with the special event Olympic stations. Operation of the Olympic call signs for one month after the Olympics' closing ceremony would cover the associated Paralympics, too.

The Federal WIA told the SMA that administration of the use of AX2SYD, should it be issued, would be delegated to the NSW Division, anticipating that it would be used within the greater Sydney metropolitan area, while AX2OOO might be used more widely.

For the just-concluded US Olympics in Atlanta, Georgia, there were four special event Olympics call signs in use. There was one "official" Olympics commemorative station, W4O, with W400O (four hundred-Oh), W96O and W26O being authorised alternative call signs.

Novice Limited Licence Proves Popular

In the 12 months following the introduction of the new Novice Limited licence, more than 200 enthusiasts have taken up licences and the distinctive H-suffix call signs are now regularly heard on the 2 m and 70 cm bands, many being active on packet radio, according to reports.

By the end of May, there were 238 Novice Limited call signs issued. New South Wales had the greatest number, with 54 H-calls on issue, with Queensland close behind, having 50 H-calls recorded. In Victoria, 37 H-calls had been issued to the end of May.

The popularity of the Novice Limited licence bodes well for future growth in amateur radio. The number of licences on issue was stagnant for several years between the announcement in 1992 that new licence grades and privileges would be introduced and the release of the new Technical Licence Specifications last year.

International Award for Australian Amateur

The WIA's Federal Coordinator for the amateur satellite service, Graham Ratcliffe VK5AGR, has been awarded the new G3AAJ AMSAT-UK Trophy for "outstanding service to the Amateur Satellite Service".

Graham is the first recipient of the recently inaugurated award, according to the Radio Society of Great Britain's (RSGB) news service. Graham was awarded the Trophy at the AMSAT Colloquium held at the University of Surrey in Britain during late July, attended by almost 100 delegates from 17 countries.

The RSGB presented a cheque for 11,000 pounds to the AMSAT-UK Phase 3D fund at the Colloquium. Presented by RSGB President-elect, Ian Kyle GI8AYZ, the donation was in addition to a 25,000 pound donation made last year to the Phase 3D satellite fund. The Phase 3D satellite may be launched in January 1997.

■ Operating

Radio Sports (ARDF) Comes to Townsville

Iain Morrison VK4IGM fills us in on this history making event.*

The VK team at the 2nd Region 3 ARDF Championships.

The Townsville Amateur Radio Club, on behalf of the WIA, was the host club for the 2nd Region 3 ARDF Championships, held from 15 – 20 July 1996.

How did TARC become involved in ARDF? Club member Wally VK4DO had been to China and other Asian areas as part of his work and to give lectures. Being a keen amateur, he always tried his best to make contact with other amateur operators. This led to his friendship with the Nanjing area Radio Club and, during one of these visits, he was introduced to "Radio Sports". He was invited back to participate in the next National Chinese Radio Sports events, and so he, Ron VK4BRG and Ray VK4LU were the first VKs to participate. From here the fever grew, with equipment being sourced, copied, improved and tested. Ray has since retired from the field but Wally and Ron have gone on to help stage what has become the most prestigious event in amateur radio history for North Queensland, and most likely for VK.

At the TARC general meeting on 6 February 1990, TARC moved that Wally arrange a Sister Club for us in China. At the TARC meeting on 5 June 1990, BY4RSA was made our sister club.

As Wally was planning another attempt in Radio Sports we ran a raffle to support the 1993 VK ARDF team which was drawn in June 1993 at Mission Beach. In October of that year, Wally, with his wife Dorothy and his son Glen, attended the first Region 3 ARDF Championships, where he and Charlie VK4CAU were the WIA Team and came fourth in the OT (Old Timers) section.

In August 1994, Wally presented his proposal on behalf of the TARC to hold the second Region 3 ARDF Championships in Townsville, and this was later accepted by the IARU Region 3 Committee. From here the planning was in earnest, the dates were set, venues and accommodation had to be found, mapped, walked, tested, and all sorts of letters of permission for use of lands arranged.

Wally is a surveyor, so his knowledge of terrains and paperwork involved in finding rightful owners was very useful. This background of his was demonstrated by his striding purposefully through the bush when showing TARC referees where their Tx was to be hidden – not bad for an old fella! We silently wondered if we would be able to locate the sites again the next day after inspecting them only once !

The action and information in Townsville started to get faster and faster, and slowly the rest of the Club members realised that, for us, this was bigger than "Ben Hur", and much bigger than our usual big event, the Bi-Annual NQ Convention!

Accommodation was arranged at the James Cook University of North Queensland, during their mid-year break, and this also turned out to be ideally close to the scrub for one of the events. To prepare Club members for the official duties, Wally held working bees and training sessions in parks, with lectures and explanations on operating procedures at the TARC Social evenings. He also detailed plans and timetables at regular Club meetings to keep us all informed of progress. Thus we were trained as Official International Referees to keep the activity uniform world wide.

In the meantime Wally had also attended various meetings and ARDF events worldwide, and assured us that there wouldn't be any problems with snow for our event!

Dorothy, Wally's wife, has also travelled and trained for ARDF; without her full support this event may not have been possible. Her diplomatic presence was evident when greeting the various delegations from overseas, many of whom she had met before.

Equipment

Ron VK4BRG went into this aspect of the operations, and spent untold days and weeks in the design, testing and building of the various bits and pieces

Chris SP5HS punching his ticket at one of the transmitter sites.

required. These included the twelve "foxes". There are five foxes used in each event with a fully operational spare being held in reserve at each site in case of operational failures. A special fox is used at the finish that is switched on continuously at the end of the time allocated for each course, to allow "lost" persons to home in on its ID code and return. Each fox contains a 2 metre and 80 metre transmitter, which are keyed in a individual code, and run by a timer. The timers all had to be capable of common synchronisation before the event, so that each Tx was only on for one minute in every five minutes. The package had to be small, battery operated, and equipped with suitable aerials.

Ron's design used a fixed electrical type J-box on the top which the four 2 m antenna elements screwed into when being used, and a BNC socket that the external 80 m balun was connected to. For 80 m, a long wire is slung up into a tree vertically, and two ground counterpoises are laid out (neatly, so as not to trip the contestants!). Murphy played his part in our events, and a couple of standby Txs were pressed into service during the events, with Ron busily delving into gear during events to make it all work again. The secret for this type of event is equipment, equipment and more equipment!

The official opening was held on Tuesday, 16 July, but teams and individuals started arriving on Saturday, 13 July. The Secretary General of the Region 3 ARDF Committee, Chen Ping, had arrived earlier and was enjoying hospitality at Strathdickie and Townsville with Wally, Dorothy, and their families. This week was used to show Chen the courses selected by Wally, and to keep the paperwork rolling in the procedures area. Each overseas visitor was given a shoulder bag made by the ladies and friends of the TARC; contents included an official badge, maps, tourist information, a copy each of July 1996 *Amateur Radio* magazine and July 1996 *Backscatter*, the TARC newsletter. The special ARDF event logo was screen printed on one side of the bag, with the TARC logo on the other.

On Saturday, the JA team were the first large group to arrive, along with various individuals on different flights. The delegation of four contestants from East Kazakstan arrived a little late on Tuesday, having taken the "long path" so to speak. A TARC working bee was held on Sunday afternoon at University Hall, which was to be the hub of all activities for the next week. The meeting room upstairs was set up for use, depending on time of day, as registration, equipment repairs workshop, jury and official meeting room, and also as an "eyeballing" lounge! A beam was erected on a mast out in the lawn area for HF operation of our special event call station VI4RDF, and two metre voice and packet links were also setup. Various other facilities were also rented for the event including tables, chairs, portable toilets, buses and lots of loaned gear from various shacks in the area.

Program

The week was planned as follows:

Saturday: Arrivals.

Sunday: Setting up and testing, more arrivals.

Monday: Arrivals.

Tuesday: 0930 Official opening. Equipment practice session locally. After lunch, all visitors transported to the Great Barrier Reef Wonderland, for tours through the Aquarium, Omnimax theatre and Museum of North Queensland. Local referees were taken bush to be shown the location of their transmitters for Wednesday's event.

Wednesday: 2 metre event.

Thursday: All day trip for visitors to Billabong Sanctuary, a local wildlife park. Local referees again into the bush to locate their transmitters next day. In the evening, the Mayoral Greeting at Townsville City Hall.

Friday: 80 metre event. Evening, official banquet and presentation.

Saturday: Departures.

A 24 seater bus was available for the whole week, to be used for shopping trips and sightseeing when not officially required.

The official opening was made by one of the TARC past Presidents, now Federal Member of Parliament for Herbert, Peter Lindsay VK4TO. Just shows what a President of the TARC can aspire to! He welcomed us all on his behalf and for the Minister of Communications and I think that, having seen the practice runs, the fun and excitement, he would have like to have stayed and joined in. Our local Area Manager for the SMA, Rick Snow, presented an apology from Ms Goode, who was unfortunately unable to attend.

"Nobu" JK1AXK, a 14 year old YL, on the hunt.

The WIA Federal President, Neil Penfold VK6NE, greeted all contestants on behalf of the WIA, and wished them all success in the events to follow. Each country's Team Leader also gave a short welcome speech, and then the photographs started. All possible combinations of individual teams, group teams, ring-ins, speech makers, etc were grouped for photographs to be taken back home, and hopefully to show the good time had by all.

Each evening, Sunday to Thursday, and at 1600 on Friday, a Jury meeting was held. The purpose of these meetings was to tidy up details for Team Leaders and Referees, as well as doing the draw for starting positions, and solving any anomalies that arose from the days activities. Each evening the question about "possibility of rain" arose, only to be quickly refuted by the locals. Rain in Townsville at this time of year is scarcer than rain in the rainy season!

A meeting of the Region 3 ARDF committee was also held on 15 July, just after the Jury meeting. This was to discuss future activities of ARDF in the region, and call for submissions for the next Region 3 Championships. At this stage only one submission was made, from the Korean Amateur Radio League (KARL) so, if this decision is passed by the IARU Region 3 meeting, the next Region 3 event will be in Korea, in 1999.

There were several special guests at the Region 3 meeting. **Thida HS1ASC** represented RAST, the Thailand Amateur Radio Society, as well as being Editor and photographer for "100WATTS" their equivalent of *73 Magazine*. The RAST is seeking official membership of the ARDF Committee, and so she was on a fact finding mission. A special thank you to Thida, who rates as one of the most active YLs ever met, as well as being dynamic, efficient and very pretty. If there were any jobs to be done she would always volunteer to lend a hand, including chair collecting, cleaning up, etc. Thida was also an invaluable assistant to Chen Ping in the computing, collating and printing out of draws, results, etc.

Krzysztof (Chris) SP5HS from PZK, the Polish Society. Chris gave details of the DARC (German) submission to hold the 8th ARDF World Championships in 1997, at St Englmar near Straubing, located about 170 km east of Munich, Germany.

Cheryl Whaatley ZL2VCC with Kimiko Akatsu JL1KEA, who received a special award for helping an injured fellow competitor.

Panayot (Pan) LZ1US, Chairman of the Organising Committee for the 11th IARU Region 1 European ARDF Championships to be held in Bulgaria from 1 – 6 September this year.

Kevin Kelly N6QAB/VK2KFX representing the ARRL (Region 2). Kevin was accompanied by his XYL Sue, who hails from Newcastle in VK2. They currently live in Lusby, Maryland on the East coast of USA.

Other visiting Region 3 officials included **Chen Ping BA1HAM; Park Young Soon HL1IFM,** Director IARU Region 3; **Izuta Hiroshi JF1RPZ;** and **Max Wheatley ZL2MAX.** For the foreign societies there were **Yoshio JA1HQG,** Managing Director, the JARL Inc; **Tae-ok Kim HL2AKR,** Director of the Korean Amateur Radio League; and **Madam Chen.**

While the Jury and other meetings were on, the sounds of fast CW permeated throughout as the overseas operators of VI4RDF pounded it out in making contacts back home. The packet station was also used to send greetings around the globe, but in a more sedate (Townsville-like) manner!

The Events

On the days of the events, the start and finish areas had to be set up. Typically an 0600 hrs muster to get the tarps up for shade, chairs out, areas roped off for equipment quarantine, roped off areas for starting lanes, portable toilets in place, water organised and, most importantly, equipment checks. This was in the pre-dawn dark, but the tent pegs went in without any cursing although the ground was very hard (not like Mission Beach!). All the equipment had to be checked, and sent out, set up in the field by the Referees and field tested before any competitors came on to the site, to minimise any chance of unfair advantage. All competitors equipment was impounded until just before they were to start in the draw order set the previous night, and once finished they had to stay in the finish area, which was also located physically some unknown distance away. The ladies and friends of the TARC handled the paperwork at both the start and finish lines, as well as the refreshments.

The 2 metre event was first, on Wednesday, and was started after some small delays. This was located in the scrub on the western side of Mt Louisa in Townsville, just past the edge of new housing developments. A personal note here was that I perhaps never really expected to see any action all day due to the bush and terrain in which we were located. However, some 38 minutes after the start, a crashing noise through the bush, and a competitor appeared, huffing and puffing, antenna in hand, ready to punch his ticket and move on to the next fox. So this was Radio Sports!

A steady stream of competitors, all very thirsty due to the 27 degree "heat" kept on appearing, and some were observed circling around for some time before locating the fox. This, no doubt, was due to the one minute in five that it was transmitting. Each fox site has two International referees, one from TARC and one from another country. So lots of international yarn swapping occurred between watching the competitors punch their tickets. The course default time was set at 140 minutes and so, after the last competitor's start time plus 140 minutes passed, the homing beacon was turned on. When every competitor was

Taken at the Banquet, (l to r) Wally VK4DO, Dorothy Watkins, Federal WIA President Neil Penfold VK6NE, Bob VK4WJ, and Jeanette Mann.

accounted for, the field sites could be dismantled and we returned back to base. The dismantling of base and clearing up of gear was required before we could depart.

Each event was attended by the local Ambulance Service to cover any possible mishap. Unfortunately, Vaughan ZL1TGC got to ride in the ambulance after breaking something in his foot. A JA YL competitor, Kumiko Akutsu JL1KEA, returned back to the start to report finding Vaughan in this sorry state, and in doing so sacrificed her attempt for a good contest result. In recognition of this she was awarded a special plaque at the awards evening "for being a good sport".

Apart from scratches and gravel rashes, there were two other injuries, but considering the speed of some of the contestants, the shale type terrain, and the "trees that grab", especially the thorny "Chinee apple", it all turned out well.

The 80 m event on Friday was held close to the University grounds, but still with shale rock and big hills to be traversed. This went the same way, an early start and pondering whether anyone would actually find us! Both days were what is referred to locally as "another lovely day in paradise", and one Korean was heard saying that "never had he ever seen the sun shine so brightly"!

The Mayoral reception, hosted by the Mayor of Townsville, Tony Mooney, in the Council's Function Room was another social success, with several of the Lady Councillors also present to welcome and join in the camaraderie that just grew and grew. Our overseas guests, following the lead of the locals (and Kiwis) took great advantage of the VK brews being offered around, as well as the copious amounts of "nibblies" available. Townsville has a Sister City in China, and it was with great excitement that Chen Ping BA1HAM was discussing with the Mayor that this was his home as well. The Townsville "Ambassador-at-Large", Graham Jenkinson, was seen in deep discussion with the Japanese, as a delegation visit from our Sister City in Japan was scheduled for the following week. The Mayor formally welcomed us all, and presented to Chen Ping, as Secretary General of Region 3 ARDF Committee, a plaque made of North Queensland timber, with the Townsville City crest carved into it. Chen replied for the rest of us and thanked the Council for their hospitality, with acclamation.

However, the social event of the week had to be the Banquet on the last night. By this time, first name basis was well and truly established, jokes and stories flowed freely over a good meal lubricated by suitable liquids. Laughter and more laughter as various translations were made and corrected, the English interpretations explained and in some cases "strined" severely. All week the use of common Aussie phrases and gestures (the polite ones only!) was taught to any overseas visitor who showed interest "mate". It all started with "cheese" for the photographs and went on to "she'll be right", etc and ending with the characteristic Aussie "yeah"!

There were numerous presentations of medals to the lucky contestants, and proudly some came to VK, with local TARC members, Sally VK4SHE, Ian VK4ZT and Don VK5CC/4 being the proudest of all!

Official presentations between each of the participating Societies and other groups continued. The model house complete with large beam antenna presented by Thida HS1ASC, to TARC President Bob VK4WJ, was a show stopper, especially when Thida told Bob that we had to make the tiny working model rig to go inside it. A specially printed tea towel, showing Townsville flora, and the ARDF logo screened on it, was then presented to all the overseas guests by the members of the TARC. This then started the memento and QSL/business card swapfest that followed, which really set the party mood into full swing.

The music was supplied by "Thunderbolt" (Trevor VK4XTC and XYL Carol), aided by lots of electronics. To help ease their vocal work load, Bob VK4WJ and Ian VK4ZT were first to volunteer their voices, followed by many international helpers.

Saturday was a sad day, as the time for parting rolled on, with airport farewells from early morning. The East Kazakstan and JA groups went at 1100 hrs, followed by the Korean group at 1330. Glen Watkins (Wally's son) looked after the Chinese group for another day, until they and the rest of the Kiwis flew out on Sunday morning.

This has stirred Glen back into his Novice Studies, for like a lot of us in Townsville, we are looking deeply into the purses with hopes to be able to get to Korea in 1999.

Well, what can the TARC do to top this? Who mentioned the World ARDF events in 2000? Keep tuned, and happy hunting!

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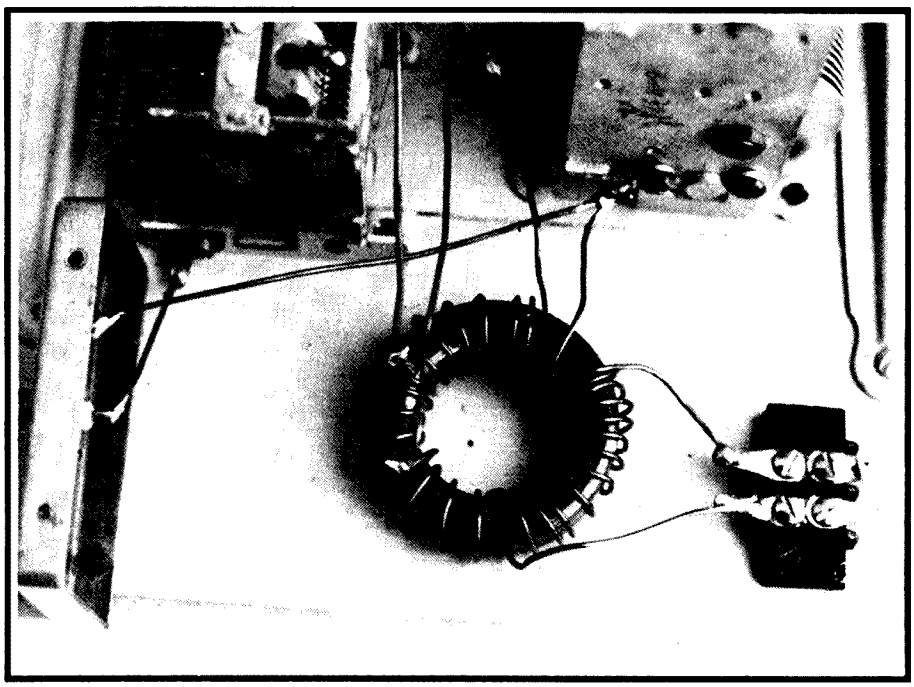
■ Antennas

The Z Match Using a Toroidal Core Coil

Lloyd Butler VK5BR explores an interesting variation in construction of a Z Match ATU.*



The toroidal core as used in the Toroidal Core Single Coil Z Match.

Introduction

The **AR Single Coil Z Match** tuner design using an open coil has now been well documented by articles presented in this journal over the last year or so. More recently I have had a number of queries concerning the possible use of a toroidal core inductor instead of the open coil.

Part of the ability of the Z Match to operate into a wide range of load resistance seems to have been partly dependent on the coupling coefficient in the coil being somewhat less than one. Whether a coil with a ferromagnetic core could be operated efficiently under similar coupling conditions has been open to question. Because of the queries, I decided to build up a toroidal core coil version of the single coil Z match and see how well it could be made to work.

The article describes the toroidal core coil design and discusses the performance of the Z match tuner in which the coil has been incorporated.

Design

To make up the coil I selected the Amidon 50 mm T200 iron powder core with the two mix (red) material. This is the same core as most people use for high power HF balun transformers.

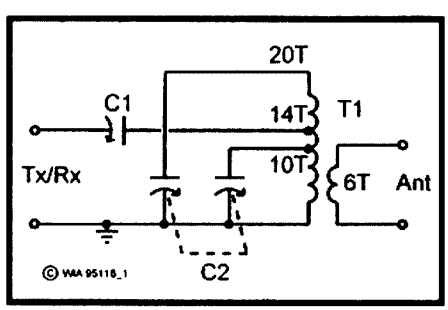


Figure 1 – Circuit diagram ot the Toroidal Core Coil Z Match.

Other iron powder cores could be suitable, but I must point out that ferrite cores should be avoided. The ferrite changes permeability with a change in magnetic flux level and hence the coil inductance changes with power level. Iron powder is much more stable than ferrite and, generally speaking, should be used for inductors in tuned circuits and filters operating at high power.

I arranged for the toroidal coil to have a similar primary inductance to the **AR** open coil unit and set the coil taps to provide the same ratio of turns. The secondary was also proportioned on the same basis. To achieve the same inductance (a little over 5 μH), 20 turns were placed on the primary and taps were connected at 14 and 10 turns. The secondary of six turns was interwound with the first six turns of the primary, commencing from the cold end.

The Z match circuit and coil arrangement is shown in Figures 1 and 2. In winding the coil, the primary of 18 SWG enamel wire is evenly spaced around the core. This leaves a gap between turns in which the secondary of similar wire can be fitted in a second winding operation. To make a tap, one method is to clean off about a centimetre of the enamel on the wire at the appropriate point and fold half the cleaned part back on itself to form a terminal which is soldered. Winding is then continued.

Another method of forming the tap is to cut the wire at the tap point with a short end which is cleaned of enamel. The end of a new piece of wire is also cleaned of enamel and twisted with the other. Winding is then continued with the new piece of wire. The twisted wires are soldered to form the tap terminal.

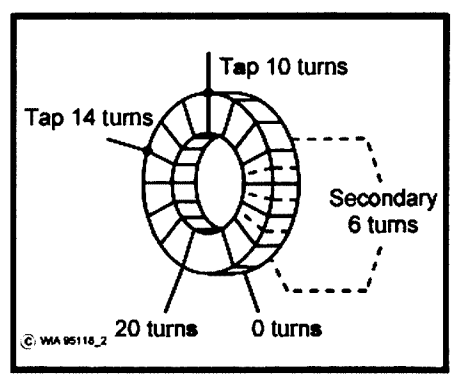


Figure 2 – Toroidal coil assembly.

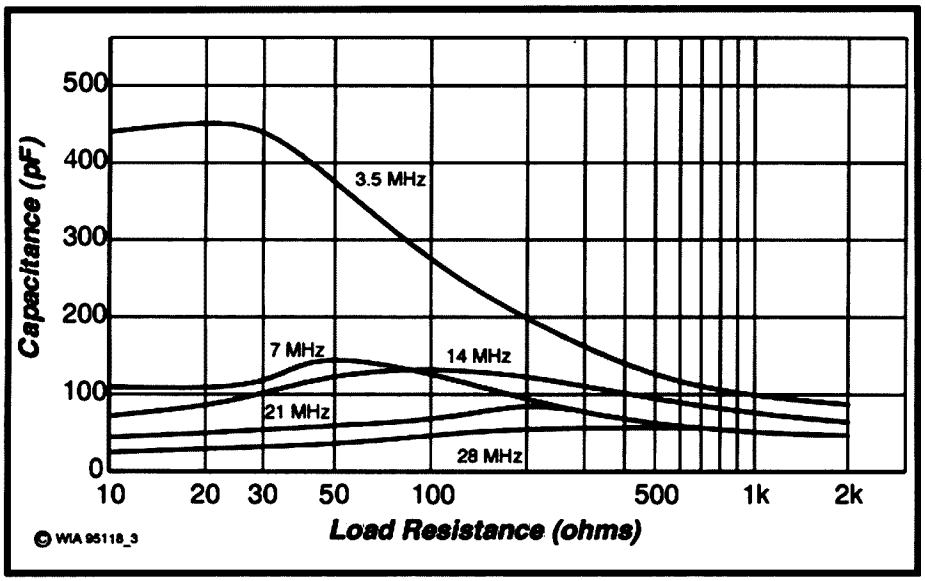


Figure 3 – Hand drawn plot of input capacitance (C1) as a function of load resistance.

Test Results

In testing the open coil AR Single Coil Z Match, load range tests were carried out over the resistance range of 10 to 2000 ohms at frequencies of 3.5, 7, 14, 21 and 28 MHz. The same tests were repeated using our toroidal core coil unit and this matched over the whole range, as did the open coil unit. Tuning curves, Figures 3 and 4, plot the capacitance needed in C1 and C2 over the load range. The curves show that the maximum capacitance for input capacitor C1 is 450 pF and for shunt capacitor C2 is 260 pF.

So far so good, but the big question concerns efficiency and possible loss in the core. In a previous article (*Amateur Radio*, September 1995) I described how I measured efficiency of a number of Z match units at 1,8, 3.5, 7 and 14 MHz. I have repeated the tests for the toroidal coil unit, refining the technique a little to extend the tests up to 28 MHz. For detail of the measurement technique, you are referred to the previous article. The results of the tests on the toroidal coil unit are given by Figure 5. This shows that efficiency is quite good over most of the load range at 3.5 and 7 MHz. At higher frequencies the efficiency falls and is particularly poor at 28 MHz.

In my opening paragraph I mention the coupling coefficient (K) of the coil. I carried out a measurement on the toroidal coil at 3.5 MHz and this indicated a value of K equal to 0.5. By comparison, open coils have been previously measured at K around 0.65. The low value of K assists in extending the load range of the Z match (this was discussed in my article in *Amateur Radio*, May 1989). In the open coil unit, the low value of K does not appear to upset the efficiency unduly. However, I suspect that it is not the ideal condition for low loss in the case of the powdered iron core.

In my opinion, loss of efficiency in the toroidal core coil is of more concern than in the open coil, Suppose we operate at a point on the efficiency curves which shows an efficiency of 60%. This represents about 2 dB loss which would be barely noticeable on the air. However, the 40% of power lost is probably dissipated in the iron powder core and, at high power, this might be sufficient to shatter the core. For this reason, I would not be too enthusiastic to operate with high power when efficiency is low.

Another factor, which could set power limits on the toroidal core coil, is the insulation resistance of the winding wire. For certain load conditions, quite high voltages can be developed in the Z Match. For example, with a 2000 ohm load at 3.5 MHz and a power of 100 watts, around 1000 volts is developed at the top end of the coil primary with potential to break down to the core. For the same load condition, around 600 volts is developed across the secondary with potential to break down to primary or to the core.

Of course, lower resistance loads produce lower voltages. For example, at 100 ohms load, voltage at the primary is around 300 and across the secondary around 140. However, one has to allow for all possible load conditions and perhaps an open circuit output condition. An arc-over condition in a tuning capacitor doesn't do much damage, but burnt insulation in the coil winding means a rewind.

There are various grades of enamel and other synthetic insulation on winding wire and I have not been able to

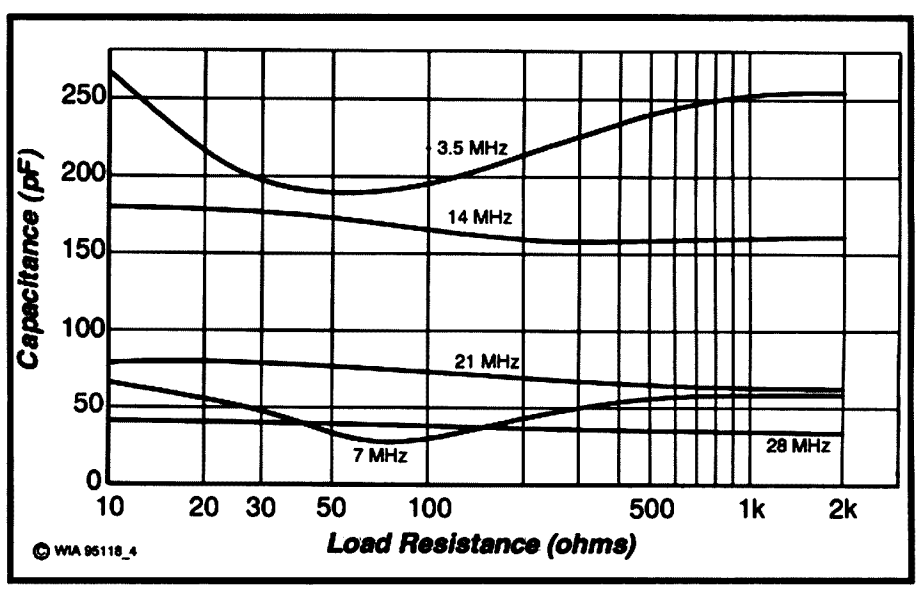


Figure 4 – Hand drawn plot of shunt capacitance (C2) as a function of load resistance.

obtain much information on the voltage ratings. General opinion seems to be that we are really testing our luck if we apply much more than a few hundred volts across the usual winding wire insulation. In my test unit I have used ordinary winding wire and this type of wire is probably quite OK for low power use. However, one might be well advised to use a better insulated wire for powers around 100 watts or more. Using the 18 SWG enamel wire, there is spacing between the turns of the windings and plenty of room for an increase of insulation thickness around the same diameter wire.

A recommendation for high voltage in one of the Amidon catalogues is to use Thermoleze insulated wire. They state that this has a very tough vinyl-like insulation having a voltage break-down potential of more than 2000 volts at a temperature of 180 degrees Celsius. They say that certain sizes of the wire are a stock line at Amidon, so perhaps the local agents, Daycom Communication Pty Ltd, could help with supply.

Considering the factors I have discussed, there are clearly reservations about the use of this type of coil design in the Z match on the higher HF bands and at high powers. However, it takes up a lot less space than the open coil and could be attractive to some of the QRP operators who use only low power on 3.5 and 7 MHz where high efficiency is achieved. It is interesting to observe that if only these two bands are to be used, only the top section of C2 is required and there is no need for the split stator tuning capacitor unit. In this case, the circuit can be simplified to the diagram of Figure 6. This makes a slight difference to the curves for 3.5 and 7 MHz shown in Figures 3 and 4, but the whole load range is still covered. The arrangement also just tunes to the edge of the 10 MHz band but, if this band is used, it might be desirable to drop off one turn from the top of the primary. With the coil turns reduced, a little more than the maximum specified capacitance of 260 pF for C2 might also be needed still to tune 3.5 MHz.

For the QRP operator, there is also the possibility of using an iron powder core with the same two mix (red) material, but a little smaller than the 5 cm T200 I have used. Some smaller Amidon types are T157 (4 cm) and T130 (3.3 cm). I have not tried these but winding calculations to the nearest full turn are as follows:

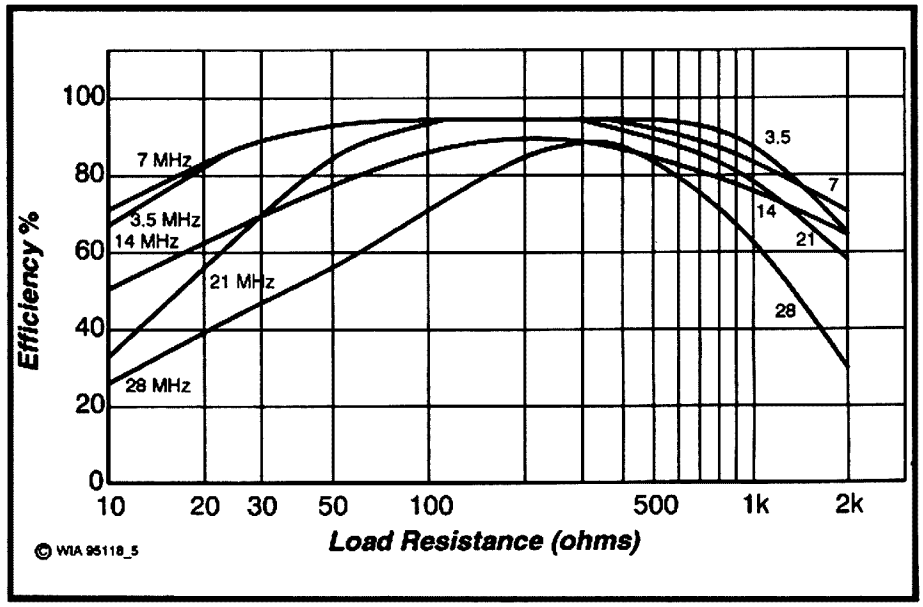


Figure 5 – Hand drawn plot of power efficiency using the toroidal core coil.

For the T157, use 19 turns on the primary tapped at 13 and 9 turns with a 5 turn secondary.

For the T130, use 21 turns tapped at 15 and 11 turns with a 6 turn secondary.

It is advisable to use the largest wire gauge possible, but in using a smaller core, there could be a problem in fitting in the 18 SWG wire specified in my diagram. I anticipate that it would be necessary to use a lighter gauge wire on the smaller core.

Conclusions

A Single Coil Z Match Tuner design using an iron powder toroidal coil has been described. The design achieves a wide load resistance matching range as did the open coil AR Single Coil Z Match. The efficiency is good at 3.5 and 7 MHz but deteriorates at higher frequencies.

Some concerns have been expressed concerning power dissipation in the core when efficiency is low. This could lead to damage of the core when the unit is used at high power. The possibility of breakdown of winding wire insulation when power is raised has also been considered.

For QRP users, who mainly operate on the 3.5 and 7 MHz bands, the toroidal core coil is an attractive proposition. Combined with miniature tuning gangs, which we have proved will work without arcing up to 25 watts, a very compact and efficient low power Z match unit can be constructed for 3.5 and 7 MHz. Although less efficient on higher frequency bands, the unit can also provide a useful service on these bands when required.

For higher power users, I think it is safer to stick with the open coil design.

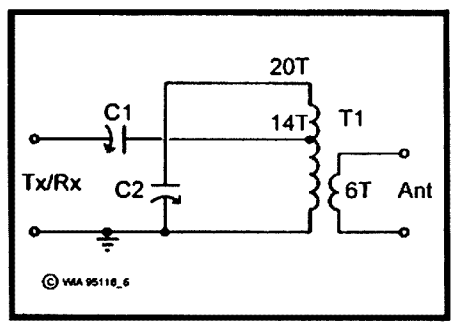


Figure 6 – Matching circuit for 3.5 and 7 MHz only.

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2. Lloyd Butler VK5BR – Efficiency of the Z Match – Amateur Radio, September 1995

3. Lloyd Butler VK5BR – Analysis of the Z Match Antenna Tuner – Amateur Radio, May 1989.

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■ Antennas

The LENFO Revisited

Ian Berwick VK3ALZ has another look at an antenna designed over 45 years ago.*

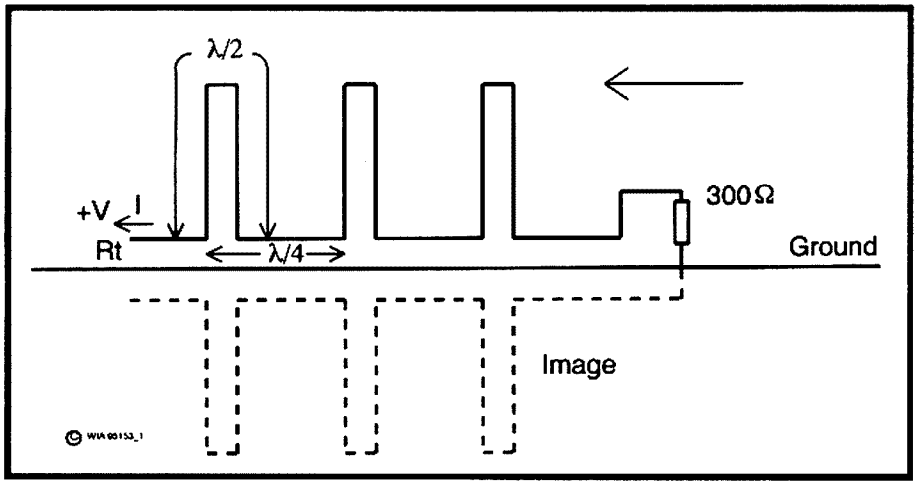

Figure 1 – Marconi-Franklin array.

Introduction

This story starts on page 3 of the May 1948 issue of *Amateur Radio*. Therein is an article entitled **Series Phased Aerial Arrays** by H K Love VK3KU (by way of explanation, H K Love established Kingsley Radio which built the AR7 receiver). In the article, the Marconi-Franklin series phased array is described and Howard Love describes how he modified the Franklin array to form beams for 10, 6 and 2 metres.

The final step in the evolution of the LENFO comes on page 14 of the January 1950 issue of *Amateur Radio*. An article entitled The **LENFO Series Phased Array,** by Len Jackson and Col Gibson VK3FO, describes how they modified the Howard Love beam to form the LENFO beam. In the following notes, I shall endeavour to analyse these antennas and provide an assessment of the LENFO in the light of current antenna requirements.

Analysis

Series Phased Array (Marconi-Franklin)

Refer to Figure 1. This array is a vertically polarised end-fire array. The driven elements are folded unipoles fed in series and working against ground. The terminating resistor maintains directivity. The direction of fire is away from the resistor. The power radiated by successive elements is in the ratio of 1, 1/2, 1/4, 1/8, 1/16, ... etc.

If R is the radiation resistance of the first element, then the effective radiation resistances of the set is

R, R/2, R/4, R/8, R/16, ...etc.

This yields for the radiation resistance of the set,

Rt = R+R/2+R/4+R/8+R/16 ...etc.

This is a geometric series whose sum is:

$$Rt = \frac{\left(1-\frac{1}{2^n}\right)}{\left(1-\frac{1}{2}\right)} = 2R$$

Now R is approximately 150 ohms. Hence, Rt is approximately 300 ohms.

The Marconi-Franklin array will not work when removed from above ground into free space because the images are lost (see Fig 1). Howard Love fixed this problem by replacing the images with real folded unipoles (see Fig 2). Note that 1/8 of the power is dissipated in R1.

This antenna has the same problem as the Marconi-Franklin in that the power radiated by each element is different. However, for optimum gain, each element should radiate the same power.

LENFO Beam

Len Jackson and Col Gibson replaced R1 with a folded dipole to achieve a little more gain (see Fig 3). They claimed 10 dB forward gain and 20 dB front to back ratio (F/B) for their four element LENFO. Elements have to be in pairs for a unidirectional LENFO, ie 2, 4, or 6, etc.

For a comparison between the Marconi-Franklin and the LENFO, refer to Figs 1 and 4. With the Marconi-Franklin, all radiation comes from the set of real folded dipoles working against a real ground. A set of imaginary images is used to account for the vertical (H) field resulting from ground reflection.

With the LENFO, a valid model for this array requires the upper and lower sets of real folded unipoles to work against an imaginary neutral or ground.

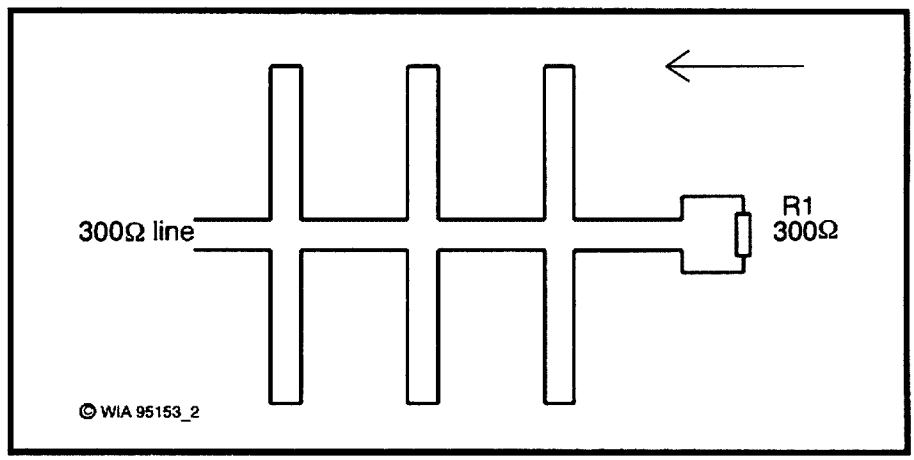

Figure 2 – H K Love array.

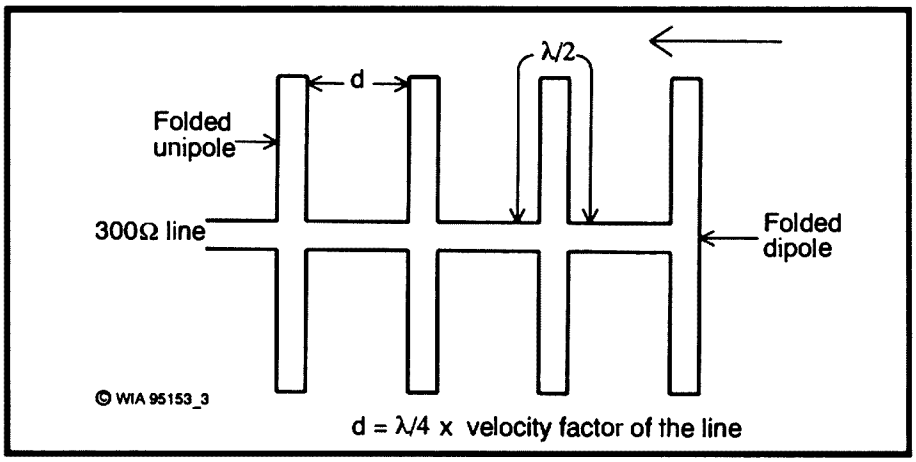

Figure 3 – LENFO beam. This is a four element array although there are six folded unipoles and a folded dipole.

With balanced excitation, each set radiates half the power. The effective radiation resistances of the upper set are 75, 37.5, 18.75, and 18.75 ohms respectively. The sum is 150 ohms. A similar situation exists for the lower set. The total radiation resistance is therefore 150+150 = 300 ohms.

At any instance, the upper set of folded dipoles are positive and the lower set are negative or vice versa. Hence, we have real and image pairs, each pair being called one element for convenience. In order to check the claimed LENFO performance, I have derived expressions for the E and H field strengths based on methods given in Kraus, Chapter 4 (see Ref 1).

We have for the four element LENFO, the E plane field strength,

$$E = \frac{Cos\left(\frac{\pi}{2} \cdot Cos\left(\frac{\pi}{2} - \Phi\right)\right)}{Sin\left(\frac{\pi}{2} - \Phi\right)} \cdot \sqrt{\frac{3}{2} + \sqrt{2} \cdot Cos\psi_0} \cdot \sqrt{\frac{5}{4} + Cos\psi_1}$$

Where $\psi_0 = \left(k \cdot \frac{\pi}{2} \cdot Cos\Phi - \frac{3\pi}{2}\right)$

and $\psi_1 = (k \cdot \pi \cdot Cos\Phi - \pi$

k is the velocity factor of the phasing sections. Refer to Fig 5 for more detail. The H plane field strength is the same as the E field without the term

$$\frac{Cos\left(\frac{\pi}{2} \cdot Cos\left(\frac{\pi}{2} - \Phi\right)\right)}{Sin\left(\frac{\pi}{2} - \Phi\right)}$$

Note that the patterns are given for free space only.

A Basic program was written to compute the field strengths for every 10 degrees, and for values of k = 1.0, 0.9, 0.65. The results were:

k = 1

E plane 3 dB beamwidth = 66 degrees

H plane 3 dB beamwidth = 116 degrees

$$Gain = 10 \cdot Log_{10}\left(\frac{41000}{66 \cdot 116}\right) = 7.3dBi$$

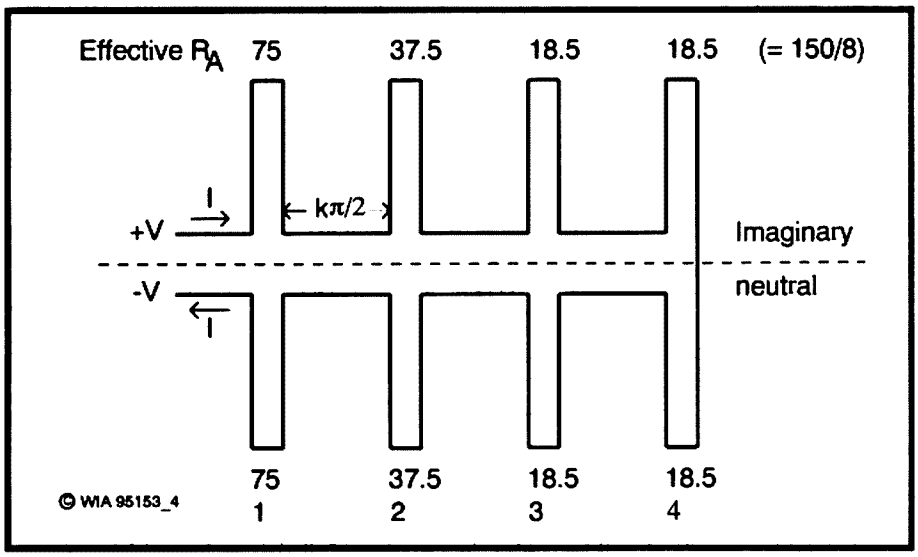

Figure 4 – LENFO model.

F/B ratio = 15.3 dB
k = 0.9
E plane 3 dB B/W = 62 degrees
H plane 3 dB B/W = 110 degrees
Gain = 7.8 dBi
F/B ratio = 14.5 dB
k = 0.65
E plane 3 dB B/W = 60 degrees
H plane 3 dB B/W = 98 degrees
Gain = 8.4 dBi
F/B ratio = 9.6 dB
The E plane polar plot for k = 1 is shown in Figure 6.

The advantages of the LENFO are wide bandwidth, simplicity, no fussy tuning, and a direct match to 300 Ohms.

The disadvantage of the LENFO is that the law of diminishing returns sets in rapidly, ie the gain does not increase very much with increasing number of elements due to the unequal excitation previously discussed.

Some suggested uses for the LENFO are:

1. Two metre band. A four element LENFO cut for 146 MHz, and mounted so that it can be rotated 90 degrees on its axis by ropes from the ground, should cover all frequencies and modes with low VSWR.
2. Six metre band. Same as for 1. above.
3. 10 metre band. A major problem with Yagi antennas on this band has been the inability to cover more than 1/4 of the bandwidth with low VSWR. A LENFO cut for 28.7 MHz should fix this.
4. 70 cm ATV. Stack four, four element LENFOs in a square for 14 dB gain, 7 MHz bandwidth and 75 ohms at the feedpoint.

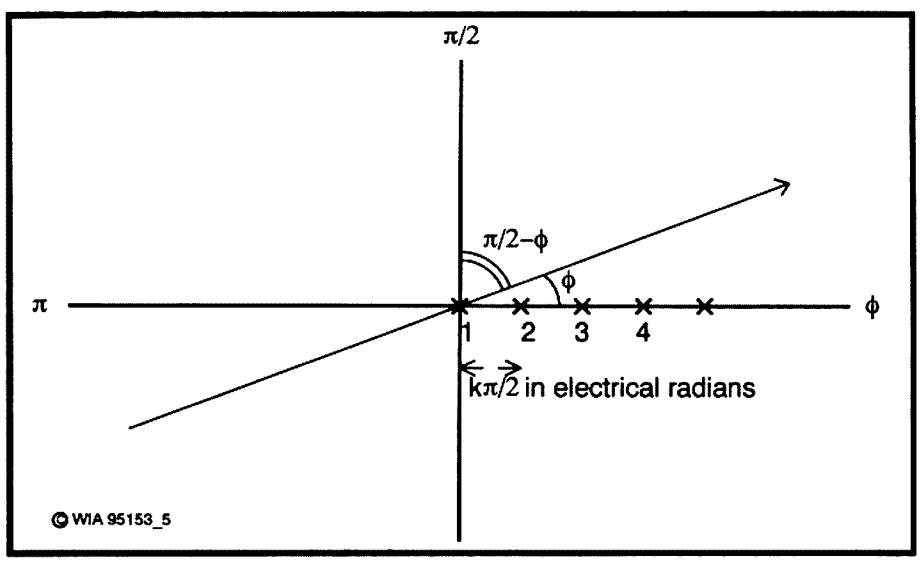

Figure 5 – Position of the elements for the E plane plot.

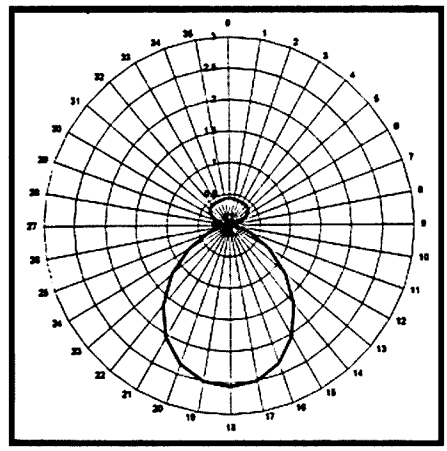

Figure 6 – Four element LENFO computed E plane field. K = 1. Note: Amplitude elements are relative field strength, not dB; and maximum gain is in direction of the feed point.

For precise dimensions of the LENFO, refer to the original article. My thanks to VKs 3JO, 3WYN, and 3ZIP, for assistance with this project.

Reference 1

Theory of End fire Arrays, KRAUS J D, ANTENNAS, Chapter 4.

107 Loongana Ave, Glenroy VIC 3046

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WIA News

VK Team Goes Well in Radiosport Championships

The first team of VK amateurs to compete in the recent 1996 World Radiosport Team Championships (WRTC-96) acquitted themselves well, making 1822 QSOs for a score of 343,604 points, well above the lowest scoring team who made 1615 contacts for 185,070 points.

As reported in last month's *WIA News*, Martin Luther VK5GN and David Pilley VK2AYD joined 52 two-person teams of HF operators from 30 countries in San Francisco for the contest held over 13-14 July. Martin and David operated W6Z.

Top scoring team was KR0Y and K1TO, operating W6X, for 2457 QSOs and a score of 761,829 points.

Congratulations to Martin VK5GN and David VK2AYD.

■ Operating

1996 Remembrance Day Contest Opening Address

The 1996 Remembrance Day Contest Opening Address was delivered by Air Marshal Les Fisher, Chief of the Air Staff.

Air Marshal Les Fisher was born in Parkes, NSW in 1941. He joined the RAAF in January 1960 and completed navigator training in 1961 and later pilot training in 1965.

Air Marshal Fisher had numerous operational flying tours in maritime patrol aircraft with No 10 and 11 Squadrons. He filled all executive positions with No 11 Squadron and has flown over 5000 hours.

Staff appointments include Maritime Staff Officer, Headquarters Operational Command; Operational Requirements Maritime, Air Force Office; and Director Joint Planning, Headquarters Australian Defence Force.

In 1976 he was posted on exchange duty with the USN at Moffett Field California, as the Plans and Readiness Officer for Commander Patrol Wings Pacific. For his achievements in this post, he received a Letter of Commendation from the United States Secretary of the Navy.

Command appointments include Officer Commanding RAAF Base Townsville in 1986, Commander Tactical Transport Group in 1987, Commander Maritime Patrol Group 1988, and Commandant Australian Defence Warfare Centre in 1990.

Air Marshal Fisher was promoted to Air Vice-Marshal on 7 November 1991 and assumed the appointment of Assistant Chief of the Defence Force (Operations). In November 1993, Air Marshal Fisher was appointed Deputy Chief of the Air Staff. On 30 November 1994 he assumed the appointment of the Chief of the Air Staff.

Air Marshal Fisher is a graduate of Joint Services Staff College. He was appointed a Member of the Order of Australia in 1987 and an Officer of the Order of Australia in 1993.

Air Marshall Les Fisher.

Air Marshal Fisher is married to the former Jan Butcher and they have two daughters, Amanda and Kym.

The Opening Address

"As Chief of the Air Staff, I am honoured to have been asked to give the opening address for this Remembrance Day Contest, which marks the 51st anniversary of the end of World War II. Although over half a century has passed, there remains a strong desire in our nation to celebrate the hard-won victory and, with even more resolution, to commemorate those who lost their lives. And so it should be. "We will remember them!"

The Wireless Institute of Australia held its first Remembrance Day Contest in August 1948 to perpetuate the names of those 26 radio amateurs who lost their lives in the service of their country. This annual event focuses on their sacrifice.

This year has been a significant year for the Royal Australian Air Force. It marks the 75th anniversary of the founding of the Service. As such, 1996 has been a year for celebrating past achievements and a year for remembering the sacrifice of former members of the Service. I note that 15 of the 26 radio amateurs who lost their lives in the war were members of the Royal Australian Air Force. As the current head of that Service, listeners will understand how gratified I am to have been invited to open the Remembrance Day Contest this year.

I am not the first Air Force officer to open this Contest. In 1971, it was Air Marshal Sir Richard Williams who enjoyed the honour. Williams had a remarkable career in the Air Force. It spanned a period when aircraft developed from frail, flying airframes barely able to become airborne to sophisticated weapons of war capable of flying at speeds approaching the speed of sound.

Williams had originally joined the Army in 1912, but two years later he was selected to undertake training as a military pilot at the first flying course conducted at Point Cook. There were four students on the course and Williams was first to qualify as a pilot, just 14 weeks after the course had started.

In 1916, Williams was sent to the Middle East on active service with the Australian Flying Corps. His first aircraft was a British-made BE2c and he recorded in his memoirs that "in those days we had no means of communicating between aircraft, or to base".

They were elementary aircraft with open, two-seat cockpits. Williams recalled that the pilot and his navigator communicated with each other "by shouting or passing notes".

By 1918, there had been many improvements in military aircraft. Wireless transmitters were standard equipment, permitting messages to be sent from the air to ground bases in Morse code – 100 kilometres was considered to be the maximum effective range. But there was still no way of communicating by wireless signals from the ground to the air, primarily because the noise level in open cockpits drowned out the sound of radio receivers. Ground

to air signalling therefore had to rely on rudimentary methods which included laying out strips of white cloth on the ground.

Despite their limited communication capability, aircraft had proved that they could be employed effectively in a range of operational roles. These included aerial combat, reconnaissance, strategic bombing, ground attack, observation for artillery fire, aerial photography and aerial re-supply. But World War I had also demonstrated that, if aircraft were to be used effectively as a weapon of war, then they had to be organised and controlled as a distinct fighting force. As a result, the Royal Australian Air Force was established as Australia's third fighting force on 31 March 1921. The leaders of this new Service came from the men of the Australian Flying Corps, including Sir Richard Williams who was to become the first Chief of the Air Staff.

The early leaders of the Air Force realised that the achievement of the full potential of the aircraft as a weapon of war was directly related to the ability to develop and exploit communication by wireless. Therefore, when an officer in the Citizen Air Force, Flight Lieutenant Howard Kingsley Love, submitted a proposal to the Air Board in 1929 to organise amateur wireless operators to support the RAAF, it was readily approved. Love, who was a professional radio engineer, was also the president of the Wireless Institute of Australia, Victorian Division. Under the sponsorship of the Institute, amateurs who operated licensed wireless transmitting stations were recruited to form the Wireless Reserve.

On joining the Reserve, members agreed to undertake prescribed training while making their services and equipment available to the RAAF to assist in meeting communications commitments.

The RAAF provided log books and message forms but, more importantly for future wartime mobilisation, the RAAF trained the operators in approved methods and procedures. Training was generally conducted twice each week during scheduled wireless telegraphy watches.

By mid-1939, there were 155 members of the Wireless Reserve. All of these amateur radio operators were called up for active service when World War II broke out. This explains why such a high proportion of those men who are the focus of this annual commemoration were members of the RAAF. It also helps explain why the RAAF was quick to establish the foundation for an efficient signals organisation which provided critical communications support throughout World War II. These amateur radio operators brought years of experience and knowledge into the service of their country.

Just how valuable this could be was illustrated by an incident involving Sergeant James Colthrup, a former amateur radio operator.

In 1940, James Colthrup was the wireless/telegraphy operator on an RAAF aircrew. While undertaking an aerial reconnaissance mission, the transmitter in Colthrup's aircraft failed to operate. The former amateur radio operator quickly discovered that a faulty condenser was the cause of the transmission failure. Drawing on his knowledge of radio physics, Colthrup ingeniously manufactured a temporary condenser using paper and tinfoil from a cigarette package. As a result, radio communications were established and the aircraft completed its operational task.

Sadly, Colthrup was not to survive the war. He is one of the 26 former radio amateurs we are remembering today.

The vital role of aircraft in war was firmly established during World War II; the air war was no longer an adjunct to the surface battle. There had been rapid improvements in the design and manufacture of the aircraft itself, and aircraft performance as a weapon platform also achieved new heights with the development of radio, electronics, radar and navigational aids. Integration of the two sciences of aviation and wireless had produced a powerful weapon capable of fulfilling a number of war-fighting roles. Australia's dedicated band of pre-war radio enthusiasts had played a small, but not insignificant, part in this.

I have much pleasure in declaring the 1996 Remembrance Day Contest open."

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QSP News

JOTA - 19/20 October 1966

The first National JOTA Opening ceremony was broadcast in 1974 from Camp Cottermouth in Canberra over the then new National HQ Scout Station VK1BP. In 1976 the station was set up in the grounds of Government House, and in 1995 at the new ACT Branch Radio Activities centre at Garran.

VK1BP will continue the tradition this year but we will also be using a number of other stations, including national callsigns VK6SAN and VK6GGN, hopefully to cover this vast continent better.

The Opening ceremony will be broadcast at 0400 UTC on JOTA Saturday, 19 October in Canberra from VK1BP on 7.090 MHz and 21.190 MHz; in Perth from VK6SAN on 14.190 MHz (beaming east), from VK6GGN on 14.125 MHz (beaming north), and from VK6SAA on 3.600 MHz; and in Townsville on 3.590 MHz and 7.080 MHz from VK4SPP. The ceremony will also be broadcast on local 2 metre stations or networks, such as VK1BP in Canberra, VK4SPP in Townsville on the VK4RAT repeater, VK6SAN in Perth on the WIA news net, VK7SAA in Hobart, and in Sydney.

Callbacks will be taken on all frequencies used and the results analysed to decide if this enhanced network, or part thereof, is successful.

Please listen to local WIA news or watch packet bulletins for local information. JOTA queries can be raised on the National Scout Nets from VK6SAN at 0200 UTC on the first, third and fifth Sundays on 14.190 MHz, the second Sunday on 21.190 MHz and the fourth Sunday on 28.590 MHz, and on packet to VK6HU@VK6WFH.

Peter Hughes VK6HU
National JOTA Co-ordinator

Technical Abstracts

*Gil Sones VK3AUI**

Antenna Comparison

The relative performance of the various HF vertical aerials is of interest to many. Also the relative performance of the vertical compared to a wire aerial or a beam is of interest. Many live in situations where space for aerials is at a premium and the compact vertical offers an attractive solution. However, it is hard to find an objective comparison.

Between 1991 and 1995 there appeared in the RSGBs monthly magazine, *RadCom*, a number of reviews of readily available verticals by the one reviewer Peter Hart G3SJX. There was also a comparison of one vertical, the Butternut, with wire aerials and a triband beam. When gathered together these reviews provide the basis for a comparison. The verticals and the wire aerials and beam were all compared with the Butternut. The tests were not all done on the same occasion but they do provide an indication of relative performance.

The verticals reviewed were the Butternut HF6V-X with accessory resonators in *RadCom*, March 1991, the MFJ-1798 in *RadCom*, September 1995, the Voyager DX-IV and the Cushcraft R7 in *RadCom*, July 1992, and the Challenger DX-VI in *RadCom*, December 1991. The comparison of the Butternut to the wire aerials and the beam appeared with the Butternut review in *RadCom*, March 1991. The Butternut HF6V-X was reviewed with accessory resonators which would make it similar to the HF9V.

All the verticals use different systems to operate. Two of them are designed with an integral counterpoise. The Butternut requires either radials or a suitable earth and uses resonators in a different manner to the usual trap vertical. The Voyager and the Challenger are both elevated feed designs and require radials. The MFJ-1798 is an inverted vertical with the counterpoise at the top and does not require radials. The R7 is called a half wave design and includes its own small counterpoise of four 1.2 m rods.

Table 1

Bandwidth and Height

The bandwidth is given for 2:1 VSWR or the highest VSWR in the Band.

Antenna	Butternut HF6V-X (with acc)	Cushcraft R7	MFJ MFJ-1798	Challenger DX-VI	Voyager DX-VI
Height	7.8 m	6.9 m	6.1 m	9.6 m	13.7 m
1.8 MHz	14 kHz (with Acc Kit)	——	——	——	70 kHz
3.5 MHz	31 kHz	——	12 kHz	130 kHz	1.9:1
7 MHz	180 kHz	87 kHz	21 kHz	1.09:1	1.6:1
10 MHz	1.05:1	54 kHz	340 kHz	——	1.7:1
14 MHz	1.3:1	204 kHz	1.4:1	2.2:1	——
18 MHz	2.2:1 (See Text)	1.6:1	1.2:1	——	——
21 MHz	1.7:1	2:1	1.4:1	2.1:1	——
24 MHz	1.1:1	1.4:1	1.5:1	2:1	——
28 MHz	1.5:1	1.19:1	880 kHz	2:1	——

The performance of the verticals is given in Tables 1 to 3.

The Butternut tested was a Model HF6V-X but was fitted with accessory resonators which brought it to the HF9V-X specification. The antenna was also fitted with a 160 metre kit. The aerial requires radials and radial kits are available. On 18 MHz the VSWR could be improved but this resulted in worsened VSWR on 21 MHz and 14 MHz.

The results of on air tests are contained in Table 2. These results are to some extent subjective and are averaged over many tests with a variety of stations. They do, however, give some idea of performance and they are all with reference to the Butternut. The differences are not great. The value of an S point is open to some question in view of the somewhat variable number of decibels assigned to it in some quarters.

The verticals are all fairly close in performance. The Challenger was only down on the Butternut at the resonance point of the Butternut but had a wider bandwidth. The results are subjective and rely on the experience and observation of the reviewer. Peter Hart G3SJX is a very experienced reviewer and operator.

During the course of the reviews of the verticals, Peter Hart G3SJX had the opportunity to compare the Butternut with some wire aerials and a three element triband beam. The results were published in *RadCom*, March 1991. The results are shown in Table 3.

The value of the beam lies not only in the signal gain but in the rejection of interference from unwanted directions. The gain may appear modest, but if an S unit is rated at 6 dB this is equivalent to a 400 watt linear compared to a barefoot 100 watt transceiver.

There is also a problem with ground mounted verticals in suburbia as they are then down amongst the clutter of buildings. This can lead to TVI and problems due to interference. Raising the vertical above the buildings can help, but it then makes the aerial fairly visible and may incur the wrath of neighbours and the building inspector. The use of a counterpoise or radial system is required with many verticals if they are mounted above ground level. The R7 and the MFJ

Table 2

Relative Performance with Reference to Butternut Vertical

Differences given in S units

Antenna	Butternut HF6V-X (with acc)	Cushcraft R7	MFJ MFJ-1798	Challenger DX-VI	Voyager DX-VI
3.5 MHz	ref	——	equal	-1 to 1.5 S (see text)	+0.5 S
7 MHz	ref	equal	equal	equal	equal
10 MHz	ref down	marginally	equal	——	——
14 MHz	ref	equal	equal	equal	-1 to 2 S
18 MHz	ref	+0.25 to 0.5 S	+0.5 S	——	——
21 MHz	ref	equal	equal	-1 to 2 S	——
24 MHz	ref	+1 to 2 S	+0.5 S	——	——
28 MHz	ref	equal	marginally down	-0.5 S	——

Table 3

Comparison of Butternut to Wire Aerials and Triband Beam

Differences given in S units

Antenna	Butternut HF6V-X (with acc)	3 El Triband 14 21 28 MHz	Sloping 7 MHz Dipole	Inverted L 120 ft H 70 ft V	Inv V 250 ft Apex 40 ft
3.5 MHz	ref	——	——	+0.5 S	+1 S
7 MHz	ref	——	equal	——	——
14 MHz	ref	+1 S	——	——	——
21 MHz	ref	+1 to 2 S	——	——	——
28 MHz	ref	+1 to 2 S	——	——	——

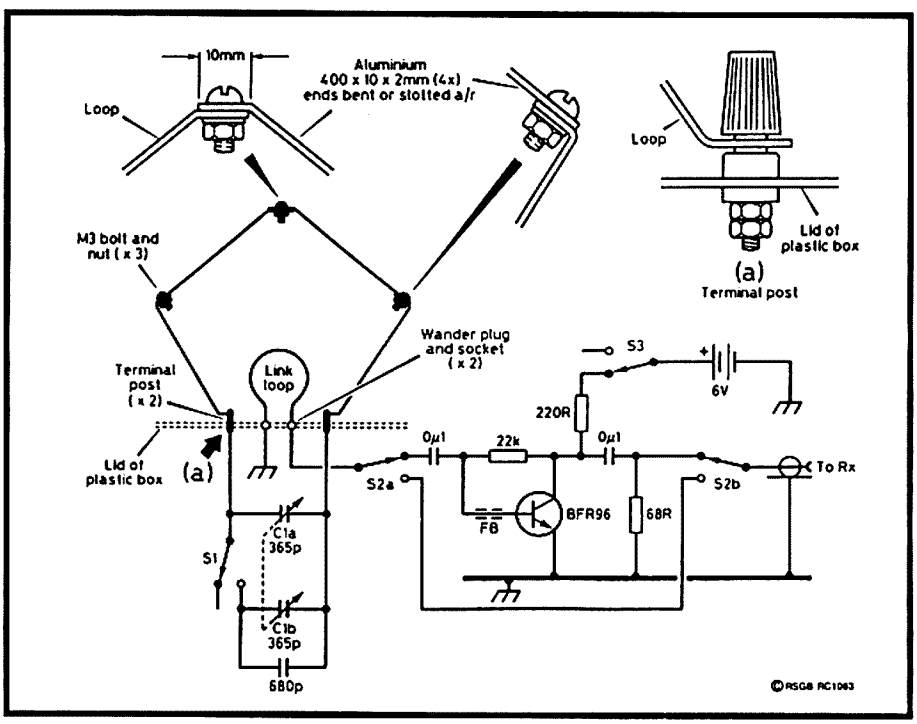

Fig 1 - PA0KSB Receiving Loop and Preamplifier.

1798 have integral counterpoises. The Butternut has accessory radial and counterpoise kits.

Receiving Loop

A useful receiving loop was described in *Electron*, January 1995 by Klaas Spaargaren PA0KSB and a translation appeared in the *RadCom* Eurotek Column of Erwin David G4LQI in July 1996. The loop is an active receiving design which can be used between 3.5 and 29 MHz.

The loop design sprang from the need for something better than the usual whip for a portable receiver. The loop can operate without a counterpoise or radials and is compact. There is the need to tune it but this is not a large problem.

The loop was made from aluminium strip 10 mm x 1.6 mm and has a circumference of 1.6 m. It is made out of four 400 mm lengths which are bolted together. The link coupling loop is made of a 45 cm length of stiff wire. Tuning is by a two section broadcast gang as used in older broadcast receivers. One section tunes 7 to 29 MHz and, with the second section switched in parallel and a 680 pF capacitor in parallel, the range 3.5 MHz to 5 MHz is covered. The minimum capacitance determines the maximum frequency. The loop is shown in Fig 1.

A low noise amplifier is used to boost signals as most receivers do not dig down to really low level signals at 3.5 MHz. This is because noise is usually a limiting factor on 3.5 MHz and extreme receiver sensitivity is not required. The signals with the loop are lower in level but the noise is also reduced so that a low noise amplifier is desirable. The amplifier and the tuning capacitor were housed in a 15 x 9 x 6 cm plastic box. The battery was made from four AA cells.

The loop was made from aluminium strip in order to achieve a high Q. You could try a scrap of pay TV hardline outer conductor as this would have similar characteristics. Another alternative would be some small diameter copper tube. The high Q results in a narrow bandwidth which is useful in rejecting strong out-of-band signals.

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■ DXpeditions

A Day on an Antarctic Island

*By Ralph Fedor K0IR as told to Stephen Pall VK2PS**

Ralph K0IR

Ralph K0IR is a medical doctor, specialising in diagnostic radiology. He has been involved in many aspects of amateur radio, but has always gravitated back to DXing and contesting, especially on CW. He is a member of several radio clubs and DX Foundations.

Ralph was a member of the 1992 VP8SSI DXpedition team. After the SSI (South Sandwich Island) DXpedition he was asked to organise and lead the DXpedition to Peter I Island. That expedition was widely celebrated as one of the most successful of all time. He was the prime organiser of the 1995 activity attempt on Heard Island and remains involved in guiding the 1997 expedition. Not so long ago, Ralph was kind enough to forward me some notes dealing with an expected typical day during a DXpedition on an Antarctic Island. Here is his story.

Ralph's Story

Based on my experiences on South Sandwich, South Georgia, and Peter I, this is how we might expect a day on Heard Island to unfold.

You awaken at daybreak to what sounds like machine gun fire. It is the fabric of the shelter being whipped by the wind. You begin the transition from the warmth of your sleeping bag to the frigid world outside. You pull cold jeans over your long underwear, put a fleece over your chamois shirt, and cover your jeans with Gortex storm pants. Your boots are stiff and icy cold as you lace them with stiff, cold fingers. You stand, pull on your Gortex parka and stocking hat, and ease your way between your sleeping comrades, being careful not to awaken them.

3Y0PI - Peter I Island. Ralph K0IR at the operating position in the CW shelter.

You move toward the shelter door, always a little off balance as you thread your way between clothing hanging from the shelter's support rods. You take care not to slip on the mini snow bank that has drifted through the zippered shelter door. A blast of cold air rushes into the shelter as you open the door. You try to exit as quickly as possible, but the groans of your team mates lets you know they felt the cold wind enter the shelter as you left.

Leaning against the wind and taking care not to slip in the mixture of snow, mud, and guano, you make your way to the cook tent. Entering, you find it empty and cold. You light the propane stove and place a two quart coffee pot full of water on the burner. While waiting for the water to become hot, you pour yourself a half glass of cold water (remember to conserve) and step outside the shelter to brush your teeth. When you return, you run a little cold water over your hands and into the five gallon bucket on the floor. You lather with soap, rinse with a little water, and dry your hands on the towel hanging from the shelter wall.

Local sunrise brings the 160 metre operator out of his operating shelter. The two of you feast on cereal with hot chocolate, coffee, or tea with a biscuit and jam and one or more bowls of canned fruit. You are beginning to feel warm as you wash your dishes, dry them, and place them in the rack for the next person to use. The breakfast stimulated your gastro-colic reflex; a bowel movement is imminent.

A tarp has been wrapped around four posts driven into the ground to fashion an outhouse. Frost is visibly present on the toilet seat. You lower your storm pants, jeans, and long underwear and plant your rear end on the icy cold toilet seat. "Eeeeee!" you say as frost and flesh meet. Some things can't be hurried, but you try to finish the task before frostbite claims your exposed flesh. Dealing with the toilet paper is a challenge; the wind whips it away from you as you attempt to form it into an acceptable bunch. You eye the ice crystals on it, grit your teeth, and try to keep your long parka from participating

The 3Y0PI team (l to r), K0IR, W6MKB, N4QCK, Martin Tosseyn, KK6EK, HB9AHL, XE1L, WA4JQS, ON6TT.

in the wiping process. You emerge from the outhouse wondering if there is anything in the rations that will promote constipation. You wash your hands, again conserving water.

The day is getting brighter now. You survey the camp and see that the night's winds have taken an A3's elements out of a single horizontal plane. The director is nearly vertical and will have to be straightened. Guys on one of the verticals have become dangerously slack and must be tightened. Jerry cans (tied to a post) are empty and need filling. A box of supplies needs to be moved but has frozen down during the night. A seal has made love to a leg on one of the tripods during the night and it is badly bent. The 15 metre beam tie down came loose during the night and the antenna is swinging freely from southwest to east.

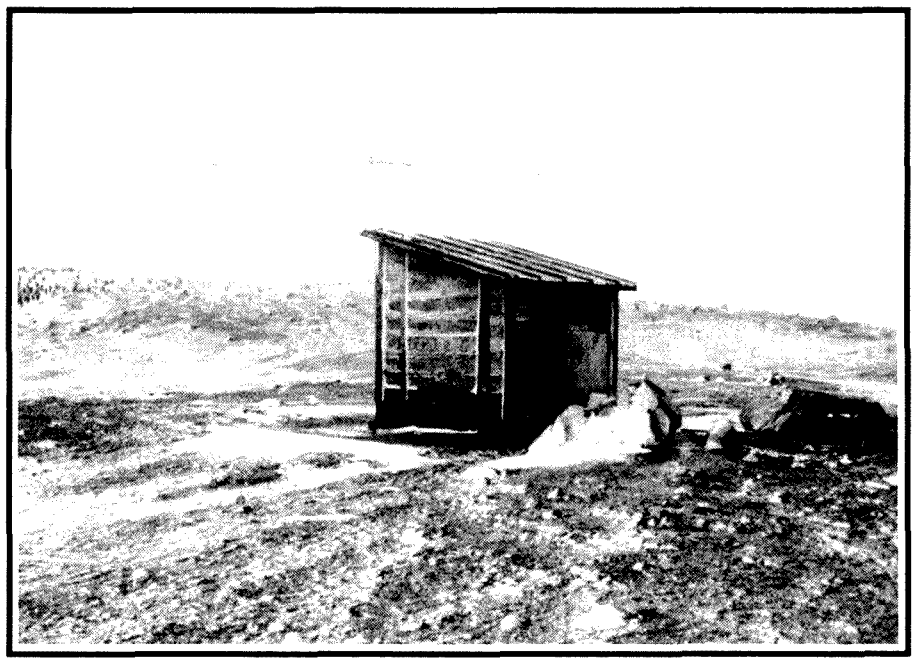
Screams come from one of the station tents. The door's zipper has iced up during the night and the 80 metre operator cannot get out. A yellowish stream has been flowing through the camp, a mixture of water from the melting glacier and penguin urine. It froze during the night and in crossing it you slip, landing on your rear end. Others have since emerged from their sleeping quarters and laugh at your plight.

For the next several hours you and your companions chip ice, straighten antennas, secure guy lines, refuel generators, pump fuel from 50 gallon drums to jerry cans, carry supplies from a cache at the beach to the camp, change oil in one of the generators, try to divert a stream that wants to flood the sleeping shelter, carry human waste from the outhouse to the storage area, and enjoy a chocolate bar.

The schedule calls for you to be on 20 SSB in 30 minutes so you drink a cup of hot coffee and scoop a plate full of baked beans from the pot on the stove. You enter the phone tent, emerge four hours later and find that mother nature has undone most of your previous repair work. While you were operating, your team mates were in the repair mode but couldn't keep up with damages brought by a 70 mph (110 km/hr) gale. One of the verticals came down and, using duct tape, a tent stake, U-bolts, and hose clamps, several of you stabilise it mechanically and hope the wind will subside enough for you to raise it before sunset.

Rain comes with the setting sun. The generators begin to sputter. Four of you try to fashion tarp covers to keep the rain from shorting out the generators.

The team leaders declare there was enough rain water caught and heated for two men to bathe that night. You're one of the lucky ones. Inside the warehouse you stand stark naked in an 18 inch square plastic dishpan with a gallon and a half of warm water in it. You wet down, lather up, rinse, and repeat the



VP8SSI. After the wind destroyed the operating tents, the team moved into this abandoned rescue hut.

process. You have been told that shivering conserves heat, and you are really conserving! You finish drying off and check that nothing has turned blue or, worse yet, black. Clean shorts and a clean tee shirt go under the long underwear you previously had on. You put on your outer gear. Wolf whistles greet you as you enter the cook tent for dinner.

Tonight's menu includes spaghetti, biscuits, canned fruit, sardines, and marshmallows. Of course there is hot coffee, tea, or chocolate. You are scheduled for 2 hours on 40. Someone else does the dishes.

You emerge from the operating tent to a world of blowing sleet and sand and are summoned to the cook tent to help change a propane bottle and solder PL-259s on a coax jumper.

Bedtime. Inside the sleeping shelter there is unhappiness. Someone's sleeping bag slid off a cot and onto the floor. It is soaked. Arrangements are made with a friend to borrow the bag of an operator who will be up all night. Your bag is icy cold as you slide into it but you know it will eventually warm from your body heat. A team member has gone to sleep before you and snores at least 150 dB above the noise level.

What seems like only moments later, someone is shaking you. "You're scheduled to be on 80 in 20 minutes." You walk carefully past three sleeping fur seals (they bite) on your way to the operating tent. The paradox plays in your mind, "Never in my life have I had such a wonderful time being miserable."

1997 Heard Island DXpedition

The Australian team member of the 1997 Heard Island DXpedition is David Muller VK2TQM who is Operations and Quality Assurance Manager for GEC Electronics in Sydney.

David's vast experience as a former Army reservist and SES member specialising in all aspects of electronic communications, will be very useful on Heard Island. The Heard Island DXpedition is founded by the participants, who have individually contributed $US10,000 each, and is also founded by donations and by corporate sponsorship. The total budget of the expedition is around $US300,000. There is still great need for funds and support. I am sure that many of the readers of these columns who need Heard Island as a new country will be willing to make a donation. Please contact David on phone (02) 9898-7426 or by e-mail on *davidm@gec.com.au, or* send your donation direct to Cordell Expeditions, 4295 Walnut Blvd, Walnut Creek, CA 94596 USA.

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Publishers of limited circulation magazines and other competent interested parties are requested to submit quotations to:-

1. Prepare galley proofs from raw copy (including sub-editing to WIA policy standards and drafting of technical drawings) and deliver to the Editor;
2. Lay out corrected galleys to final page proofing stage;
3. After Editorial approval, print the magazine following the present standard and format; and
4. Deliver the magazine to subscribers following the distribution list supplied by the WIA Federal Secretariat.

The following broad guidelines are to be used as the basis for the quotation:

* Raw copy (in a mix of typewritten and handwritten hard copy and digital copy) and general instructions on layout of each issue are to be provided by the Editor in sufficient time to allow printing and delivery to readers in the first week of each month;
* The tenderer will supply the name of a Production Manager to the Editor, as the point of contact;
* The tenderer will furnish details of arrangements to ensure continuity of service;
* For production purposes, the Editor, WIA, is to be the link person between the publisher and the Institute;
* The quotation is to be submitted on a cost per copy basis;
* Quotations should reach the Secretary by Friday, 27 September 1996;
* All respondents will be advised of the outcome of their submission by 31 October 1996. The successful tenderer will be required to produce and deliver the first issue for January 1997. Any transition arrangements will be negotiated. Copies of the magazine are available for reference from the address below;
* All queries should be addressed to:

The Secretary, WIA,
PO Box 2175
Caulfield Junction, VIC 3161.

Note: WIA divisions may see fit to quote, on the basis of sub-letting all or part of the process to a publishing house.

■ Book Review

Practical Packet Radio

Author: Stan Horzepa WA1LOU

Published by: ARRL

Reviewed by: Gil Sones VK3AUI

Packet radio has come a long way from the early 1980s but, even with the latest computer, software and terminal node controller (TNC), it can still be somewhat of a black art. This book goes a long way to providing the answers to your questions and is a useful item to have beside you as you experiment with packet.

It provides essential information in an easy-to-read format. It also provides plenty of reference material to answer your questions.

Amongst other things, there is information about the operation of Bulletin Boards and also about DX Packet Clusters. The DX Packet Cluster is becoming a very popular tool of DX operators in many parts of the world. They are not as prevalent here in VK as yet, but they are growing.

TCP/IP is mentioned and some information is provided. However, if you are trying to get going with TCP/IP you will probably want a specialised textbook. This book does, however, provide an overview and this is valuable for the average packet user.

The book gives much good information and is a worthwhile acquisition for anyone looking at packet. It provides a lot of reference material which is easy to read and find.

Practical Packet Radio is available from Daycom Communications Pty Ltd who provided the review copy. The price is $34. **ar**

■ History

Mission Accomplished

Wilbur Wright, Secretary, Sigs 2 Div Assocn.*

A prime aim of Australia Remembers 1945-95 was to encourage all Australians to remember and thank all veterans of World War II.

One war veteran who influenced our living standards was soldier, manufacturer, public servant, publisher and humanitarian, Oswald Mingay MBE. *(For several reasons we were unable to publish before now this tribute to a great man, but "better late than never". Ed)*

Os, born at Lithgow in 1895, joined the local post office as a messenger, then transferred to Sydney to be a technician. His departure to World War I was delayed through diphtheria.

At the Western Front, to withstand heavy bombardment, elaborate telephone communication systems were set up. CO Signals Second Division later remarked Os could not be spared as an officer as he was too valuable as a technician.

Os was mentioned in despatches for supervising restoration of the Charleroi telephone exchange system. After the war, he remained in London for further technical training.

Post WWI

Back in Australia he was a member of the Wireless Institute of Australia and set up an amateur radio station. By 1922 the radio industry was growing rapidly and he joined Bulgin Electric Co Ltd. He pioneered commercial radio by transmitting on 250 metres despite a warning it broke patent rights. Listeners said the music was very clear and voice items were blurred.

In 1925 he decided to be a manufacturer. His top-of-the-line product was the Super Power Eight

Receiver. Os announced that radio sets now worked off the mains and did not require batteries.

As secretary of the WIA, Os realised it was concerned with amateur activities and there was now a need for a professional engineers' association. Business-wise, Os conducted a radio column in the *Telegraph* and founded the Australian Radio College to train technicians. In 1930 he set up Mingay Publishing Company. 35 years later, he handed over to George McBride, Thomson Publications. In the meantime, he played a key role in the formation of the Institution of Radio and Electronics Engineers, Australia.

With Os as secretary and Sir Ernest Fisk as president, IREE proceedings publications earned world recognition for radio technology advancement. By instituting an award for the best annual paper, he helped stimulate the radio industry and was known as the "father" of the IREE.

In 1938 he was involved in organising the first World Radio Convention Sydney, to which Guglielmo Marconi was invited.

In World War II, Os organised the Army Signals Comfort Fund and served in the Ministry of Munitions with Colonel Sam Jones. Together they went on a mission to the USA concerning communication supplies. Sam said it was the first time Os was subdued when he was confined to bed with a cold. At one stage it is believed that it was requested some noughts be crossed off the Australian requisition! This mission was very important to our war effort.

Post WWII

After the war Os was involved in many community activities, including the RSL, Legacy, and Rotary, and established the Australia-wide industry fellowship BREIF club. With wife Theo they were known for their warm hospitality. He was a keen bowler.

When he announced his retirement in 1965, some extraordinary farewells were organised. In Melbourne, Sir Arthur Warner (Electronic Industries) said, "you can argue with Os and still keep smiling". When Chairman, Sir Lionel Hooke (AWA) presented Os with a Sydney Harbour painting, he said he

Sir Ernest Fisk presenting a Life Membership Badge to Oswald Mingay at a BRIEF luncheon held at the Sydney Trocadero on 6 December 1962.

VK QSL BUREAUX

The official list of VK QSL Bureaux. All are Inwards and Outwards unless otherwise stated.

VK1		GPO Box 600 CANBERRA ACT 2601
VK2		PO Box 73 TERALBA NSW 2284
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VK4		GPO Box 638 BRISBANE QLD 4001
VK5		PO Box 10092 Gouger St ADELAIDE SA 5001
VK6		GPO Box F319 PERTH WA 6001
VK7		GPO Box 371D HOBART TAS 7001
VK8		C/o H G Andersson VK8HA
		Box 619 HUMPTY DOO NT 0836
VK9/VK0		C/o Neil Penfold VK6NE
		2 Moss Court KINGSLEY WA 6026

expected Os to reply with a few shots including some back-slaps and smacked bottoms!

Os Mingay's old unit, Sigs 2 Div, now 8 Signal Regiment, is in its 80th year of continuous service and his contribution to his old unit cannot be adequately measured. As president, he organised get-togethers and continuously looked after the welfare of his mates for the best part of 60 years.

His initiative and active support in the commissioning of paintings commemorating the service of signalmen in two world wars ensured completion of the project. His hope that the "Bully" be continued has been fulfilled. His publishing interests are a living memorial.

At his farewell he used an old army phrase. He said his "mission was accomplished" and he was happy to hand over to the next generation. He believed those who followed electronics had a wonderful opportunity because of the big developments coming.

1/51 Fairlight Street, Fairlight NSW 2094

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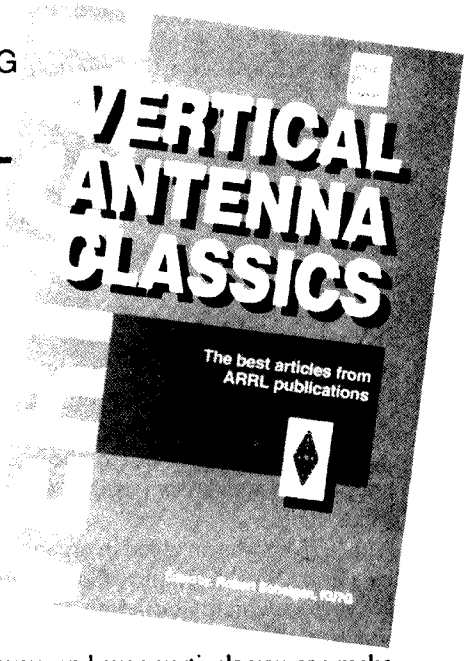
■ Book Review

Vertical Antenna Classics

Edited by: Robert Schetgen KU7G
Published by: ARRL
Reviewed by: Bob Tait VK3UI



This new release contains 121 pages, divided into six chapters, and covers all the essentials of vertical antennas, such as radials, ground systems, mobile, directional arrays, plus a section on computer modelling and MININEC.

The section on modelling is very detailed and contains all the necessary data to allow you to roll your own vertical. This section is backed up by the next chapter on using MININEC which will compute all those complex impedances for your own designs. A plotting program will give you an on-screen radiation pattern for your favourite antenna; input a new frequency and observe the changes before you actually build the antenna.

If all this seems a bit much, then there are some simple nomograms to allow you to calculate how long to make the radiator, and what size capacity hat you need if you wish to go for a short vertical. There are also details on matching, feedlines, tuners and lots more.

There are Discones, J poles, verticals with gain, phased arrays, directional arrays, and even verticals you can make to improve the operation of your handheld.

This publication is well presented, formatted in the familiar ARRL style, and would be a worthwhile addition to any radio amateur's library.

The review copy was supplied by Daycom Communications Pty Ltd and the cover price is $26.00.

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QSP News

Regulations Examinations

The WIA Federal Examination Committee is at present working on bringing the Regulations examinations up to date. No changes have been made so far, as we have been waiting for the release of the revised RIB 71 and the approval of the draft Regulations Question Bank. However, as it seems that these are still some time off, the existing Bank is being reviewed and modified to incorporate the contents of the Technical Licence Specifications (TLSs) which have been released.

We have been assured by the SMA that these publications and the other RIBs are being reprinted and made available.

It will take a few weeks for all changes to be approved by the SMA. Examiners and candidates will be notified when the changes are expected to reach the examination papers being sent out by the WIA Exam Service.

ALARA

Sally Grattidge VK4SHE, ALARA Publicity Officer*

The Second Mrs Mac

(From QNEWS, 23 June)

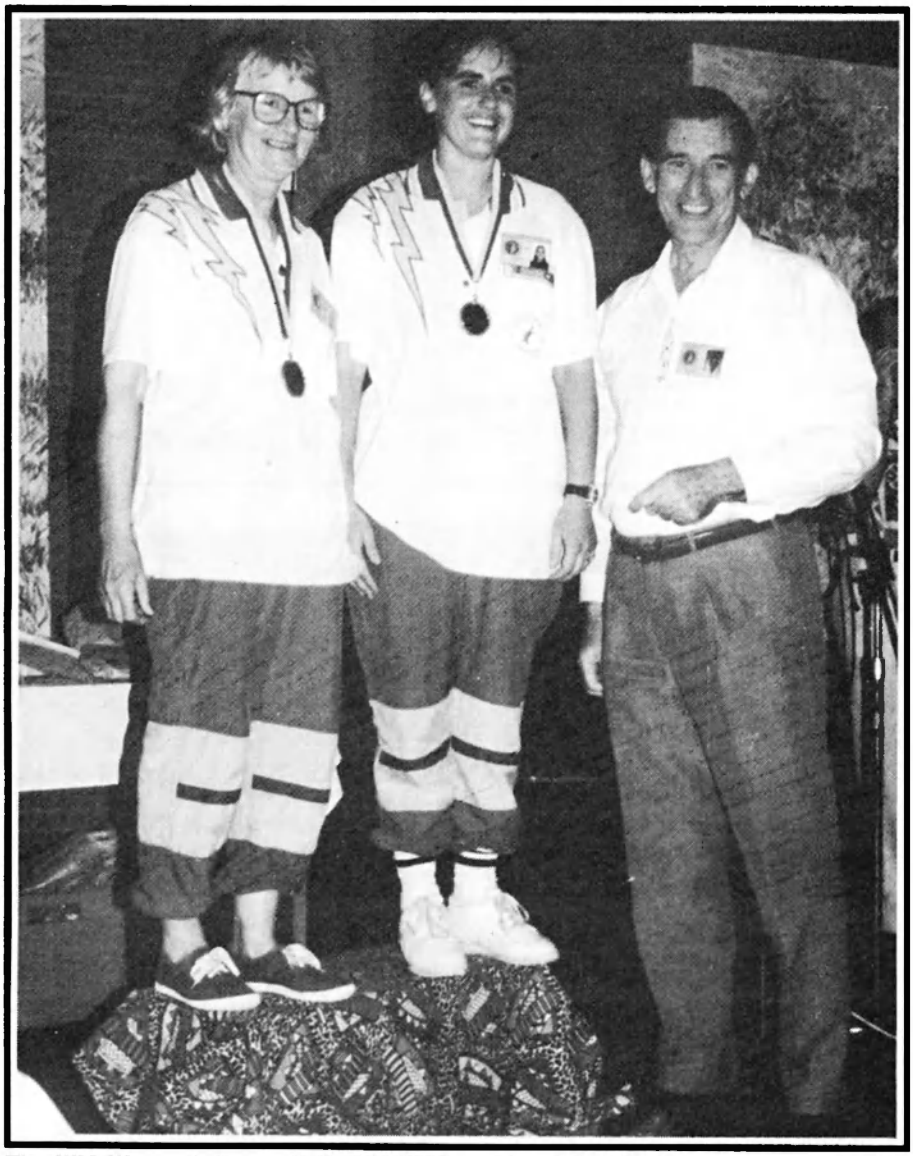
Amateurs in Brisbane were surprised to hear of the 100th birthday of Mrs Florence V Mackenzie on 20 June this year. The Florence V Mackenzie we all know so well, famous for teaching Morse Code during World War II, among many other achievements, is no longer with us. But Graham VK4BB could not resist meeting her namesake in a Brisbane nursing home and discovered an interesting connection with amateur radio.

Florence herself was never licensed, but her husband Matt VK4GK was a very active amateur, and her daughter Madeleine (Pugh) was the youngest licensed amateur in the British Empire after passing all her examinations at the age of twelve.

Florence learned to send Morse code so that her husband could practise receiving, although she claims she was never good at reading it. She also checked Matt and Madeleine's sending when they practised using a key which activated a light for each dot or dash. Florence watched for the light to see they were doing it correctly.

Father and daughter worked all available DX countries with "low wave". Being so young, Madeleine had to have a senior person with her for safety reasons when she operated, and Florence often took this role. Only once did she have to rescue her daughter and this was when Madeleine fell asleep on a Monday morning after a weekend BERU contest. Her hand touched the terminals of the key giving her a small shock and sending the key flying across the room. Florence switched off the rig (and probably sent her to bed).

Madeleine's father was Australian Secretary of the Radio Society of Great Britain and regular meetings were held in their house and those of other members, including "the U boys", VK4UU, VK4US, VK4UL and VK4AP, as well as VK4RY and VK4AW. He also started a Sunday morning commercial station, and experimented with 2 m and 5 m in the car. Florence monitored his signals while he drove around. For such devotion to duty this remarkable lady definitely deserves a mention in *Amateur Radio!*



The WIA Women's team, Sally VK4SHE and Sue VK3LSL, being presented with bronze medals by the WIA Federal President Neil Penfold VK6NE.

(Photograph by Iain VK4IGM)

A Good Scout

(from Christine Taylor VK5CTY)

Jenny Housden was one of the operators of the very successful club station VK5GGA in the ALARA Contest. The certificate has pride of place on the wall of the radio shack at Douglas Scrub near McLaren Vale. Jenny has been such an energetic and resourceful leader of Guide radio activities during her five years that she has been re-elected for another two years – something almost unheard of!

She has run, and continues to run, a series of very successful radio events with different Guide groups from time to time with the able assistance of local amateurs. Mostly the stations operate on two metres but, when possible, HF contacts are sought. An international camp is taking place at Douglas Scrub at the end of the year and there is sure to be a radio station. Dates, etc will be publicised when available so that you can listen for them.

ARDFing – A YL's Point of View

(Sally VK4SHE)

In July, Townsville Amateur Radio Club hosted the 2nd Region 3 ARDF championships (details and results elsewhere in this issue of *Amateur Radio*) with Sue VK3LSL and Sally VK4SHE competing in the Women's section for the WIA team.

You may think I am just a teensy bit crazy to try out a new sport by representing my country at an international event. It is not the kind of thing I would normally do, not being

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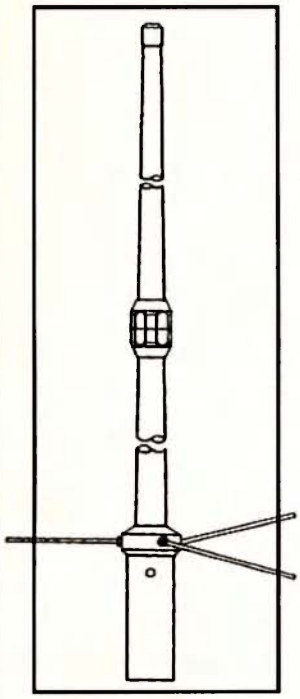

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Sally VK4SHE finding the fox.
(Photograph by Iain VK4IGM)

of a competitive nature (in other words, I hate losing), but the persuasive powers of Wally VK4DO (organiser of the event) were hard to resist, and YLs willing to make public idiots of themselves were thin on the ground.

So there I was, resplendent in green and gold, poised at the start, accompanied by two Oriental gentlemen who looked like they knew what they were doing, and who disappeared into the scrub before I had the headphones on.

I had suspected that a couple of turns round one of Townsville's parks (green, shady and FLAT) would be poor preparation for going bush and I was right. After more than half the time allowed had passed with no fox found, and scrambling up a rocky near vertical incline, I decided this was a stupid sport and I would never do it again. "Did you use the track?" someone asked later. "Only wimps use tracks" I replied. I wonder where it was?

Things started to improve from that moment. One fox was found, and the hard slog uphill became a slide and stumble down. When you finish, however unsuccessful, everyone claps, there is hot tea and sandwiches, friendship, lively discussion and a great sense of achievement.

The whole week was an eye-opener to those of us who had only heard about serious **Radio Sport**. The Opening Ceremony, with teams in colour co-ordinated track suits and endless photographs, set the mood. Townsville turned on perfect weather and, in spite of the heat, which those from colder climes remarked on, some impressive times were recorded (I estimated I would need about a week to find all the foxes). There was a wonderful atmosphere of friendship, much chatter in many languages and many smiles between those who had no common language. The Closing Ceremony was a feast of gift-giving and congratulations.

Radio Sport has great potential for involving families and young people in amateur radio. This event was serious stuff but, like many sports, it can be played at various levels and enjoyed by all ages and states of physical fitness. Making the "sniffers" would be an interesting project for beginners in electronics and, for the more skilled, there seems to be no limit on creativity when chasing the ultimate design. The hunt is fun and challenging and could be just the shot in the arm our aging amateur population needs.

The YL competitors were Luo Chunyan and Yang Chunxiang from China; Cheryl Wheatley ZL2VCC, Denise Hider ZL3TDW, Anne McMaster ZL3VR and Margaret McConnachie ZL3UD from New Zealand; Okada Miwa JF0REU, Akutsu Kumiko JL1KEA, Imamura Hideko JG6EKO, Watanabe Nobue JK1AXK, Yamagami Yoshiko JQ1LCW and Takahashi Mitsue JL1HAC from Japan; and Sue Diggins VK3LSL and Sally Grattidge VK4SHE (the locals).

The list would be incomplete without Thida Denpruckthan HS1ASC from Thailand, officially an Observer, although she appeared busy every time I saw her. Thida is one of those rare people who make everyone they meet feel like a special friend.

ALARAmeet Extra

Please note the ALARAmeet Special Effort will be run the same as in the past. Those not attending, or any who need more information, please contact a committee member. Apologies for putting this in an earlier issue as the Special Event (blame the static on 80 m).

Birthday Net

The ALARA Birthday net was held on Saturday, 27 July on 3.588 MHz with fair conditions, but a smaller net than last year. Heard on the net were Christine VK5CTY, Bron VK3DYF, Pat VK4PT, Meg VK5AOV, Maria VK5BMT (portable somewhere near Darwin), Debbie VK5DEB, Sally VK4SHE, Marilyn VK3DMS and Jenny VK3MDR. If you were there and not mentioned, let me know. Thanks to Christine for staying the distance and keeping everybody together. Happy 21st to ALARA.

*C/o PO Woodstock, QLD 4816
Tel: 077 788 642

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AMSAT Australia

*Bill Magnusson VK3JT**

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The Path to Valhalla

The antarctic winter is in full fury but the tiny OSCAR satellite orbiting at 800 km is oblivious to the icy winds and perpetual darkness below. It is about to come out of eclipse and into the sunlight once more. It encounters 14 such sunrises each day. From a vantage point on the satellite one could see the coastlines of Australia and New Zealand come into view over the edge of the earth.

Simultaneously, in amateur radio shacks in Hobart and Dunedin, two computers take control of the stations. The receivers and transmitters switch automatically to Doppler corrected frequencies and the antenna rotators swing long crossed Yagi beams to intercept the faint signals now just audible from UoSAT-OSCAR-22.

In a moment or two, signal strength meters begin to climb, lights dance on terminal node controllers and 9600 baud data streams up the computer screens. The game is afoot!

This is the magical world of the digital amateur radio satellites. There is pure poetry here for the initiated but be warned ... the path to Valhalla can be stormy!

The above scenario makes the rather naive assumption that everything works according to plan. Indeed, once it is all set up and working, the entire system is virtually bullet proof and many such stations operate continuously unattended. Much of the packet radio BBS mail is carried through a world wide network of automated amateur radio digital satellite stations. However, just in case you think it all looks too easy, I would urge you to consider the words of Dr Earl Hackett in one of his "body programs" on our ABC radio some years ago. *"The three main branches of science are easy to distinguish, if it smells bad...that's chemistry, if it's green or it wriggles...that's biology and if it doesn't work...THAT'S PHYSICS!"*

Fortunately, in this world of frightening complexity, of innumerable and seemingly insuperable variables, heroes of Wagnerian proportions are at work. At Surrey University, and the various AMSAT group headquarters, these heroes have placed in our hands a number of amateur radio satellites that are very reliable in operation. I chose the word "heroes" carefully. Their efforts are indeed heroic.

The phase 1, 2 and 3 satellites and, more recently, the three main digital birds UO-22, KO-23 and KO-25, have provided us with stable operating platforms with which to experiment. We, the users, need to have only modest equipment and reasonable technical knowledge to enjoy the fruits of their labours and extend our amateur radio activities into the space age.

But, the path to Valhalla lies strewn with the wreckage of many failed attempts. The designers and builders of our amateur radio satellites have "given it their best shot". Their score is on the board. Anything short of this on the user's part is bound to produce less than satisfactory results. Nowhere is this more true than in the case of the digital satellites.

System Requirements

Location

You should think carefully about this before getting all excited about satellite work. You need to be able to see the sky. The more sky you can see the better. THE SATELLITES ARE UP IN THE SKY! If you can't see the sky, forget about working the satellites. Pardon me for labouring this point but I hope you can see the importance of it. One can work DX from the bottom of a valley on 20 and 40 metres. It's not so easy with satellites. The electrical noise environment should also be considered. Satellite signals are weak. It's not like working in "kilowatt alley".

Antennas

Unless you live in a remote noise free area and you are skilled in making all-sky, omni-directional antennas and high gain, extra low noise state of the art preamplifiers, you will need to have a steerable az/el system. This usually means an az/el rotator, insulated cross boom and high gain switchable circular polarised Yagis for 145 MHz and 435 MHz. You will still need the low noise preamplifiers mounted up the mast as close as possible to the antenna feed points. Since the current digital birds use mode J you will be transmitting on 145 MHz and receiving on 435 MHz full duplex, ie simultaneously.

Therefore, you will need some form of filter in the receive line, preferably at the antenna terminals, certainly before the pre-amp. In my case I made a cavity resonator from copper tubing. Without this you will lose all the benefits of full duplex operation; when you transmit, your receiver will be hopelessly desensitised. No satellite antenna system would be complete without the best feedline you can afford. An affordable minimum would be 9913 for the main down leads and good quality, BRAND NEW 213 for the flexible bits around the rotators. Fit BRAND NEW connectors to all feedlines.

Automatic Antenna Tracking

Unless you have four arms, or a pet octopus, you will need to use some form of auto-track system. They fall into two main types. There are free standing "track-box" devices and they work well. I have one for my 2.4 GHz dish. The other most common type is the Kansas City Tracker. This is a computer card that you put inside your computer. It has an option to automatically tune your uplink and downlink frequencies to compensate for Doppler shift variations. The track-boxes also have this option. Again, the result is one less octopus in the radio shack. What's that you say? "I haven't got a computer". Get one or forget about the satellites. You can only sponge on your friends for so long.

Radios

The choice here is yours and the sky's the limit. I use a pair of older Icom rigs, the IC-271/471 combination. Pardon me for shouting but NO MATTER WHICH RIG YOU USE IT WILL NEED MODIFICATION BEFORE IT WILL WORK WITH THE 9600 BAUD SATELLITES. Many newer rigs claim to be 9600 baud capable, and a few of them will cope quite well with data from the local

packet network, but at the time of writing I do not know of any rig which will work the digital satellites "out of the box". Even the bright, shiny ones that claim to be "satellite ready".

The mods are slight and can be done with confidence. They are well documented. It's nice if your radios will switch 12 volts up the co-ax for the pre-amps (be careful where you put your cavity filter!).

Modem

You have some choice here. You can build from a kit or buy ready-made from a number of sources. The most popular choice seems to be a TNC-2 type terminal node controller with an attached G3RUH 9600 baud modem card. The three main digital birds UO-22, KO-23 and KO-25 will respond to this system. Other satellites, like Fuji, use PSK modulation and need a modem which will cope with PSK. The adjustment of the modem may require some test gear to get the transmitter deviation to be exactly +/-3 kHz. The modem talks to the computer through its serial port and to the radios via the mods referred to earlier.

Computer

This is determined somewhat by the software you intend using, but let's assume you are going to give it your best shot and run something more than the most basic DOS software. Whilst programs like PB/PG are still in use, the digital birds are so capable that, to do them justice, one should be using one of the fancier Windows-based programs available these days. Your computer should be capable of running Windows without restriction. It should have a large hard disk, 200 Megabytes or more, plenty of RAM and a good VGA monitor. I use Windows 3.11 but, looking to the future, it will soon become necessary to convert to Windows 95/96 etc in order to keep up with the inevitable software upgrades. The computer must have a serial port capable of supporting at least 19200 baud operation.

Software

Here's where we lean heavily on the heroes again. Last year the satellite community was alive with talk of a new program called WiSP. It was written by Chris Jackson ZL2TPO. Chris now holds the call G7UPN and works at the University of Surrey as UoSAT Command Station Manager. It would not be exaggerating to say that WiSP has revolutionised the digital amateur satellite scene. So much so, I won't bother mentioning any other software.

If you're serious about the digital birds, get into WiSP. It consists of a number of modules which are interactive. The two main modules are GSC, the Ground Station Control and MSPE, the Microsat Protocol Engine. Together they are capable of integrating the station into a fully automatic working unit. Getting it all together. VALHALLA!

I know of stations that are far more comprehensively equipped than the above, but I don't know of any that are successful that do not conform roughly to the above outline. You can add HF. You can add PSK. You can work straight packet, eg MIR. You can tool up for the phase 3 birds like AO-10/13 and P3D. If you want to do well at any of these you need to specialise. I don't know any satellite operator who "works all the OSCARS".

Assembling a station to cope adequately with the digital satellites is a bit daunting when you begin. The setting up of antennas, auto-track, auto-tune, modems, modifying radios, configuring your computer and setting up WiSP will test one's perspicacity to the limit but, when it's all up and running, the results are spectacular and immensely satisfying. Feeling a bit jaded lately? Lost your drive? Don't reach for the Barrocca, try the digital birds.

*RMB 1627, Milawa VIC 3678
CompuServe: 100352,3065
Internet: 100352.3065@compuserve.com
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WIA News

Ham Radio in the Movies

Amateur radio is coming to a theatre near you. Two recently released American films incorporate amateur radio in their plot lines.

The science fiction thriller, *Independence Day*, revolves around aliens taking over the Earth. Commercial communications links are thrown into disarray, Earth satellites are destroyed or disabled by the aliens and the US Space Command uses amateur radio to send out instructions for retaliation against the invaders. Hams spread the word using Morse code. Look out for the straight keyers. More details can be gleaned from the Internet at *http://www.id4.com/* on the World Wide Web.

In *Phenomenon*, American actor Forest Whittaker plays a radio amateur. He gets to use Morse code, while co-star John Travolta apparently decodes digital-mode signals in his head.

Amateur radio transceiver manufacturers are apparently unconcerned at this new development.

US RF Safety Standards Affect American Amateurs

According to a recent release from the American Radio Relay League (ARRL), the US Federal Communications Commission (FCC) has issued a new RF safety standard which will require US amateurs running more than 50 watts PEP to conduct routine RF radiation evaluations.

To come into force on 1 January 1997, the new standard will require those amateurs using more than 50 W PEP to conduct routine RF radiation evaluations to determine if RF fields are sufficient to cause human exposure to RF radiation levels in excess of those specified. Previously, amateurs in the US had a blanket exemption from this requirement.

The FCC was reported to have said, "Measurements made during a Commission/EPA study of several typical amateur stations in 1990 indicated that there may be some situations where excessive exposures could occur."

Amateurs operating stations running less than the 50 W PEP limit are categorically excluded, according to the ARRL report. However, stations using powers above that level will have to perform routine evaluations to see that their stations comply with the regulations for maximum permissible exposure (MPE). Where station RF radiation could exceed the limits, operators are required to take action to prevent such an occurrence. This could mean relocating the antenna, changing power levels or emission type, or a combination of remedies.

Push-to-talk mobile and portable amateur transceivers will be excluded from routine evaluations. The ARRL has an Internet Web site devoted to the subject, at *http://www.arrl.org/news/rfsafety/* from which more information can be obtained.

The WIA knows of no move to introduce a similar standard in Australia at this stage.

Support the WIA in order to protect amateur radio frequencies

Awards

*John Kelleher VK3DP - Federal Awards Manager**

Congratulations are due to the officials and net controllers of the Down Under County Hunters Net. This group has forged ahead through much difficulty and is, almost daily, supplying a few "rare ones" to those who frequent 14255 kHz. The original plan was to operate over the period of the US weekend, but they have blossomed out to include a daily look at the US counties, and to hasten qualifying for the prestigious USCA Award.

Congratulations are also due to those responsible for the re-activation of the VK1 Award Net. I would like to see more of this type of activity, especially from those organisations who, in the past, ran very successful 80 metre nets.

ZP Awards Program

The Radio Club Paraguayo issues the following awards to any amateur operator, or SWL, for confirmed contacts or reports, according to the rules for each award. A contact with a ZP station is mandatory for any of these awards. Contacts with mobile stations (ZP0) before 1991 will be acceptable.

All Diplomas are issued on a "mixed" basis (no band or mode separation) except for those where all contacts were made on digital modes (RTTY, Packet, Amtor, Pactor, SSTV, or any other computer generated signal), or via satellite. Send certified list (GCR rules) - please NO QSL CARDS - with a fee of $US5.00 or 5 IRCs for each award to: Radio Club Paraguayo, Award Manager, PO Box 512, Asuncion, Paraguay.

All Mediterranean Countries Award (AMCA)

This award is issued for contacts with inland countries, as follows. A2, A5, C31, CP, EK (ex UG6), ER (ex UO5), EU (ex UC2), EX (ex UM8), EY (ex UJ8), EZ (ex UH8), HA, HB, HV, JT, LX, OE, OK, OM, T7, TL, TT, TZ, UJ (ex UI8), UN (ex UL7), XT, XW, YA, Z2, ZP, 3DA0, 4J (ex UD6), 4U1ITU, 5U, 5X, 7P, 7Q, 9J, 9N, 9U, and 9X. Class A = 41 countries; Class B = 30; and Class C = 20.

Tropics of Cancer and Capricorn Award (TCCA)

This award is issued for contacts with countries touched by the Tropics of Cancer (A4, A6, BV, BY, C6, HZ, KH6, SU, S0, S2, TZ, VU, XE, XZ, 5A, 5T, 5U, and 7X) and Capricorn (A2, CE, C9, LU, PY, VK, V5, ZP, ZS, and 5R). Class A = 28 countries; Class B = 20; and Class C = 12 countries.

All Zone 11 Prefixes Award (AZ 11 PX)

Issued for contacts with different prefixes of stations, located in CQ Zone 11, from the following list: ZP0-9, PP0-PP9, PQ0-PQ9, PR0-PR9, PS0-PS9, PT0-PT9, PU0-PU9, PV0-PV9, PW0-PW9, PY0-PY9, ZW0-ZW9, ZV0-ZV9, ZX0-ZX9, ZY0-ZY9, ZZ0-ZZ9 and any special or contest prefixes. Class Gold = 100 prefixes with at least 10 ZP prefixes; Class Silver = 60 prefixes with at least 5 ZP prefixes; Class A = 30 prefixes; Class B = 19 prefixes; and Class C = 12 prefixes.

South America Award (DSA)

Issued for contacts with stations located in ITU Zones 12 (FY, HC, HC8, HK, HK0 (Malpelo), OA, PZ, 8R, YV, and CP1-8-9), 13 (PY6-7-8, PY0, (Fernando de Noronha), and PY0 (St Peter and Paul)), 14 (CE1-2-3-4-5, CE0X, CE0Z, CP2-3-4-5-6-7, ZP, CX, and LU (A-U, Y)), 15 (PY1-2-3-4-5-9, and PY0 (Trinidade)), 16 (CE6-7-8, VP8 (Falklands), and LU (V, W, X)), and 73 (KC4USP, LU (Z), CE9 (AA-AM), VP8 (Graham Land), and VP8 (South Georgia, South Orkney, South Sandwich, and Sth Shetland). Class A = 33 countries and 6 Zones; Class B = 25 countries and 6 Zones; and Class C = 18 countries and 5 Zones.

The Diploma Paraguay (DP)

Issued to amateurs living outside Paraguay, for confirmed contacts with five different ZP stations. South American amateurs should contact 15 different ZP stations.

Certificado Radio Club Paraguayo (CRCP)

Issued for confirmed contacts with 15 different ZP stations.

Worked All ZP Award (WAZP)

Issued for confirmed contacts with one station in each of the nine call areas (ZP1 to ZP9). Special or contest prefixes are not valid for this award. Special certificates are issued for ZP100, 150, 200, 250, 300, 350, 400, 450, and ZP500, for claims for that number of stations.

ZP3 Award

Issued for confirmed contacts with stations located in the third call area (ZP3), as follows: ZP, 10 stations; CE, CP, CX, LU, and PY, five stations; and rest of the world, two stations.

Mercosur Prefixes Award (Mercosur - PX)

Issued for confirmed contacts with stations located in the countries which are part of the Mercado Comun del Sur Mercosur Trade Agreement (LU-Argentina, PY-Brazil, ZP-Paraguay, and CX-Uraguay) after 1 January 1995. At least one prefix of each country is required. Special event and contest prefixes are acceptable for this award. Class A = 60 prefixes; Class B = 40; and Class C = 20 prefixes.

Diploma Departamentos del Paraguay (DDP)

Issued for contacts with one fixed or portable station located in the Nation's capital city, and each of the following departments into which Paraguay is divided:

Call	Area	Department Capital	City
ZP1	XVI	Boqueron	Filadelfia
	XVII	Alto Paraguay	Fuerte Olimpo
ZP2	XV	Presidente Hayes	Pozo Colorado
ZP3	I	Concepcion	Concepcion
	XIII	Amambay	Pedro Juan Caballero
ZP4	II	San Pedro	San Pedro del Ycuamandyju
	XIV	Canindeyu	Salto del Guaira
ZP5	Capital City of the Country		Asuncion
ZP6	III	Cordillera	Caacupe
	IX	Paraguari	Paraguari
	XI	Central	Aregua
ZP7	IV	Guaira	Villarrica
	V	Caaguazu	Coronel Oviedo
	VI	Caazapa	Canzapa
ZP8	VIII	Misiones	San Juan Bautista
	XII	Neembucu	Pilar
ZP9	VII	Itapua	Encarnacion
	X	Alto Parana	Ciudad del Este.

Class A = 18 Departments; Class B = 16; and Class C = 12 Depts.

ZP1 Award

Issued by the Radio Club Filadelfia ZP1FF (RCP's affiliate), for confirmed contacts with different ZP stations located in the first call area (ZP1). A contact with ZP1FF is mandatory. South American stations should contact 30 stations, and the rest of the world 10 stations.

Fortines del Chaco Award

Issued by the Radio Club Filadelfia (RCP's affiliate) for confirmed contacts with stations located in the following Chaco War forts (outposts): Boqueron, Pitiantuta, Toledo, Km 145, Km 160, Km 180, Guachalia, Lagerenza, Campo Via Nanawa, Trebol, Isla Poi, Tte Montania, Camacho (Mcal, Estigarribia), Tte Enciso, Tte Martinez, and Tte Rojas Silva. The contact with Fort Boqueron is mandatory. South American stations should contact eight forts, and the rest of the world four forts.

Contact All Time Zones (CATZ)

The start for valid contacts is 1 July 1996 at 0000z. The world is divided into 24 time zones. Each time zone is 15 degrees wide. For the sake of this award, half-hour zones and out-of-zone artificial time changes will be ignored. This award is based on the true 15 degrees each, world map 24 time zones.

The applying station must have one (two-way) contact on amateur radio allocated frequencies with a station in each of the worlds' 24 time zones. Contacts with one's own nation does not count. The operator applying for the award must have made all 24 contacts from a location within the same country. The award may be endorsed as the applicant wishes in regard to band and/or modes.

An applicant for the award must be in possession of 24 QSL cards, one from each of the time zones. A list should be made showing each contact's call sign, date, band, mode and the time zone starting with the Prime Meridian (0 deg), and moving eastward. There is a fee of $US5.00 to cover the cost and mailing of the 8 x 10 certificate (mailed unfolded).

It is not necessary to mail your QSL cards to World Radio. Send a statement signed by two other licensed radio amateurs (General Class or above) that they have inspected and verified the required QSL cards. The application should be addressed to: CATZ Award, World Radio, 2120 28th Street, Sacramento, CA 95818, USA. Those receiving the CATZ Award will have their name and call sign reported in the World Radio DX column.

PO Box 2175 Caulfield Junction 3161

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Club Corner

Seen communicating at the Rivarland Radio Club's "Communication 96" were (l to r) Bob Wilkinson, Adrian Rolmann VK5AJR and Nail Francis VK5ANF.

Radio Amateurs Old Timers Club (RAOTC)

Would members please note that the usual September luncheon in Melbourne will be held on Tuesday, 17 September at 12.30 for a 1.00 pm start.

The venue will be the Bentleigh Club in Yawla Street, Bentleigh. The cost will be $21.00, plus refreshments if required. There will be a most interesting talk by Trevor Mitchell VK3CUP who held a very responsible position at the Woomera Rocket Range at its busy time.

It is important that firm bookings be in the hands of the Club Secretary, Arthur Evans VK3VQ, not later than Thursday, 12 September. It is gratifying that our membership is slowly but steadily increasing. This encourages the Committee to believe that they must be doing something right!

Allan Doble VK3AMD

Radio Amateurs Old Timers Club of South Australia

The annual luncheon will be held on Thursday, 24 October at 12 noon at the Aviation Institute Club at the Adelaide Airport.

As usual, we invite amateurs 60 years and over who have held, or are eligible to hold, an amateur radio licence for 10 years and over (ladies are welcome), to join us.

Please RSVP by 17 October to either the President, Jack Townsend VK5HT on 295 2209; the Secretary, Ray Deane VK5RK on 271 5401; or the Assistant Secretary, Lew Schaumloffel VK5AKQ on 263 0882.

For those using public transport, take TA Bus 278 (Currie Street) to Stop 9.

Ray Deane VK5RK

Kempsey and District Amateur Radio Club Inc

KADARC Inc will be holding its second field day on Sunday, 6 October commencing at 9.00 am.

The program for the day will include trade displays, flea market, mobile and talk-in foxhunts, demonstrations, refreshments and food. A full program with all details will be published as the event draws near.

KADARC Inc meets on the third Tuesday of each month at 7.00 pm in the Guides Hall, Verge Street, Kempsey and visitors are always welcome.

For information, contact the President, Ray Wells VK2TV on 065 628 549; or the Secretary, Ted Bastow VK2WL on 065 617 218. Alternatively, packet messages may be addressed to VK2TV@VK2TV.

Ray Wells VK2TV
President

Moorabbin & District Radio Club Inc

Annual General Meeting

The AGM of the Club was held on 19 July and was attended by more than 30 members and visitors. The following office bearers were re-elected unopposed for the coming year: President, Lee Moyle VK3GK; Vice President, David Armstrong VK3KXJ; Secretary, Paul Girling VK3ALE; Treasurer, Morrie Lyons VK3BCC; Committee Members, Wally Hunt VK3JWH, Harold Hepburn VK3AFQ and Jerry Viscaal VK3MQ.

VK3APC Nets

The Club nets are on air every Monday night at 7.30 pm on 146.550 MHz for members who do not have HF capability. At 8.00 pm the long running HF net continues on 3.567 MHz, plus or minus QRM. Even if you are not a member of the Club, you are most welcome to join in and have a go at gaining points for the Club Award.

Meetings and Activities

First Friday of the month: Natter Night from 7.30 pm.

Third Friday of the month: General Meeting, commencing at 8.00 pm.

Every Tuesday morning: Tuesday Group, commencing at 10.00 am.

Every Tuesday night: Hobby Group, from 7.30 pm.

For information about the Club, write to the Secretary, PO Box 58, Highett VIC 3190.

Denis Babore VK3BGS

Ballarat Amateur Radio Group Inc (BARO)

At the Annual Meeting of BARG held on Friday, 26 July the following people were elected to office to conduct the affairs of the Ballarat Amateur Radio Group Inc for the 1996/7 year: President, Gordon Cornell VK3FGC; Vice President, Mary Curnow VK3FMC; Secretary, Geoff Smith VK3ADB; Treasurer, Murray Felstead VK3AAI; Education Officer, Tom George VK3DMK; and WICEN Co-ordinator, Gordon Cornell VK3FGC.

The committee and members of BARG are looking forward to a very active and productive year this year with several ventures and activities on the go, not least of which will be the BARG HAMVENTION '96 which will be conducted over the weekend of 26 and 27 October. If you came along to last year's event, you would have appreciated the advantages of the shift in venue to the Ballarat Showgrounds; we can promise that this year's arrangements will be even better. If you weren't able to come along last year we are very sorry that you missed out, but we suggest that you mark your calender now. If you should be looking for accommodation over that weekend you should make a booking ASAP. The superior weather in Ballarat at Hamvention time encourages a lot of organisations to hold activities over this weekend and consequently Hotel/Motel/Caravan Park bookings are at a premium.

I should also mention that in the extremely unlikely event that the weather is in any way inclement, it will be of little concern as all activities (except foxhunting, of course) will be conducted under cover and in proximity to the "free coffee dispensers". We are all looking forward to seeing you at this prestigious event.

Norm D'Angri VK3LBA
Publicity Officer

Riverland Radio Club Inc

The Riverland Radio Club Inc held its seventh AGM on 4 July. In his annual report, President Tony Hutchison VK5ZAI said membership of the Club had remained static, but assets continue to grow, including an HF transceiver, power supply and PSK modem.

Tony thanked all who helped make the main event of the year, Communications 96, successful.

The WIA slow Morse practice sessions are broadcast five nights a week under the watchful eye of Kingsley Brauer VK5AKN.

After operating the BBS since its inception, Richard Tolhurst VK5AET has handed over to Ivan Smith VK5HS. Although the 2 m access cannot be used at present, 70 cm is working well.

Gary Watt VK5CWP, Chris Hedger VK5PBI and David Wilson VK5NAP were again involved with JOTA.

Tony VK5ZAI attended the WIA state conference as a delegate with Doug VK5GA as observer. Other visits were to the property of Lou Jantke VK5LE, also an inspection of the 5MV ABC studio in Renmark.

The new committee comprises: President, David Wilson VK5NAP; Vice President, Mike Mackintosh VK5CK; Secretary, Doug Tamblyn VK5GA; Committee Members, Tony Hutchison VK5ZAI, Kingsley Brauer VK5AKN, Malcolm Gardener, Adrian Reimann VK5AJR and Chris Hedger VK5PBI.

Doug Tamblyn VK5GA
Secretary
ar

Contests

*Peter Nesbit VK3APN - Federal Contest Coordinator**

Contest Calendar Sep - Nov 96

Sep 1	Bulgarian DX Contest	(Aug 96)
Sep 1	Panama Anniversary Contest (SSB)	(Aug 96)
Sep 7/8	All Asia DX Contest (Phone)	(May 96)
Sep 14/15	Worked All Europe (Phone)	(July 96)
Sep 21/22	SAC DX (CW)	(Aug 96)
Sep 28/29	SAC DX (Phone)	(Aug 96)
Sep 28/29	CQ-WW RTTY DX Contest	(Aug 96)
Oct 5/6	VK/ZL/Oceania DX Contest (Phone)	(Aug 96)
Oct 6	RSGB 21/28 MHz Contest (Phone)	
Oct 12/13	VK/ZL/Oceania DX Contest (CW)	(Aug 96)
Oct 19/20	Worked All Germany Contest (Mixed)	
Oct 20	RSGB 21/28 MHz Contest (CW)	
Oct 20	Asia-Pacific Sprint	(Jun 96)
Oct 26/27	CQ-WW DX Contest (Phone)	
Nov 1/7	HA QRP Contest	
Nov 9	ALARA Contest	
Nov 9/10	WAE RTTY DX Contest	(Jul 96)
Nov 9/10	OK-DX CW Contest	
Nov 16/17	IARU Region 1 160 m Contest	
Nov 16/17	All Austria CW Contest	
Nov 23/24	CQ World-Wide DX CW Contest	

Those of you who missed the 160 m contest in July missed a real treat. If you thought activity on 160 was minimal, and mainly composed of local contacts, think again! Most VK call areas were well represented, there were plenty of ZLs, and even some Ws. Other DX included ZK1 and VQ9. Competition was intense, and it's decades since I heard so many stations on the band. As one ZL said, he had more 160 m QSOs that one evening than he had in his whole life!

From my own observations, several conclusions could be drawn. Firstly, it is not necessary to have an enormous antenna to put out a competitive signal, providing it is well matched and has a low resistance ground system. Secondly, a low noise receiving antenna is well worth the effort, because there are many stations who can hear you well enough, but whom you are struggling to hear (a rather pleasant change from the higher bands, where the skip often goes the other way)! Finally, it is possible to be fully competitive on both phone and CW, as demonstrated by many stations (but unfortunately not by me, as I realised this just a bit too late).

A full report on the contest will appear in due course. In the meantime, start thinking about how you can improve your station on 160, in time for next year. With more time for overseas publicity, hopefully we can attract some European activity next time (or even that elusive VQ9)!

Don't forget to submit your RD contest log. Until next month, good contesting! (For information this month, thanks to DL2DN, OK2FD, SM3CER, VS6BG, *JARL*, *RSGB*, and *CQ*). 73s, Peter VK3APN

Addendum

In the June issue, the NZART 80 m Memorial Contest was shown as CW only, whereas in fact both CW and phone QSOs are allowed. Please amend your issue accordingly, in case you happen to refer to it next year.

In the August issue, in the seventh paragraph, the correct name of the cq-contest e-mail reflector is *cq-contest@tgv.com*. This is not the same as the admin server mentioned in the following paragraph, *cq-contest-request@tgv.com*, which only processes subscriptions.

RSGB 21/28 MHz DX Contest

Phone: 6 October, Sun 0700 – 1900z
CW: 20 October, Sun 0700 – 1900z

The object is to work as many UK stations as possible on 21 and 28 MHz (UK includes GI, but not EI). Categories (single or multioperator) are: open, restricted, QRP, and SWL. In the restricted section, only one antenna is allowed, which must be a single element no more than 15 m high, and 100 W max O/P. The open section has no antenna or power limitations.

Send RS(T) plus serial starting at 001; UK stations will add their county code. Score three points per QSO. The final score equals the total points times the total multiplier (counties worked on each band added together). Use a separate log for each band. Send logs and summary sheets, postmarked by 14 November, to: RSGB HF Contests Committee c/o G3UFY, 77 Bensham Manor Road, Thornton Heath, Surrey CR7 7AF, England. A comprehensive range of awards is offered.

SWLs may only log UK stations making contest QSOs with overseas stations. SWL logs should be headed time UTC; callsign heard; number sent by that station; callsign of station being worked; new multipliers; points. In the column headed "station being worked" the same callsign may only appear once in every three QSOs except when the logged station counts as a new multiplier.

Worked All Germany DX Contest (CW & Open)

19/20 October, 1500z Sat – 1500z Sun

In this contest, which occurs on the third full weekend every year, the world works Germany. Categories are: Single operator all band (CW, mixed, and mixed QRP max 5 W output); Multioperator single Tx; SWL. Use 80 – 10 m, and exchange RS(T) plus serial number. German stations will add their DOK (location code). Each station may be worked once per band per mode.

Score three points per QSO, and determine the final score by multiplying by the total number of German districts (first letter of DOK) worked on each band regardless of mode. Send logs,

The antenna farm of Takeshi JA3AAW contributed to an excellent five band effort in the 1995 VK/ZL/Oceania DX Contest, earning him first place Asia!

summary and dupe sheets to arrive by 20 November to: Klaus Voigt DL1DTL, PO Box 72 04 27, D-01023 Dresden, Germany. Logs on DOS disk are welcome, if accompanied by a signed summary sheet.

CQ WW DX Contest

Phone: 26/27 October, 0000z Sat – 2400z Sun
CW: 23/24 November, 0000z Sat – 2400z Sun

Sponsored by *CQ Magazine*, these contests are undoubtedly the premier HF events of the year, and present the opportunity to work many rare countries and zones even with modest equipment. They are open to all stations world-wide, on 1.8-30 MHz (no WARC bands). Categories are: single operator; single operator low power (max 100 W output); single operator QRPp (max 5 W output); single operator assisted (for those using DX spotting nets); multi-operator single transmitter; and multi-operator multi-transmitter.

Single operator stations can enter as single or all band, and can change bands at will. Multi-operator stations must enter as all band. Multi-operator single Tx stations must stay on a band for at least 10 minutes, EXCEPT that one – and only one – other band may be used during the 10 minute period, if – and only if – the station worked is a new multiplier. Multi Tx stations are exempt from this rule, but can only radiate one signal per band at any one time.

Exchange RS(T) plus CQ zone. Score three points for QSOs with stations in a different continent, and one point for QSOs with stations in the same continent (for VKs this means Oceania as defined for WAC). Stations in the same country or call area can be worked for additional multiplier credit, but have zero points value. The total multiplier is the number of DXCC countries plus zones worked. Final score equals total points times total multiplier.

Use a separate log for each band. Show new multipliers in the log the first time they are worked, and duplicates with zero points. Entrants are encouraged to include a "dupe sheet" for each band, which becomes mandatory for 200 QSOs or more. Computer logs are welcome, and must be in ASCII on DOS disk, using separate files for each band, eg VK7AAA.20 for a 20 m log; alternatively in K1EA "CT" .BIN format, eg VK7AAA.BIN. Label the outside of the disk with the callsign, the files included, mode, and category. Disks MUST be accompanied by a paper printout satisfying logging instructions. The committee may request a disk from high scoring stations to enable the log to be checked by computer, if the log originally submitted was a computer printout.

Include a signed summary sheet, showing power output for low power and QRPp entries, and send the log postmarked by 1 December (phone) or 15 January (CW) to: CQ Magazine, 76 North Broadway, Hicksville, NY 11801, USA. Indicate Phone or CW on the envelope. Numerous awards, trophies and plaques will be awarded to the leading entrants in the various categories and countries.

Results of 1995 IOTA Contest

(Full listing in RadCom March 1996)

(Posn/call/section/QSOs/mult/score):

#20	VK4MZ	SSB	189	37	56,869
#10	VK4EMM	Mxd	97	27	21,330
#13	VK7BC	Mxd	40	29	14,355

Results of 1995 CQ WPX SSB Contest

On 7 MHz, VK3EW had the highest score in Oceania, and was seventh worldwide. Other scores are as follows:

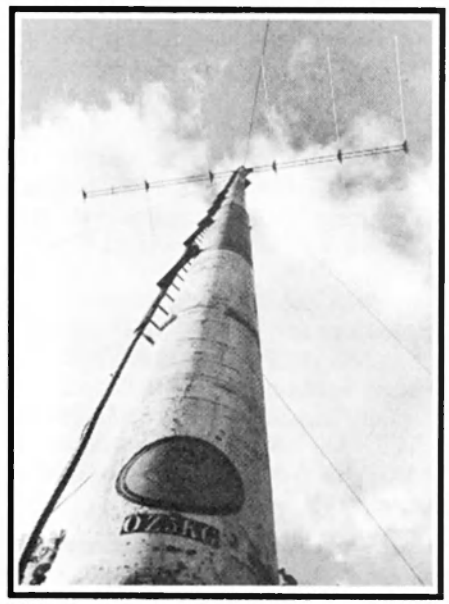
(Call/band/score/QSOs/prefixes)

Single Operator:

VK5GN	A	3,915,877	1726	587
VK3TZ	A	2,318,316	1134	572
VK2ARJ	28	27,413	127	79
VK3SM	14	5,085	133	45
VK8BE	14	1,380	25	20
VK3EW	7	3,222,576	1100	504
P29NR	A	1,124,750	932	409

Multioperator:

VK4MZ	A	5,111,600	1876	650
VK6ANC	A	1,406,886	1101	442



The six element 20 m monobander of Tom OZ5KQ, a keen contester. A 4CX1500 linear amplifier further contributes to his very potent signal.

Results of 1996 PACC Contest

(Call/QSOs/mult/score; * = certificate)

VK2APK*	42	17	714
VK4XA	22	12	264
VK4TT	14	8	112
VK3APN	6	4	24

*PO Box 2175, Caulfield Junction, VIC 3175
pmesbit@melbpc.org.au

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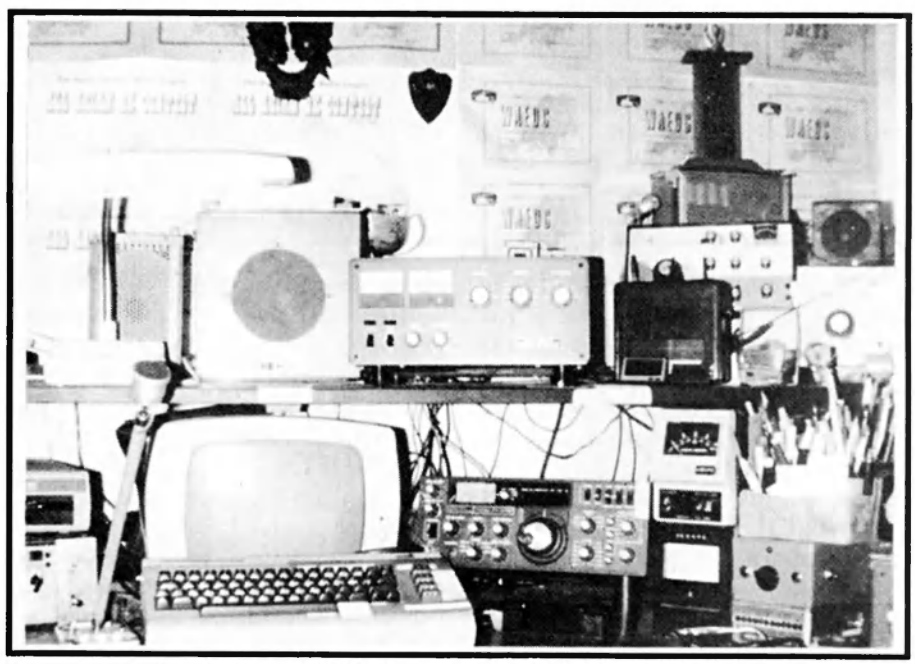


Keen contester, Dietmar VK2APK, can be heard in most overseas DX contests. This picture of his operating position shows a few of the many awards he has won over the years

Divisional Notes

Forward Bias - VK1 Notes

Peter Parker VK1PK

VK1 Member Wins Prize Rig

A VK1 Division member has won the Icom 706 transceiver in the WIA's national membership competition. George Bromley VK1KGJ was presented with the prize at the July Divisional meeting by Kiyoshi Fukushima of Icom Australia. The VK1 Division wishes George many happy hours on the air with the new rig, and thanks Icom for the donation of the prize.

Members present at July's meeting also participated in a discussion on coaxial and open wire feedlines. Appropriately, the raffle prize was 50 metres of RG213 coaxial cable. It was won by Jim VK1FF.

Symposium Date Confirmed

Mike VK1KCK, the organiser of this year's Canberra Amateur Packet Radio Group Technical Symposium, reports that this event will be held on 23 November. The Symposium will cover many aspects of amateur radio techniques, with streams for operating and technical topics. Mike invites those who wish to speak or present a paper to get in touch with him. You can phone Mike on 292 0053, or send a packet message to VK1KCK @ VK1KCM.

1996 Australasian Sprints

The VK1WI callsign was activated during both the CW and SSB Australasian Sprints, held in July. Jim VK1FF made 33 contacts on CW, while Phil VK1PJ made 51 in the SSB section.

UHF News Service Reinstated

After a long absence, the Sunday evening Divisional Broadcast can once again be heard on 70 centimetres. Relayed by Phil VK1PC, the retransmission goes to air on the 438.375 MHz Ginini repeater. Thanks to repeater linking, listeners in the Goulburn area can receive the bulletin on 438.325 MHz. Apart from this new UHF service, the broadcast may also be heard on some repeaters in southern NSW.

VK180 Receiver Update

The ceramic resonators ordered for the second batch of the VK180 receiver kits have now arrived. Short-form kits for the simple direct conversion receiver are once again available from the Division. The price is unchanged from last time – just $3 per kit.

VK2 Notes

Richard Murnane VK2SKY

Just a reminder for those of you who have fallen into the habit of faxing your news directly to Michael VK2YC, our former Broadcast Officer (along with his many other hats). Please now send your news items to the Divisional Office so they can be forwarded to me for inclusion in the broadcast.

Also, be aware that the printed submissions **must** be in the Divisional Office by close of business (2 pm) on the Friday preceding the broadcast. I have better things to do on a Saturday night than sit around waiting for late news items (ask my YL if you doubt me!). Likewise, submissions via packet or Internet e-mail should be in by Friday afternoon: make sure to allow for forwarding delays through the various networks.

All hard copy that ends up at the Divisional Office will be faxed to me, where my OCR (Optical Character Recognition) software will convert it to ASCII text. The text will then be formatted for the packet radio and Internet editions of the broadcast (these have been neglected somewhat in recent weeks, due to various technical difficulties).

Please ensure that you use a plain "sans serif" typeface (eg Arial if you use Windows), so that the text passes more clearly through the fax machine. The OCR software will then convert the text reliably (I will not be spending my weekends compensating for defective printers/fax machines, either: if the OCR can't make sense of your copy, it will be excluded from the electronic editions of the news).

Please limit your submission to about 90 seconds of air time, as we try (and frequently fail) to squeeze a large number of news items into about 45 minutes on-air. In paper terms that's one, or at the most two, pages of double-spaced text, with wide margins to allow the announcer to make notes.

Perhaps, most importantly, **check that your news item is readable!** Give your copy to someone else and have them read it to a third person. If that person understands it, then you have the makings of a readable news item and the VK2WI broadcast team and listeners will thank you.

Thought for the month:

"Pay no attention to what critics say; no statue has ever been erected to a critic." Jean Sibelius.

VK3 Notes

Jim Linton VK3PC

Articles of Association

Members who were present at the annual general meeting passed a resolution requiring the Memorandum and Articles of Association of WIA Victoria to be revised and updated. This onerous and costly task has been commenced, and a first draft completed for comment and review by Councillors.

The next step is to furnish a copy of the documents to WIA Victoria's company legal advisers for scrutiny. It is anticipated that, during this month, copies will be available for examination and comment by members, who will be given a reasonable period to respond to the draft; after which time it is intended to produce a document to present before a Special General Meeting for adoption.

Federal Finances and 1997 Subscription

A battle is continuing in the Federal WIA arena to bring expenditure under control. The office manager Donna Reilly has resigned from her position and has not yet been replaced.

The WIA Victoria Council has been concerned for some time with the cost efficiency of the Federal Secretariat and is seeking to have immediate changes made to its financial management.

In a formal communication received from the WIA Federal Secretary it was advised that the Federal Directors will seek an increase in subscriptions in 1997 amounting to $2.00 per member of each Division. The WIA Victoria Council will have, by the time these VK3 Notes are published, met and considered its position in relation to the demand for a subscription increase.

This Council passed a resolution earlier in 1996 to oppose vigorously any increase in the contribution made to Federal coffers, unless it could be properly justified.

Submission to Parliament

Time is running out for WIA Victoria members to have their say on the WIA submission to the 38th parliament on Amateur Radio Service Licensing.

A draft of the submission was published as a supplement to the April issue of *Amateur Radio* magazine.

The submission is likely to be the single most important exercise undertaken in the post-war era by the WIA which has a charter to protect and further the pursuit of amateur radio.

WIA Victoria members who wish to contribute to the review process of the draft submission have a very limited time left to put their views and comments in writing, to the Secretary.

Broadcast Re-transmission

A reminder that the VK3BWI voice broadcast can be heard at 1030 hours local on the first Sunday of each month.

It has been suggested that the broadcast be re-transmitted at another time, either Sunday or Monday night. This could be a limited transmission broadcast on a two metre repeater and the 80 metre band.

Before the WIA Victoria Council considers this matter further, members are invited to express their views regarding a re-transmission. A decision will be based on the level of support among the membership, and also take into account the existing limited human resources available which enable us to have only 12 broadcasts a year.

If you consider a broadcast re-transmission would be useful, then the Council would like to hear from you. Any submissions or comments should be made by writing to the Secretary at the WIA Victoria office.

VK6 Notes

John R Morgan VK6NT

Divisional GM

At the July GM, a near-capacity audience attended a presentation by Mike Ryan, the SMA's Area Manager for WA. It was in four sections: an official explanation of how our licence fees are calculated, a question-and-answer session covering numerous aspects of the Amateur Radio community's interaction with the SMA, demonstrations of the Agency's latest spectrum analyser equipment, and their use of the InfoMap synergistic software package to display the geographic and spectral relationships between all licensed transmitters throughout Australia. In the latter sections, Mike was ably supported by his colleague Bill Kelson, the Frequency Assigner with the local Customer Services Team.

General Meetings are held on the third Tuesday of each month in the Board Room, 3rd Floor, CWA House, 1174 Hay Street, West Perth, commencing at 8 pm. There is no meeting in December. All interested persons (members and non-members, licensed or listener) are invited to attend, and will be plied with free coffee and biscuits.

VK6WIA News Broadcasts

On behalf of the Council and members of the Division, the President, Cliff VK6LZ, would like to thank Phil VK6KS for his work in producing the weekly VK6WIA news broadcast while the Broadcast Officer, Tony VK6TS, was temporarily unavailable. The members of the VK6QC club are also thanked for permitting Phil to originate the broadcast from their shack.

Study Classes

On the evening of 14 August 1996, the participants in the Division's NAOCP Study Class are due to sit their various examinations. By the time these VK6 Notes are published, it is hoped that there will be a few new Novice and Limited Novice callsigns on the air.

Another NAOCP course is presently being planned, and an AOCP upgrade course may be conducted if there is sufficient interest. If you are interested in participating in either course, please contact the Division's Secretary, Christine VK6ZLZ, on Perth (09) 459 6218.

WA Repeater Group

The 13 members who attended the August GM heard pleasing news concerning the Hoddywell 2 m repeater (VK6RHW, 147.225 MHz). It is now most likely that the equipment, which was recently taken off the air after the site's owners became disenchanted with our occasional maintenance visits, is going to have a new home nearer to Northam. Jim VK6CA, the Site Manager, is in the final stages of negotiating the new site, which is expected to have no problems concerning access. When the re-installation is complete, the callsign of this repeater may be changed so as to reflect the name of its new home.

There was more good news when Eddie VK6KED offered to construct and install WARG's long-proposed 2 m repeater on Rottnest Island (VK6RAT, provisionally 146.750 MHz).

WARG invites you to take part in its informative and entertaining VHF net, held every Sunday morning, commencing at 10.30 am. Listen for Clive VK6CSW, signing VK6RRG on the Lesmurdie repeater (VK6RLM, 146.750 MHz). Meetings are held at the Scout Hall on the corner of Gibbs Street and Welshpool Road, East Cannington, on the first Monday of every month, starting at about 7.30 pm. The odd-numbered months are General Meetings, and the even-numbered months are Technical Meetings.

If You Have Material...

Material for inclusion in this column may be sent to VK6NT @ VK6ZSE.# PER.#WA.AUS.OC, or to PO Box 169, Kalamunda WA 6076, or via telephone on (09) 291-8275.

"QRM" News from the Tasmanian Division

Robin L Harwood VK7RH

On 13 July, Divisional Council met in Launceston, with an apology from VK7GL and VK7RN. VK7ZDJ was the chairman. Joe Gelston VK7JG was elected to fill a casual vacancy on Council and is now assistant Divisional secretary. There were several decisions made at Council, including the Operating Guidelines and Rules for WICEN in Tasmania. We are indebted to Phil Harbeck VK7PU, who is the Divisional WICEN co-ordinator and Mr P Corby VK7ZAX, our Hon Solicitor, for the work that has gone into formulating these. The new Operating Guidelines and Rules are now operational and all Branches will have copies of these by now.

The Division has run out of membership certificates and, as Membership Officer, I am aware that there are several individuals who have yet to receive theirs. If you have not received yours yet, could you please write to the Secretary/Divisional Membership Officer and let me know. The address is 5 Helen Street, Newstead TAS 7250.

There has been a re-organisation of the HF re-broadcast of VK7WI on Sunday mornings. To allow for better propagation to the mainland states, signals on 3570 kHz will now come from the northern half of the island, whilst the 7090 kHz transmission will be coming from the south. The 20 metre relay is unaffected, as is the Tuesday night re-broadcast prior to the Tasmanian Devil Net. Please note that you can fax your news to the Broadcast Officer at (03) 62 293402.

On 19 August, all telephone numbers in Tasmania had two extra digits added and the three separate area codes were abolished. The area code for Tasmania is now 03 and numbers formerly in the 002 area code are now prefixed by 62, 003 by 63, and 004 by 64. So the Divisional phone number is now (03) 634 42324. Don't worry you have six months to get used to it!

Council also welcomed the following individuals to the Division: Ralph Bradshaw VK7RV; Allan Van Dullem VK7KAN and Brian Stevenson VK7HSB.

The Southern Branch will be meeting on 4 September 1996; the venue will be given on VK7WI. Last month they visited the Police Communications Centre.

The Northwestern Branch will be meeting on Tuesday, 10 September 1996 at 1945 hrs at Penguin High School, Dial Road, Penguin.

The Northern Branch met last month at the studios of Launceston's commercial TV station, and received the resignation of the President and Secretary from the branch and the WIA. Listen to VK7WI for the date and venue of the September meeting.

ar

How's DX

*Stephen Pall VK2PS**

As I write this, the 26th Olympiad at Atlanta is in full swing. During the past week many VK and ZL radio amateurs spent less time than usual at their radios, and more time than usual before their television sets watching the international sporting spectacle passing before their eyes.

The bands were also busy with special calls originating from the USA, all celebrating the special event. K400PI and KD000DI were very busy together with the official Atlanta special event station W40 which had huge pile-ups on the bands.

My mind wandered back to the Barcelona Olympics in 1992. There was a "Radio Amateurs Barcelona 1992 Activity" organising committee which provided a variety of programs for the international radio amateur fraternity to take part in the Barcelona games. There was an Olympic Award Program with sixteen official Olympic Stations spread among the main cities of Spain, all with EH92 special prefixes and different one letter suffixes.

There was also the Olympic HF Contest with an interesting multiplier system where the prefixes of each DXCC country which had previously organised Olympic Games had special point value. There were 17 such prefixes. Contact with the 16 special event Spanish stations also carried additional points.

And the winners of the Contest? A certificate was awarded to the first three placings in each mode category, and an Olympic medal for those classified in the first three of each continent in each category and a medal and special trophy for the world leader in each category.

Six months later a series of colourful QSL cards in the Spanish national colours were pouring out of the QSL bureaux drawers.

What about Sydney 2000? Are we ready as Australian amateurs to tackle the huge task? I recall a 16 line news item in the March 1995 issue of *Amateur Radio* on page 18 which said that the WIA had applied to the Spectrum Management Agency for the Special event callsign AX2000 (A-X-two thousand).

The SMA replied that they had applied to the International Telecommunication Union (ITU) for permission to use the callsign, but the ITU's reply was that the use of such a callsign is prohibited.

"However all is not lost", says WIA News, "the WIA may use AX2OOO (A-X-two-triple oh) during the Sydney Olympic games."

One hopes that all those who are organising the amateur activity celebrating the Sydney Olympics in four years time are well advanced with their planning. A lot of hard work is still ahead, liaising with the organising committee, getting a variety of permissions, running the bureaucratic maze, designing QSL cards, getting prizes, getting sponsors for printing costs, etc. Time is not on our side. I wish them tuck!

Ashmore Reef – VK4ALF/VK9

Steve AA6LF who, with his wife Tina, is circumnavigating the world in a small boat, spent the last six months in Northern Australia, mainly in Queensland, activating a number of islands to the delight of those who follow the IOTA (Islands on the Air) program. He showed up on the IOTA frequencies on 2 August from Ashmore Reef.

The island group of Cartier Island and Ashmore Reef is situated at Lat 12° 32' South and 123° 33' East, about 340 miles north of Derby, West Australia. Ashmore Islands, as the reef is called (East, Middle and West Island), lie about 30 miles to the north-west of Cartier Island. All of the islands are small and low, and are composed of coral and sand. Vegetation consists mainly of grass. Turtles, at certain times of the year, and sea-cucumber are abundant. The islands are uninhabited.

Great Britain took formal possession of the Ashmores in 1878 and Cartier was annexed in 1909. In 1931 the islands were placed under the authority of Australia.

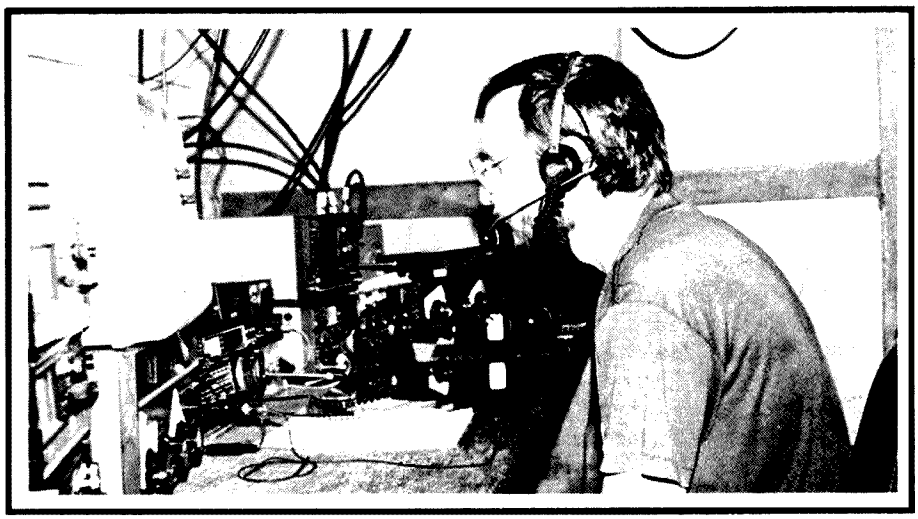
Steve left the Ashmores after three days and is now proceeding to Indonesia. He arrived on Ashmore at 0130 UTC on 2 August. It took him two hours to establish his station on West Island. As the area is a marine and estuary preservation area, his landing permit allowed him to operate during the local daylight hours only, which was usually from 2300 UTC to 1000 UTC. The purpose of the restriction is the protection of the breeding turtles which, at this time of the season, are congregating on the island. The change of the tides also influenced his landings. At dusk he removed his ICOM 735, Butternut vertical and batteries from the island, spent the night on the boat, and next day set up the station on dry land.

He stayed only three days on the reef and in the first few hours of his activity he made about 60 QSOs and worked 8 countries. Send your QSL card with the usual return address and postage to his QSL Manager, Gerald D Branson AA6BB, 93787 Dorsey Lane, Junction City, OR-97448, USA.

Heard Island – VK0 Update

In a fax sent to me early in August, Ralph K0IR, said: *"We continue with our plans for Heard Island. Still scheduled to sail from Reunion Island on 3 January, and anticipate arriving at Heard Island on approximately 12 or 13 Jan. One 20 ft sea-container will leave the West Coast of the US headed for Reunion on 1 Sept. Another will leave on 1 October. The team will begin assembling on Reunion during the last week of December. This expedition should have one of the best and most elaborate arrays of low band antennas ever assembled for a DXpedition. If amateurs need Heard Island on the low bands, this will be the opportunity to work it. Of course we will have excellent antennas on the other bands as well, including satellite.*

We are still in need of funding to help to offset the tremendous financial burden on



Rich HC8A on San Cristobel Island, Galapagos Group.

The antenna collection of Uli LA0CX, the well known Norwegian DXer.

each of the team members. As we get nearer to our sailing date, we hope more contributions will come in."

Donations should be sent to Bob Schmieder, Cordell Expeditions, 4295 Walnut Blvd, Walnut Creek, CA 94596 USA.

North Korea – P5

During the past months a number of messages from "well informed" sources suggested a proposed early activity from North Korea. A Hungarian group of operators were allegedly ready for immediate action. However, the reality is somewhat different. Laci HA0HW, the QSL Manager of Sanyi HA7VK who is at present in North Korea and has applied for a licence to operate from there, reports that Sanyi has received the following letter from the Minister of PTT, DPRK, regarding his licence application: *"Dear Mr Sandor Csige. On July 5th 1996 I received your kind letter. Your letter informed me that you serve good purposes. However, I'm required to inform to you, that I can't give you positive answer. Yours sincerely, Eim Hak Sob, Minister of PTT."*

Palestine – ZC6

In June 1966 a Japanese amateur group led by Yoshi JA1UT with JA1UPA, JA8CDG, JA8RUZ/KH2 and G3NOM was active from Palestine using their own callsigns with the ZC6 suffix. They made approximately 6000 QSOs on 7, 14 and 21 MHz, CW, SSB and RTTY mode.

A press release issued by JA1UT and G3NOM said: *"The operation was linked with a United Nations project, to improve communication between certain hospitals and ambulances in the Gaza area and to establish communications at the newly constructed Palestine International Airport. Amateur radio was a secondary activity."*

As a DXer, one wonders when Palestine will become a new DXCC Country. The Palestine Authority has a National Assembly, issues its own postage stamps and passports, has its own police force and judicial system, and has a Ministry of Posts and Telecommunications that assigns frequencies and licences for telecommunication services in Palestine. It already has draft regulations for the amateur radio service. Three Palestine nationals already have licences, and arrangements are in place for a club station at the MPT Headquarters. Equipment and antennas have been donated by the JA1UT group.

One only hopes that Palestine will soon join the multitude of DX countries under the DXCC award system.

Future DX Activity

* Bernhard DL2GAC, well known for his activities under the H44MS callsign, advises via Frank YJ8AA that he will be in India in Nov 1996 together with his friend DF9FN, both operating SSB and CW. In January 1997, he and other German friends will be active again in the Pacific area.

* Jim VK9NS hopes to be able to visit Mani VU2JPS on Andaman Islands in the first part of September.

* Dave WJ2O plans to be active from Swaziland in October.

* Paul KK6H will be in Tonga for at least six months using the callsign A35RK on 10 to 40 metres, mostly on CW and RTTY. QSL to W7TSQ.

* Fred Laun K3ZO will be operating from Thailand, for one month from 15 September, as HS0ZAR. QSL to home call, callbook address.

* Maike DL4XS, Dieter DL3KDV and Mirko DL6ET will be on Mayotte (FH) between 9 and 11 September. They are planning to be active on all HF bands with major emphasis on the low bands. QSL to DL4XS at (new address): Maike Stargardt, Friedrichstahl 21, 51688 Wipperfuerth, Germany.

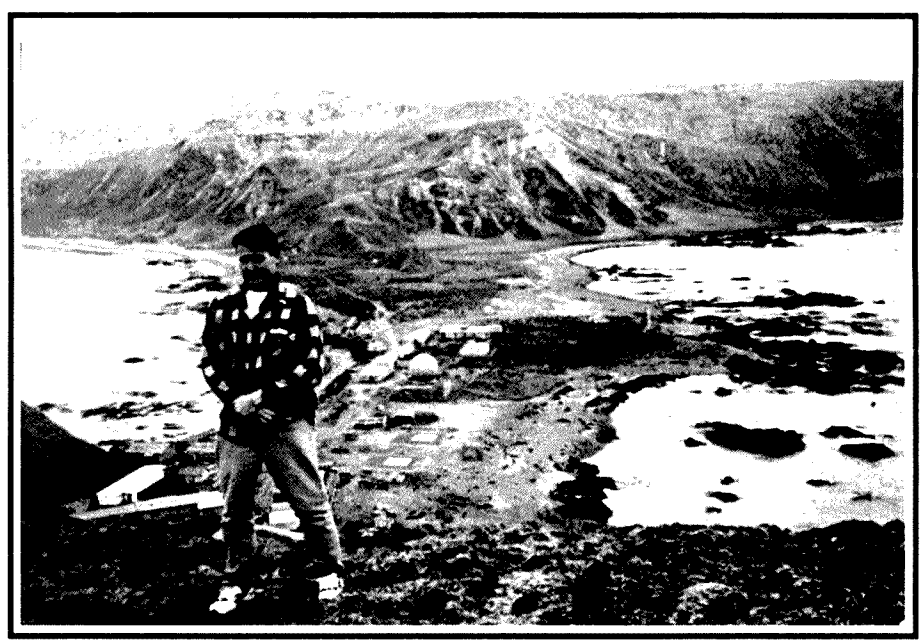
* HH5HK David is resident in Haiti. He was heard on 14160 kHz around 1245 UTC. QSL to W3RM.

* Gary WA1JBB who, for the past three years, was active from Gambia as C53HG, is moving to Namibia V5. He hopes to be active by September. His QSL Manager is W3HCW.

* The Danish branch of the International Police Association will be active from Nuuk, Greenland from 28 October till 11 November on 10 to 160 metres CW using the callsign OX3IPA. QSL direct only to OZ5AAH.

* There will be some SSB/CW activity from Benin, with the callsign TY1RY, preceding the CQ WW RTTY contest on Sept 28. QSL direct only to Eddie Schneider, PO Box 5194, Richmond, CA 94805, USA.

* Mike will be active again from Saudi Arabia with the callsign 7Z5OO. QSL to W1AF.



Warren VK0WH on Wireless Hill, Macquarie Island with the ANARE Base in the background.

Interesting QSOs and QSL Information

* CP0ARA – Rene – 3798 – SSB – 1122 – June (E). QSL to Rene Zegarra Paz Soldan CP1FQ, Box 3102, La Paz, Bolivia, South America.

* CY0AA – 14025 – CW – 1333 – June (E). QSL via Roger H Mayer WD8SDL, 5639 Monica Ct, Cincinatti, OH 42238, USA.

* FR/G/FH5AM – Manuel – 14160 – SSB – 0623 June (E). QSL to the Manager, Manuel, BP 44, Dzaoudzi, CP-97610, Mayotte, France.

* KC6BP – Jeff – 14025 – CW – 0731 – June (E). QSL via Hunson Kaz Soong AA8HZ, 3902 N Michael Road, Ann Arbor, MI 48103, USA.

* FO0REB – Mario – 3799 – SSB – 1049 – July (E). QSL via Mario Rebufello CX4CR, Priamo 1505, 11400 Montevideo, Uruguay, South America.

* JW7QIA – Peter – 14234 – SSB – 1235 – July (E). QSL via Sandnesgruppen Og Jaerengr LA8D, av NRRL C/o Odd Egil Heradsveit, Box 88, N-4301 Sandnes, Norway, Europe.

* P40Z – Dennis – 7005 – CW – 0654 – July (E). QSL via Dennis R Motschenbacher AA7VB, 0110 SW Porter St, Portland, OR 97201, USA.

* 3Z0PEA – 14006 – CW – 1408 – July (E). QSL via SP1NQF via QSL Bureau.

* OI0NJV – 14202 – SSB – 1343 – July (E). QSL via Reijo Joki OH3NVJ, Sivakkat 7, SF-15880, Hollola, Finland.

* K000DI – Dave – 14186 – SSB – 0627 – July (E). QSL via David B Kunkee K0DI, 3330 N 53rd Street, Lincoln, NE 68504, USA.

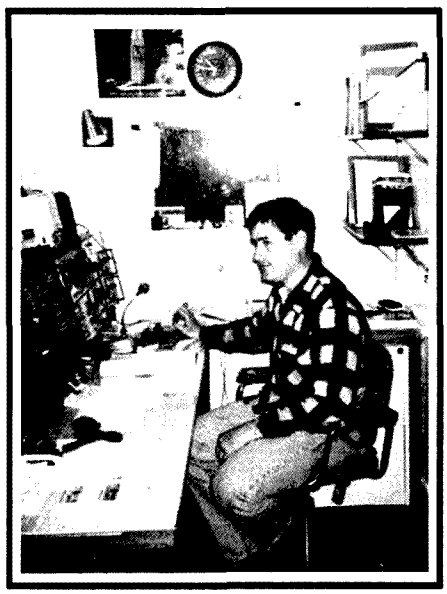
* FR5FC – Patrick – 14164 – SSB – 0546 – July (E). QSL direct only, via Patrick Benard, RN1 Trou D'eau, BP 98, F-97434 Saint Gilles Les Bains, Reunion Isl, France.

* K6W – 14164 – SSB – 0529 – July (E). QSL via the W6 QSL bureau.

From Here and There and Everywhere

* Rolf XV7SW is still active on the lower bands. *"But it is such hard work"*, he said in a note to me. *"I have great difficulties in hearing anything on the lower bands at present due to the cyclone season. I have just ordered a JPS digital filter hoping that this might help."* Letters to XV7SW seem to be on the safe side. He replies within four weeks, and it takes only five days for the letter to reach Sydney from Hanoi. Rolf's address is Rolf T Salme, Embassy of Sweden, Box 9, Hanoi, Vietnam.

* Stuart VK8NSB's proposed August activity from Croker Island has not eventuated. A number of circumstances, including the absence of an operator with full call privileges, caused the cancellation of the planned IOTA DXpedition.



Warren VK0WH in the ANARE Base operating shack on Macquarie Island, using a straight key.

* Macquarie Island was quite active at the end of July and early August. After some antenna work, Warren VK0WH was able to spend a number of days on the ANZA net on 14164 kHz at 0500. Many VK, ZL and Americans had their first VK0 contacts with Warren which made everybody very happy.

* The ARRL DXCC 2000 Ad Hoc Committee met on 21 July and discussed, amongst other things, the following topics: history and cost of DXCC; international aspects; how to seek membership input; and basis and purpose of the program, etc. The committee has decided to meet again in the Northern Autumn.

* It is that time again. The 24th SEAnet Convention will take place in Madras, India from 22 to 24 November. The convention is organised by the Madras Amateur Radio Society, PO Box 2274, 38 Arcot Road, Vadapalani, Madras, 600026, India. Tel/Fax (91) 44 832047. An interesting program combining culture, sightseeing and amateur radio is in the offing for those who want to attend. Contact the Society for further information.

* Nodir EY8MM says that amateurs resident in some former Soviet Union republics like Kirghizstan (EX), Tadzhikistan (EY), and Kazakstan (UN) have some problems with their local post. Best to use the Bureau system if you are not in a hurry; but for direct requests do not send green stamps, only two IRC, no reply envelopes but pre-addressed stickers.

* The new address of the Uzbekistan (UK) QSL Bureau is Uzbek Radio Amateur Federation, PO Box 0, Tashkent, 700000 Uzbekistan, CIS.

* The official Olympics commemorative station W40 was very active from Atlanta, Georgia during the Olympic games.

* Craig A35CT is leaving Tonga permanently. With his departure there will be no functional "A3" QSL Bureau. Craig has been the "Bureau" for the past four years.

* Bill VK4FW has reminded me that the Oceania DX Group is not "his" group (see *Amateur Radio*, July 1996). It is a four months old independent DX group with nearly 50 members in over 15 countries. Bill is only the Secretary/Manager of the group. Other office holders are Jon VK4CY, President; Vickie VK2IVK, Senior Vice President; Elvira IV3FSG, Junior Vice President; and Carl N4AA, Director. The group has a net every Saturday on 14245 kHz at 0330 UTC and again on the same day at 0930 UTC on 3620 kHz. Postal address is ODXG, PO Box 929, Gympie QLD, 4570.

* F08DX is the special call of the Bora Bora Radio League situated on Bora Bora Island in French Polynesia. All QSLs go to N6VO.

* It was reported that Chris ZS8IR had made nearly 3700 QSOs with 113 countries, 48 ITU Zones and 35 "CQ" Zones as at early July.

* Ali, one of the operators at 5A1A, attended the Friedrichshafen Ham Radio Convention in Germany where he met many present and future DXers who intend to go to Libya. Three Bulgarian amateurs planned to be on the air in August from Libya. Brendan G0UCT said that preparations were well under way for a future activity and Andy DJ7IK says that he is planning a contest operation for next year.

* The DXpedition by the Central Arizona DX Association to Midway Atoll from 18 to 25 August marked the turning over of Midway from military control to civilian administration, namely the US Fish and Wildlife Service, and renaming the atoll the "Midway Atoll Wildlife Refuge".

* The World Radio Team Contest 1996, known as WRTC, has taken place during the IARU HF Contest on 13 and 14 July. It was also dubbed "Radio Olympics". The teams operated from the San Francisco area and all of them used more or less the same type of equipment. All were issued with American 1 x 1 callsigns, eg W6X. This year 52 official teams took part from: W, VE, DL, 9A, LZ, OH, UA, JA, LY, S59, OK, EA, SM, ZS, YT, LU, F, UT, HA, G, I, SP, UN and PY. Australia was represented by the team of

VK5GN and VK2AYD, who were placed 45th out of the 52 entries with a total points score of 337,152 from 1,822 QSOs using the callsign W6Z. The top scorer was an American team, W6X with a total of 761,829 points out of 2,457 QSOs.

QSLs Received

FG5FC (4 w F6DZU); HG1S (4 m HA1KSA); XV7SW (4 w op); VK9CR (5 m DK7NP); VK9XM (3 m JA1BK); 9J2BO (1 m W60RD).

Thank You

Many thanks to my fellow amateurs whose assistance is always very much appreciated. Special thanks to VK2XH, VK2KFU, VK2TJF, VK8NSB, VK9NS, L40370, K0IR, XV7SW, YJ0AA, *The Australian Encyclopedia*, and the publications *QRZ DX, The DX Bulletin, DX News Sheet, 425 DX News, ODXG, INDEXA, The ARRL DX Desk, and Go List QSL Managers list.*

**PO Box 93, Dural NSW 2158*

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WIA News

New WIA Members

The WIA bids a warm welcome to the following new members who were entered into the WIA Membership Register during the month of July 96.

L21021	MR N J JACKSON
L21022	MR J MCELVENNY
L30937	MR M SILVASICH
L30938	MR M LESLIE
L40374	MR RW GROVES
L40376	MR C CONNELLY
VK2AKL	MR G R CROTHERS
VK2BNZ	MR T E GRIFFITHS
VK2FHY	MR N KENJO
VK2GQQ	MR J MOURITSEN
VK2HJM	MR J MCVAIGH
VK2KCE	MR A J MCLEAN
VK2LX	MR M J FLEMING
VK2TJY	MR D A COOPER
VK2UTS	MR C H DURHAM
VK3COS	MR R A BAINES
VK3EKB	MR K G BODE
VK3GFW	MR G WILSON
VK3III	HORSHAM ARC
VK3TJD	MR J DICKINS
VK4AGW	MR A WOOD
VK4BIT	Mr N HARDISTY
VK4CUJ	MR DL JONES
VK4PRS	MR R SCHILLING
VK4WIR	ROCKHAMPTON & DISTRICTS ARC
VK4WOU	MR WG UNDERWOOD
VK6WA	MR L HARRISON

Over to You – Members' Opinions

All letters from members will be considered for publication, but should be less than 300 words. The WIA accepts no responsibility for opinions expressed by correspondents.

Support for Editor

I am amazed to hear in our local NSW Sunday news of the interference to your editorial activities.

The freedom of the press, and speech, are vital to the continuance of our democratic way of life and must be fought for at all costs. I have always felt that the magazine suffers from too much censorship as is.

The local state issues are heavily controlled by their writers leaving a very bland and non-informative magazine. As an example, practically nothing was ever published during the recent, and present, upheaval leaving members at the mercy of the rumour mills.

It is the duty of the magazine to inform WIA members as to what is going on in their organisation and I would ask you to ensure that this happens.

John Saunders VK2DEJ
PO Box 299
Ryde NSW 2112

More Support

Last Sunday (30 June) I fired up my HF transceiver for the first time in about four years, having moved house in the meantime and not yet having proper antennas erected.

I was fortunate enough to tune into the VK2 Divisional Broadcast to hear their President talking (very supportively) about you.

I just thought I'd let you know that I fully support his comment. Your job as I see it, and so well carried out, is to edit the magazine and to present differing views on all matters relating to amateur radio, without censorship unless the material is obscene or libellous.

A healthy society is one which asks questions and presents differing viewpoints, and not one which is fed with the censored views of a few. In that sense, *Amateur Radio* is doing an admirable job, and I applaud your efforts.

Don Jackson
VK3DBB
55 Ryan Road
Pakenham VIC 3180

An Appeal

You were kind enough to publish in *Amateur Radio*, October 1992, my letter regarding the formation of "The Beaufighter Association of Western Australia". I am happy to report there was a most gratifying response from radio amateurs country-wide and that the Association is now very firmly established.

At a recent meeting it was decided to establish, within the Aviation Museum, Perth, a distinct section devoted to the Beaufighter and Beaufort aircraft which served Australia so well in WW II and also in England and the Mediterranean.

An informative display needs aircraft parts, such as flying instruments, navigation and radio equipment, also personal items like flying clothing, badges of category and rank, pieces of aircraft structure, and lumps of "flak", etc together with photographs, personal and official documents, letters, citations, published material, and old newspapers, etc.

The Museum staff can copy, enlarge and restore the photographs and documents and maintain control over all items. If desired, they will be returned to contributors.

We would also appreciate hearing of any possible source of suitable bits and pieces (eg on the Internet we find there is a derelict Beaufighter off an island in the North used for practice SCUBA diving!).

Radio amateurs are prolific squirrels but it would be good to share with future generations an image of those hectic days. If desired, the donor's name can be shown on any item.

Our Association regards this as a most worthwhile project and would appreciate any items, no matter how seemingly ordinary. Kindly contact:

Sam Wright VK6YN, 19 John Street, Gooseberry Hill WA 6076 (tel 09 293 3506)

Keith Nicholson, 19 Lillian Street, Cottesloe WA 6011 (tel 09 384 4627)

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Pounding Brass

*Stephen P Smith VK2SPS**

CW operation to the beginner must be very confusing when you consider the variety of keys and keying equipment currently available on today's market. I have attempted to simplify this by dividing the equipment into three categories, manual, mechanical and electronic, which I will discuss briefly in turn.

Manual

The manual key is also known as the pump key or the hand key, being basically an on/off switch with few adjustments when compared to the more complex mechanical variety.

Adjustments consist of a forward set screw to set rear contact spacing (moving this screw up or down brings the rear contact closer or further apart), and a spring tension adjustment which tensions the arm depending upon the downward force applied to the knob by the operator.

The manual key has been around for nearly 150 years and is still the mainstay of Morse transmission today, although the electronic keyers are more in favour.

The basic manual key was invented by Alfred Vail in 1899 and was named the "Correspondent". From its humble beginning it has undergone many physical changes but its basic operating concept has remained the same, that is an on/off switch.

The most important factors are the ease of operation and operator comfort. In Australia we rely heavily on British influence. This shows in our keys. When compared to American design we operate the key with the forearm held above the table. Keys used with this operating style are the familiar PMG type and the Clipsal. On the other hand, Americans rest their forearms on the table, so the key used will be low profile. It is easy to distinguish between the two. A high profile is measured from the bottom of the key base to the top of the operating knob, and can be anywhere from 80 – 100 mm. On the other hand, a low profile can be anywhere from 15 – 25 mm. I do not know why these two different styles have developed, but you should use the style with which you feel more comfortable.

Speed was a major concern. A good operator could send anywhere from 30 – 38 wpm, but not much beyond this point. He could only send high speed for short lengths of time before loss of wrist action, commonly known as "glass arm". This problem was overcome by the introduction of the "Bug".

Mechanical

The semi-automatic key, commonly called a Bug or Speed Key in America, or Jigger here in Australia, was invented by Horace Martin in the early 1900s.

The Bug revolutionised code sending. Speeds in excess of 45 wpm could easily be achieved. The semi-auto will send a string of precise dots when the dot level is activated, the amount of dots sent being determined by the position of a movable weight on the pendulum, one end of which is free and the other end is fixed to a spring which is attached to the base support.

Some operators place two or more weights upon the pendulum to decrease dot speed. Dashes are produced manually by pushing the lever in the opposite direction.

One problem facing operators with semi-autos is matching the speed of the dashes, or their spacing, to the mechanically generated dots. If the dots are sent too quickly (due to the weight being incorrectly positioned or not heavy enough) in relation to the dashes, the sending rhythm will be out of synch. I will not go into adjustment at this stage as mechanical keys are much more complex to adjust and operate than a manual key; but, with a proficient operator, beautiful sounding Morse can be generated from these mechanical marvels.

The only company which produces Bugs is the "Vibroplex" Company in the USA. Here in Australia they can be purchased from Daycom Communications Pty Ltd, and range in price from $260. to $420 for the Gold Base version.

Another version of the mechanical Bug is the "Sideswiper". It is not as popular as the above, but has its followers. Basically, the key is a simple paddle that closes the circuit when the lever is moved either right or left. Under operating conditions the operator usually moves the lever in alternating directions to manually generate successive code elements whether it is dots or dashes.

Timing is more critical with these type of keys than any others if the correct ratio of 3:1 is to be achieved.

Electronic

Both single-lever and dual-lever paddles are very common today on the amateur bands, and are more commonly used by operators who prefer to operate at higher speeds than the manual or semi-auto operator. Quite a few still use a single-lever paddle and don't operate at an excessive speed which would make the change to a dual-lever paddle worth the effort. On the other hand, if you require to be a top notch operator, iambic is the way to go.

A keyer is an electronic circuit that can automatically produce a continuous string of dots when one paddle contact is closed, and a continuous string of dashes when the other paddle is closed. The iambic keyer goes one step further. If both paddle contacts are closed simultaneously, the keyer will produce a string of alternating dots and dashes.

Any paddle simply consists of two "on/off" switches which are closed to control the circuit (keyer). An iambic paddle is one that allows the user to close both switches either separately or simultaneously, to allow for iambic keying.

Remember that any dual-lever paddle may be called an iambic paddle, because it is the keyer, and not the key that determines the form of code generated. We will continue with iambic keyers next month.

**PO Box 361, Mona Vale NSW 2103*

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Stolen Equipment

The following equipment has been reported stolen. If you have any information that may lead to the recovery of the equipment, please get in touch with the advised contact as soon as practicable.

Make:	Yaesu
Model:	FT-290R
Serial Number:	3-280-766
Type:	Portable transceiver
Accessories:	YM-47 mic, plastic carry case and strap
Stolen from:	Blackwood High School
Date:	July 1996
Owner:	Adelaide Hills Amateur Radio Society Inc
Callsign:	VK5BAR
Contact details:	PO Box 401, Blackwood South SA 5051

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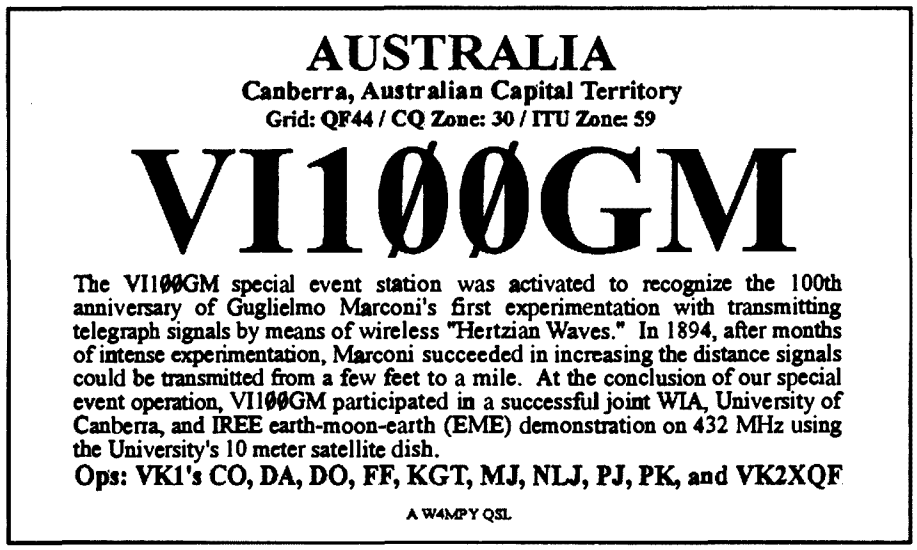
QSLs from the WIA Collection

Ken Matchett VK3TL Honorary Curator WIA QSL Collection*

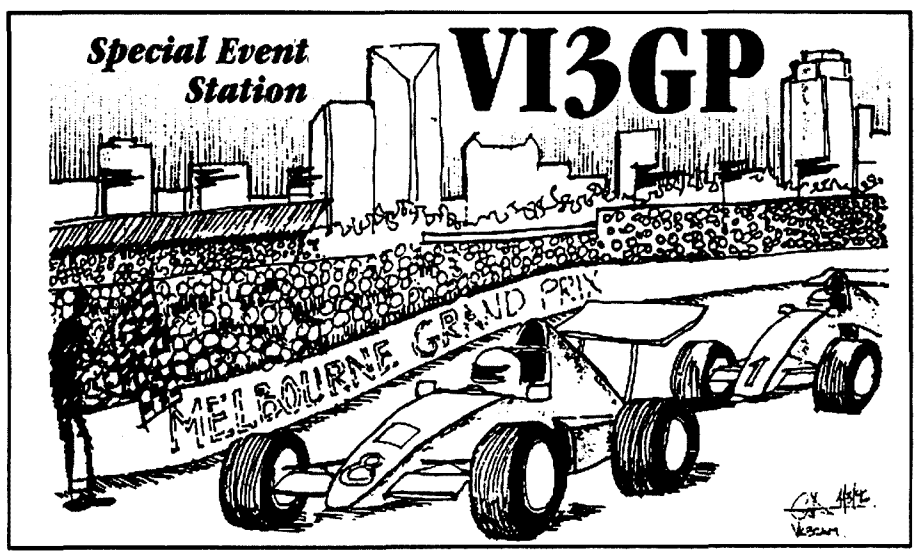
VI100GM

The celebration of the 100th anniversary of Marconi's first experimentation with radio transmission saw the issue of the VI100 prefix for the first time. Half of the 900 or so QSOs made during the special event operation were on CW (by Jim VK1FF), and the remainder on SSB by other operators listed on the QSL. The greatest interest came from overseas operators wishing to work the group on 70 cm via moonbounce. The latter was a highly successful operation, contacts being made with stations in Europe, North America and Asia.



VI3GP

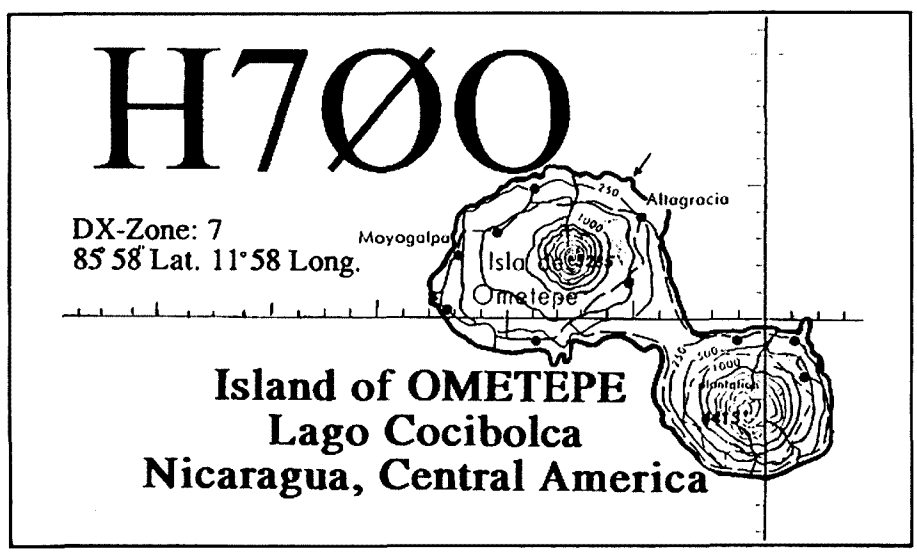
This well-designed QSL celebrated the inaugural running of the Australian Formula 1 Grand Prix in Melbourne. The event took place amid considerable controversy at Albert Park in March 1996. The special event callsign was the brainchild of the progressive Melbourne radio club, the Eastern and Mountain District Radio Club. Operation was mostly confined to the HF bands, over 100 DXCC countries being logged.



H70O

This prefix, H seventy O, is one of the new Nicaraguan prefixes, which looks remarkably different to the YN prefix to which we have been accustomed for so long. In fact, some of the H prefixes are quite new. Cyprus (5B4) has issued the H25 prefix, and Panama (HP) the H31 prefix. We are quite used to the H4 prefix of the Solomon Islands and the H5 prefix of Bophutatswana.

The H70O QSL celebrated a DXpedition to the Island of Ometepe, an island of two volcanoes and home to about 15,000 people of indigenous origin.



Thanks

The WIA would like to thank the following for their kind contribution of QSL cards to the National Collection: Percy VK4CPA, Lindsay VK4GZ, Bob VK6MQ, Mike VK6HD, Jim VK9NS, Bob VK5MM, and Jim VK4BX and the Hervey Bay ARC. Also the family and friends of the following SKs: John Matthews VK3WJ (courtesy of Gordon VK3GB); and Bernie Kellow VK5PAE (courtesy of John VK5FOX).

**4 Sunrise Hill Road, Montrose VIC 3765*
Tel (03) 9728 5350

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Repeater Link

*Will McGhie VK6UU**

CTCSS Decoder

Using the NE567 as a CTCSS decoder is nothing new. However, there are few ICs that are available at a reasonable price for CTCSS decoding. The newer ICs generally require more complex circuitry. They do provide faster and more reliable decoding than the NE567; however, for simplicity, cost and availability, here is a simple design using the NE567.

The NE567

The NE567 is a phase lock loop chip with a logic output. When the incoming signal is within a cycle or two of the internal oscillator, the internal oscillator is able to shift its frequency to that of the incoming signal. The two signals then phase lock and a logic output is produced. This logic output can then be used to control circuitry such as an audio mute, or a repeater link system.

The Circuit

The audio input to the NE567 must come from a source that has good low-frequency response. This audio source does not have to be muted. The audio level required is around 200 mV peak to peak. Lower levels slow down the decode time, which is typically under half a second. Also, the audio source should have much of the speech removed, hence the low pass filter made up of R1, C1 and R2, C2.

C3 and C4 control the phase lock loop delay and frequency bandwidth window. With the component values shown, and 200 mV input, the decode time is under half a second and the bandwidth plus and minus 4 Hz.

As the internal oscillator runs all the time, the decoder can also be used as an encoder. For lowest harmonic content, use pin 6 rather than pin 5. The July 96 *Repeater Link* column shows how to use the NE567 as an encoder, and how to reduce harmonic frequencies from the triangular wave form. The low pass filter shown from pin 6 is a high impedance output, and would require a buffer amplifier, as shown in the July 96 column.

RV2 is a multiturn potentiometer to allow for fine frequency adjustment. With the values shown, RV2 will adjust the frequency from 40 Hz to about 400 Hz. With the circuit I constructed, adjusting RV2 to 123 Hz resulted in the value of RV2 being 5.6 kilohms.

Note the use of MKT capacitors. It is most important to use an MKT type for C7. I used MKT capacitors for all, except the values above 1.5 µF.

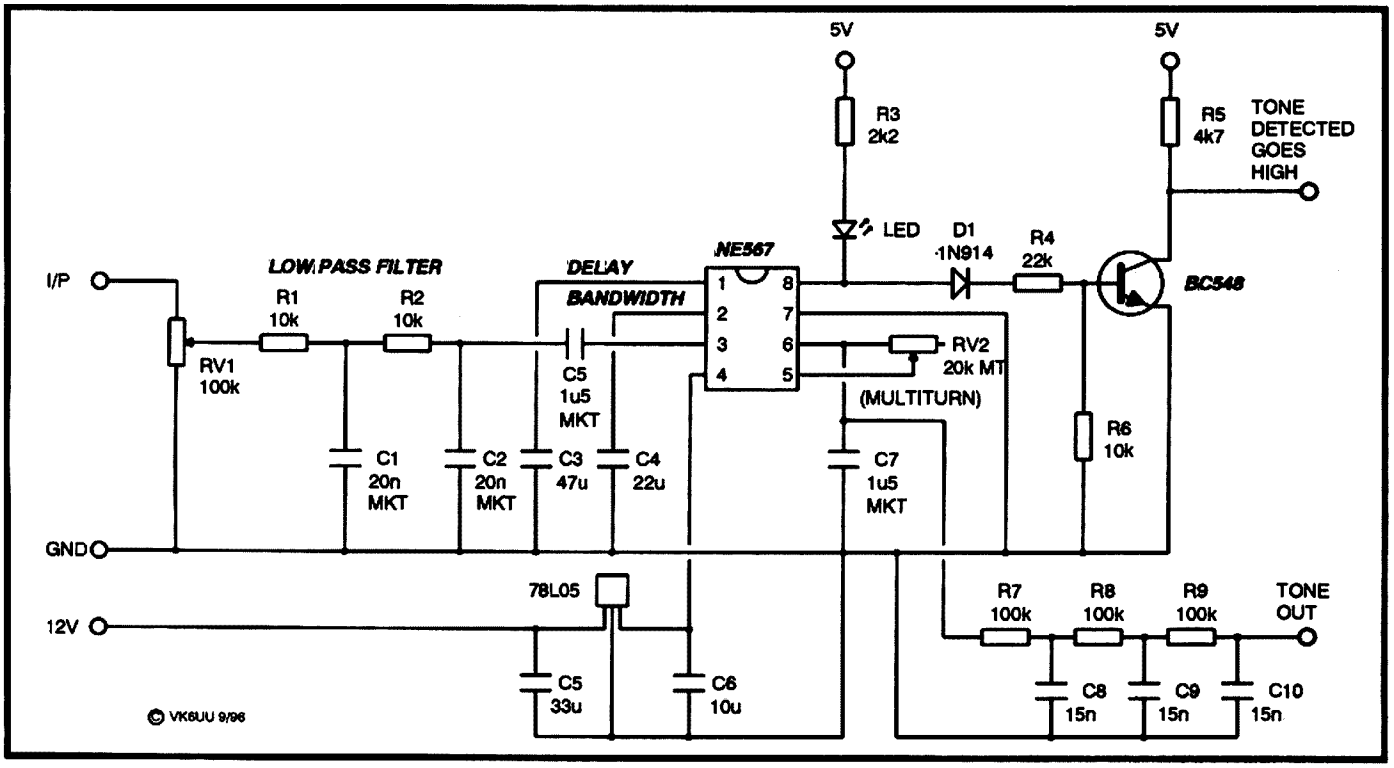
The LED lights when the circuit decodes an incoming CTCSS tone. The output transistor produces a logic high on decoding a CTCSS tone. The diode D1 is a good idea, as some NE567s don't go below 0.6 of a volt on decode. Sometimes there is enough voltage to hold the transistor on. The 0.6 volt drop across D1 and R6 overcomes this problem.

Adjustment

This requires adjusting RV2 to the required frequency you wish to decode, as measured at pin 5. A frequency counter is the easiest way to do this. Without a frequency counter, a CRO can be used to measure the frequency. If you have a dual trace CRO, compare a known frequency on one trace to the NE567 frequency on the other trace. If you have no suitable test equipment, slowly adjust RV2 until the lock LED lights with the required input CTCSS tone to pin 3. RV1 should be adjusted for 200 mV peak to peak (70 mV RMS) as measured at pin 3.

10 Metre Gateways

You may be interested in what progress has occurred in allowing 10 metre gateways to operate on the 29 MHz FM segment. After considerable communication between a number of interested amateurs and FTAC, we are at a point of deciding where in the 29



CTCSS decoder and encoder.

MHz segment gateways can be placed. This is a difficult process as there are many calls for segments of the 10 metre band to be satisfied. There may be little activity in the entire 1.7 MHz of the 10 metre band, but it all has to be allocated. Also of concern is the international situation, as this band has to be seen in the context of international propagation and other countries' usage.

However, all the difficulties aside, it sure is taking a long time to decide where to allocate a couple of FM channels for gateway use. In VK6 a gateway system was installed and became operational over two years ago. It was then decided, after discussion with several individuals and FTAC, to sort out the legal and technical requirements of gateways. This procedure was started in VK6 by writing to the WIA VK6 Division to seek its support on a gateway proposal. That was in September 1994. Two years ago.

Now it is important not to lay blame on any individual or committee or organisation, as I have been involved in the decision making process and have seen where many delays have occurred. These delays can be as simple as a person or persons not responding to information and proposals circulated by FTAC. FTAC often operates in a vacuum, requesting feedback and not receiving it. Decisions then have to be made at times in isolation, along with the delays this produces.

Our methods of deciding some of these issues suffer due to the heavily regulated nature of amateur radio. Even when we decide where to place gateways on 29 MHz, and what guidelines they operate under, there is still negotiation with the SMA. Further delay. I do not understand why the SMA are involved with many amateur radio issues like this. How we use our bands should be our decision alone.

21 Waterloo Crescent, Lesmurdie 6076
VK6UU @ VK6BBR

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Spotlight on SWLing

*Robin L Harwood VK7RH**

Well, spring is here and I'm already noticing a distinct change to propagational patterns. The higher frequencies are gradually staying open into the early evenings. It also looks likely that it will be a long slow haul from the sunspot minimum, which may have just passed.

Don't forget that there are some seasonal alterations made to shortwave frequencies in some regions on the first Sunday in September. Usually at the end of September, the majority of European broadcasters and those broadcasting into that region, change both their frequencies and times to coincide with the end of Daylight Saving. However, the European Union unilaterally decided to extend this until the end of October, with the consequence that alterations will take place then.

The Governors of the British Broadcasting Corporation (BBC) announced major changes to the structure of the Corporation, to separate the programming and technical structure, and allowing programming to be put out to tender. Naturally, there is quite a deal of opposition to these planned changes from within the organisation, as well as from outside. One of the proposals was to integrate the BBC World Service news with the domestic news output. This latter proposal has upset many of the "Beeb's" shortwave fans, who rely on its impartiality and authority. Some of these fans include Archbishop Desmond Tutu, Mikhail Gorbachev, George Bush, and they have also voiced their opposition to the planned restructure of the BBC World Service News and Current Affairs output.

There were several hostages in Lebanon about 10 years ago, whose only point of contact with what was happening in the outside world was the BBC World Service. Individuals, such as Terry Waite, who publicly acknowledged the contribution of the Beeb to their morale, have also added their weight to the cause of saving the BBC World Service.

Late in June and in early July, as I was randomly tuning over the 8 MHz marine allocation as I frequently do, I came across a broadcasting station at 0530 UTC, interspersed predictably with a lot of CW interference, being right on the edge of the SITOR segment and the beginning of the CW coastal segment. The station was broadcasting music with a definite Eastern flavour with excellent modulation and good signal strength. The language was obviously Turkish in origin and, judging by its professionalism and presentation, I decided to check the Voice of Turkey's output on 9445 and 9460 kHz. I was quite surprised to find that the programming on 9460 was indeed identical to that on 8445, yet significantly there was nothing on 9445. So it appears as if somebody has accidentally programmed the transmitter to operate 1 MHz down from its usual operational frequency. Strangely enough the signal level on 8 MHz was better here than 9445 kHz had ever been.

I was curious about this odd occurrence and posted a bulletin on the *rec.radio.shortwave* Internet newsgroup to ascertain if others were also hearing it. I did receive a reply from a technical engineer who claimed all I was getting was an image so I checked on another receiver using a different IF and was still hearing the station. Fortunately, others also heard it and the editor of the *World Radio and Television Handbook*, Andy Sennit, informed us that accidental setting of the wrong frequency happens even in the best of stations. If this was the case, it was a whole week before the engineering staff at the Voice of Turkey woke up to the mistake.

In last month's column, I mentioned that CW was rapidly disappearing from HF as more operators are relying on INMARSAT. However, it appears as if HF will be around for quite some time as Globe Wireless, operator of several HF coastal stations, is expanding and widening its coverage by acquiring several HF stations throughout the world. Its operational headquarters are at Half Moon Bay, California. All of its output is controlled from there and incoming messages are handled. All modes are employed including e-mail.

The stations in the Globe Wireless Network are as follows:

Palo Alto Radio KFS

Palo Alto Radio, call sign KFS, is located on the west coast of the United States and has been on the air, continuously, since 1912. It is the flagship station of Globe Wireless. The KFS transmit site is located in the city of Palo Alto, (Santa Clara County) California. The latitude is 37 degrees, 26 minutes, 44 seconds North; the longitude is 122 degrees, 6 minutes, 44 seconds west and the ground elevation is five feet. The site is in a marshy area near the southern end of San Francisco Bay. The antenna complement includes twelve full-wave dipoles, two inverted cones and a loaded vertical for MF. Seventeen transmitters are in use for CW, SITOR and GlobeEmail service on MF and HF. The base of the original antenna tower with its 1921 inscription is still visible.

The receivers for KFS are located six miles south of Half Moon Bay, (San Mateo County) California. The latitude is 37

degrees, 23 minutes, 3 seconds north; the longitude is 122 degrees, 24 minutes, 38 seconds west. The site is on a 150 foot cliff overlooking the Pacific Ocean. The antenna complement includes three log-periodic dipole arrays, several wire V-beams and several rhombics. The receivers in use for CW are Watkins-Johnson model 8271, and for SITOR TCI 8074s are used.

Hawaii Radio KEJ

This is a new coastal radio station constructed by Globe Wireless in early 1995. It is located on the island of Molokai in the Hawaiian Islands, Pacific Ocean. The KEJ transmit site is located near Kahalelani, Maui County, Hawaii. The latitude is 21 degrees, 10 minutes, 45 seconds north; the longitude is 157 degrees, 10 minutes, 49 seconds west; and the ground elevation is 640 feet. The antenna complement is five quarter-wave verticals with elevated ground planes. Five Henry two kilowatt transmitters are in use on the SITOR service on HF.

Gteberg Radio SAB

Gteberg Radio, call sign SAB, operates Globe Wireless transmitters from a location in Sweden. The station is owned and maintained by Telia Mobitel, a Swedish company. Six transmitters are in use for SITOR and GlobeEmail service on HF.

Slidell Radio WNU

Slidell Radio, call sign WNU, is located on the Gulf of Mexico near New Orleans, Louisiana. The transmitters for WNU are located near Pearl River, (St Tammany Parish) Louisiana. The latitude is 30 degrees, 22 minutes, 12 secs north; the longitude is 89 degrees, 47 minutes, 26 seconds west; and as you would expect, being on the delta, the ground elevation is very low at 26 feet. Twenty one transmitters are in use for CW and SITOR service on MF and HF. The receive site for WNU is located on Radio Road near Pearl River, Louisiana.

VCT

VCT is located on the island of Newfoundland in the northwest Atlantic Ocean. The facilities for VCT are provided and operated by Neweast Teleoceanics, a Globe Wireless partner. The VCT transmit site is located 40 kilometres south of St John's, Newfoundland, Canada. The latitude is 47 degrees, 14 minutes north; the longitude is 52 degrees, 51 minutes west. Four Collins HF-80 transmitters, with one kilowatt of output power, are in use for SITOR and GlobeEmail service on HF. This station has a limited coverage for 1500 miles around the North Atlantic.

Awanui Radio ZLA

Awanui Radio, call sign ZLA, is a new coastal radio station constructed by Globe Wireless in 1995. It is located on the north island of New Zealand, in the Southern Pacific Ocean. This station is remotely controlled from Globe Wireless headquarters in California. Incidentally, the callsign of ZLA was first used from 1913 until 1930 when the site reverted to agricultural usage. The site was re-activated last year. Some old-timers may remember hearing the old Telefunken quenched spark sender, presumably on 600 metres. The ZLA transmit site is located near Awanui, New Zealand. The latitude is 30 degrees, 00 minutes south; the longitude is 175 degrees, 00 mins west. Eight Henry two kilowatt transmitters are in use for SITOR on HF. The antennas are individual omni-directional vertical arrays for each marine band in use. The receivers for ZLA are also located about ten miles from the transmit site.

Bahrain Radio A9M

Bahrain Radio A9M is located in the central Arabian Gulf, is currently under construction and is expected to become operational later this year.

Perth Radio VIP

The latest station to join the Globe Wireless Network will be our own VIP, Penh Radio. Although Telstra will continue to be responsible for technical maintenance of the existing equipment, the installation of new data equipment and connection to Half Moon Bay is expected to be completed shortly.

Also Globe Wireless has bought the licenses for the old RCA stations, WCC at Cape Cod, Massachusetts, and San Francisco Radio KPH, and hope to bring them on to the network once approval is obtained from the American FCC. This will leave WLO in Mobile, Alabama as the only significant American HF station not in the Globe Wireless Network. Also, Globe has purchased the old VOA transmitting site in Dixon, California to be the new transmission centre for both KPH and KFS and will eventually phase out both the Bolinas and Palo Alto sites.

Globe Wireless are very keen to obtain reception reports of their various stations from SWLs on land and also reports from ships at sea. All correct reception reports will be verified by a QSL card from the various Globe stations. Reports should contain the following information:

* Date and Time (UTC) of your reception.
* Call Sign (QRA) of the Globe Wireless network station heard.
* Either the actual frequency (QRG), or ITU channel number Mode of transmission heard (SITOR, CW, etc).
* Signal strength (QSA) and quality.
* Any interference (QRM) heard on frequency, or on adjacent channels.
* Did you hear traffic or idle signals? If traffic, who was Globe working? (Don't quote the nature of the traffic or its contents.)
* The model number of your receiver and type of antenna used.
* Location (QTH) of your receiving station.
* Any other comments.

Reports should be sent to: Globe Wireless, Attn: Engineering Department, One Meyn Road, Half Moon Bay, CA 94019, USA. Don't forget to put your return address in order to receive your QSL card.

Globe Wireless definitely sees HF communications as continuing and much cheaper than satellite based systems presently available.

5 Helen Street, Newstead TAS 7250
VK7RH@VK7BBS.LTN.TAS.AUS.OC
Internet: robroy@tassie.net.au

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WIA MORSE PRACTICE TRANSMISSIONS

VK2BWI	Nightly at 2000 local on 3550 kHz
VK2RCW	Continuous on 3699 kHz and 144.950 MHz 5 wpm, 8 wpm, 12 wpm
VK3COD	Nightly (weekdays) at 1030 UTC on 28.340 MHz and 147.425 MHz
VK3RCW	Continuous on 145.650 MHz, 5 wpm, 10 wpm
VK4WIT	Monday at 0930 UTC on 3535 kHz
VK4WCH	Wednesday at 1000 UTC on 3535 kHz
VK4AV	Thursday at 0930 UTC on 3535 kHz
VK4WIS	Sunday at 0930 UTC on 3535 kHz
VK5AWI	Nightly at 2030 local on 3550 kHz
VK5RCW	Continuous on 144.975 MHz, 5 wpm to 12 wpm
VK6RCW	Continuous on 147.375 MHz, 4 wpm to 11 wpm
VK6WIA	Nightly at 1930 local on 146.700 MHz and nightly (except Saturday) at 1200 UTC on 3.555 MHz

VHF/UHF – An Expanding World

*Eric Jamieson VK5LP**

All times are UTC.

New Distance Record on 24 GHz

On 7/7/96 Neil Sandford VK6BHT/p and Walter Howse VK6KZ/p extended their Australian distance record to 86.2 km over a path from the Darling Scarp near Pinjarra, south of Perth, to Karrinyup, a suburb of Perth. SSB signals were 42/41 on 24048.1 MHz. This was a non-optical path and partly obstructed by trees. Temperature was 18 degrees C and relative humidity 41%. This contact followed a number of contacts the previous day over distances of 69.2 and 79.7 km.

Wal said: *Equipment used at both ends was based on the DB6NT Mark 2 transverter with a DB6NT HEMT PA. Due to lack of measuring equipment the power out is unknown but thought to be in the tens of milliwatts. Penny feeds were used with 600 mm dishes.*

The HEMT PA is based on a DB6NT design with the PCB obtained from the UK Microwave Committee. The circuit comprises a 2SK1844 HEMT followed by two MGF1303s and finally by two MGF1303s in parallel. A four pole waveguide switch is used to enable this amplifier to be used on receive as well as transmit.

The major uncertainty lies in the output level of the DB6NT Mark 2 transverter. My amplifier and Neil's (both built by Neil VK6BHT) have a gain of about 22 dB.

Unfortunately, there is little test gear available (let alone on the surplus market) which covers 24 GHz. We are hoping to calibrate a waveguide diode meter against equipment which Roger Bowman VK5NY brought back from Texas.

Planning for 50th Anniversary

From the *Geelong Amateur Radio Club Newsletter* comes news that the 50th anniversary of the formation of the Club will take place in 1998. Planning is under way and being considered are a Special Event Callsign, Anniversary Dinner, publishing of the Club history, special events, souvenirs, etc.

Barry **VK3YXK** and Dick **VK3ABK** would appreciate the loan of any archival material such as letters, news-sheets, cuttings, photographs, etc for inclusion in any writings or proceedings.

Two Metres

From Melbourne Ron **VK3AFW** reports that, despite the winter conditions, the bands are not dead! Regular weekend aircraft enhancement skeds continue. *"The real DX is never S9"* to quote Ron.

On 27/6 at 2210 VK3AFW worked Andrew VK7XR on 144.080 5x1/5 and 5x3/6 on SSB. This is normally a CW contact. 30/6: 2210 VK7XR again at 5x3; 2214 Des VK3CY worked VK7XR at 5x1. These contacts were made when the temperature was -4 degrees C! 9/7: 2202 VK3AFW to Peter VK2APP on CW and SSB at 5x2/3 over the 480 km path; 2214 VK3AFW to VK7XR 5x5 and on 432 MHz 5x1.

Six Metres

Cliff **ZL1MQ** said that the winter Es this year favoured the lower half of the North Island. ZL3 had no openings. The first sign of winter Es was 24/5 with Kerry ZL2TPY working VK2ABW/2; 15/6 ZL2TPY worked VK9YQS on Lord Howe Island, and on 16/6 added VK2YHN and VK2YLO around 0500. 18/6 ZL2AGI, ZL2KT and ZL2TPY worked VK3LK, and ZL2AGI added VK3ALM. ZL2TPY to VK7YAD. On 19/6 the trio worked VK4AFL; 20/6 and 22/6 VK2FLI and VK2YLO by ZL2TPY. Kerry reported the VK4RGG beacon seven times during June.

A rare winter opening occurred on 3/6 when ZL1TBC contacted ZL2TPY over a path of 480 km. This short skip opened 144 with ZL1AMN working ZL2TAL. ZL1TBG reported the Wellington two metre and 70 cm beacons were copied on 3/6 and 4/6.

John ZL3AAU/TPK reports: *Who says six is dead? Six is alive and well. Try listening for the ZL3SIX beacon on 50.040. I have copied the following beacons and stations over the past two weeks.*

27/6 0414z VK2RSY 52.420 519, 0422 VK7RAE 50.056 529, 0425 VK7RST 52.370 319, 0426 VK2RHV 52.325 419, 0507 VK7RAE 50.056 579, 0507 VK7RST 519.

28/6 0442 VK2RHV 419, 0442 VK2RSY 319.

29/6 0130 VK4RGG 50.057 419, 0130 VK7RAE 419.

30/6 0342 VK4RGG 519, 0347 VK4AFL 50.145 5x7 working ZL3ADT and ZL3TIC. 1/7 0522 VK7RAE 50.056 519, 0523 VK7RST 52.370 419.

3/7 0153 VK4AFL 50.110 41, 0157 VK2RSY 419.

8/7 0413 VK7RAE 519, 0416 VK2RSY 519; 0420 50.089 5x2 two SSB stations using six to set up a two metre contact.

9/7 0523 VK7RAE 519, 0541 VK3LK 50.130 52-9 working ZL3AAU and ZL3TLG.

18/6: Adam VK3ALM reported from Melbourne a good winter Es opening:

0300 VK2FZ/4 QG63 1450 km, 0507 ZL2KT RF80 2740 km, 0510 55.250 ZL Video Ch2, 45.240 ZL Video Ch1, 45.250 ZL Video Ch1, 45.260 ZL Video Ch1, 0521 ZL2AGI RF80 2740 km, 0525 ZL3TY RE57 2260 km.

25/6: Don VK6HK reported VK8VF/b around 0300 via Es.

30/6: John VK3ATQ worked VK2, 3, 4, 7 and ZL – no other details.

13/7: John **VK4KK** worked ZL3NE/1 at 5x9 between 0500 and 0600 and said that on 14/7 the band opened between 0200 and 0630 during which time VK4s worked VK2, 3, 5, 7 and VK9YQS on Lord Howe Island, the latter using a vertical antenna. FK was worked by VK3OT, VK5BC and VK4s. VK4TL worked into North Queensland.

Internet News

With thanks to *Internet Six News, The "On Line" Six Metre Magazine, VHF DX Reports,* Geoff **GJ4ICD** and John **VK4FNQ**, the following is a selection of happenings in the Northern Hemisphere on six metres.

7/6: What a day! N4HSM/VP5 and Jimmy W6JKV/VP5 from Turks/Caicos were in for 2 1/2 hours on phone and CW up to S9+; they worked many Europeans with best DX to YT1AU about 8600 km.

9/6 brought one of the biggest VHF contests in the USA and everybody was put on alert in the USA to beam to Europe; it certainly worked as many Gs worked W2/3/4/5 with strong signals. C6AIE (Bahamas) in for three hours off the back of his beam, but could not hear Europe! The band was open from 1151 to 1745, but it was hard to break into the kilowatts of power. Signals were so good that GJ0JSY worked a W4 with eight watts to a dipole! Other news was that Pierre HB9QQ operating as 8Q7QQ (Maldive Islands in the Indian Ocean) heard signals propagated by sporadic "E" on 50 MHz.

11/6: GJ4ICD in Jersey worked W1/2/3/4/8/9 along with FP5EK and several VE1/3s, 54 stations were worked on CW and SSB, the best being KB9IEC in EM69 at a distance of 6400 km. VP9MZ was also heard.

13/6: Just after lunchtime the band opened from EA to W1/3 and WP4; this was

the 20th transatlantic 50 MHz opening in 1996 and by far the highest number of openings ever recorded. W1/3 also worked EH8BPX and CT3FT at 1600z. Later in the day W1/2/3/4/7 were worked in the UK

14/6: Good opening to SM3FSK in JP64, a new square for many, and Nick G3KOX worked WA1OUB at 1100z for the 21st USA to Europe opening. Costa SV1DH also reported that he had notched up his 151st country with 4L6PA; he also reported that on 1 July he heard KP4 at 8900 km. Later in the day W1/2/3/4/0 and VE1/3 were worked in central and northern UK plus SM7 and ON4; down here in Jersey things were much poorer with only VE9AA making the trip. On the same day came a report from JA1 that three JAs made it into KL7 at about 5700 km.

4L6PA Expedition

On 16/6 the team arrived in Georgia, Russia, and set the 50 MHz beacon operating on 50.123 MHz. So far no QSOs have been made on 50 MHz. 18/6: JA6IMJ said 4L6PA was worked in JA5/6 at 0956 5x5 on 50.110. That's a long all-land path at around 7500 km. 4L6PA also worked PA and DL. 20/6: 4L6PA worked Charlie VS6XMT at 0619 on 50.110 SSB, signals 5x1 both ways, distance 6750 km. 22/6: 4L6PA to PA, SM, G4. 23/6: 4L6PA into Europe – worked GJ4ICD at S9 giving Geoff country number 155.

16/6: Good KP4 opening at 1715 with KP4EIT SSB and KP4A CW into GJ/G/GW/PA0/F/DL at up to S9/599 until 2045; also, the VO1ZA one watt beacon was heard for many hours in the evening, signals often S9. CT3 and EH8 were audible most of the day.

20/6: 1730 KP4EIT and KP4A into ON/PA/G/GJ/GW/F. KP4EIT was very strong for about 90 minutes with reports of 59/59 to GJ. Mike CY0AA worked EH8 off the back of his beam. The VO1ZA beacon was again heard in Europe. This was the 12th double hop USA/Caribbean day from Europe in June!

A report from **JR3HED** indicates that JD1ADP/b Ogasawara Islands has returned to 50.012 MHz and, from the same area, JD1BJP is active. The VR2SIX/b on 50.074 has not been reported yet. HLs and BVs are active, sometimes BYs and DUs too. KH2 and 9M2 may be QRV this summer.

By the end of June, Chris G3WOS had worked 56 countries on 50 MHz, David G3FPQ (a newcomer to 50 MHz, but not to HF operators) had worked 54 and GJ4ICD had worked 63 out of a total of 69 countries worked in the UK. Jose EH7KW reported having good conditions to W4/5; his best DX was KB5IUA at about 8057 km which was a new 1996 ES distance record.

From the UK

The June report from Ted Collins **G4UPS** confirms most of what has already been written in regard to the northern hemisphere summer openings, with much attention being paid to contacts across "the pond." It seems the beacons, VO1ZA on Newfoundland and the Canadian VE1PZ, have been very consistent as pointers towards the openings. Also, the fact that from 5 to 10 June, N4HSM and W6JKV mounted a DXpedition to Turks and Caicos Islands (east of Cuba) provided a welcome addition to the countries worked tallies of many UK and European stations.

The following 35 countries are a sample of what was worked from the UK: 2E1, 4L6, 4X1, 9A4, CN8, CT, D, EH, EU, F, G, GU, GW, HA, HB, I, IS0, KP4, LA, M0, OE, OH, OK, OZ, PA, S55, SM, SP, SV, VE, VP5, W1, W3, YU, ZB2. Two new prefixes appear in the list, 2E1 and MO, but don't become alarmed that you previously missed them, they are part of two new series being issued in the UK. In addition Ted heard 21 beacons.

Ted makes good use of 28 MHz beacons for pointers towards 50 MHz openings, but mentions it is not uncommon for 50 MHz to be open when 28 MHz appears closed. When Ted hears the 50 MHz VO1ZA or VE1PZ beacons and there is no activity from the North American continent, he often telephones Bob Mobile WA1OUB to warn him of an opening and the news is placed on the DX-Cluster. That's co-operation!

From the Other Side

Emil Pocock W3EP in *QST's The World Above 50 MHz for* August reports that: *The 1996 sporadic-E season got off to a booming start, with no less than five days of 50 MHz transatlantic propagation in May. This is unprecedented! The opening of the afternoon of May 28 was outstanding. Stations from Nova Scotia to Florida and west to at least Ohio worked Europeans in a dozen different countries as far east as Germany, Austria and Malta. The band remained open for at least five hours.*

VE9AA made 67 QSOs in 15 countries, WA1OUB had 75 QSOs in 17 countries. Leigh VE1GA used an FT-620B running 10 watts to a dipole and worked several GM stations on both CW and SSB. N0LL in EM09 made a 7100 km contact to EH7KW.

Indeed, the sporadic-E conditions during the entire month resembled the peak of the season, not the beginning. E-skip appeared on at least 26 days in May, for a start. Double-hop conditions were evident on at least seven of those days!

Stations were making good use of European television video signals on 48.250 and 49.750 MHz as useful indicators of transatlantic MUF as they did in 1995.

There is every chance that the good conditions of the northern hemisphere will translate to similar conditions for our coming summer, so it will not pay to ignore those north-westerly video signals which are likely to appear as early as November; they may well be coming from places much further away than Asia.

Our most regular out-of-country contacts are with ZL and, when conditions are right, there is always activity from KH6. There is limited activity from FK, FO, P29 and, at the moment, from VK9L, and occasionally from DU, VK9L and VS6.

But there is no activity from the following, all within extended Es range: 3D2, 5W, 9M6, A3, C2, FW, H4, JD1, KC6, KH0, KH1, KH2, KH5, KH7, KH8, KH9, T2, T30, T31, T32, T33, V6, V7, V8, VK9C, VK9W, VK9X, VR6, YB, YJ, ZK1, ZK2, ZK3, ZL7, ZL8, ZL9. It appears a station will operate this year from JD1 and there is a possibility of limited YB activity, but the other call areas just don't have the interested population to support six metre operating, while some of those areas virtually have little or no population. The opportunities could be there for many more six metre contacts but it seems our only chance comes from those stalwarts who mount DXpeditions.

Were it not for the ZLs and the JAs, the latter usually via TEP, then we would be well and truly isolated when F2 is absent.

Closure

Local information has been scarce this month, probably reflecting the mid-winter conditions, but with the approach of the equinox we may see more contacts.

Closing with two thoughts for the month:

1. Those obsessed with health are not healthy; the first requisite of good health is a certain calculated carelessness about oneself, and

2. After a little experience, a man realises he can go to bed at midnight and seldom miss anything.

73 from The Voice by the Lake

PO Box 169, Meningie SA 5264
Fax: (085) 751 043
Packet: VK5LP@VK5WI.#ADL.#SA.AUS.OC
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Have you advised the SMA of your new address?

Silent Keys

Due to space demands obituaries should be no longer than 200 words.

The WIA regrets to announce the recent passing of:-

G (George)	HIMOLIJ	L30271
F C (Fred)	MEYER	VK2AAX
R J	FLYNN	VK2AY
L W S	COCKS	VK2DF
L T (Tas)	MCLOUGHLIN	VK2GV
L L	BRENNAN	VK2LM
A J (Tony)	BISHOP	VK4DWM
N D (Noel)	JACKSON	VK4ZNJ

Laurence Tasman (Tas) McLoughlin VK2GV

Shortly before he was to come on air on his regular Saturday morning 8 am sched, Tas closed his logbook. It was with great sadness that I heard of his passing on Saturday, 27 July 1996, and said farewell to a long-standing radio and personal friend. Tas and I became instant friends when I introduced myself with my callsign, VK2ZFO at that time. Since then I have spent many happy months with Tas in his shack, and going pedestrian, tractor and "gee-gee" mobile.

He was a genuine home-brewer, his first transceiver being a self-constructed "Swan" transceiver. He made all the necessary testing equipment himself, too. His aerials were also hand-made, having many repairs and adjustments made to them, partly due to the galahs who fancied the wiring for chewing.

As an early amateur in the district he put Ellerston, near Scone, on the map, obtaining his DXCC. Despite his lifelong handicap of severe diabetes he was always cheerful, helpful and mischievous in the kind sense of the word. Because of his diabetes he had to suffer many visits and stays in hospital, still keeping in contact on 2 m.

Many of us will miss him on the air as he had a unique audio quality in speech and tone.

We, as amateur and personal friends of Tas, extend our sympathies to his family and friends. May you rest in peace, Tas.

Fred Overvliet VK2AFO

F C (Fred) Meyer VK2AAX

Fred passed away several months ago at the age of 81 years. Fred's original callsign was VK2AGD; but he let it lapse and was re-issued with his well known call of VK2AAX, a call which many would have heard sent in CW at breakneck speed on 40 metres. Fred's skill in Morse was second to none.

He had an interesting past. Fred was a radio technician with the Police Service and, in later years, practising his trade as a pastry cook, owned and operated the Victory Sponge Kitchen in Hunter Street, Newcastle.

Fred had been confined to hospital for many months prior to his death and a large number of his friends from Westlakes Amateur Radio Club attended the funeral service to say farewell to a good mate and a true "silent key".

Greg Smith VK2CW

Rex Shilton VK4CAG

Rex passed away quietly in his sleep on 10 June in the Buderim Private Hospital, having been admitted two weeks previously battling cancer and pneumonia. Rex was 70 years of age.

Rex trained as a Marine Wireless Operator in 1942. At 17 he went to sea on his first ship. During the war years he saw service as an Australian Mariner in the waters around Australia, and the Middle East route via India as his ship's third Radio Officer.

Following the war, Rex continued to work in communications with the Civil Aviation Authority, serving in many locations from Tasmania to Queensland. Upon retirement in 1986, Rex and his wife Jacqueline settled in Maleny, immediately joining the Sunshine Coast ARC.

Rex was still keen to take on new challenges and to learn new technologies. Acquiring his first C64, he proceeded to master computing and packet radio. He built his own modem, and then helped many others to build theirs.

Always the willing worker, Rex supported his Club, WICEN, JOTA, contesting, and local library displays promoting amateur radio to the community. He was active in his local community as Secretary of the Maleny Arts and Crafts Group, and Treasurer of the Maleny RSL.

Rex was to be admired to the very end, never commenting upon his difficulties and always inquiring of others well being. It was apparent to a number of us that the end was not far away, as Rex set about in earnest to get his affairs finalised in order to save his family the burden. He is survived by his wife Jacqueline and four children.

Geoff Sanders VK4KEL

Rev Tony Bishop VK4DWM

Joining the Divine Word Missionary brotherhood at Marburg, QLD in November 1957, he went to Chicago in 1960 to study theology for two years. Then, in 1962, he went to Rome and studied for four years. Returning to his home town of Mackay, Tony was ordained into the Missionary priesthood. His first appointment was as assistant rector at the novitiate in Marburg in 1966.

In 1971 he went to a parish called Mindoro in the Philippines for over two years. He was transferred to the Bishop's House in the Philippines in charge of students and was involved in administration and audio/visual educational activities. Tony came to Sydney in 1976 and was in charge of a community of Brothers at Kellyville. In 1978 he became a provincial and the first procurator at the DWM located at Epping, Sydney. In 1985 he went to Melbourne and served as Rector and Director of Studies, returning to Sydney in 1988.

Along the way he qualified as an amateur radio operator holding the calls VK2DKY, VK3DWM and VK4DWM. Whilst in Melbourne he qualified as a video technician, then the BOCP in Sydney. He also spent several years in a technical capacity with community radio station 2BCR Bankstown.

Tony was always assisting and sharing his knowledge with missionary outposts in Papua New Guinea, the Philippines and his many amateur friends. In 1989 he went to Brisbane and was resident chaplain at the Holy Spirit Home for senior citizens. Unfortunately, Tony had not been in good health for some time and was later diagnosed as having cancer; after two years, he passed away on Friday, 10 November 1995 and was buried at the Nudgee Centre of the DWM, Brisbane.

Peter Mulligan VK2ABH
Joe Pietras VK2AJP
Pierce Healy VK2APQ

Victor Chennell VK5JH

It is with regret that I report the passing of Vic Chennell on Saturday, 1 June 1996, after a prolonged illness. Vic was born in 1908 and obtained his amateur licence in 1927.

I first met Vic in the early 1950s when, like many others, I was very active on the old 288 MHz band. It was during this time that Vic encouraged many a young fellow to obtain an amateur licence.

Vic spent a great deal of time on jaunts to various vantage points around the Adelaide area with his 288 MHz gear, giving us "young blokes" the opportunity to observe. And observe we did, with one of the group making the observation that radio waves appeared to travel better from north to south than they did from south to north. This was backed up a short time later in a paper by some professor suggesting just that.

Later Vic spent some time teaching English in Japan. On his return, he held regular skeds on 21 MHz with many of the friends he met during this time.

To his wife Chiyo, daughter Gwenda and family, I extend my deepest sympathy.

Ivan Huser VK5QV
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WIA News

USA Celebrates "Amateur Radio Day"

Saturday, 21 September, is Amateur Radio Awareness Day in the United States. It is a promotional event sponsored by the American Radio Relay League (ARRL), the purpose of it being to provide an opportunity to drum up media and community interest in amateur radio activities.

The League suggests interested US amateurs should write and distribute news releases about the event, and put on public ham radio demonstrations in schools or shopping malls, for example. The ARRL provides press kits and other publicity aids specially for the event.

Never a country to do things by halves, the US also has an Amateur Radio Week in June each year. This year, it ran from the 16th to the 23rd. Amateur Radio Week is tied to the annual Field Day in the US, which runs over the week's concluding weekend.

The ARRL also produces an Amateur Radio Week/Field Day publicity kit. "Letting people know what the hobby is all about and the valuable service hams provide in times of disaster is the name of the game," according to the ARRL.

A proposal for a National Amateur Radio Day in Australia is being prepared by the WIA Queensland Division (see *WIA News*, June 1996, p 4), with the idea that WIA Divisions, affiliated clubs and individuals set up and operate displays to generate community awareness and media publicity about amateur radio. This proposal was planned to be on the agenda for a WIA Federal Council meeting in July. However, this meeting was cancelled to reduce WIA Federal operating costs. The planned proposal is to go forward at the next scheduled Federal Council meeting in October.

UK Amateurs on 73 kHz

British amateurs are now experimenting on their new 73 kHz band, according to a recent news report from the Radio Society of Great Britain. The new allocation is 2.8 kHz wide, centred on 73 kHz, and operators are able to use all permitted modes.

The August issue of the RSGB magazine, *Radio Communications* contained a number of features and articles on the UK's new low frequency band. The Society has also just published a book on the subject, titled *The LF Experimenter's Source Book*. It brings together source material from all over the world covering antennas, propagation, receivers, transmitters and test equipment, said the RSGB. It is priced at seven pounds, 50 pence.

The WIA is pursuing a low frequency allocation for Australian radio amateurs, proposed to be in the 150-200 kHz region, to coincide with allocations available to New Zealand, Papua New Guinean and American amateurs.

Technical Correspondence

All technical correspondence from members will be considered for publication, but should be less than 300 words.

Strip Yagis

I thank the team at *Amateur Radio* magazine for publishing my article on the "strip" two metre Yagis. However, I was surprised and somewhat mystified by the Technical Editor's suggestion, at the end of the article, about two mounting bolts per element.

Perhaps I misunderstand, but firstly, given the small area available for element mounting, I'm not sure how one could utilise two bolts. Secondly, additional holes would seriously weaken the boom, and thirdly, there is simply no reason for using a second bolt. As long as the mounting holes are accurately drilled, well centred, and a good match for the bolts used, the element rigidity when the bolts are tightened is perfectly adequate.

My own antenna (five elements), mounted on a 30 foot tower for nearly five years, has never required any maintenance whatsoever.

One mounting bolt is fine, although the use of washers is recommended.

Felix Scerri VK4FUQ
9 Garbutt Street
Ingham QLD 4850

(Thank you for reassuring us about the practicability of one bolt per element, Felix. Your article was one of the few on which I "keep my hand in" at technical editing, and I do tend to adopt a "belt and braces" attitude to things like this, particularly in a mobile application. Your experience with a fixed antenna shows me to be perhaps too cautious. Bill Rice VK3ABP, Editor.)

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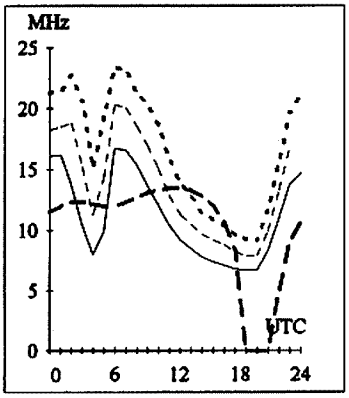
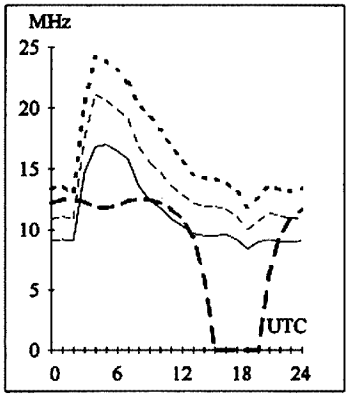
HF PREDICTIONS

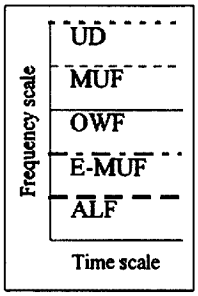
Evan Jarman VK3ANI

Adelaide-Dakar 233
First F 0-5 Short 16725 km



Brisbane-Johannesbnrg 229
Second 4F3-5 4E0 Short 11634 km





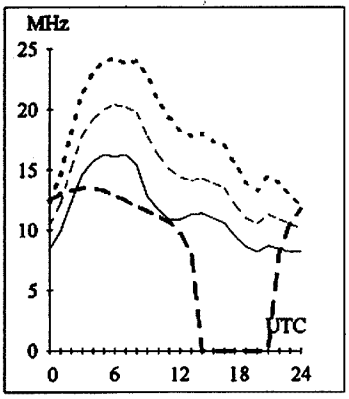
These graphs show the predicted diurnal variation in key frequencies for the nominated circuits. They also indicate a possibility of communication (percentage).

The frequencies identified in the legend are:-

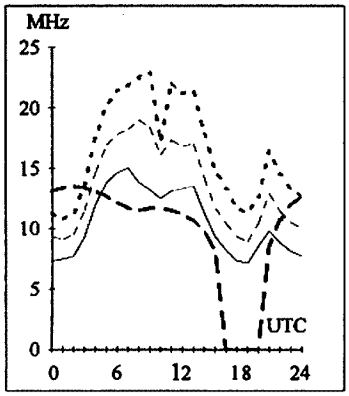
- Upper Decile (10%)
- Maximum Useable Frequency (50%)
- E layer MUF
- Optimum Working Frequency (90%)
- Absorption Limiting Frequency

The predictions were made by one of the Ionospheric Prediction Service Stand Alone Prediction Systems. The T index used is shown above the legend. The Australian terminal azimuth (degrees), path length (kilometres) and propagation modes are also given for each circuit. ar

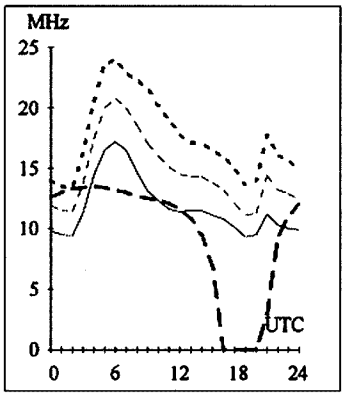
Adelaide-Helsinki 323
First F 0-5 Short 14602 km



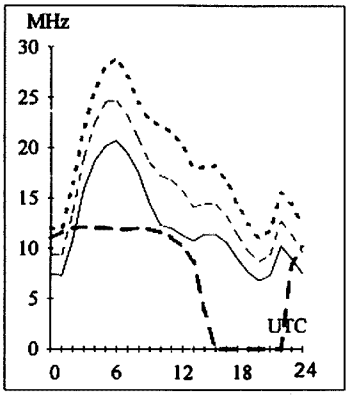
Brisbane-London 327
First F 0-5 Short 16526 km



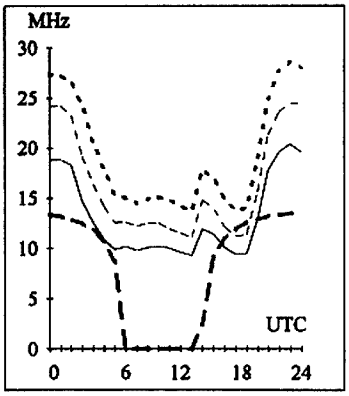
Canberra-Berne 304
First F 0-5 Short 16594 km



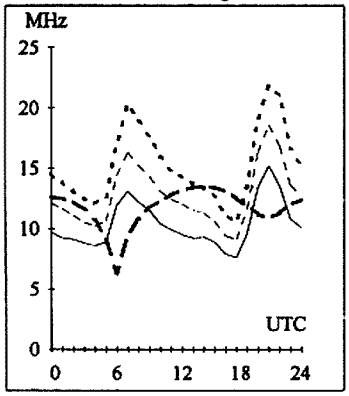
Darwin-Harare 250
Second 4F4-6 4E0 Short 10594 km



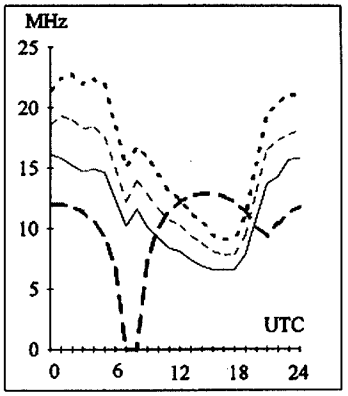
Adelaide-San Francisco 61
First F 0-5 Short 12994 km



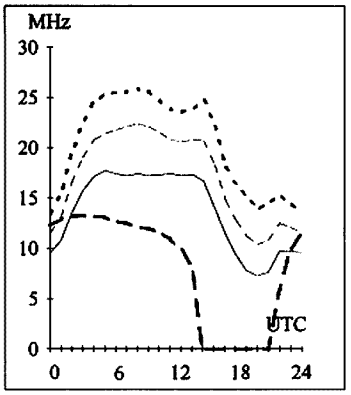
Brisbane-London 147
First F 0-5 Long 23498 km



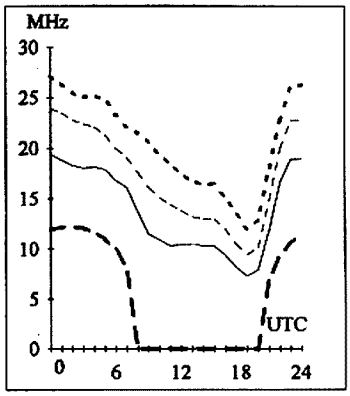
Canberra-Brasilia 159
First F 0-5 Short 14060 km



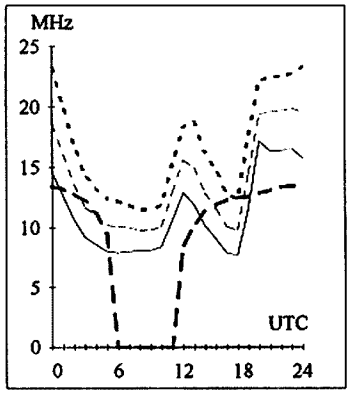
Darwin-Kiev 319
Second 4F2-6 4E0 Short 11800 km



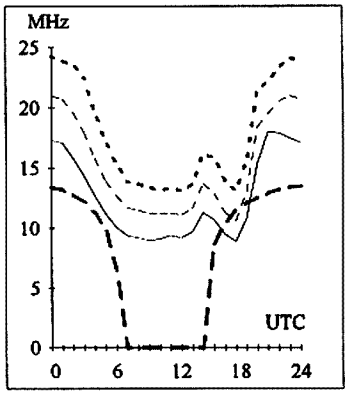
Adelaide-Tokyo 1
Second 3F4-8 3E0 Short 7855 km



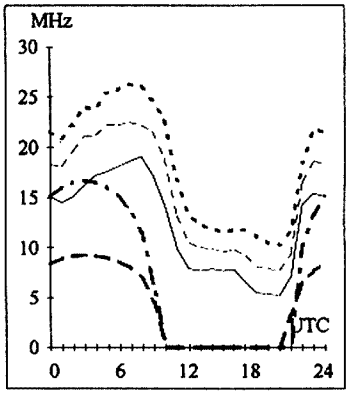
Brisbane-Ottawa 52
First F 0-5 Short 15306 km



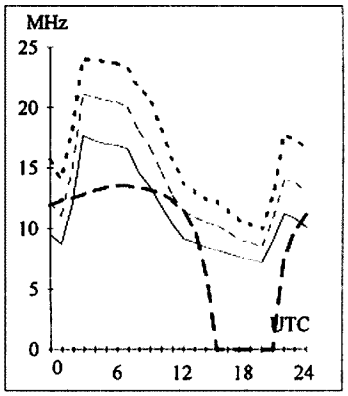
Canberra-Vancouver 46
First F 0-5 Short 12739 km



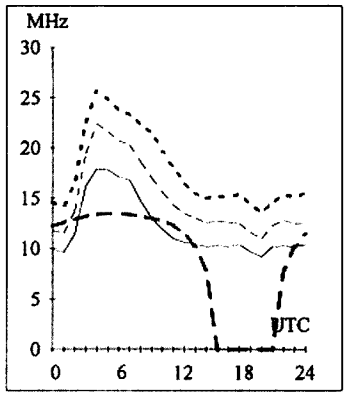
Darwin-Osaka 5
Second 3F11-18 3E2 Short 5264 km



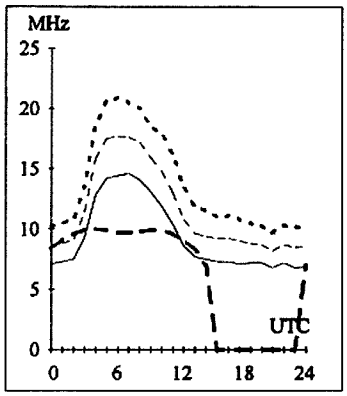
Hobart-Cairo 278
First F 0-5 Short 14264 km



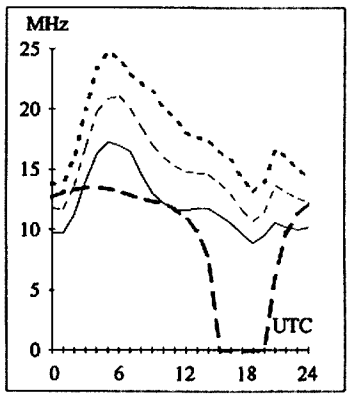
Melbourne-Athens 289
First F 0-5 Short 14949 km



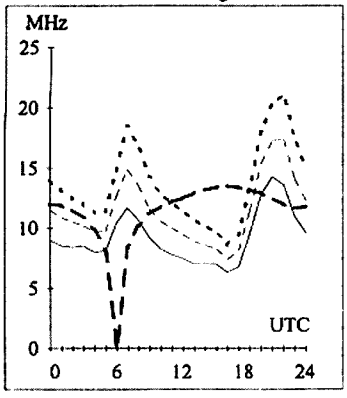
Perth-Capetown 237
Second 4F7-11 4E0 Short 8701 km



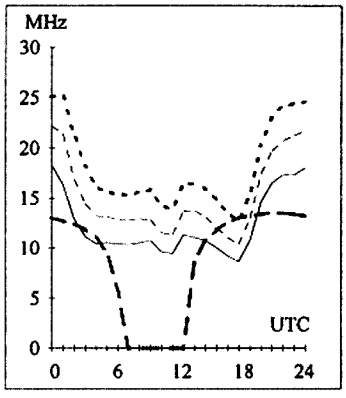
Sydney-Budapest 306
First F 0-5 Short 15776 km



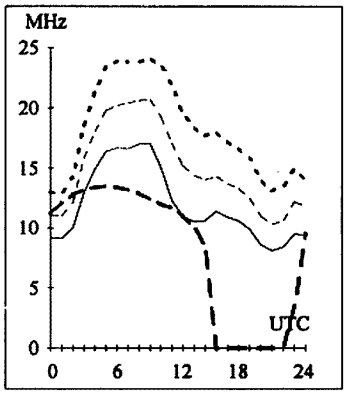
Hobart-London 123
First F 0-5 Long 22620 km



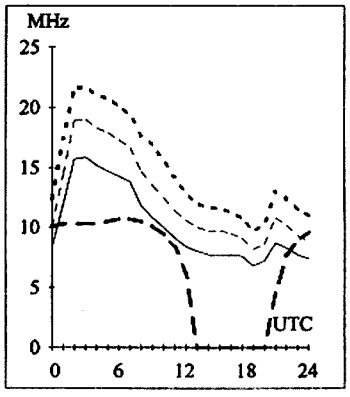
Melbourne-Dallas 76
First F 0-5 Short 14480 km



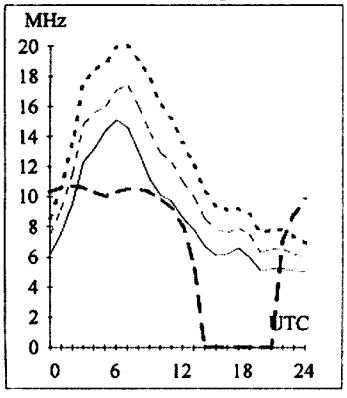
Perth-Copenhagen 319
First F 0-5 Short 13693 km



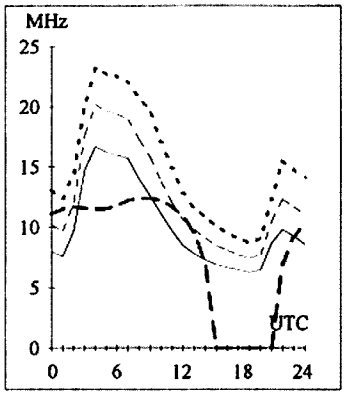
Sydney-Mauritius 251
Second 4F7-9 4E0 Short 9087 km



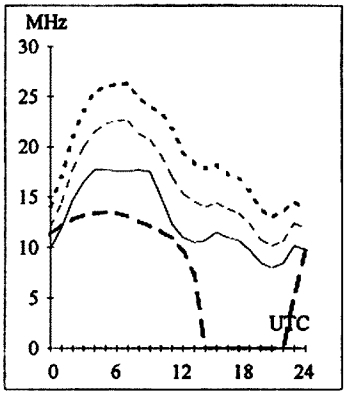
Hobart-Marion Island 223
Second 3F4-8 3E0 Long 7912 km



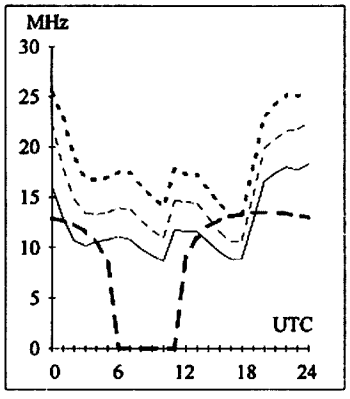
Melbourne-Lusaka 241
Second 4F3-6 4E0 Short 11153 km



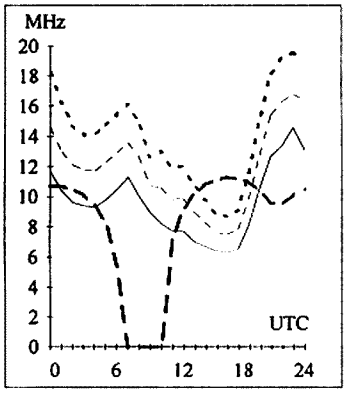
Perth-Moscow 324
First F 0-5 Short 12219 km



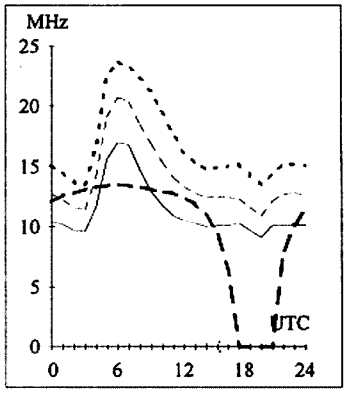
Sydney-Miami 86
First F 0-5 Short 15026 km



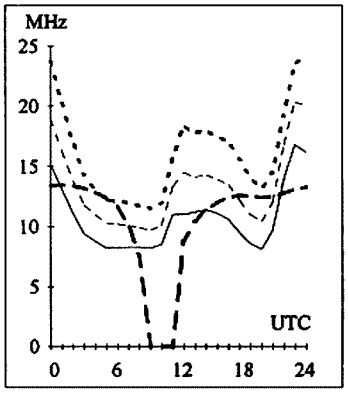
Hobart-Santiago 149
Short 10687 km



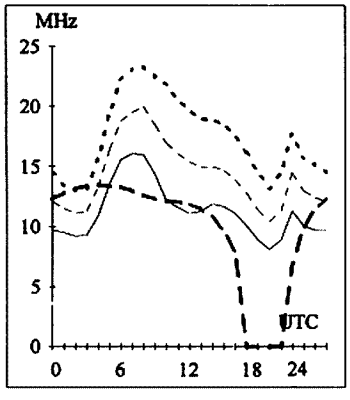
Melbourne-Madrid 286
First F 0-5 Short 17308 km



Perth-Washington 53
First F 0-5 Short 18614 km



Sydney-Paris 312
First F 0-5 Short 16957 km



HAMADS

TRADE ADS

• **AMIDON FERROMAGNETIC CORES:** For all RF applications. Send business size SASE for data/price to RJ & US Imports, PO Box 431, Kiama NSW 2533 (no enquiries at office please ... 14 Boanyo Ave Kiama). Agencies at: Geoff Wood Electronics, Sydney: Webb Electronics, Albury: Assoc TV Service, Hobart: Truscotts Electronic World, Melbourne and Mildura: Alpha Tango Products, Perth: Haven Electronics, Nowra: and WIA Equipment Supplies, Adelaide.

• **WEATHER FAX programs** for IBM XT/ATs *** "RADFAX2" $35.00, is a high resolution shortwave weatherfax, Morse and RTTY receiving program. Suitable for CGA, EGA, VGA and Hercules cards (state which). Needs SSB HF radio and RADFAX decoder. *** "SATFAX" $45.00, is a NOAA, Meteor and GMS weather satellite picture receiving program. Needs EGA or VGA & WEATHER FAX PC card, + 137 MHz Receiver. *** "MAXISAT" $75.00 is similar to SATFAX but needs 2 MB of expanded memory (EMS 3.6 or 4.0) and 1024 x 768 SVGA card. All programs are on 5.25" or 3.5" disks (state which) plus documentation, add $3.00 postage. ONLY from M Delahuntly, 42 Villiers St, New Farm QLD 4005. Ph (07) 358 2785.

• **HAM LOG v.3.1** – Acclaimed internationally as the best IBM logging program. Review samples....AR: "Recommend it to anyone"; The Canadian Amateur: "Beyond this reviewer's ability to do it justice. I cannot find anything to improve on. A breakthrough of computer technology". ARA: "Brilliant". Simple to use with full help, the professional HAM LOG is immensely popular (now in its 5th year), with many useful, superb features. Just $59 (+ $5 P & P), with a 90 page manual. Special 5 hour Internet offer. Demos, brochures available. Robin Gandevia VK2VN (02) 369 2008 BH fax (02) 369 3069.Internet address rhg@ozemail.com.au.

FOR SALE NSW

HF transceivers **Icom IC735** s/n 01635, $750; **Yaesu FT7** s/n 8G060790, $300; HF linear Yaesu FL110, $225. All with manuals. ONO. Simon VK2EII QTHR (02) 328 7141.

Kenwood TS530S HF xcvr s/n 1120973 with spare PA valves, $675; **Tono MR- 1300E** 2 m 130 W amp s/n 75488, $500; **Kenwood MC50** Desk Mic, $60; **Yaesu YD-148** Desk Mic, $50; **Kenwood TH25A** 2 m HH s/n 9073547 with spkr/mic & case, $265. Steve VK2KFJ (02) 9975 3933 AH.

Yaesu FT-757GX Tx/Rx excellent condition s/n 3M030511, $800; **Emtron EAT-300** ant-tuner s/n 001036, $30; **Emotator 502SAX** rotator as new, $300. David VK2QJ QTHR (02) 9630 3404.

General Radio Model 1606-A RF bridge, 400 kHz 60 MHz resistance and reactance; **Marconi Model TF2002** signal generator, 10 kHz 72 MHz AM/FM; **Hewlett Packard Power Meter 430C** with bolometer, model 477B; **Hewlett Packard** noise sources **HP349A, G752D, X347A, S347A**; Distortion analyser **HP332A**; Test Oscillator **HP651**; Tektronix CRO; 422 Marconi sig gen **TF1066, TF801**; Power meter **HP430C, HP410B; Yaesu 101E**; RF bridge model **GR1606A.** Peter VK2CPK (02) 9605 4790.

Kenwood TS940S transceiver with inbuilt ATU, s/n 5700664, vgc, mic and manual, orig packaging, $2,300. Paul VK2HV (049) 33 5995 after 6 pm.

Yaesu FT901DM HF xcvr, good condition, comes with manual & cables, base mic YD-148, $650 ono, includes mod from CQ magazine; **Yaesu FV-901DM** external VFO, excellent condition in original box with leads and manual, $325 ono; **Icom IC-2GAT** handheld with BP-70 battery, boxed and mint condition, includes wall charger, antenna, manual & circuits, also BC-36 charger, AD- 12 external pwr adaptor, HM-46 speaker microphone, LC-40 carry case, MFJ-1714 dual bander 1/2 wave ant, cost $1,140, sell for $850 ono, can separate, all in mint condition; **Icom LC-40** carry case, good condition, $20; **Motorola hand held leather carry case,** heavy, good condition, $25; **MFJ** transmitter antenna switch model MFJ-1700B, excellent condition, $125; **Phillips GM-2877** signal generator, no pwr lead, fair cond, $30; **BC-275** 27 MHz frequency counter by NACL, fair condition, $35; **RF Signalizer** 27 MHz model M-10, range from -15 dB to +15 dB, good condition, $35; Three band, short wave Radio Kit, **K-6355** from D Smith, includes all hardware, components and instructions, $65; **Leson pwr mike TW-205B**, good condition, boxed, no plug assy, $35; **WIA Correspondence Course**, 3 books, excellent condition, $35; **Old headphones** with connector by S G Brown Ltd London, PAT 29833, good condition, collectors items, make an offer. Steve VK2SPS (02) 9999 2933 after 6 pm.

FOR SALE VIC

Yaesu FT107M, full solid state, all band, HF xcvr, in-built AC PSU, VGC, $650. Ron VK3OM QTHR (059) 44 3019.

Valves, two 4/400, new and one ceramic socket, $100. Ken VK3JII QTHR (03) 9580 5347.

Yaesu auto tune ATU **FC-757AT**, suits FT-757, vgc, complete with manual, $350. Don VK3DON QTHR (03) 9848 3059.

Amateur Radio Garage Sale. **Vintage Amateur Radio equipment,** parts and magazines. All reasonable offers considered. 9 am – 2 pm, Saturday, 14 September, 6 Hadley Crt, Glen Iris 3146.

Diamond SX-400 VHF/UHF pwr/swr meter (similar to Revex W540), $110; **Revex W502** HF/6 m PWR/SWR meter, $140, both as new – check DSE catalogue for specs; **Icom IC-R7000** comm Rx, 25 MHz to 2 GHz, as new condx, orig carton, manual, etc, $850 ono. Damien VK3RX (054) 27 3121.

Yaesu 101ZD, EC w/manual, $475; **Yaesu FT707 ATU**, EC w/manual, $100; New matched pair **6146Ws** and new **12BY7**, $100 or as lot, $600. Bob VK3PT (054) 39 6314.

Shack Sell Out. **Kenwood TS680S**, $900; Power supply PS50, $250; **Kenwood MIC60**, $100; Linear **Yaesu FL2100B**, $600; Emtron antenna tuner **EAT-1000A**, $275; Antenna rotator **Ham M**, plus cable and coax, $180; **Dummy load**, $50. Ken VK3TL (03) 9728 5350.

Shack Clearance. **Kenwood MA5**, HF mobile antenna set, 80/10 m, $125; **Yaesu FT208** 2 m HH, spkr mic, charger, 12 V DC adapt, $175; **Yaesu FP12** 15 amp PSU, $150; **Yaesu FP707** 20 amp PSU, $225; **Yaesu FT-101E** as new, $325. Ron VK3OM QTHR (059) 44 3019.

Microwave modules **MMT144-28 transverter**, full documentation, $160; **Yaesu FT7** transceiver (mint condition), $300; **Clipsal key**, $45; **Emotator 103LBX** rotator, vgc, $200; **MFJ949D** 300 W ant tuner, vgc, $250. Roger VK3XRS (051) 52 1163.

ATN 13-30-8 8 element log periodic antenna, 13-30 MHz, complete with all parts and accessories inc balun, manual, vgc, $500. Bruce VK3WL (052) 82 2664 AH, (03) 9480 0111 BH or mobile (018) 67 6199.

IBM compat **XT computer**, 20 Mb hard disk, 5.25" 360 k floppy, 640 k RAM, Hi res green monitor, keyboard, comms and other software, good condition, $80; **Baycom packet modem**, as MDRC design, made up and going, $55. Harold VK3AFQ QTHR.

FOR SALE QLD

Kenwood TS430S, $950; Power supply **PS30-20A**, $190; **Yaesu FT480R**, 30 watts, $280; **Yaesu FT207R** (needs repair), $50; Automatic A/T, **Daiwa CNA-1001**, $230; **Trapped Longwire**, 3.5-14 MHz, $160; Speaker Mike **YM-24A**, $45. Sigi VK4ASN QTHR (07) 3207 2050.

Southern Cross tower, 10 m free standing, c/w rotator and masting, $500 ono; **50 MHz Yagi**, 11 el 9 m boom, $250; **Belcom Liner 430** 70 cm SSB, $150. Rod VK4KZR QTHR (07) 3353 3379 AH.

Uniden 2020 tcvr with mic, manuals, AC/DC power cords, power supply NR, failed during QSO with VE/W3. LAO. Alan VK4BWG QTHR (07) 3408 3652.

CRO cameras 2 Hewlett Packard I Tektronix and handbook with adaptor plates & graticules. Polariod cameras. Reimburse cost. John VK4AAF (079) 28 6573.

Valves. 833A unused boxed with fittings, $70; 16 Vintage Phillips, Mullard, Osram 4-pin, eg **PM12A, A442, MII4**, $250; 4000 S/H **octal, miniature, metal**, $1,000 ono. Hadgraft, 17 Paxton St, Holland Park Qld 4121 (07) 3397 3751 AH.

Transmitting tubes, new boxed **810** or **813**, $50 matched pair; **QE08-200**, $60 pair; **Phillips QB3-300**, $25; **12BY7A**, $10; **Yaesu FV101DM** digital VFO (unused), $75; **Power Supplies** 13.5 V 3 amp protected (regulated), $25; **Willis U10D** 25 watt UHF transceivers, $30; **6B4-G triodes**, new, $10 each; **Coaxial relays** 1 pole 6 position BNC, 28 VDC, $40; Ditto "N" type SPDT, UHF precision, 3 GHz, 48 VDC, $40; Plate blocking **capacitors 1000 pF 20 kVw**, $25. John VK4KK QTHR (07) 3269 6647.

FOR SALE SA

Versa tuner model **MFJ901B**, unused, tunes all antennas, $120. Murray VK5BVJ QTHR (087) 38 0000.

Sony R/R tape recorder, superb unit, as new stereo, 2 mic inputs, top of line response 30-15000 Hz, also pro "BASF" tapes available, 3 speed mod super Hi Fi pro dance music sell at fraction of cost, $250; Akai as above, $220. VK5DC QTHR (08) 31 4194.

FOR SALE WA

FRG7 Com Rx, gc, $125; **FT290R** 2 m tcvr, gc, $200; **Tokyo Hi power 2 m linear**, 150 W, $200; **Kenwood TS830S**, price negotiable, with **MC50** mike; **Cushcraft R5** vertical, 14-30 WARC, $400. VK6BEB QTHR (098) 41 7773.

WANTED NSW

AR8 parts for restoration. Knob, aerial rectifier assembly, sprockets and chain, connectors (for power, junction and loop), front panel, valve shield, side covers, loop aerial. Ray VK2ZON QTHR (1995) (02) 489 8561.

Mecrograph or McDonald Pendograph or any unusual Australian keys or semi- autos, pay top dollar for any of the above. Steve VK2SPS (02) 9999 2933 after 6 pm.

WANTED VIC

Circuit and technical info required for 1930's "Super Gainer" receiver. Vic VK3KVT QTHR (03) 9754 4860.

WANTED QLD

Single pole three position ceramic rotary switch for linear amp bandswitch, **roller inductor** for linear amp. Ron VK4BL QTHR (07) 55 0230.

Heathkit 6 m amplifier, Heathkit **2 m all-mode transceiver**, Heathkit **SB200** amplifier, Heathkit **VHF SWR-power meter**, Heathkit **HF SWR-power meter**, Heathkit **rotary coax switch**, Heathkit **HW16, HW101, DX40, DX60** transmitters/transceiver for operational Heathkit Museum. Contact "Doc" VK4CMY PO Box 24, Dalveen Qld 4374 or phone (076) 85 2167 before 8 pm please. Vietnam Veterans Wireless Group.

Transistor RCA40582 or proven equivalent, finals driver for Atlas 210X. Can anyone please help? Happy to pay. John VK4SZ QTHR (070) 61 3286.

WANTED SA

Valves one **6U8** or **6EA8**, one **7360** for Yaesu FT200. Murray VK5BVJ QTHR (087) 38 0000.

WANTED WA

Satellite receiver KU-Band B-Mac for rural TV reception, will pay freight, costs, must be in working order. Trevor VK6ZTJ QTHR (098) 25 1008 or fax (098) 25 1240.

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• THE WIA QSL Collection (now Federal) requires QSLs. All types welcome especially rare DX, pictorial cards and special issue. Please contact the Hon Curator, Ken Matchett VK3TL, 4 Sunrise Hill Road, Montrose VIC 3765, Tel (03) 9728 5350.

• DO YOU HAVE ANY used telephone cards or stamps lying around? If so could you please send them to the Epilepsy Association of South Australia Inc, PO Box 12, Woodville SA 5011.

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Editor's Comment

Continued from page 2

And, of course, we do now, even more urgently, need some new and preferably young enthusiasm on the Publications Committee. Volunteers need a firm dedication to amateur radio and preferably some journalistic competence (or at least a good grasp of English!). Keyboard skill is highly desirable.

To wind up, last month we were preparing to hit the Strzelecki Track, and also to go to Dalhousie Springs. We ran out of time! But we had a thoroughly enjoyable trip to Innamincka and spent several days camped by the gently-flowing Cooper. The planned second half (up the Oodnadatta Track) will just have to wait for another year.

Bill Rice VK3ABP
Editor
ar

Hamads

Please Note: If you are advertising items For Sale and Wanted please use a separate form for each. Include all details: eg Name, Address, Telephone Number (and STD code), on both form. Please print copy for your Hamad as clearly as possible.
* Eight lines per issue free to all WIA members, ninth line for name and address Commercial rates apply for non-members. Please enclose a mailing label from this magazine with your Hamad.
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* QTHR means address is correct as set out in the WIA current Call Book.
* WIA policy recommends that Hamads include the serial numb.er of all equipment offered for sale.
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WIA Divisions

The WIA consists of seven autonomous State Divisions. Each member of the WIA is a member of a Division, usually in their residential State or Territory, and each Division looks after amateur radio affairs within its area.

	Division Address	Officers			Weekly News Broadcasts		1996 Fees
VK1	ACT Division GPO Box 600 Canberra ACT 2601	President Secretary Treasurer	Philip Rayner John Woolner Bernie Kobier	VK1PJ VK1ZAO VK1KIP	3.570 MHz LSB, 146.950 MHz FM each Sunday evening commencing at 8.00 pm local time. The broadcast text is available on packet, on Internet aus.radio.amateur.misc newsgroup, and on the VK1 Home Page http://email.nla.gov.au/~cmakin/wlaact.html	(F) (G) (S) (X)	$70.00 $56.00 $42.00
VK2	NSW Division 109 Wigram St Parramatta NSW (PO Box 1066 Parramatta 2124 Phone (02) 689 2417 Freecall 1800 817 644 Fax (02) 633 1525	President Secretary Treasurer (Office hours Web:http://sydney.dialix.ozau/~wiansw e-mail address: wiansw@sydney.dialix.oz.au	Michael Corbin Eric Fossey Eric Van De Weyer Mon-Sat 11.00-14.00 Mon 1900-2100)	VK2YC VK2EFY VK2KUR	From VK2WI 1.845, 3.595, 7.146*, 10.125, 24.950, 28.320, 29.120, 52.120, 52.525, 144.150, 147.000, 438.525, 1281.750 (* morning only) with relays to some of 14.160, 18.120, 21.170, 584.750 ATV sound. Many country regions relay on 2 m or 70 cm repeaters. Sunday 1000 and 1930. Highlights included in VK2AWX Newcastle news, Monday 1930 on 3.593 plus 10 m, 2 m, 70 cm, 23 cm. The broadcast text is available on the Internet newsgroup *aus.radio.amateur.misc*, and on packet radio.	(F) (G) (S) (X)	$66.75 $53.40 $38.75
VK3	Victorian Division 40G Victory Boulevard Ashburton Vic 3147 Phone (03) 9885 9261 Fax (03) 9885 9298	President Secretary Treasurer (Office hours	Jim Linton Barry Wilton Rob Hailey Tue & Thur 0830-1530)	VK3PC VK3XV VK3NC	VK3BWI broadcasts on the 1st and 3rd Sunday of the month, starts 10.30 am. Primary frequencies 1.840 AM, 3.615 LSB, 7.085 LSB, and FM(R)s 146.700 Mt Dandenong, 147.250 Mt Macedon, 147.225 Mt Baw Baw, and 2 m FM(R)s VK3RMA, VK3RSH and VK3ROW. 70 cm FM(R)s VK3ROU and VK3RGL. Major news under call VK3WI on Victorian packet BBS.	(F) (G) (S) (X)	$72.00 $58.00 $44.00
VK4	Queensland Division GPO Box 638 Brisbane QLD 4001 Phone (074) 96 4714	President Secretary Treasurer	Geoff Sanders John Stevens John Presotto	VK4KEL VK4AFS VK4WX	1.825 MHz SSB, 3.605 MHz SSB, 7.118 MHz SSB, 14.342 MHz SSB, 28.400 MHz SSB, 29.220 MHz FM, 52.525 MHz FM, 146.700 MHz FM, 147.000 MHz FM, 438.525 MHz (Brisbane only), regional VHF/UHF repeaters at 0900 hrs Sunday. Repeated on 3.605 MHz SSB & 147.000 MHz FM, regional VHF/UHF repeaters at 1930 hrs EAST Monday. Broadcast news in text form on packet under WIAQ@VKNET.	(F) (G) (S) (X)	$72.00 $58.00 $44.00
VK5	South Australian Division 34 West Thebarton Rd Thebarton SA 5031 (GPO Box 1234 Adelaide SA 5001) Phone (08) 8352 3428 Fax (08) 8264 0463	President Secretary Treasurer Web: http://www.vk5wia.ampr.org/	Peter Watts Maurie Hooper Charles McEachern	VK5ZFW VK5EA VK5KDK	1827 kHz AM, 3.550 MHz LSB, 7.095 AM, 14.175 USB, 28.470 USB, 53.100 FM, 147.000 FM Adelaide, 146.700 FM Mid North, 146.800 FM Mildura, 146.825 FM Barossa Valley, 146.900 FM South East, 146.925 FM Central North, 147.825 FM Gawler, 438.425 FM Barossa Valley, 438.475 FM Adelaide North, ATV Ch 35 579.250 Adelaide. (NT) 3.555 USB, 7.065 USB, 10.125 USB, 146.700 FM, 0900 hrs Sunday. 3.585 MHz and 146.675 MHZ FM Adelaide, 1930 hrs Monday.	(F) (G) (S) (X)	$72.00 $58.00 $44.00
VK6	West Australian Division PO Box 10 West Perth WA 6872 Phone (09) 351 8873	President Secretary Treasurer	Cliff Bastin Christine Bastin Bruce Hedland-Thomas	VK6LZ VK6ZLZ VK6OO	146.700 FM(R) Perth, at 0930 hrs Sunday, relayed on 1.825, 3.560, 7.075, 14.116, 14.175, 21.185, 29.680 FM, 50.150 and 438.525 MHz. Country relays 3.582, 147.350(R) Busselton and 146.900(R) Mt William (Bunbury). Broadcast repeated on 146.700 at 1900 hrs Sunday, relayed on 1.865, 3.563 and 438.525 MHz; country relays on 146.350 and 146.900 MHz.	(F) (G) (S) (X)	$60.75 $48.60 $32.75
VK7	Tasmanian Division 5 Helm Street Newstead TAS 7250 Phone (03) 634 42324	President Secretary Treasurer	Andrew Dixon Robin Harwood Terry Ives	VK7GL VK7RH VK7ZTI	146.700 MHz FM (VK7RHT) at 0930 hrs Sunday relayed on 147.000 (VK7RAA), 146.725 (VK7RNE), 146.625 (VK7RMD), 3.570, 7.090, 14.130, 52.100, 144.150 (Hobart) Repeated Tues 3.590 at 1930 hrs.	(F) (G) (S) (X)	$72.00 $58.00 $44.00
VK8	(Northern Territory is part of the VK5 Division and relays broadcasts from VK5 as shown received on 14 or 28 MHz).						

Note: All times are local. All frequencies MHz.

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This is a very easy-to-use transceiver, and unlike some competing models, small size doesn't mean small facilities. Some micro-rigs can't even activate simple functions like a noise blanker without using multiple keystrokes, but not so in Yaesu HF transceivers. The FT-840 provides easily accessible features such as variable mic gain and RF Power controls, SSB Speech Processor for greater audio punch, and IF Shift plus CW Reverse to fight interference. Dual Direct Digital Synthesisers ensure clean transmitter output and fast Tx/Rx switching, as well as greatly improved receiver performance compared to earlier PLL designs. The low noise receiver front-end also uses an active double-balanced mixer and selectable attenuator for improved strong signal handling, so you can fight through pile-ups rather than have to worry about overload from other local signals.

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October 1996
Volume 64 No 10

Amateur Radio

Journal of the Wireless Institute of Australia

IN THIS ISSUE:

*Drew Diamond's Receiving Converter for 6 Metres

*WIA Submission on the Radcom Amendment Bill 1996

*Review of Yaesu MD-100A8X De-luxe Desk Microphone

Plus

lots of amateur radio news, information, articles and special interest columns.

Amateur Radio

Journal of the Wireless Institute of Australia

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CONTENTS

Cover

At the left is Chris VK6KCH, and on the right Dennis VK6LD, installing two new 20 kg solar panels at the 12 metre (40 ft) level on the 32 metre (100 ft) tower which supports the VK6RTH repeater antenna installation. For the full story, see the Vertical section of *Repeater Link* on page 48.

BACK ISSUES

Available, only until stocks are exhausted, at $4.00 each (including postage within Australia) to members.

PHOTOSTAT COPIES

When back issues are no longer available, photocopies of articles are available to members at $2.50 each (plus $2.00 for each additional issue in which the article appears).

The opinions expressed in this publication do not necessarily reflect the official view of the WIA, and the WIA cannot be held responsible for incorrect information published.

Amateur Radio Service

A radiocommunication service for the purpose of self-training,intercommunication and technical investigation carried out by amateurs, that is, by duly authorised persons interested in radio technique solely with a personal aim and without pecuniary interest.

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Founded 1910

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Editor's Comment

Questions, Answers and Changes

In last month's issue you may have noticed an advertisement on page 23 inviting quotes for the production and publishing of this magazine. No doubt you would like to know why Executive is proposing changes in this area.

The reason is in order to investigate whether *Amateur Radio* can be produced at less cost than by our current procedures, while retaining at least the same standard and format. It's your money, which possibly can be made to go a little further. It may be, nevertheless, that costs are already as low as possible, so cannot be further reduced. Change in this case would be pointless.

A change which has already been made is in our selection procedure for articles to be published in *Amateur Radio*. With a few exceptions, mostly involving topicality, we have up till now published technical articles, in particular, in the order in which they were received.

We have now decided that this is unfair to authors whose work is ready to publish while others need more editing, drafting or even re-writing, but still receive priority because they were received earlier. From now on, articles will be published in the order in which they become ready for publication.

Also, over the last few months there have been changes in the presentation of the propagation predictions, usually appearing on pages 52 and 53. This has involved a great deal of "behind the scenes" activity by Evan Jarman VK3ANI. We are happy to discover that not only have you, our readers, commented favourably on these changes, but that Evan has even received enquiries and congratulations from a couple of overseas experts for his improvements in presentation of the predictions.

Amateurs with Orders of Australia are continuing to appear. Eric Jamieson VK5LP was awarded an OAM in 1985. Good work Eric, sorry to be 11 years late!

Bill Rice VK3ABP
Editor

CONTRIBUTIONS TO *AMATEUR RADIO*

Amateur Radio is a forum for WIA members' amateur radio technical experiments, experiences, opinions and news. Manuscripts with drawings and/or photos are always welcome and will be considered for possible publication. Articles on computer disk are especially welcome. The WIA cannot assume responsibility for loss or damage to any material. *"How to Write for Amateur Radio"* was published in the August 1992 issue of *Amateur Radio*. A photocopy is available on receipt of a stamped, self addressed envelope.

■ WIA News

Roger Harrison VK2ZRH, Federal Media Liaison Officer

WIA Submission Calls For Amateur Service to Have its Own Licence System and a Licence-for-Life

The WIA has called for the creation of an Amateur Operator Licence separate from the current radiocommunications licensing systems, and the once-only issue of a licence-for-life to anyone meeting the requirements of an Amateur Operator's Certificate of Proficiency.

These requirements were called for in a WIA submission last month to the Department of Communications and the Arts (DOCA) in response to the *Radiocommunications Amendment Bill 1996*. The submission is published in this issue of *Amateur Radio*.

Additional submissions concerning other aspects of the Radiocommunications Amendment Bill and the Australian Communications Authority Bill were also sent to DOCA last month. The submissions were made in response to the release for public comment of Exposure Draft legislation proposing to amend the Radiocommunications Act 1992 and to create the *Australian Communications Authority* (ACA). The government gave a deadline for submissions of 5 September, one day short of three weeks from the day they were released, Friday, 16 August.

On learning of the news (see *WIA News*, page 3 in September's *Amateur Radio* magazine), the WIA proposed fast-tracking the Submission on Amateur Licensing, the exposure draft version of which was published as a supplement in the April issue of *Amateur Radio*. As the deadline for initial comment on this had expired on 30 June, work was already well under way on drafting a final version for consideration by the WIA Federal Council at its October convention. The submission to DOCA was compiled by Roger Harrison VK2ZRH in cooperation with the WIA Federal Council and ITU Conference and Study Group Coordinator, David Wardlaw VK3ADW.

It was determined in Federal Council discussions that this submission should focus on the legislative issues, to create a fourth licensing system for amateur operators, and to leave the administrative matter of cost minimisation in relation to fees to a later submission to the Minister, but that this issue should be foreshadowed in the WIA's DOCA submission. In arguing for a fourth licence system specifically for amateurs, the WIA submission presented evidence of how the present three licensing systems are unsuited to the Amateur Radio Service in fundamental ways. Apparatus Licensing and Spectrum Licensing have clear commercial purposes, being based on economic concepts of scarcity and demand, and that the availability and use of spectrum to a licensee denies its availability and use by others, which the SMA terms "spectrum denial."

The price-based fees framework attached to Apparatus and Spectrum licensing, the WIA submission argues, reflects these economic concepts but has been severely distorted in the SMA's application of it to amateur licences. The WIA foreshadowed that the Amateur Radio Service in Australia would be better served by a licence fee regime that was truly transparent, equitable for all

Additional Submissions

The WIA also submitted to the Department of Communications and the Arts additional comments on aspects of the government's proposed amendments to the Radiocommunications Act. These concerned the sale of spectrum licensing bands while still occupied, the repeal of Technical Licensing Specifications, EMC standards provisions, and health and safety provisions.

The WIA raised concern for the position and rights of radio amateurs where amateur frequency allocations may be affected by spectrum licensing, particularly where amateurs are the secondary service in an affected band. The WIA said that the Amateur Service in such cases is in a lesser position than incumbent primary users with whom the allocation is shared.

Technical Licensing Specifications (TLSs) are to be repealed, according to DOCA, because they are a redundant legal instrument, as licence conditions determinations serve the same purpose. The WIA expressed concern that replacing TLSs by determinations on licence conditions might not lead to better administrative flexibility and efficiency.

On the matter of EMC, the WIA expressed the view that current EMC provisions as applicable to the Amateur Service would continue. On the health and safety amendments proposed by the government, the WIA said that any determination made under these proposed provisions must be based on sound science and risk analysis.

Regarding the draft Bill to create an Australian Communications Authority, the WIA said it welcomed the move and would seek participation on any and all relevant advisory committees proposed in the draft Bill. The WIA advised that we are presently represented on, among other committees, the International Radiocommunications Advisory Council and the Radiocommunications Consultative Council, as well as preparatory groups working on agenda items for the World Radio Conferences.

licensees and reflected the value to the community of the Amateur Service.

Because Amateurs operate only in frequency bands which are available to them nationwide, a large proportion of which are secondary allocations shared with primary users on a non-interference basis, the issuing of any number of amateur licences does not increase spectrum denial. It increases spectrum sharing among amateurs which is what amateurs want, a consequence opposite to the economic foundations of the Apparatus and Spectrum licensing systems. In addition, the non-pecuniary nature of amateur interests and operations which is fundamental to the International Telecommunications Union's definition of the Amateur Service, conflicts directly with the commercial nature of these two licensing systems.

Class Licensing, the WIA also argued, does not suit amateur licensing either, as it is a system which authorises any person to operate radiocommunications devices of specified kinds or for a specified purpose, and Class Licences are not issued to individual users. Amateurs require individual licences and the freedom to operate equipment of their own choosing and/or their own manufacture.

For the reasons advanced that the Amateur Radio Service does not fit into any of the present licensing systems, the WIA submission proposes that a fourth licence system be created under Chapter 3 of the Radiocommunications Act, which would be called the Amateur Operator Licence. This would retain the current seven amateur licence sub-types and licence conditions, along with newly drafted administrative provisions similar to those which currently apply.

However, the submission proposes that certain provisions be modified and included in the government's proposed amendments to the Act, to permit either: a once-only licence issue for life to a person meeting the requirements of an AOCP, or alternatively, provide for a five-year licence duration, with renewal. The purpose of this, the WIA submission argues, would be to reduce the administrative requirements associated with the Amateur Operator Licence, to pave the way for a future reduction in government administrative costs and thus in Amateur licence fees.

IARU News

David Wardlaw VK3ADW

First Report on Future of the Amateur Service Committee Discussion Paper

The International Amateur Radio Union (IARU) released last month the first report from the Discussion Paper put out by the Future of the Amateur Service Committee (FASC) in April this year.

The Discussion Paper sought informed debate by the amateur community on a number of issues, including the definition of the Amateur Service, the definition of the Amateur-Satellite Service restrictions on communications with certain (banned) countries, third party messages, the technical and operational qualifications to become an amateur, retention of the Morse code test as an ITU treaty obligation, and the international recognition of amateur licenses.

The FASC is chaired by Michael Owen VK3KI, Vice-President of the IARU, the other members being Tom Atkins VE3CDM, John Bazley G3HCT, Terry Carrell ZL3QL, Larry Price W4RA and David Sumner K1ZZ.

The 8-page report highlighted the fact that many hundreds of pages of comments had been received from societies, organisations and individuals and the Committee has summarised the variety of points and arguments submitted. The WIA sent a response to the Committee in June.

Interestingly, in response to the Discussion Paper's comments on the ITU definition of the Amateur Service, AMSAT North America has suggested the deletion of the words "interested in radio technique" from the definition: *A radiocommunication service for the purpose of self-training, inter-communication and technical investigations carried out by amateurs, that is, duly authorised persons [interested in radio technique] solely with a personal aim and without pecuniary interest.* The Committee suggests this proposal deserves further discussion.

The Discussion Paper's question on retention of testing Morse code ability being retained or not as a treaty obligation elicited "by far the greatest response", the FASC said. Many responses addressed this issue alone. While many responses opposed the suggestion that Morse code testing should cease to be a treaty obligation, FASC reported receiving some careful arguments in favour of taking the requirement out of the international regulations and leaving it to administrations to determine whether Morse is a licensing requirement for a country.

These are just two highlights from the Committee's 8-page report. FASC said they hope this first report will be considered by the IARU Region 1 Conference this month in Tel Aviv, Israel. They propose to prepare a further report for consideration by the Region 3 Conference in 1997, to be held in Beijing, China. The process would then be repeated for the Region 2 Conference in 1998. Throughout the process, the Committee aims to seek comments and submission from individuals, groups and societies. The task of formulating a global policy, after each Region association had expressed their views, is proposed to be delegated to the IARU Administrative Council after the Region 2 Conference in 1998.

The FASC report is available on the World Wide Web at *http://www.iaru.org/fasc2out.html* or via links on the various WIA Divisions' Web pages. Copies of the FASC Discussion Paper and First Report are available from the WIA Federal Councillor in your state Division.

Support the WIA in order to protect amateur radio frequencies

Progress on Special Olympic Call Signs

In response to recent WIA representations to the SMA for use of the AX prefix by all Australian amateurs, and two special event call signs to celebrate the Sydney Olympics in 2000, to be available for a period of six months before the opening ceremony to one month after the closing, the Spectrum Management Agency has granted permission for their use for three months prior to one month after.

This means that the AX prefix and the special event call signs will be available for use from 15 June through 2 November, inclusive, in the year 2000.

At the WIA-SMA meeting on 28 June last, the WIA proposed that, in addition to a special event call sign for the Olympics to signify its international significance, that either NSW amateurs be allowed to use the VI prefix as the Olympics, being held in the State capital of Sydney, was a significant event for NSW, or alternatively that all Australian amateurs be able to use the AX prefix because the Olympics was an international event. The SMA, in their recent response to the Institute, said that they considered the use of the VI prefix would devalue the importance of the event for the whole of Australia.

Following the June WIA-SMA meeting, the WIA submitted a request for a further special event Olympics call sign, AX2SYD. (See *WIA News*, page 6, September issue of *Amateur Radio*). The SMA has advised that, unfortunately, VK2SYD is taken, but they have reserved VK2SOG as an alternative. The SMA also said that, that if this is not acceptable, the WIA should advise preferences and check availability for reservation until after the Olympic games. The Institute is considering the matter and will reply in due course.

Apparently, the first actual application for an Olympics special event call sign was made by the Westlakes Amateur Radio Club in NSW, who wrote the SMA the morning after it was announced in September 1993, that Sydney was selected as the host city for the 2000 Olympics. They sought VI2000AUS, or something similar. The same day, the WIA Federal President, Neil Penfold VK6NE, faxed the WIA Federal Secretary and asked him to request that the SMA reserve AX2000 or AX2OOO. The Federal Secretary eventually contacted the SMA on 5 October 1993, requesting AX2000 for the period of the Olympics and the use of the AX prefix by all Australian amateurs. Also on 24 September 1993, NSW Division Special Projects Officer, Stephen Pall VK2PS, discussed the possibilities of a variety of call signs with the Sydney Area Office of the SMA. No application was subsequently made by the NSW Division, having learned of the WIA Federal application for AX2000.

In November 1994, the SMA advised the International Telecommunications Union Radiocommunications Bureau of the WIA's application for the AX2000 (AX-two thousand) call sign. The Bureau replied the following month, advising that call signs formed from two characters followed by four digits may be used for identification of ship stations in the maritime mobile service. They also said that the international Radio Regulations stipulated that all transmissions with misleading identification are prohibited. So that's the reason why AX2000 could not be issued.

While there was considerable correspondence between the SMA, the WIA and Westlakes ARC over Olympics special event call signs during the ensuing years, the rest, as they say, is history.

Interference on 160 m Notified to SMA

Recent complaints by amateurs to the WIA of interference from strong digital transmissions in the 1800-1825 kHz segment of the 160 metre band were notified to the Spectrum Management Agency in August. This segment is an exclusive amateur allocation in Australia.

The interfering signals originate from continuously operating digital global positioning system (DGPS) beacons located in New Zealand, used for error correction in GPS satellite navigation systems. They are licensed by the New Zealand Ministry of Commerce.

Information supplied by the WIA's New Zealand counterpart, the New Zealand Amateur Radio Transmitters (NZART), advises that five licences have been issued for operation in this segment of the 160 m band, with two already in operation. The operating stations are at Napier, on 1816.5 kHz, and Wellington, on 1818.5 kHz. These two stations run 100 watts output power to omni-directional antennas. Other stations have been assigned frequencies of 1817.5 kHz (150 W, Dunedin) and 1822.5 kHz (150 W, Christchurch), and another on 1825.5 kHz at Wellington. It is not known when they may be operational.

The NZART has asked the Ministry of Commerce to investigate moving the three stations which had not entered service to frequencies below 1800 kHz and to seek new frequencies for the existing stations, also below 1800 kHz.

The WIA notified the SMA's Customer Service Group Technical Services Team in late August and has asked if the SMA would consider confirming the incidence of interference in Australia from these beacons and making the WIA's complaint known to the NZ Ministry of Commerce. The NZART has also been notified of the WIA's action.

Canadian Authorities to Delegate Call Sign Assignment and Other Administrative Operations to Amateur Company

Canadian amateurs expect next year to have control of administration of their call signs, issuing of amateur certificates and maintaining certificate records and other administrative operations, proposed to be delegated by the Canadian regulatory authority responsible for spectrum management, Industry Canada, to a new not-for-profit company staffed by amateurs.

This move follows an Industry Canada funded pilot study completed earlier this year under the auspices of a joint RAC/Industry Canada committee called the Amateur Delegation Working Group. The new company to administer the scheme is to be called Amateur Radio Administrative Services (ARAS). It is being incorporated by the Radio Amateurs of Canada (RAC) and they have set up a home page on the World Wide Web at *http://www.aras-sara.ca/aras2.htm* which outlines the background and explains its role.

ARAS will issue certificates to new amateurs and those who upgrade their qualifications, and collect the related fees. The company will also maintain records of the level of certification of all Canadian amateurs, updated with input from official Delegated Examiners following examinations. ARAS said they will look after the management of all call signs assigned to radio amateurs in Canada, of which there are some 46,000 in the Industry Canada database. ARAS will deal with requests for new call signs and call sign changes. They intend to provide an on-line call sign database to be updated monthly, initially, but more frequently later.

The company will be managed and operated by qualified, paid professional staff, according to the ARAS home page. It will have a general manager responsible to the ARAS board of directors and will be run as an independent operation serving all Canadian radio amateurs and potential radio amateurs. It is expected that ARAS will be in operation by mid-1997.

The WIA is looking closely at this development since suggesting devolvement of call sign administration and eventual devolvement of issuing amateur certificates of proficiency in the February Exposure Draft submission to government, *Towards A New Licensing System.*

Intruder Interference – Notify WIA Intruder Watch Coordinator

If you discover possible intruders on the amateur bands, the effective way to report them is to notify the WIA Intruder Watch Coordinator. Some amateurs have been contacting the SMA's monitoring station at Quoin Ridge in Tasmania about interference problems from probable intruders on the bands.

The SMA has advised the WIA that their Quoin Ridge monitoring station does not accept such complaints directly. If you hear what you think is a transmission from an intruder, or you suffer interference from an apparent intruder, note down the date, time, frequency and any other pertinent facts, and send your report to the WIA Intruder Watch Coordinator in your local Division, or to Federal WIA Intruder Watch Coordinator, Gordon Loveday VK4KAL, Freepost Rubyvale, Qld 4702.

Remember to leave a three second break between overs when using a repeater

Tariffs: Minister Replies to WIA

The Minister for Industry, Science and Tourism, John Moore, has replied to the WIA in response to a letter from the Federal President, Neil Penfold VK6NE, who wrote to the Minister responsible for Customs, Geoff Prosser, in May over the matter of tariffs being applied to amateur equipment which was previously imported duty free under Tariff Concession Orders.

The reply, sent on 7 August, was a form letter outlining the government's actions, with 38 pages of attachments comprising two Australian Customs Notices outlining the tariff amendments is some detail. The upshot is: imported amateur equipment ordered and landed here after 15 July 1996 will cost more than it otherwise would have. While the increase will amount to some $30-$50 per $1000 of landed cost, this represents the same order of increase in fees, in dollar terms, that the Spectrum Management Agency proposed in December 1994. The only factor which now, serendipitously, works in amateurs' favour is the appreciation in value of the Australian dollar against the Japanese Yen, as most imported amateur equipment comes from Japan.

However, the WIA's argument that the tariff represents a tax on knowledge gained through self-education still stands because, even with the current favourable A$-Yen exchange rate, imported amateur equipment costs more than it otherwise would without the tariff.

The WIA has written to the Australian Customs Service seeking clarification of the tariffs which now apply to the Tariff Concession Orders covering specified amateur radio equipment in order to determine facts about the application of the new tariff system to amateur equipment.

New WIA Members

The WIA bids a warm welcome to the following new members who were entered into the WIA Membership Register during the month of August 96.

L21023	MR A DEAN	VK5DL	MR A MILLER
L30940	MR F PAPWORTH	VK6KBC	MR B E COLMER
VK2DTX	MR A S THEAKSTON	VK6SI	MR G G MATTHEWS
VK2FEJ	MR G STRATTON	VK7HSB	MR B STEVENSEN
VK2GJT	MR G J TOWELLS	VK7KAN	MR A VAN DALLEM
VK3QS	MR G E STRANGE	VK7RV	MR R H BRADSHAW

■ Receivers

Receiving Converter for 6 Metres

Drew Diamond VK3XU describes a simple but effective converter to enable listening on this exciting band.*

HF general coverage receivers tune from perhaps 100 kHz to about 30 MHz. If we wish to hear signals on higher frequency bands, the usual approach is to precede the receiver with an appropriate converter. To tune from 50 to 51 MHz, for instance, we could use a 33 MHz crystal oscillator and mixer to "frequency-convert" the required band down so that it may be tuned from 17 MHz (50 minus 33) to 18 MHz (51 minus 33). Here are plans for a relatively simple converter to access this interesting band.

Construction is straight-forward, and no "hard-to-get" components are required. Sensitivity is quite good; a 0.1 microvolt CW signal from a (laboratory grade) generator plainly stands out from the internally generated noise, and even a 0.05 microvolt signal can easily be perceived. Whilst it cannot be claimed that this converter is "bomb-proof" under very strong signal conditions, it does an admirable job considering the low cost and relative simplicity. No instances of harmful interference have so far been observed.

Circuit

The circuit is greatly simplified by using a 33 MHz crystal oscillator module (of the type intended for computer applications) for the local oscillator. Tank L3 at the TTL square-wave output of the oscillator "sines" the LO signal, which is then applied to the oscillator port of the NE602 balanced mixer at pin 6. The 33.000 MHz signal thus obtained is rock steady, accurate, and spectrally pure. IF at 17 MHz (to receive 50 MHz) is extracted via the broad-band matching transformer T1 connected between output pins 4 and 5 of the NE602.

The NE602 is an active mixer with a published NF of 5 dB. At a quiet semi-rural location, it was found that antenna noise actually exceeds the internal noise, so an RF amplifier is not thought to be necessary (and would probably degrade strong-signal performance anyway). To improve immunity to out-of-band signals, a double tuned circuit band-pass filter is recommended for the front end at L1 and L2. After band-pass filtering, the signal is coupled to the mixer input at pin 1 of the NE602.

Construction

A meld of "paddyboard" and "ugly" was used for the prototype. A board size of about 52 x 75 mm is suggested. A ready-made circuit board is not offered, but do not be discouraged by the

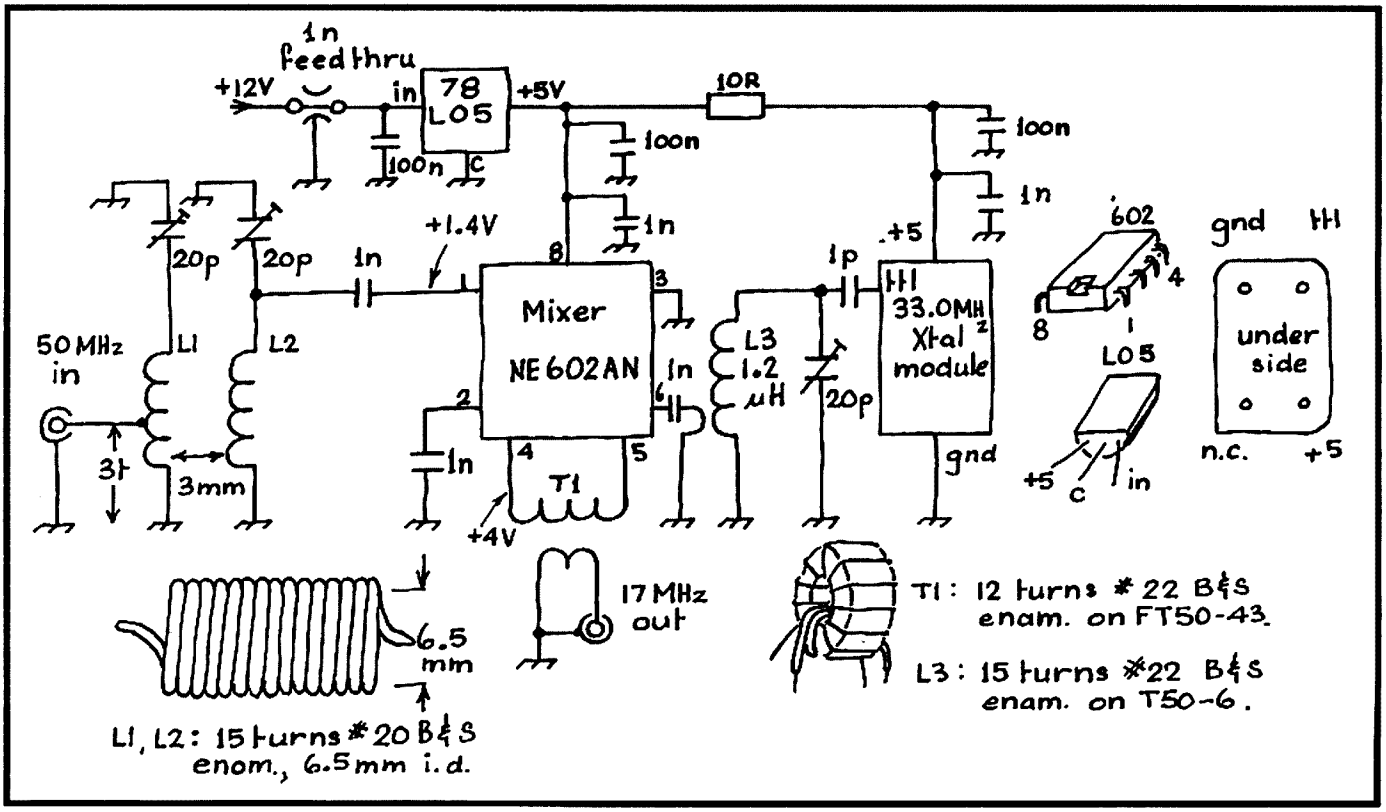


Figure 1 – Circuit diagram for the 6 m receiving converter.

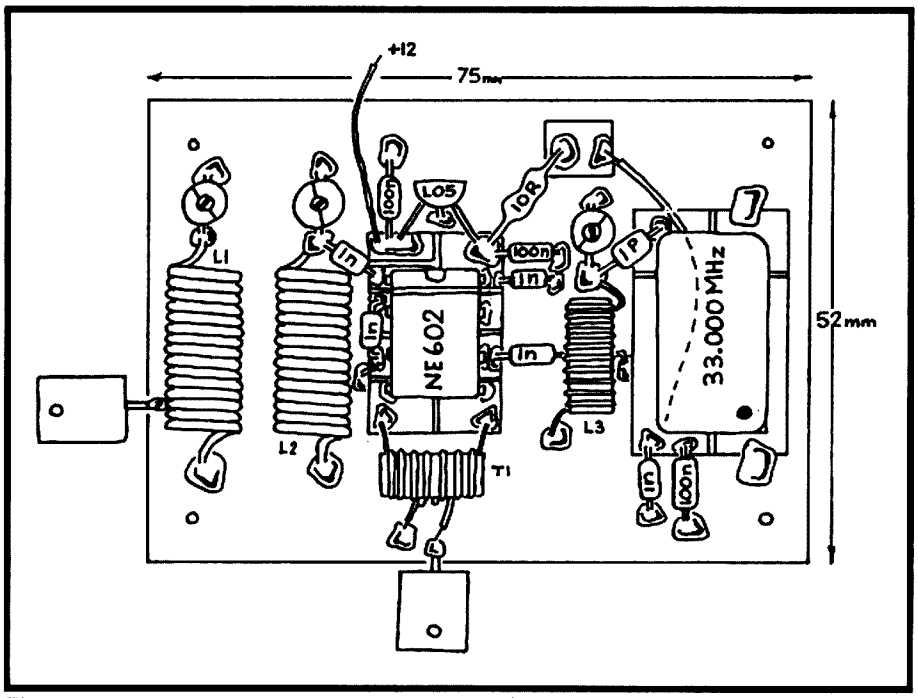


Figure 2 – Board layout for the 6 m receiving converter.

construction method; a plain circuit board is quite appropriate to a project of this kind.

The NE602 is soldered to a small substrate pad board which, in turn, is soldered or glued to the main board. Use a junior hacksaw to form the individual lands on the substrate pads (see Ref 5). The oscillator module may also be mounted upon a small substrate, where the pad for the TTL output should be fairly small to avoid capacitive loading. Or the crystal module may simply be inverted "dead bug" fashion upon the main board.

All connections and component lead lengths should be as short as is reasonably practicable. By-pass and coupling capacitors must be either monolithic, ceramic chip or ceramic types. Take care when soldering monolithic capacitors; too much heat for too long may unsolder the lead from the actual component. It is recommended that the completed converter board be housed in a die-cast or aluminium box with coax connectors to suit your set-up. Tuning holes are not required.

The input filter coils were wound with #20 B&S (0.81 mm) enamelled copper wire, close-spaced, 15 turns each, using the shank of a 6.5 mm (or 0.25" near enough) drill to obtain correct internal diameter. The antenna input is tapped three turns up from the "earthy" end of L1. Take care not to short adjacent turns. The variable trim capacitors should have a maximum capacitance of not more than 20 or 22 pF. Observe that the rotor of the trimmers (which connects to the slotted ferrule) is the lead soldered to circuit board foil.

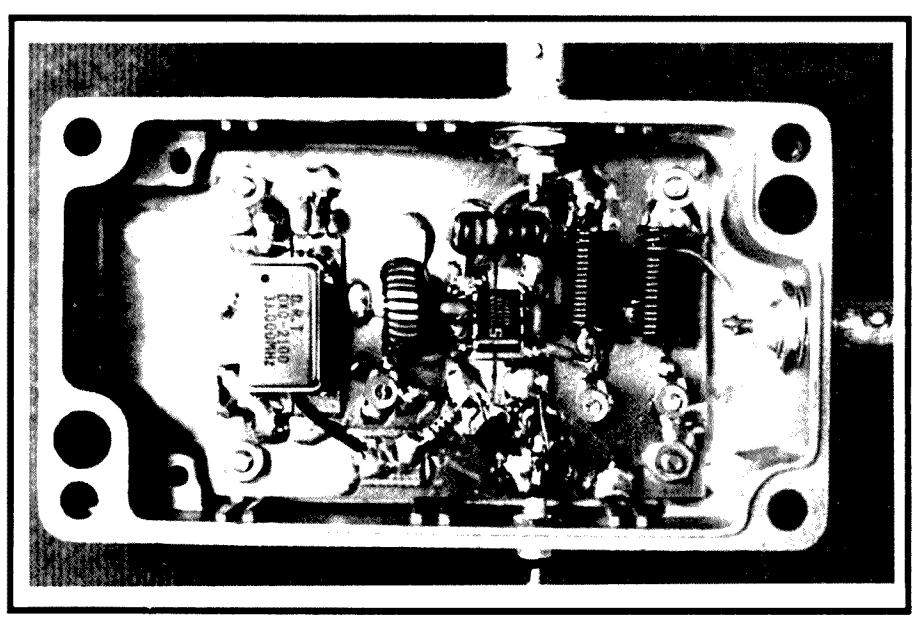
The oscillator tank L3 is 15 turns of #22 B&S (0.63 mm) enamelled wire wound on an Amidon T50-6 toroidal core. The 33 MHz signal is picked off through the one-turn link, simply formed by passing one lead of the 1 nF capacitor through the hole of the L3 toroid, and soldering that end to ground foil.

For the output transformer T1, wind about 12 turns of #22 B&S enamelled wire on to an Amidon FT50-43 toroidal core, and spread to occupy about 2/3rds of the circumference. The link is two turns of ordinary hook-up or enamelled wire wound in the gap.

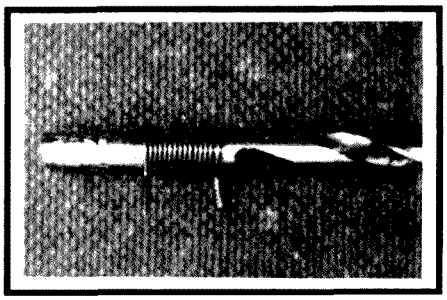
Tune-up

The only test equipment required is one pair of good ears and perhaps a step attenuator. With a coax cable, connect the output of the converter to the input of your general coverage receiver, which is tuned to about 17 MHz (for 50 MHz) and set to receive SSB or CW. Adjust all trim caps to about half mesh. Apply +12 Vdc supply to the converter rail. Background noise should increase a little. Check that the 78L05 is supplying +5 V to the NE602 and oscillator module. When the LO signal is peaked, you ought to hear an increase in background noise as the mixer begins functioning. Tweak the 33 MHz 20 pF trimmer for maximum noise, which should occur at about half mesh.

Connect a 6 m antenna to the input. As a prelude, adjust the two input trimmers for maximum noise, which should occur at about half mesh each.



Top view of the 6 m receiving converter in a die cast box with the lid off.



A coil wound on a 6.5 mm drill shank.

Tune to a beacon signal (see *WIA Call Book* for frequencies). For example, if the nearest beacon is on 50.057 MHz, then tune your Rx to about 17.057 MHz. If the signal is very strong, temporarily weaken it if necessary by connecting a stepped attenuator between antenna and converter input, which is switched for a signal level that just exceeds the internal noise level. Now adjust the input trimmers for what you consider best signal strength at lowest noise across the band of interest.

Troubleshooting

To help in any necessary trouble-shooting, salient voltages are shown on the schematic. Check voltages around the NE602; a badly wrong voltage would be a vital clue. To avoid break-through of 17 MHz short-wave signals, your general coverage receiver must be well shielded (ie of a type which is housed in a metal cabinet).

Parts

The Amidon cores, NE602AN and passive components should be available from Truscotts Electronic World [(03) 9723 3860] and Stewart Electronics [(03) 9543 3733]. Not least, check out the WIA SA Division Equipment Supplies Committee. Obtain a price list by writing to: PO Box 789 Salisbury, SA 5108 and enclose a SASE. The 33.000 MHz crystal oscillator module was purchased from Rod Irving Electronics [(03) 9543 2166] (I derive no special favours from recommending these suppliers).

References and Further Reading

1. *VHF-UHF Manual; Jessop- RSGB.*
2. *The VHF/UHF DX Book; Edited by Ian White, G3SEK – DIR Publishing.*
3. *NE602 Primer; Carr; Elektor Electronics Jan '92.*
4. *Small Signal FET Data Book – Philips.*
5. *"Paddyboard" Circuit Construction; Amateur Radio Feb 1995.*

Parts List

Capacitors	Quantity
20 pF (or 22 pF) trim cap	3
1 nF (1000 pF) monolithic	5
1 nF feed-through	1
100 nF (0.1 µF) monolithic	3
Resistors	
10 ohm 1/4 W	1
Semiconductors	
NE602AN	1
78L05 +5 V chip	1
Miscellaneous	

Die-cast or aluminium box, 33.000 (not 33.333) MHz crystal module, FT50-43 toroidal core, coax connectors to suit, double sided circuit board material for main board and scraps for paddyboards, #20 B&S (0.81 mm) & #22 B&S (0.63 mm) enamelled wire, hook-up wire, screws, nuts, solder, etc.

**45 Gatters Road, Wonga Park VIC 3115*

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WIA Submission to the Department of Communications and the Arts on the Radiocommunications Amendment Bill 1996

CONTENTS

1.0 Introduction

This submission responds to the exposure draft of the *Radiocommunications Amendment Bill 1996*, released by the Minister on 16 August 1996.

The Wireless Institute of Australia, the peak body representing the interests of Australian radio amateurs, seeks amendments to the Radiocommunications Act to provide a more appropriate licensing system for the Amateur Radio Service in Australia.

The submission argues a case that the present licensing systems are unsuited to the Amateur Radio Service in fundamental ways, although radio amateurs are presently licensed under the Apparatus licence system.

The WIA commends consideration of the proposed amendments to be included in the *Radiocommunications Amendment Bill 1996.*

2.0 Executive Summary

2.1 Definition of the Amateur Radio Service

The Amateur Radio Service is a unique radiocommunications service formally recognised and defined by the International Telecommunications Union (ITU). Under Australian law the Amateur Radio Service was originally recognised under the *Wireless Telegraphy Act 1905* and under the succeeding *Radiocommunications Acts 1983* and *1992*.

As defined by the ITU, the Amateur Service is "A *radiocommunication* service for the purpose of self-training, intercommunication and technical investigations carried out by amateurs, that is, by duly authorized persons interested in radio technique solely with a personal aim and without pecuniary interest."

Included is the Amateur-Satellite Service, defined as "A *radiocommunication service* using space stations on earth *satellites* for the same purpose as those of the *amateur service*."

2.2 Qualifications for Radio Amateurs

Article 32 of the International Radio Regulations states that radio amateurs must have operational and technical qualifications.

In Australia, this is given effect under the *Radiocommunications Act 1992*, Section 299 (International Agreements etc) and Part 4 of the Radiocommunications Regulations – *Examinations for Certificates of Proficiency.*

In Australia, as in the rest of the world, radio amateurs are licensed as technically qualified individuals to operate a radiocommunications station in accordance with regulations and conditions set down for the Amateur Radio Service.

2.3 Unique Nature of the Amateur Radio Service

The ITU formally recognises the unique nature of the Amateur Radio Service, which is also reflected in the definition of the Amateur licence type as determined by Australia's SMA.

Radio amateurs have the freedom to operate equipment of their own choosing and/or their own manufacture. They have the ability to move among and

within their allocated frequency bands which extend throughout the spectrum from medium frequencies to the extra high (microwave) frequencies. Amateurs are able to change the technical aspects of their operation according to their individual interest or requirements, within their licence conditions determined under the Act.

The Amateur Radio Service has gained access to spectrum through participation in and representations made at many World Administrative Radio Conferences over the years since their inception, effectively recognising the intrinsic value of the Amateur Radio Service to the world community.

2.4 Proposal for an Amateur Operator Licence

The Wireless Institute of Australia contends that the Amateur Radio Service does not fit into any of the three Australian licensing system models delineated in the Radiocommunications Act: Apparatus Licensing, Spectrum Licensing and Class Licensing.

Apparatus Licensing and Spectrum Licensing have clear commercial purposes being based on economic concepts with licence fee frameworks which reflect these concepts and purposes, while Class Licensing focuses on the licensing of prescribed equipment.

The present licensing system models each has distinct limitations or conflicts in relation to the Amateur Radio Service, its definition and activities.

Because the definition of the Amateur Service, which emphasises the non-pecuniary interest of amateur radio pursuits along with self-training and intercommunication, together with the unique nature of amateur radio activities and the requirement that radio amateurs be licensed as individuals, it is proposed that a fourth licence system be created under Chapter 3 of the *Radiocommunications Act*, to be called the **Amateur Operator Licence**.

This Amateur Operator Licence would recognise the complete flexibility amateur radio operators have in pursuing their activities, within the framework of the allocated amateur frequency bands and applicable licence conditions determined under the *Radiocommunications Act*.

To create the Amateur Operator Licence, it is proposed that provisions be drafted to amend the Act to outline Amateur transmitter/receiver licences, types of licences, licence application procedures, duration of licences, compliance with plans and licence conditions.

In addition, it is proposed that provisions be drafted to amend the Act to outline issuing of licences, renewal of licences and other related conditions to suit the purpose and administration of the **Amateur Operator Licence**, to permit either:

- a once-only licence issue for life to a person meeting the requirements of an Amateur Operator's Certificate of Proficiency,
- or, alternatively, provide for a five-year licence duration, with renewal.

2.5 The Value of the Amateur Radio Service to the Community

In support of this proposal, the WIA contends that the Amateur Radio Service is of demonstrable value to the community in many specific ways, and through these, can be said to return value to the community. For example:

- Education and self-training, providing a skilled resource in the community;
- Motivating young people to take up scientific or technological careers;
- Contribution to the advancement of scientific knowledge;
- Contribution to the development of technology; and
- Providing communications assistance during emergencies and community events.

As it is a practical impossibility to apply the Apparatus Licensing system's Spectrum Access Tax formula to amateur operations, the Amateur Radio Service in Australia would be better served by a licence fee regime (with regard to Chapter 5, Part 5.7 of the Act) that was truly transparent, equitable for all licensees and reflected the value to the community of the Amateur Radio Service.

A purpose of proposed changes to the administration of Amateur licensing is to reduce the administrative requirements of the Amateur Operator Licence, to pave the way for a future reduction in government administrative costs and thus in Amateur licence fees.

3.0 The Amateur Radio Service

The Amateur Radio Service is a unique radiocommunications service formally recognised and defined by the International Telecommunications Union (ITU). Under Australian law the Amateur Radio Service was originally recognised under the *Wireless Telegraphy Act 1905* and under the succeeding *Radiocommunications Acts 1983* and *1992*.

3.1 Definition

The ITU Radio Regulations define the Amateur Service as follows:

> "A *radiocommunication service* for the purpose of self-training, intercommunication and technical investigations carried out by amateurs, that is, by duly authorized persons interested in radio technique solely with a personal aim and without pecuniary interest."
>
> [ITU Radio Regulations, S1.56]

Following the advent of artificial earth satellites in the late 1950s, by December 1961 a satellite designed and constructed by radio amateurs was orbiting the earth, dubbed OSCAR, for Orbital Satellite Carrying Amateur Radio. Some 40 amateur radio satellites have been launched in the intervening 30 years, the latest on August 17, 1996. This development in amateur radio is formally recognised by the ITU and a definition for the

Amateur-Satellite Service has been incorporated in the international Radio Regulations.

"A *radiocommunication service using space stations* on earth satellites for the same purpose as those of the *amateur service*."

[ITU Radio Regulations, S1.57]

Article 32 of the International Radio Regulations states that radio amateurs must have operational and technical qualifications. In Australia, this is given effect under the Radiocommunications Act 1992, Section 299 (International Agreements etc) and Part 4 of the Radiocommunications Regulations – *Examinations for Certificates of Proficiency.*

For the purposes of licensing Australian radio amateurs, the Spectrum Management Agency (SMA) defines the Amateur licence type as:

"A station that:

- is operated for the purposes of self training in, intercommunication and technical investigation into, radiocommunications by individuals who:
  - do so solely with a personal aim; and
  - do not have a pecuniary interest in doing so; and
- is operated on amateur frequencies or frequency bands specified in the licence or in a technical licence specification referred to in the licence; and
- may participate in the Amateur Satellite service."

[*Inquiry Into the Apparatus Licence System – A New Outlook*, SMA, Febniary 1995]

In Australia, as in the rest of the world, **radio amateurs are licensed as technically qualified individuals** to operate a radiocommunications station in accordance with regulations and conditions set down for the Amateur Radio Service.

Radio amateurs pursue their interests in the true meaning of the Latin root of the word amateur, that is, for the love of it.

The ITU formally recognises the unique nature of the Amateur Radio Service, which is also reflected in the definition of the Amateur licence type as determined by Australia's SMA.

3.2 Radio Amateurs' Activities

There are three "foundation stones" to radio amateurs' activities, which are enshrined in the ITU definition of the Amateur Service: self-training, intercommunication and technical investigations.

3.2.1 Self-training

In order to obtain the Amateur Operators Certificate of Proficiency and gain a licence, prospective radio amateurs must sit for a publicly conducted examination, comprising modules of theory, regulations and/or Morse code operation, depending on the licence sub-type desired. The system is illustrated in Appendix LS1, *The Amateur Licensing System*. The Australian amateur licensing system provides for seven licence sub-types, so there are multiple "entry points" to the licensing system to accommodate candidates' interests and level of knowledge. The licence sub-types are as follows:

Unrestricted
Limited
Novice
Intermediate
Novice Limited
Amateur Beacon
Amateur Repeater

The last two sub-types are unattended stations operated by licensed individuals or special interest groups for the benefit of other radio amateurs. These licenses are not obtained by examination.

Candidates for the first five licence sub-types all sit for multiple choice theory and regulations papers, while candidates for the Unrestricted, Intermediate and Novice licences sit for additional practical sending and receiving tests in Morse code. The pass mark in the theory and regulations papers is 70%.

The syllabuses for these examinations is published by the SMA (*Information for Prospective Amateur Operators*, RIB70 Revised, August 1994). The syllabuses cover basic electrical and electronics theory and technology, radiocommunications principles and technology, interference and safety. A level of knowledge is required such that licensees can assemble and operate their stations with sufficient competence such that they can carry on their pursuits and technical experiments or investigations without being a danger to themselves or others, and without causing harmful interference to other spectrum users.

Right from the outset, even before a licence can be obtained, amateur radio necessarily involves self-training. An amateur starting out at a level other than Unrestricted, must undertake further self-training in order to upgrade his or her licence level.

Having obtained a licence, radio amateurs will *learn for themselves*, in a practical way, about the techniques and technologies involved in radiocommunications. They have the comparative freedom and the flexibility to pursue an enormous range of radiocommunication techniques and technologies, ranging from: medium frequency transmission, propagation and reception, through high frequency (shortwave) transmission, propagation and reception, earth satellite communications techniques and digital communications technologies, television transmission and reception to microwave technologies and communications techniques, to name but a few among the vast scope of pursuits conducted.

People who have an interest in technology and gain an understanding of it through self-training are better equipped to adapt to and benefit from an increasingly technological world which is undergoing continuous and rapid change. This is particularly so for young people. The Australian amateur radio community particularly encourages young people's interest in radiocommunications technology.

3.2.2 Intercommunication

The purpose of assembling and operating a radiocommunication station is to make contact with other people having a like interest. Radio amateurs use their radio frequency band allocations, which are spread throughout the spectrum from the medium frequencies (MF) through to the microwave extra high frequencies (EHF), to communicate with one another.

The intercommunication may be by means of the international Morse code, which operates as a "universal language" irrespective of the amateurs' country of origin, culture or language, by voice communication, by the exchange of digital text-data transmissions, or by the exchange of images. The content of the intercommunication may be related to technical issues or it may be personal exchanges between the operators, similar in nature to having a conversation face-to-face with another person. That is, it is normal human interaction.

When radio amateurs become involved in providing communications assistance during emergencies, the intercommunication comprises important messages related to the emergency event.

Radio amateurs come from all walks of life, are found among the ordinary citizens of large cities and rural communities, in prominent businesses and scientific institutions, schools and universities, government authorities, politics, and among the world's royalty.

It is through all the varieties of intercommunication that radio amateurs continue their technical self-training and also learn the pertinent procedures necessary to establish radiocommunication contact in all the spheres available to them.

On the international scale, intercommunication between radio amateurs helps to break down not only barriers of distance, but barriers of understanding about culture and life among other communities around the world. Radio amateurs belong to an international fraternity bound together by their mutual interest in amateur radio activities. International understanding is thus fostered through such personal and cultural exchanges between radio amateurs throughout the world.

3.2.3 Technical investigations.

As outlined above, radio amateurs have the freedom and the flexibility to pursue an enormous range of radiocommunication techniques and technologies within the bounds of the applicable regulations and licence conditions. This freedom to conduct technical investigations is fundamental to many of the contributions Australian radio amateurs have made to the Australian community and indeed, to the Australian economy.

In order to pursue technical investigations and self-training in as many spheres of radiocommunications as possible, the Amateur Service has access to small bands of frequencies spread throughout the radiofrequency spectrum, ranging from the medium frequencies (MF), through the high frequency (HF, or "shortwave") range, right through to the upper microwave extra high frequencies (EHF). A proportion are exclusive to the Amateur Radio Service, but radio amateurs share a considerable amount of spectrum on bands allocated to primary users from other services (eg defence, industrial equipment and broadcasting). On bands where radio amateurs are secondary users, they must avoid interference to and accept the possibility of interference from, the primary users. The availability of such a wide variety of frequency bands throughout the radiofrequency spectrum provides and encourages the flexibility and freedom for radio amateurs to undertake technical investigations of an enormous variety, unfettered by limitations on access to spectrum.

Radio amateurs have gained access to spectrum through participation in and representations made at many World Administrative Radio Conferences over the years, effectively recognising the intrinsic value of the Amateur Radio Service to the world community.

When someone is able to conduct a practical technical investigation for themselves, they gain a better understanding and a deeper knowledge of the subject than by any other means. When that is driven by a strong personal interest, as it is with amateur radio activities, then that understanding is immeasurably strengthened. This principle applies regardless of the technical level of the participant and the investigation.

Knowledge and understanding gained in this way can never be trivialised. Such people become an important community asset. **Where it motivates young people to take up a tertiary course in engineering or science, and/or to enter a career in electronics or telecommunications technologies, or the sciences, then the nation benefits through the addition to our skill resources and economically through their participation in the work force or through their entrepreneurship.**

4.0 Radiocommunications Licensing Systems and the Amateur Radio Service

The *Radio Communications Act 1992* creates three licence systems for the purpose of managing access to, and the use of, the radiofrequency spectrum:

- Apparatus Licensing,
- Class Licensing, and
- Spectrum Licensing.

It is noted that the *Radiocommunications Amendment Bill 1996* does not propose to alter this three-pronged approach.

The Wireless Institute of Australia contends that the Amateur Radio Service does not lit into any of these Australian licensing system models.

4.1 Apparatus Licensing

This was the predominant form of radiocommunications licensing before the enactment of the *Radiocommunications Act 1992*.

The Act, Part 3.3 – APPARATUS LICENCES,

Division 1 – Types of apparatus licences, says, at S.97:

(2) A transmitter licence authorises:

(a) the person specified in the licence as the licensee; and

(b) subject to Division 4, any person authorised by that person under section 114; to operate specified radiocommunications transmitters, or radiocommunications transmitters of a specified kind.

Section 114 concerns authorisation of third party users to operate the equipment in the licensee's absence. In the case of radio amateurs, this is not permitted except to other licensed amateurs.

The Act also provides for transfers of licences between parties, so that equipment may continue to be used under the licence when ownership passes from one party to another, for example.

4.1.1 Commercial Nature

The SMA explains the role and purpose of Apparatus Licensing as follows:

"Apparatus Licensing . . . authorises the operation of radiocommunications equipment for a particular frequency, geographic location and use."

[*Implementing Spectrum Licensing*, SMA Discussion Paper, February 1995]

From this it is clear that this licence system is principally suited to, and intended for, private sector and public sector business operations, as it focuses on equipment and its uses in terms of radiofrequency spectrum locations and geographic locations.

4.1.2 Fees Framework

The fees framework also reflects the commercial nature of the Apparatus Licensing model. This applies, in addition to administrative charges, a Spectrum Access Tax.

"The Tax is derived from a formula that takes account of the licensee's spectrum access, in terms of four parameters:

i. spectrum location;

ii. geographic location;

iii. channel bandwidth; and

iv. area of coverage.

The tax varies according to these parameters: as the demand for the location (geographic and spectrum) increases, the tax increases; and as the amount of spectrum access increases, the tax increases."

[RB 68A, Apparatus Licence Fee Schedule, SMA June 1995]

This formula values 'scarcity' and 'demand', and acts as "a rationing device", according to the SMA. The formula embodies the concept of "spectrum denial". That is, a licence to operate radiocommunications equipment at a particular spectrum location (frequency), having a given channel bandwidth and area of coverage in a given geographic location is said to deny other users the use of the specified frequency and channel in the given area. **The tax formula is thus fundamentally based on commercial, economic concepts.**

However, because radio amateurs operate only in allocated frequency bands available to them nationwide, the issuing of any number of Amateur licences does not increase spectrum denial, it increases spectrum sharing among amateurs, which is what amateurs want. The allocated Amateur frequency bands exist under a concept similar to that of national parks, which exist for the interest and enjoyment of the community. These allocations are made in accordance with the *Australian Radio Frequency Spectrum Plan* and accord with allocations for Amateur frequency bands in ITU Region 3 determined by the ITU.

The fee framework for the Apparatus Licensing system has been severely distorted in the SMA's application of it to Amateur licences. This distortion arises because:

- the amateur radio frequency allocations are spread throughout the spectrum from the medium frequencies (MF) through to the microwave extra high frequencies (EHF);
- a proportion of the bands are "secondary" allocations in which radio amateurs share occupancy with primary users on a non-interference basis;
- radio amateurs have the freedom and flexibility to move around the spectrum, from band to band and within their allocated bands;
- radio amateurs are free to use their band allocations and vary their equipment as they see fit, constrained in technical operation only by the applicable licence conditions determined by the SMA covering specified bands, transmission modes, bandwidths and powers, etc;
- and radio amateurs are spread throughout Australia, in cities, in rural and remote regions, and they have the freedom and flexibility to move their stations from location to location, and to operate mobile stations in land vehicles and boats.

These factors render quite meaningless the application to Amateur licences of the concept of spectrum denial related to geographic location, channel bandwidth and area of coverage in the Spectrum Access Tax formula.

4.1.3 Apparatus Licences an Asset

That Apparatus Licensing is intended for business operations is further strengthened by the fact that the *Radiocommunications Amendments Bill 1996* proposes, on page 13 in Schedule 1 (34), that Apparatus Licences are to be treated as an asset (except for S.102 broadcast services band licences).

This is anathema to the Amateur Radio Service, would appear to breach the definition of the service as set out in Section 3 of this submission, and more

strongly draws the Amateur Radio Service into a commercial licensing system model.

4.1.4 Transfer of Licences

Further, the Act allows for transfer of Apparatus Licences between parties by a simple administrative means. Amateur Radio licences are prohibited from being transferred in this way because the individual radio amateur is licensed according to a qualification held – the Amateur Operators Certificate of Proficiency – not the capabilities of the equipment they own. A radio amateur cannot give or assign their licence to another person to use. Transferring of licences is anathema to the purpose of licensing amateur radio operators. Amateurs exchange transmitting and receiving equipment with each other, but the licence does not go with it.

Clearly this factor in the Apparatus Licensing model has distinct limitations for the Amateur Radio Service. Radio amateurs do not want the ability to transfer licences in the way conferred by the Act. It has chaotic implications for the orderly regulation of the Amateur Radio Service. Simply restricting transfer of Amateur licences by means of an administrative determination does not resolve the basic dilemma.

4.1.5 Summary

The actual model for amateur radio operations is distinctly at variance with the core precepts of the Apparatus Licensing system which are of a commercial nature.

The Amateur Radio Service, by reason of its non-pecuniary nature, does not lit into the Apparatus Licensing system as presently constituted, and even less so as it is proposed to be constituted following passage of the proposed amendments.

4.2 Class Licensing

Introduced with the new Act in 1992, the SMA defines Class Licensing as follows:

> "A class license authorises any person to operate radiocommunications devices of specified kinds and/or for a specified purpose, provided the operation is in accordance with the conditions of the licence. They are used where individual frequency assignments are not required.
>
> "The SMA does not issue class licences to individual users."
>
> [*Inquiry into the Apparatus Licence System*, SMA Discussion Paper, December 1993]

4.2.1 Equipment

Radio amateurs require the freedom to operate equipment of their own choosing and/or their own manufacture. The establishment and operation of amateur beacons and repeaters, which have their own licence sub-type, necessitate individual frequency assignments.

4.2.2 Individual Licences

Radio amateurs require individual licences. This is a fundamental consequence of the ITU definition of the Amateur Radio Service. Australian radio amateurs would likely not be recognised by the members of the International Amateur Radio Union if the Amateur Radio Service in Australia operated under a Class Licence and Australian radio amateurs did not have individual licences.

4.2.3 Summary

Having regard for the requirements of the Amateur Radio Service, and noting the above definition, it is quite clear that Class Licensing is not a suitable licensing system for the Amateur Radio Service.

4.3 Spectrum Licensing

The SMA defines Spectrum Licensing as follows:

> "A spectrum licence authorises the licensee to operate radiocommunications equipment within core conditions (frequency and geographic boundaries, and emission limits beyond those boundaries), subject to certain other conditions. A spectrum licensee can vary the use and technical operating arrangements within the emission limits, and assign the licence in whole or in part to a third party through trading or subleasing. Spectrum licences may be issued only in spectrum bands designated by the Minister."
>
> [*Inquiry into the Apparatus Licence System*, SMA Discussion Paper, December 1993]

4.3.1 Flexibility

A Spectrum Licence confers considerable flexibility of operation on the licence holder.

> "Spectrum licensing, instead of focusing on equipment and its uses (which in turn defines the area covered and the frequency bandwidth used), authorises the use of spectrum within specified limits of frequency bandwidth and coverage area. Under spectrum licensing, licensees will have the flexibility to change their equipment, antenna, siting, in fact any aspect of their use of spectrum, provided they comply with the core technical conditions of their licence, and any coordination requirements."
>
> [*Implementing Spectrum Licensing*, SMA Discussion Paper, February 1995]

This sounds like almost an ideal prescription for amateur radio operations, because it allows the flexibility required by the Amateur Radio Service, but the difficulty arises as to who would be the licensee. Would there be one licensee, who would then have responsibility to regulate operations within the allocated spectrum, or would all Australian radio amateurs hold the spectrum licence jointly and severally?

Radio amateurs require individual licences. As noted previously, this is a fundamental consequence of the ITU definition of the Amateur Radio Service.

4.3.2 Primary/Secondary Conflict

A number of Amateur frequency bands are allocated on a primary-use basis and others are shared by radio amateurs with primary users from other radiocommunications services (eg defence, broadcasting).

If radio amateurs were Spectrum Licensed, this mixed primary/secondary status could create a technical conflict of usage and rights where frequency bands are shared with other services, as well as administrative difficulties in the resolution of occupancy and interference.

4.3.3 Commercial Purpose

The clear primary purpose of Spectrum Licensing is the ability to assign, trade or sublease the licensed spectrum, in whole or in part, granting rights analogous to property rights in the radiofrequency spectrum.

> "A spectrum licence provides the licensee something like a property right, where the licensee can trade and subdivide the spectrum to other users."
>
> [Speech to the *Wireless Technology Forum*, Sydney, 15 February 1996, by the Spectrum Manager, Christine Goode]

For similar reasons advanced in regard to transfer or trading of Apparatus licences, this aspect of the Spectrum Licensing model conflicts with the requirements of the Amateur Radio Service.

Likewise, restricting spectrum licence assignment for the purpose of Amateur licensing by means of an administrative determination would not resolve the basic dilemma.

Spectrum Licensing has a clear commercial purpose, particularly borne out by the fact that Spectrum Licences for bands of frequencies designated for Spectrum Licensing will be sold by the SMA by auction, tender or offer.

The Government's policy framework relating to charges to be levied for Spectrum Licences provides that:

> "new spectrum licences will generally be allocated by a price-based allocation system which recovers the scarcity value of the spectrum;
>
> • all spectrum licensees will also be required to pay a separate annual fee related to the costs of administration of spectrum management; and
>
> • the SMA will be able to reserve spectrum licences for direct sale to public and community service providers, in some cases at concessional rates."
>
> [*Implementing Spectrum Licensing*, SMA Discussion Paper, February 1995]

Clearly, Spectrum Licensing is a framework for "spectrum for sale" in a like manner to real estate.

4.3.4 Uncertainty of Renewal

A Spectrum Licence is more akin to a leasehold rather than a freehold property title, because it has a limited tenure without presumption of renewal.

> "The Act provides that a spectrum licence may be issued for a period of up to 10 years, but there will be no automatic right for a person to be issued a second spectrum licence after the expiration of their first."
>
> [*Implementing Spectrum Licensing*, SMA Discussion Paper, February 1995]

The Act provides a mechanism for renewal, but with a "public interest" test.

> "The Act provides that the SMA may re-issue a spectrum licence to the original licensee without following the re-allocation procedures which would normally apply if that would be in the public interest.
>
> "The "public interest" in this case is able to be determined by the Minister, but any determination by the Minister is a disallowable instrument, able to be disallowed by either the House of Representatives or the Senate during the 15 sitting days after tabling.
>
> "The SMA expects that only very few situations will actually meet public interest criteria, for example, volunteer community or public services."
>
> [*Implementing Spectrum Licensing*, SMA Discussion Paper, February 1995]

Clearly, this mechanism has a deal of uncertainty associated with it.

Radio amateurs want the certainty of continued access to their allocated spectrum and the renewal of their licences from period to period, so this aspect of the Spectrum Licensing system is anathema to radio amateurs.

4.3.5 Summary

It is clear the role of Spectrum Licensing and the requirements of the Amateur Radio Service, while having some congruence, have fundamental differences and Spectrum Licensing is not a suitable system for the Amateur Radio Service.

5.0 Towards a New Amateur Radio Licensing System

5.1 Amateur Radio Activities and the Licensing Systems

Amateurs *operate* radiocommunications stations comprising equipment which may:

- be designed and constructed by themselves;
- be assembled from units of commercially manufactured equipment originally designed for civilian, government or military applications, and adapted or modified for amateur radio pursuits;
- be assembled from commercially manufactured equipment designed for the world amateur radio market; or
- comprise a variety of combinations and permutations of the above.

Radio amateurs operate their stations on bands allocated under the Australian Radiofrequency Spectrum Plan (published by the SMA). These bands range from the medium frequencies (MF) through to the microwave extra high frequencies (EHF). Radio amateurs operate within the specified limits of these bands and are only constrained in technical operation by

the applicable licence conditions covering specified bands, transmission modes, bandwidths and powers, etc. Radio amateurs have total flexibility to change their equipment, transmission modes, location and antennas, provided they comply with the core technical conditions of their licence, and any coordination requirements. This flexibility is essential to maintaining technical experimentation as one of the core activities and attractions of amateur radio.

By the very nature of radio amateurs' activities, the equipment used changes as the interests, pursuits and goals of the individual amateur change.

Among all the defined radiocommunications services, amateur station operation is unique.

5.1.1 Limitations of Present Licensing Systems

As has been demonstrated earlier, Apparatus Licensing is a poor licensing model for amateur radio activities because it is prescriptive, as it

> "authorises the operation of radiocommunications equipment for a particular frequency, geographic location and use."
>
> [*Implementing Spectrum Licensing*, SMA Discussion Paper, February 1995]

Apparatus Licensing is particularly suited to, and widely used by, private and public sector services as it is fundamentally based on commercial, economic concepts.

Likewise, it has been demonstrated that **Class Licensing** is not suitable for general licensing of amateur radio operators as it authorises the operation of

> "... radiocommunications devices of specified kinds and/or for a specified purpose ... The SMA does not issue class licences to individual users."
>
> [*Inquiry into the Apparatus Licence System*, SMA Discussion Paper, December 1993]

Similarly, **Spectrum Licensing** has limitations for general licensing of radio amateurs, as many amateur radio frequency bands are shared with primary users, while radio amateurs have primary occupancy on many other bands. In addition, the 10-year tenure of a Spectrum Licence, without presumption of renewal, does not suit the reason-for-being and activities of the Amateur Radio Service.

Radio amateurs have always been licensed as technically qualified individuals and by the very nature of their activities, require individual licences.

5.2 The Present Amateur Licensing System

Amateur radio operators are presently licensed under the Apparatus Licensing system. The licence type is categorised as **Amateur**, under which there are seven sub-types, as follows:

Unrestricted
Limited
Novice
Intermediate
Novice Limited
Amateur Beacon
Amateur Repeater

The last two sub-types are unattended stations operated by licensed individuals or special interest groups for the benefit of other radio amateurs.

A person wishing to gain an amateur radio licence has to sit for a publicly conducted examination, comprising modules of theory, regulations and/or Morse code operation, depending on the licence sub-type desired. The system is illustrated in Appendix LS1, *The Amateur Licensing System*. Candidates sit for multiple choice theory and regulations papers, and for practical sending and receiving tests in Morse code. The pass mark in the theory and regulations papers is 70%.

The amateur radio community's peak body, the Wireless Institute of Australia (WIA), has conducted the nationwide amateur examination service on behalf of the Spectrum Management Agency (SMA), operating under a Memorandum of Agreement, since 1992 when the SMA devolved the examination routine to the WIA. This service is formally known as the *WIA Exam Service*. Accredited invigilators supervise candidates sitting for the amateur licence examinations. The WIA has drafted examination syllabuses and questions banks and negotiated approval with the SMA. So, all the routine aspects of administering the amateur exam system are conducted by the WIA.

Upon receiving notification of the necessary pass mark in the required examination modules, a candidate applies to the Spectrum Management Agency for them to issue the necessary Certificate of Proficiency. This Certificate is issued to the individual and is unique to that person, just as is a Higher School Certificate. The SMA assigns the candidate a Customer Number. Again, this is unique to the individual.

Upon receipt of an Amateur Certificate of Proficiency, the candidate applies for a licence and call sign. The licence is renewable at annual or 5-yearly intervals. A radio amateur's Certificate of Proficiency is held for life (even if their licence lapses through non-renewal, is relinquished, is suspended or revoked by the SMA), but a call sign may be taken up and relinquished or changed as the licensee sees fit.

5.3 Amateur Licence Fees

Amateur licence fees are currently determined under the general Apparatus Licence fee framework which is shown in Section 4 of this submission to be based on commercial, economic concepts.

Radio amateurs operate in defined frequency bands and have the flexibility to, at will, use transmissions of differing bandwidth, transmit on different frequencies within their assigned bands (many of which are shared with other primary users or shared internationally), and to change their location. **Hence, it is a practical impossibility to apply the Apparatus Licensing system's Spectrum Access Tax formula to amateur operations.**

In the case of radio amateurs, their licence fees are paid out of private income, and are recurrent expenditure. As a consequence of the ITU definition of the Amateur Service, radio amateurs cannot have a pecuniary interest in their pursuits and thus licence fees must be paid from their private income. From WIA membership statistics, it is estimated that between one-fifth and one-quarter of Australia's radio amateurs are either students, retirees or pensioners, on restricted incomes. The WIA scale of membership fees reflects this fact, with reduced payments available to members in these circumstances. But it must be acknowledged that radio amateurs who are students or pensioners also make their collective contribution in being of value to the community.

The Amateur Radio Service in Australia would be better served by a licence fee regime (with regard to Chapter 5, Part 5.7 of the Act) that was truly transparent, equitable for all licensees and reflected the value to the community of the Amateur Radio Service.

The issue of minimising the cost of administration of Amateur licensing and thus licence fees is to be taken up in a separate submission to the Minister for Communications and the Arts.

5.4 Proposal for a New Licence

It has been shown that the Amateur Radio Service in Australia does not fit into the present three licensing systems under the Radiocommunications Act.

5.4.1 An Amateur Operator Licence System

Owing to the definition of the Amateur Service, which emphasises the non-pecuniary interest of amateur pursuits along with self-training and intercommunication, together with the unique nature of amateur radio activities and the requirement that radio amateurs be licensed as individuals, it is proposed that a fourth licence system be created under Chapter 3 of the *Radiocommunications Act*, to be called the **Amateur Operator Licence**.

This Amateur Operator Licence would recognise the complete flexibility amateur radio operators have in pursuing their activities, within the framework of the allocated amateur frequency bands and applicable licence conditions determined under the *Radiocommunications Act*. The present seven licence sub-types would be retained.

5.4.2 Provisions and Conditions

It is proposed that provisions similar to Sections 97 (transmitter and receiver licences), 98 (types of licence), 99 (applications for licence), 103 (duration of licences), 104 (compliance with plans), 107 (licence conditions), and 108 (additional conditions for transmitter licences) of the Act would be drafted to apply to the **Amateur Operator Licence**.

5.4.3. Administrative Provisions

It is also proposed that provisions such as those in Sections 100 (issuing licences), 129 (application for renewal), 130 (renewing licences) and 131 (other provisions) of the Act be modified and included to suit the purpose and administration of the **Amateur Operator Licence**, to permit either:

- a once-only licence issue for life to a person meeting the requirements of an Amateur Operator's Certificate of Proficiency,
- or, alternatively, provide for a five-year licence duration, with renewal.

The purpose of this would be to reduce the administrative requirements associated with the Amateur Operator Licence, to pave the way for a future reduction in government administrative costs and thus in Amateur licence fees.

Appendix 1 – The Wireless Institute of Australia

Appendix 2 – The Value of the Amateur Radio Service to the Community

Appendix LS1 – The Amateur Licensing System

• All extracted from the WIA Submission exposure draft.

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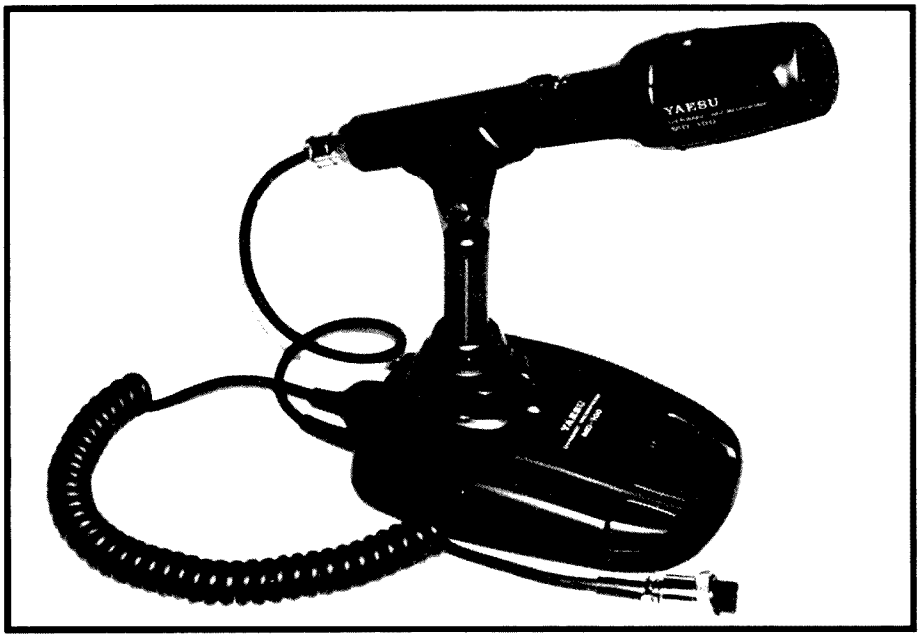
■ Equipment Review

Yaesu MD-100A8X Desk Microphone

*Reviewed by Ron Fisher VK3OM**



Yaesu MD-100A8X microphone.

When I wrote the review of the FT-1000MP I mentioned that I would like to look at the matching Yaesu desk microphone, the MD-100A8X. I guess that Chris Ayres, Dick Smith's amateur radio guru, must read our reviews because a few weeks later an MD-100A8X arrived at the Federal office along with another FT-1000MP to try it out on. No doubt about it, an equipment reviewer's life is never dull.

Just in case you haven't seen one of these very elegant microphones, let me tell you all about it. Firstly, it is a brand new design quite different from the older Yaesu desk microphones. It is now very smooth and rounded and not as heavy looking as some of the previous models. According to the advertising material, and also the operation sheet that comes with the microphone, it is described as having "a heavy diecast base and a high impact plastic mic housing".

The last point is right, but the first is wrong. The base is not diecast at all, but plastic. The "heavy" part comes from a collection of steel bars glued to the bottom plate. I wonder if any MD-100A8X were ever made with diecast bases or perhaps Yaesu just assumed they were when the delivery came from the Japanese Microphone Company. I assume that Yaesu don't actually manufacture their own microphones. I might be wrong.

In actual fact, diecast or not, the whole thing is very well made and I cannot see that it is in any way inferior for having a plastic base. But Yaesu do need to put their advertising right. *(Stop Press! Yaesu have been advised by Dick Smith Electronics and will amend the instruction sheet. Ed)*

MD-100A8X Features and Facilities

The microphone element is a 500 ohm dynamic mounted to give a cardioid response. That is, it has a pronounced front to back ratio in its sound pick-up pattern. This means that it will not respond to noise from the back and sides and results in a much cleaner overall sound compared to a non-directional microphone.

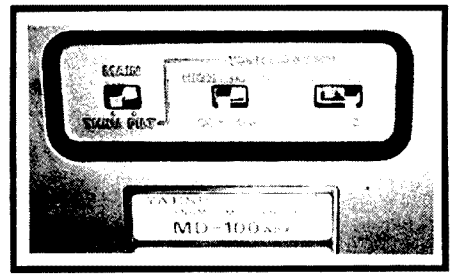
However, the interesting part is the electronics that are built into the base. Here are circuits that provide two positions of bass cut and one position of high boost. Yaesu don't tell us how this is done, and there is no circuit diagram supplied. The whole thing is built on to a shielded circuit board which would require quite a bit of unsoldering to get to. I drew a line at this point.

The bass cut and high boost are controlled with three miniature switches set into the underneath of the base (see photograph). The push-to-talk bar is set right at the front of the base with a PTT lock button on the left hand side. The scanning control is unusual in that it is spring loaded, holding it in the centre position, with a slight pressure needed to produce either up or down scanning. More pressure brings in fast scanning, but note that this control is not (unfortunately) a duplicate of the shuttle-jog tuning of the FT-1000MP.

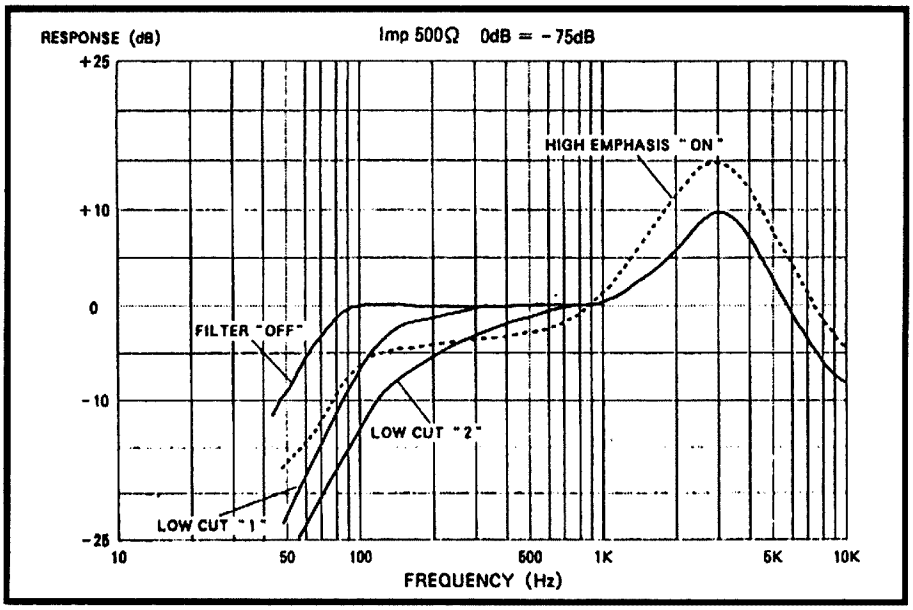
The base of the MD-100A8X is connected to the microphone with a short lead terminating in a standard eight pin metal line socket that mates with the microphone. On the rear of the base are two output connectors. The first is a metal eight pin plug, the second a modular eight pin plastic socket. Our review microphone was not supplied with the standard connecting lead to go to the transceiver so the lead for the MH-31 hand mic was unplugged from the microphone body and the modular plug connected to the socket on the base of the MD-100A8X.

Performance

On-air reports were very favourable with the high boost switched out, but most thought it sounded too sharp with



Bass cut and high boost controls under the base of the microphone.



Frequency response curves of the MD-100A8X microphone.

the boost in. I have included the response curve as supplied with the microphone, which shows that, even in the normal position, there is quite a bit of high frequency boost. Perhaps the extra high frequency output might be useful under very poor conditions.

The two bass cut positions did not affect the quality to any great extent. The first bass cut position produced no audible effect at all while the second gave a just noticeable reduction in the low end.

Well, on-air tests are interesting, but you have to rely on what other people think, so I decided to make up some adaptors to connect the MD-100A8X to a good quality tape recorder and see just what it sounded like. While on the job, I also decided to check out a variety of other microphones as a comparison. The results were, to say the least, very interesting.

Firstly, on air reports indicated that the MD-100A8X on the FT-1000MP and my usual station set-up of a Shure 444 and a TS-940S sounded very similar. However, listening to the two microphones on tape, they were totally different. In fact, the Shure 444 was without doubt the worst sounding microphone of all tested. It sounded very peaky and far too sharp.

The MD-100A8X, on the other hand, had a very clean transparent sound with excellent highs and well balanced bass response. I checked out several hand microphones, including the MH-31 as supplied with the FT-900 and FT-1000MP. Most of these produced a boxy sound that was absent with all the desk microphones. In fact, there was far less difference between sound quality of the hand microphones than the desk mics with the exception of the Shure 444. Some of the other microphones tested were the Kenwood MC-50, MC-60, MC-42, MC-35 and the MC-10, a very old hand microphone with much better than average quality.

MD-100A8X Conclusion

If you would like to improve your transmitted audio quality, then a desk microphone is the right way to go. The MD-100A8X produces superb audio from the FT-1000MP.

However, beware! Good audio from a good microphone is the beginning. But you also need a transmitter which is capable of producing good distortion-free quality with the response from the filter properly set-up. There are many transmitters out there that don't meet the above requirements.

At a list price of $229 the MD-100A8X is not cheap, but it will produce quality you can be proud of. Thanks to Dick Smith Electronics for the loan of the MD-100A8X and the FT-1000MP to go with it.

24 Sugarloaf Road, Beaconsfield Upper VIC 3808

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Technical Abstracts

*Gil Sones VK3AUI**

VFO Stabiliser Circuit

A VFO stabiliser known as the "Huff and Puff Stabiliser" has been described in RSGB publications over many years. It is the brainchild of Klaas Spaagaren PA0KSB and originally appeared in Pat Hawker's *Technical Topics* column in *RadCom* in 1973. The circuit enables a VFO to be locked to a comb generated from a crystal oscillator with the result that the oscillator can be locked every few Hertz. This enables a good VFO to be stabilised with a stability approaching a PLL. A block diagram of the basic system is shown in Fig 1.

In the February 1996 issue of *QEX*, Klaas Spaagaren PA0KSB published an improved version of the technique. This also appeared in *RadCom* in July 1996 in Pat Hawker's *Technical Topics* column. The improved circuit uses a different arrangement with a higher frequency crystal oscillator. The basic arrangement is shown in Fig 2. The output of the digital mixer and a clock signal are applied to a sample and hold circuit to either increase or decrease the voltage applied to a varicap in the VFO. The circuit will lock at approximately every 10 Hz. The switch S3 is used to centre the circuit if required. The VFO is tuned normally and will then lock to the nearest 10 Hz point. The full circuit is given in Fig 3.

The VFO signal input to the circuit is approximately 4 V p-p. The varicap in the oscillator circuit should provide a variation of 1 kHz/V to cope with expected drift. A detailed explanation of the circuit is given in *QEX* together with information to adapt the technique to other frequencies.

QEX can be obtained on subscription from the ARRL or single copies are available at Daycom Communications Pty Ltd.

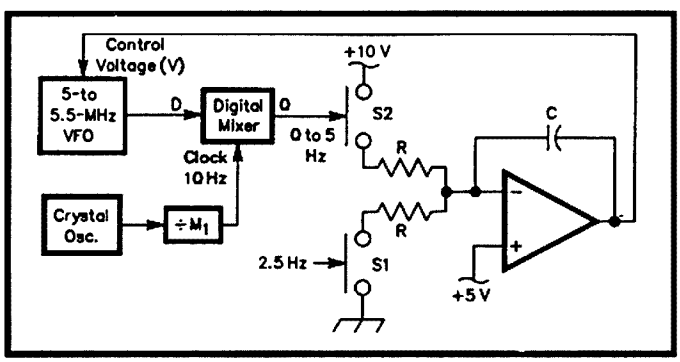

Fig 1 – Block diagram of basic Huff and Puff Stabiliser.

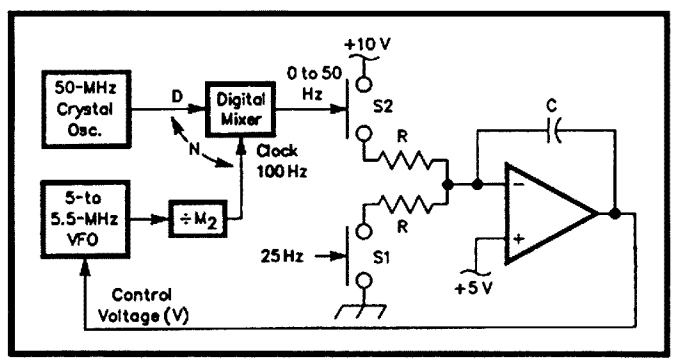

Fig 2 – Block diagram of improved Huff and Puff Stabiliser.

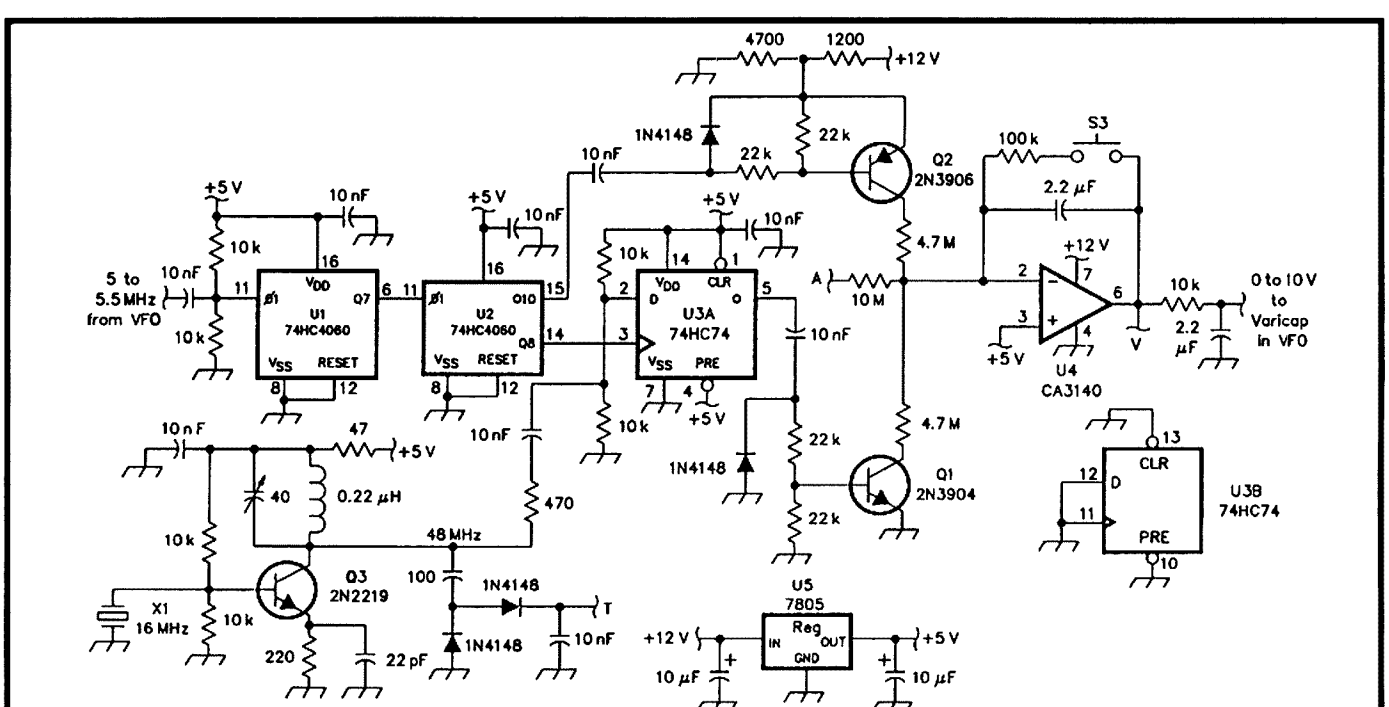

Fig 3 – Circuit of improved VFO stabiliser circuit.

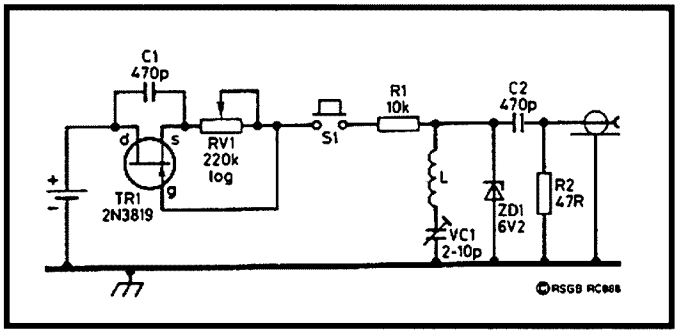

Fig 4 – Noise generator.

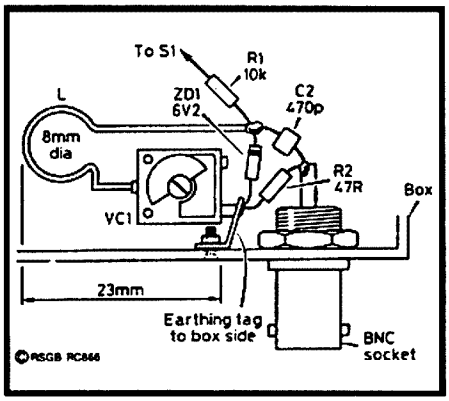

Fig 5 – Layout of tuned circuit and components.

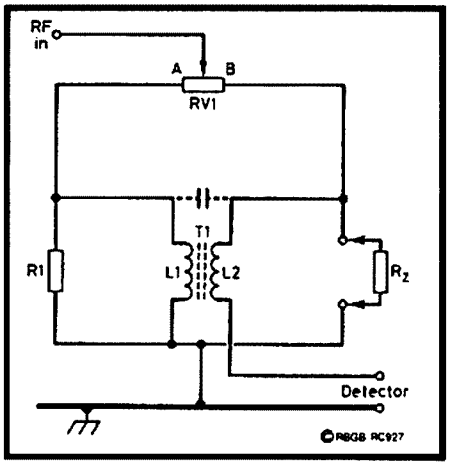

Fig 6 – Bridge circuit.

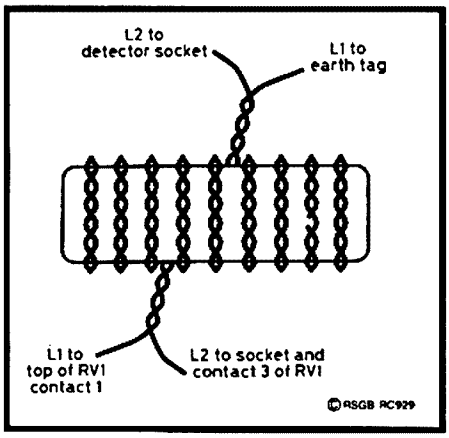

Fig 7 – Winding of ferrite transformer.

Noise Generator

A useful noise generator was described in *RadCom* for February 1996 by Sven F Weber G8ACC. The noise generator is powered by one of the small alkaline 12 volt batteries used in remote controls and other appliances. The output was sufficient for a variety of uses up to the 432 MHz band. It can be used for receiver alignment as well as to compare receiver sensitivity, and has enough output to drive an impedance bridge.

The circuit of the noise generator is shown in Fig 4. The FET is used as a current source and the noise is provided by the current through the Zener diode. The inductor and capacitor provide compensation on 432 MHz and the capacitor is used to peak output at 432 MHz. The potentiometer varies the current and hence the noise output. The layout of components is shown in Fig 5. A small metal box should be used for construction.

RF Impedance Bridge

A simple RF Impedance Bridge companion to the noise generator was described in *RadCom* for March 1996 by Sven F Weber G8ACC. It uses a 100 Ohm Cermet potentiometer as the variable element and a transformer which is bifilar wound on a small ferrite toroidal core.

The circuit of the bridge is shown in Fig 6. The winding of the ferrite transformer is shown in Fig 7. The resistor R1 is a 100 ohm metal film resistor. The ferrite core is a T37-12 ferrite core of 10 mm OD and is 4 mm wide. The winding is 10 turns of a closely twisted pair of 26 or 28 SWG enamelled wire. The core is supported by the short wire leads going to the sockets. The layout of the bridge in a small box is shown in Fig 8.

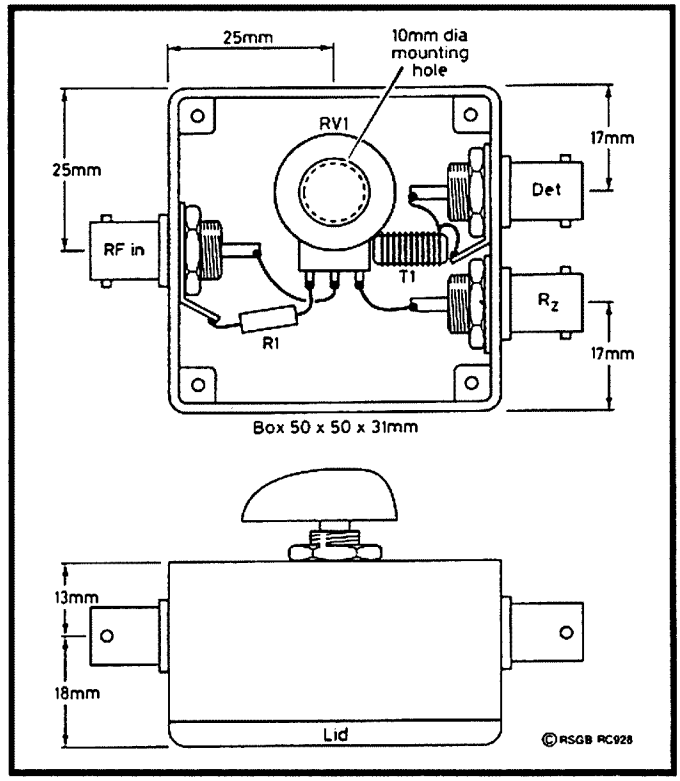

Fig 8 – Layout of bridge in small box.

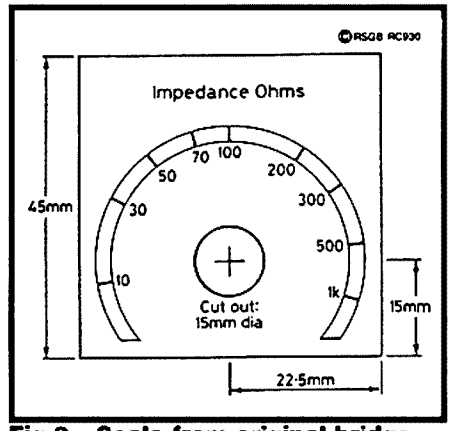

Fig 9 – Scale from original bridge.

The bridge can be calibrated by using a series of small standard value resistors to give calibration points. The scale obtained with the original is shown in Fig 9. Operation up to 30 MHz is fairly easy and, with care, operation into the VHF region is possible. A carbon linear pot would work up to 30 MHz.

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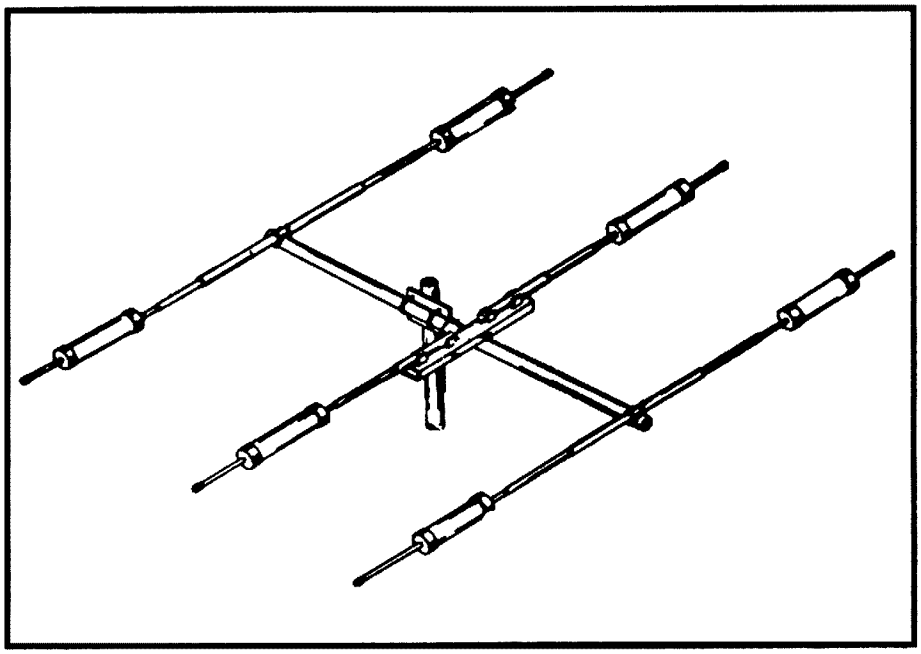
■ Antennas

Random Radiators

*with Ron Cook VK3AFW and Ron Fisher VK3OM**



The Mosley TA-33 as used by Jim Andrews VK2BO.

Triband Trap Beams Again

After our discussion on triband trap beams several months ago, we were surprised that it brought very little reaction. In fact, there was no defence of the performance of these beams at all; that is, until now.

A letter from Jim Andrews VK2BO puts the other side. I hope it might inspire others to tell us of their experiences with these antennas good or bad. So over to Jim to tell his story. *"Each year after the Remembrance Day contest when I have worked you a couple of times, I decide I will drop you a note and disagree with one of your themes in* Random Radiators. *Recently you mentioned once again your doubts on trapped beams, particularly the triband Yagi type. I have been using a Mosley three element tribander which first went up in 1962. While it has had three lots of cable replaced, it has never been taken down for servicing, my motto being "let sleeping dogs lie".*

Also, I do a lot of QRP work using a Heathkit HW-7 with two watts output. This has given me 80 countries on 20 metres using the Mosley tribander.

After your original comments, I put up a dipole running north-east by south-west, which would favour Europe on both short and long path. At this time I was working into Europe each evening short path running two watts into the beam. I called DL1SV on the beam and received 559. Then I called him on the dipole and he couldn't copy me. He got me again when I went back to the beam.

I tried this test with several European stations on both long and short path and could never raise them on the dipole. When using the higher power of 15 watts from an FT-7, I could get into Europe but with signals down 4 to 5 "S" points compared to the beam.

Doubts about the efficiency of the dipole? Well, it was running at about 35 feet using a current balun. I always use current baluns which I find superior to commercial voltage types. The SWR was flat at 14.050 MHz and it worked quite well on high power

Later, I put up my old 20 metre ground plane antenna. The base was 20 feet above ground with four sloping radials which also served as guy wires. This antenna had been used very effectively before I installed the triband beam. The dipole was taken down and that co-ax feed (RG8U) was used. The length of the radials and radiator were adjusted to give a 1:1 SWR at 14.100 MHz. The SWR was checked by adding a seven foot length of RG8 to make sure that it was not the length of the feed line that was producing the 1:1 SWR.

This ground plane was quite good into the USA, Canada and Japan, and also seemed to be as good into Europe as the dipole. However, I could not check one against the other because only one feed line was available. I could not raise Ws and VEs using the ground plane and two watts, but could if I used the beam. With high power, the ground plane was OK into the USA but down by about three "S" points compared to the beam.

So, from observation only, I find the beam works much better than either the ground plane or the dipole when using QRP. During the RD contest I found the beam very good on 20 and 10 metres but I know on 15 metres it doesn't get near the makers specs".

Thanks Jim for your thoughts on beams. Perhaps some trap beams are better than others. We hope other readers might have a say on the subject.

Open Wire Feed Lines

We are asked from time to time where open wire feeder cable can be obtained. Well, there is open wire feeder cable available on the market.

We know that Daycom Communications Pty Ltd in Melbourne sell 400 ohm cable which looks like over grown 300 ohm TV feeder. I (one of the Rons) have never used it, so I can't comment on its performance. There is quite a lot of plastic between the wires so it might detune when wet.

One of us uses the old 300 ohm open wire TV feeder which was sold by Hills Industries for fringe area reception. Unfortunately, it hasn't been available for years. I believe it was made in Taiwan and imported into Australia.

Perhaps it's still being made. If so, there is a market out there waiting.

However, there is an alternative. Make your own! A letter from Maurie Phillips VK5ZU describes how he goes about it. It might be worth a try. Over to Maurie. *"From time to time I hear discussion on air regarding sources of supply or methods of construction of open wire feed lines. I build my own using the following materials. For spreaders I use 1/4 inch black nylon tube as used for domestic irrigation systems. They are known as rigid risers and are available at K Mart and most hardware stores.*

The conductors I use are 40/.0076" black PVC insulated flexible conductor as used for 10 amp rated 240 volt circuits. As an alternative, you could use 23/.0076" as used for 5 A rating on 240 volt circuits. I purchased mine in pre-metric days as single core on a 100 yard reel.

An alternative would be to purchase two core figure-eight household flexible and split it. Black PVC covering is preferred to give some resistance to deterioration from ultraviolet radiation.

Construction

Cut the spreaders to the desired length. This will generally only be critical if the feed-line impedance is required to match the antenna impedance. A good choice would be about 4 to 5 cm spacing. Using a heated steel nail make shallow slots at opposite ends of the spreaders ensuring that they are parallel to each other. Then drill holes about 5 mm in from the slots to hold your tie wires. The spreaders are spaced at about one metre intervals".

Thanks for your ideas Maurie. If you are building a G5RV this might be the answer for a low loss feeder. You could even try different feeder spacing to achieve a better match. Of course, one of the Rons doesn't like G5RV antennas unless the open wire feeder goes right into a balanced ATU such as a Z match. But that's another story. So for now, it's goodbye from me and goodbye from him.

The two Rons

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■ Propagation

The Maunder Minimum

Paul Clutter VK2SPC has been studying the history of sunspots.*

How would you like to have about 100 years of continuous exceptional DX capabilities on all bands? Well, that was the case during the 12th and early 13th centuries AD but, unfortunately, there was no radio to take advantage of it. However, there have been periods of high solar activity lasting for over 17 years.

On the down side, there have been short periods of 7.3 years and, worst of all, evidence from various sources shows that there have been long periods with a lack of any solar activity at all.

The first sunspot cycle to be recorded began in 1775 and is referred to as cycle one. Cycle 23 will be high just after the year 2000. One of the highest number of sunspots (201) was counted in 1957.

The most recent long term minimum is a seventy year period beginning about 1645 AD. This period has been named the "Maunder Minimum" after E W Maunder who was the Superintendent of the Solar Department of Greenwich Observatory in the late 1800s. During those seventy years, there appears to have been little or no solar activity at all. This period is also known as the "Little Ice Age" in Europe, but it has not been established if this was caused by low sunspots.

Another long period apparently began about 1460 AD and extended about ninety years. Analysis of the carbon 14 isotope in tree rings is used to record solar activity going back beyond the few hundred years available by sunspot numbers. The carbon 14 isotope is formed continuously in the atmosphere by the action of cosmic rays and the level of cosmic rays entering the atmosphere is modulated by solar activity. When the sun is quiet, the carbon content rises, and is lower in times of high solar activity. The carbon 14 is assimilated by the trees along with carbon dioxide and shows up in the annual growth rings.

On the other hand, carbon 14 data indicates a long period of exceptionally high solar activity in the 12th and early 13th centuries AD.

Carbon dating, developed just after WW2 by Willard F Libby and co-workers, can go back 70,000 years. Substances with carbon 14 are wood, charcoal, marine and freshwater shell, bone and antler, peat and organic bearing sediments, carbonate deposits, dissolved CO_2 and carbonates in ocean, lake and ground water sources.

From this information, we can conclude the eleven year cycle may not be a regular feature in the "pulsing" life of the sun.

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WIA News

Overseas Visiting Amateurs Can Pay Lower Licence Fee

Following representations to the Spectrum Management Agency at the WIA-SMA meeting in November last year concerning the SMA charging the full $51 for reciprocal licences for amateurs visiting from overseas, even if they stayed only a few weeks, the SMA has advised that they have a minimum licence charge of $24 which would apply in such circumstances.

This would allow, on a pro rata basis, a visiting amateur to use a reciprocal licence for a maximum period of 105 days, or about three and a half months. The $24 minimum fee applies even if the reciprocal licence is only required for a few days or weeks, the SMA said.

■ Antennas

Horizontal Antennas Above Real Ground

Ralph Holland VK1BRH explores the relationship between antennas and ground.*

Introduction

Antennas are influenced by the effect of the ground and by the type of conductors from which they are constructed. The feedpoint impedance is the summation of the radiator's self impedance, the mutual impedance of its image in the ground, and the loss resistance. The loss resistance is the summation of the RF resistance in the conductor, and the resistance introduced by consumption of power in ground losses and other media close to the antenna. The conductor's resistance is modified by the skin-effect which causes the current to only flow in the outer parts, or skin, of the conductor. The effect causes the resulting resistance to increase in proportion to the square root of the frequency (see Tables 1 and 2).

Horizontal antennas are subjected to the influence of a broadside image in the ground. The antenna and its image are in anti-phase, so radiation tends to be cancelled at low angles and the radiation resistance is lowered because the mutual impedance of the image is subtracted from the self-impedance of the driven element.

Modelling to quantify the effects of locating antennas above real ground I have, once again, resorted to computer modelling using NEC-2 (Ref 1). All simulation results have been performed with 1.22 mm diameter wire (SWG#18) and the assumption of loss-less conductors.

The simulation results are displayed graphically so you can determine the trends and evaluate your own antennas. The soil parameters for each simulation are enclosed in square brackets. For example, [13,5] represents ground with a relative dielectric constant of 13 and conductivity of 5 milli-Siemens/m (2S = 1/2 ohm, while 4S = 1/4 ohm). The selected values are: [5,1] for poor soil, [13,5] for average clay soil, [20,30.3] for good soil and [80,5000] for sea water, which is very close to perfect. Table 1 and Table 2 are included so you can evaluate conductor resistance losses due to the skin effect (Ref 2).

Results

Fig 1 shows the effects of various types of grounds on a 1.825 MHz horizontal 0.5 wave dipole between 0.01 and 0.25 wavelengths above the ground. Note how, over poorer soils, the feedpoint impedance is dramatically higher than the resistance for perfect ground. Also, notice how the feedpoint resistance for a horizontal antenna becomes very low as the antenna

			Ohm / Lambda							
B&S AWG	dia mm	Dc. mOhm/m	1.825 MHz	3.5 MHz	7.0 MHz	10.1 MHz	14.2 MHz	18.1 MHz	21.2 MHz	29.0 MHz
36	0.13	1356.4	329.59	195.37	114.92	89.43	71.08	60.62	54.77	44.84
34	0.16	841.0	223.82	135.88	82.17	64.82	52.16	44.84	40.72	33.64
32	0.20	536.5	158.03	98.24	60.95	48.64	39.54	34.21	31.19	25.94
30	0.25	337.1	112.16	71.47	45.44	36.65	30.05	26.14	23.90	19.99
28	0.32	212.2	81.15	52.94	34.38	27.97	23.09	20.17	18.48	15.52
26	0.40	133.5	59.67	39.76	26.28	21.52	17.85	15.64	14.36	12.10
24	0.51	83.9	44.56	30.23	20.26	16.67	13.89	12.20	11.21	9.47
22	0.64	52.8	33.72	23.20	15.71	12.98	10.84	9.54	8.78	7.43
20	0.81	33.2	25.82	17.96	12.26	10.16	8.51	7.50	6.91	5.85
18	1.02	20.9	19.89	13.96	9.59	7.96	6.68	5.89	5.43	4.61
16	1.29	13.1	15.44	10.90	7.52	6.26	5.26	4.64	4.28	3.64
14	1.63	8.3	12.04	8.54	5.92	4.93	4.15	3.66	3.38	2.87
12	2.05	5.2	9.42	6.71	4.66	3.89	3.27	2.89	2.67	2.27
10	2.59	3.3	7.40	5.28	3.68	3.07	2.59	2.29	2.11	1.80
5	4.62	1.0	4.07	2.92	2.04	1.71	1.44	1.27	1.18	1.00
1	7.35	0.4	2.54	1.83	1.28	1.07	0.90	0.80	0.74	0.63
	25.40	0.0	0.73	0.53	0.37	0.31	0.26	0.23	0.21	0.18
	100.00	0.0	0.18	0.13	0.09	0.08	0.07	0.06	0.05	0.05
	500.00	0.0	0.04	0.03	0.02	0.02	0.01	0.01	0.01	0.01

Table 1 AWG round copper wire resistance.

SWG	dia mm	Dc. mOhm/m	Ohm / Lambda 1.825 MHz	3.5 MHz	7.0 MHz	10.1 MHz	14.2 MHz	18.1 MHz	21.2 MHz	29.0 MHz
36	0.19	587.1	169.23	104.70	64.63	51.47	41.75	36.09	32.87	27.31
34	0.23	400.6	127.14	80.28	50.59	40.66	33.23	28.86	26.36	22.01
32	0.27	290.7	100.94	64.82	41.51	33.58	27.59	24.04	22.00	18.43
30	0.31	220.5	83.30	54.24	35.17	28.59	23.59	20.60	18.88	15.85
28	0.38	154.8	65.72	43.51	28.61	23.38	19.37	16.96	15.56	13.10
26	0.46	104.7	51.11	34.39	22.91	18.81	15.64	13.72	12.61	10.64
24	0.56	70.1	39.92	27.24	18.34	15.12	12.61	11.08	10.19	8.62
22	0.71	43.3	30.02	20.76	14.11	11.68	9.77	8.60	7.92	6.70
20	0.91	26.2	22.55	15.76	10.80	8.96	7.51	6.62	6.10	5.17
18	1.22	14.7	16.42	11.58	7.98	6.64	5.58	4.92	4.54	3.85
16	1.63	8.3	12.05	8.55	5.92	4.94	4.15	3.67	3.38	2.88
14	2.03	5.3	9.52	6.78	4.71	3.93	3.31	2.92	2.70	2.29
12	2.64	3.1	7.24	5.17	3.60	3.01	2.53	2.24	2.07	1.76
10	3.25	2.1	5.84	4.18	2.92	2.44	2.05	1.82	1.68	1.43
5	5.38	0.8	3.48	2.50	1.75	1.46	1.23	1.09	1.01	0.86
1	7.62	0.4	2.45	1.76	1.23	1.03	0.87	0.77	0.71	0.61

Table 2 SWG round copper wire resistance

approaches a perfect earth (the feedpoint resistance of a perfect conductor over a perfectly conducting ground is the radiation resistance of the antenna).

Fig 2 illustrates the overall antenna efficiency; a measure of how much power is radiated over the hemisphere, compared to power fed into the antenna (the missing power is absorbed by the ground).

Fig 3 illustrates the effect upon the maximum gain. However, at 160 m, poor ground means the maximum gain is at an elevation of 90 degrees, ie straight up!

Figures 4, 5, and 6 show the effect upon feedpoint resistance at 3.5 MHz, 7.0 MHz and 14.0 MHz respectively.

Table 1 and Table 2 give the RF resistance of round copper wire at various frequencies. The values are listed in ohms per wavelength. You must halve these values for wires carrying co-sinusoidal currents. The resulting value, when added to the graphical results, accounts for losses in a non-ideal conductor.

Conclusions

The radiation resistance of a horizontal antenna is lowered as the antenna is brought closer to the ground because self and mutual impedances subtract.

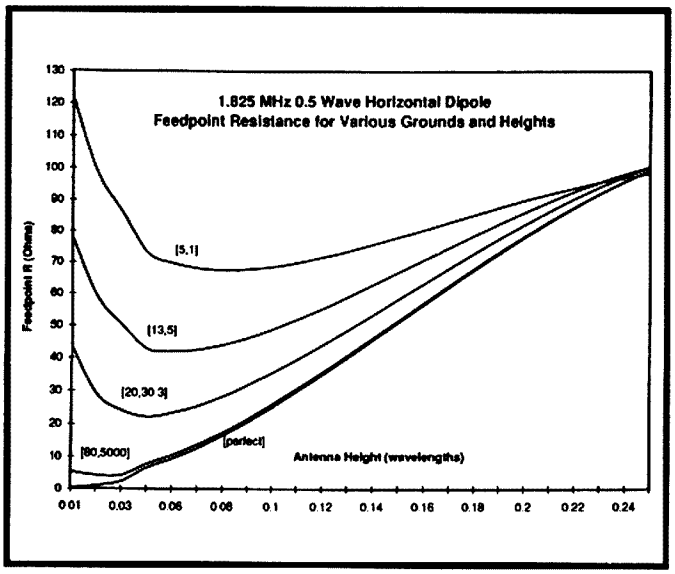

Figure 1

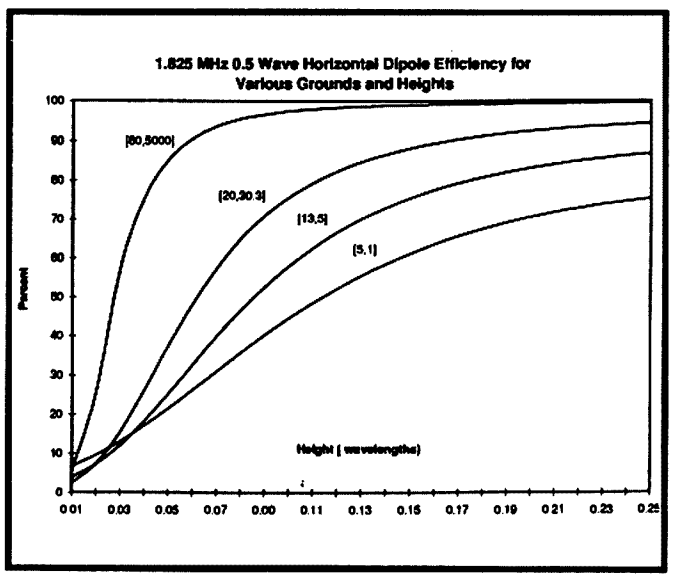

Figure 2

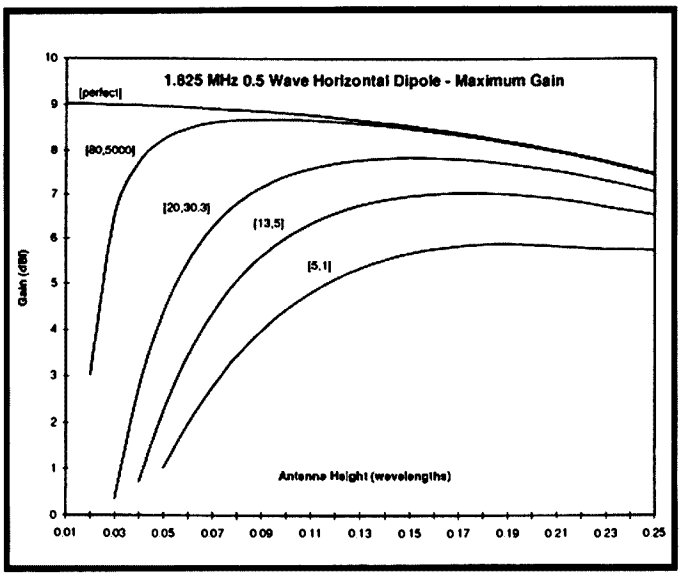

Figure 3

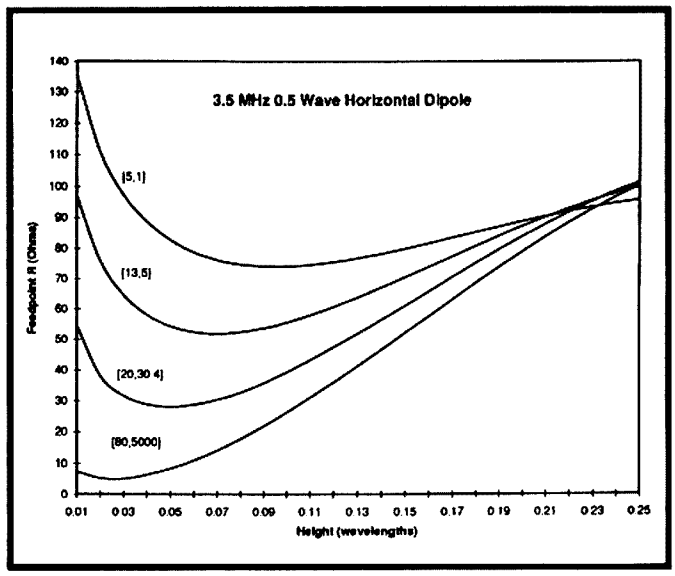

Figure 4

As a horizontal antenna approaches lossy media the feedpoint resistance rises due to increasing power losses in the media. You must be wary of this tendency for low antennas to apparently present a good feedpoint resistance.

Poor conductors, or inappropriate conductor sizes, will also introduce loss resistance. This effect is particularly noticeable in cases such as loading coils. By comparison, though, a horizontal radiator has less ground loss than a vertical antenna mounted at the same average height (compare the graphs for horizontals against those for verticals from Ref 3).

References

1. Computer program NEC-2, G J Bourke, Lawrence Livermore National Laboratory, 1984.

2. Fields and Waves in Communication Electronics, Simon Ramo, John R Whinnery and Theodore Van Duzer. Publisher John Wiley and Sons.

3. Short Vertical Antennas and Ground Systems, Ralph Holland, Amateur Radio, October 95.

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Technical Editor's Note

This article is entirely theoretical and relies on computer simulations. It is advisable to check such computer simulations against empirical data before committing considerable resources. The computer simulation used is well recognised but caution is always advisable. There have been empirical articles and data on the subject by other authors. Comparison may be worthwhile. The computer simulation can often point to the source of effects noticed empirically, just as the empirical data can validate the assumptions made in the computer simulation.

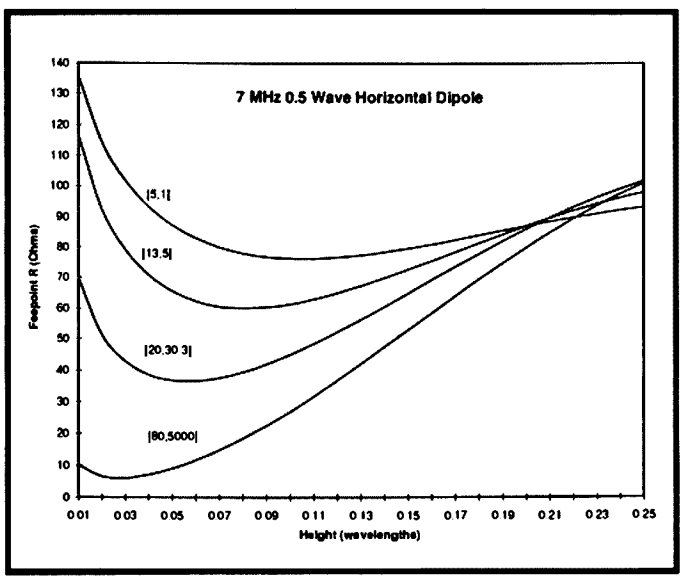

Figure 5

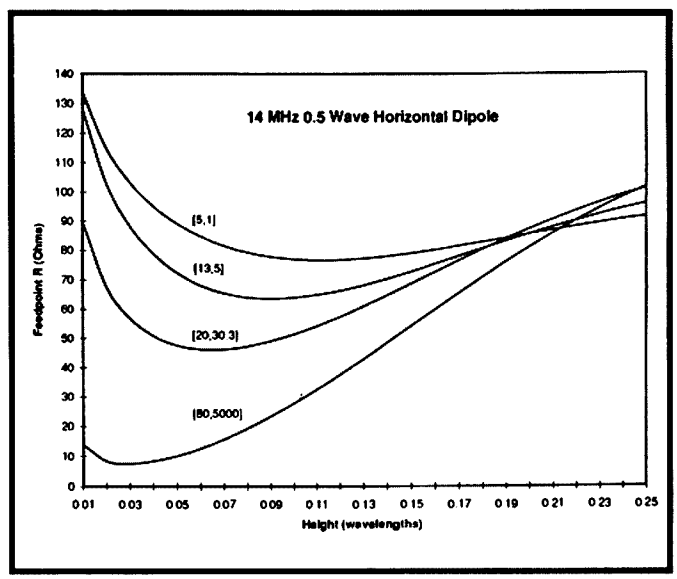

Figure 6

ALARA

Sally Grattidge VK4SHE, ALARA Publicity Officer*

The VK5 ALARA 21st Birthday cake.

Welcome New Members

Elizabeth VK7TLK, sponsored by June VK4SJ; and Fiona VK6 (no call yet).

Birthday Celebrations

Also on the Birthday net, and not mentioned last time, were Bev VK4NBC and Poppy VK6YF. Christine VK5CTY, who ran the net, almost did not make it as she had been busy all day delivering census material.

VK5 Lunch

Sixteen members attended the Birthday lunch this year, three of whom travelled more than 50 km to get there, and included two interstate visitors, Dot VK2DDB, and Rae VK8NYL who was visiting her father in Adelaide.

Janet VK5NEI was surprised and delighted to meet up with Rae after many years. They first met in Nauru before either had a radio licence, when Janet was a nursing sister and Rae was one of the young mothers in the maternity clinic. Rae obtained her first licence just before leaving Nauru, but had to re-sit the exam when she applied for one in P29 land.

Also at the lunch were some of ALARA's early members: Lorraine VK5LM the first VK5 member?, Myrna VK5YW who ran some of the earliest nets, Jenny VK5ANW, and Denise VK5YL who joined soon after ALARA was started by the group of YLs in VK3.

The new VK5 State Representative, Jean VK5TSX, provided a beautiful key-shaped 21st Birthday cake and matching key badges for the occasion. Meg VK5AOV took the uncut portion of the cake to the next VK3 lunch in Melbourne (if you didn't get it girls, she's eaten it!). Mascot VK5GAL (Meg's radio doll) sat at the table, along with the wooden ALARA badge which has represented Joan VK5BYL for so many years as family commitments at this time of year prevent her from attending in person.

Tina VK5ZTC showed her magnetic book marks which were much admired. ALARA Historian Deb VK5DEB tucked into a wicked dessert while those who need longer tape measures looked on in envy. Also present were Sue (XYL of Steve VK5AIM), Joy VK5YJ, Joan (XYL of John VK5EV ex VK5ZRH) representing the Girl Guides, Sue VK5AYL and Christine VK5CTY. Apologies and Birthday greetings came from Jenny Housden (Girl Guides), Joyanne VK5BJH (daughter of Joy), Maria VK5BMT (travelling, of course!), Mary VK5AMD and Beryl Bennet.

DX

Jackie G7MZI and OM Pete ran a radio station for a big international scout camp (held every four years) from 31 July to 7 August and were on the air daily on 20 m and 15 m with an FT-990 with homebrew linear to a three element tribander under the callsign GB0WSS. Did any of our members hear them?

Picnic in the Park

The Townsville YLs got together in August for a picnic lunch in the Palmetum, a particularly picturesque park on the banks of Ross River. BYO lunch took place under a shady tree near a small fountain followed by a stroll through the "rain forest" area of the park (rain provided by sprinklers, this being Townsville). Present were Ann VK4MUM, Sally VK4SHE, Annette, Dawn, Lyndell and Noelene.

The weekly YL net on Wednesdays at 6 pm on the two metre repeater (146.700 MHz) has been well supported in recent weeks. Visiting YLs (escaping the southern chill) are welcome to join in.

Contest

Don't forget the ALARA Contest in November (details in the *Contests* column). This is a friendly, informal contest with plenty of opportunities to chat. So, if you have never tried a contest before, or are just curious about ALARA, have a listen and make a few contacts.

Novices please try for the Florence McKenzie Trophy as we would love to have a winner to receive it this year. Everyone else, listen for Novice YLs on CW, and offer Novices on SSB a CW contact; in other words, blow the dust off that key and have it ready.

**C/o PO Woodstock, QLD 4816*
Tel: 077 788 642

ar

Seen at the VK5 Lunch, (l to r) Sue (XYL of Steve VK5AIM) and Dot VK2DDB.

Also seen at the VK5 Lunch, (l to r) Janet VK5NEI and Rae VK8NYL.

AMSAT Australia

*Bill Magnusson VK3JT**

National co-ordinator
Graham Ratcliff VK5AGR
Packet: VK5AGR@VK5WI
AMSAT Australia net:
Control station VK5AGR
Bulletin normally commences at 1000 UTC, or 0900 UTC on Sunday evening depending on daylight saving and propagation. Check-ins commence 15 minutes prior to the bulletin.

Frequencies (again depending on propagation conditions):

Primary 7.064 MHz (usually during summer).

Secondary 3.685 MHz (usually during winter).

Frequencies +/- QRM.

AMSAT Australia newsletter and software service
The newsletter is published monthly by Graham VK5AGR. Subscription is $30 for Australia, $35 for New Zealand and $40 for other countries by AIR MAIL. It is payable to AMSAT Australia addressed as follows:
AMSAT Australia
GPO Box 2141
Adelaide SA 5001

Long Awaited MIR Operations on 70 cm

A message from DL3LUM indicates that the SAFEX II equipment onboard MIR has been activated. This event marks the start of a new era of operations on MIR. All previous operating has been on 2 metres. Over the years there have been many attempts to get MIR up and running on 70 cm but they have all fallen by the wayside.

At the time of writing the SAFEX equipment is operating in the QSO mode connected to the digital speech recorder. You can listen to a short message recorded by the cosmonauts on 437.925 MHz. The other modes have to undergo testing before being activated in the next weeks and months. Please send your reports to DL3LUM. The message can be received with a simple 70 cm hand held transceiver.

DL3LUM may be reached via packet at *DL3LUM@DB0AAB.#BAY.DEU.EU* or e-mail at *joerg.hahn@dlr.de*

My latest reports indicate that MIR is in an unfavourable attitude for the amateur radio antenna system so don't be surprised if signals are a bit weak. Fortunately, MIR undergoes regular orbit and attitude adjustments to accomodate visiting freighters and shuttles and to keep the orbit safe. Hopefully this situation will be a temporary one.

OSCAR-13 ... We Live in Interesting Times

As James Miller writes in his exhaustive prognosis of the last months of OSCAR-13's life, *"Without an atmosphere AO-13 would hit the earth's surface on 1997 Feb 03".*

Well, we do have an atmosphere and the perigee of AO-13 is already grazing its upper reaches. As I write this (in August), InstanTrack puts the perigee height at 202 km. Even a brief time each perigee spent hurtling at some 28000 km/hour through the rare upper atmosphere generates heat. Too little to show above the uncertainty threshold in the telemetry yet, but a small amount of energy is dissipated each time and the perigee drops further.

The orbit of AO-13 is oscillating in a quite complex way. The oscillations have a short term 10 day period and a number of longer term periods during which the perigee rises and falls. The perigee has dropped to values of a few hundred km in the past and recovered, but AO-13 cannot recover from this current situation. It will enter the main body of the atmosphere and burn up in early to mid December 1996. Updated reports and refined estimations of the precise re-entry date can be obtained from the various AMSAT internet sites.

The control team have been using this critical but interesting period as a learning exercise to extend limited command and telemetry transmission for as long as possible. One such ploy has been to alter the attitude to alon/alat 90/0. This should minimise tumbling and ease the over-heating of the solar panels. It may even extend the transponder usable time although the 2 metre antennas and some other fragile hardware appendages will probably have melted by the first week in December!

What a great bird AO-13 has been. I remember vividly its first operational orbit. We in VK/ZL were fortunate to be in a position to hear it start up. I was listening on 2 metres and heard its beacon turn on for the first time, right on time while I was washing up the evening meal dishes. The psk telemetry was surprisingly loud and clear. I recall the many fine contacts we had into northern Europe and north America and Africa and the regular VK/ZL gang on mode B. I cut my teeth on microwave satellite operations using AO-13's "S" mode. So did many others. What a thrill it was to hear those weak but perfectly readable signals on the little helix antenna you could hold in one hand.

Well done AO-13 and hurrah for the heroic work of the design, construction, launch and control teams and to the many thousands of amateurs world wide who contributed to the funding of the AO-13 project. A grand job done by all.

Those of us who have been fortunate enough to have taken part in the operations of AO-13 should view the experience with satisfaction and look forward with great anticipation to AO-13's successor, P3D. In the meantime, we can hone our skills on AO-10. Although limited in operation, its orbit is safe from the problems that beset AO-13.

Working with AO-10 is a challenge given its current condition. Only mode "B" is available and only then when the solar panels are fully illuminated. Give it your best shot and it will give you a measure of your station's capability on mode "B".

JAS-2 Successfully Launched

The JAS-2 spacecraft was successfully launched on 17 August 1996 at 0153 UTC. It has been confirmed that it is in the planned orbit.

Callsign: 8J1JCS
Analog mode Output power: 1 W
Uplink passband: 145.900 – 146.000 MHz
Downlink passband: 435.800 – 435.900 MHz
Digital mode 1200bps BPSK
Uplink frequencies: 145.850, 145.870, 145.890, 145.910 MHz
Downlink frequency: 435.910 MHz
9600bps FSK
Uplink frequency: 145.870 MHz
Downlink frequency: 435.910 MHz
Digitalker: FM voice, max 25 seconds
Downlink frequency: 435.910 MHz, output power 1 W
CW telemetry: Downlink frequency: 435.795 MHz, 12 WPM.

Full Doppler Tuning

An article on this topic appeared in the March/April 1996 edition of the *AMSAT Journal*. It was written by Ron Parsons W5RKN. It caused me to cast my mind back to my "Beginner" series which was published in Amateur Radio in 1991.

In part 10 of that series I wrote: *"Range calculations also have another important spin-off. The rate of change in range with respect to time at the observer's location is a measure of how quickly the satellite is moving towards or away from the observer. This can be resolved into a factor and*

applied to the beacon and transponder frequencies to work out of Doppler shift..... Remember, however, that this is only a one way Doppler calculation and is of use only when communicating directly with a satellite. It does not take into account a signal being relayed through an orbiting transponder. This is a much more difficult problem as it involves two different rates of change relative to two separate locations".

Ron's article touches on this last point and goes on to describe some recently produced software that allows users to invoke full Doppler tuning when in contact via an amateur satellite transponder. According to Ron's article the currently available software, "Nova" for the IBM clones and "McIntosh Master Control" for the Mac OS system will take into account all the problems which, until now, have made working the analog birds difficult, particularly in low orbit VHF/UHF situations. He describes complete contacts made with no manual tuning corrections at all. Maybe someone locally has tried it and can confirm these claims. If it is to work properly it would mean your computer clock would have to be spot-on, your keps right up to date, and the other parties in the QSO would need to be running the same system.

New Control Program for the FT-736-R

Whilst on the subject of computer control of Doppler shift, AMSAT-Australia newsletter no. 135/136 carried a description of a Windows application called FT7361. It can be used to control a Yaesu FT-736-R together with WinOrbit. Two of its stated features are to do with Doppler correction. It is claimed that it can take care of "Full Doppler Tuning" with the analog birds as well as simple Doppler correction on the digital birds.

On to Mars

More information is coming to light regarding the Mars explorer mission and its possible applications for amateur radio operators. The Mars Global Explorer (MGE) is due for launch in November 1996. At a workshop held at Jet Propulsion Laboratory (JPL), Pasedena in June 1996, Professor Michael Owen W9IP, of St Lawrence University, New York discussed various amateur radio activities supporting the Mars Relay Test Flight which is scheduled to take place some 20 days after launch.

The 150 ft Algonquin radio telescope will probably be used but Michael described how more modest systems could do valuable work. Well equipped amateur radio satellite or EME operators will be in a position to take part if their 70 cm tracking antenna has high gain, right hand circular polarisation and their pre-amp has a very low noise figure.

Your system will **HAVE** to be good. Twenty days after launch the MGE will be 6 million km from Earth. It is estimated that antenna gain required will be >21 dBi. Despite the claims of many antenna designers and manufacturers (and home-brewers), in practice it is easier said than done to exceed 20 dBi gain and there will be few amateur installations that meet this requirement.

On rough calculations, a 70 cm dish with C/P feed would need to be about 6 metres diameter and a crossed Yagi would need to be 24 wavelengths or 16 metres long. The average OSCAR station would fall short of this unless you go in for a bit of terrestrial DXing as well as the OSCARs. Successful EME stations will be in with a good chance as will successful UHF DXers who can elevate their 70 cm antenna array. Incidentally, don't go looking for "keps" for the MGE. It is NOT in elliptical orbit around the Earth and conventional tracking programs will not work. A special program has been devised to plot its position in az/el terms. Up-to-date information on this program, progress of the project itself, and the ways in which amateurs can participate will be available on the JPL web site on the Internet.

**RMB 1627, Milawa VIC 3678*
CompuServe: 100352,3065
Internet: 100352.3065@compuserve.com
E-mail: vk3jt@amsat.org

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WIA News

WIA-SMA Joint Working Group Tackles 80 m DX Window Expansion

The WIA and the Spectrum Management Agency have formed a working group to look at the WIA's proposal for expansion of the 80 metre DX Window, as a result of discussions at the last WIA-SMA meeting on 28 June.

The joint working group consists of, from the SMA, Peter Allen from the Customer Service Group Technical Projects, Len Bray from the Business Directions Group Spectrum Planning Directions, and Alan Jordan from the Business Directions Group Compliance and Licensing Directions, with Roger Harrison VK2ZRH and David Wardlaw VK3ADW from the WIA.

As the Australian Radiofrequency Spectrum Plan is presently being revised, scheduled for re-issue on 1 January 1997, this represents an opportunity to seek an expanded allocation for Australian amateurs in the 3750-3999 kHz segment of the HF spectrum.

The WIA has proposed that Australian amateurs be permitted to use 3760-3900 kHz on a secondary basis, between the hours of 1700-0830 local time Mondays to Thursdays, and from 1700 on Fridays through 0830 Mondays. In addition, the WIA has proposed that Intermediate Licensees get access to the expanded DX Window and that 3750-3760 kHz be permitted for amateur emergency service (WICEN) use during notified emergencies, with 3760 kHz lower sideband reserved for non-emergency nets and exercises.

UK Exam Fees Rise

The British regulatory authority, the Radiocommunications Agency, has agreed to a rise in the fees for Morse code tests, according to the Radio Society of Great Britain (RSGB).

From 1 September, said the RSGB News report, Morse code examination fees will be 20 pounds for the 12 words per minute test (that's almost $40 Australian), while the 5 wpm test will cost 15 pounds, or just under $30.

While exam costs may be comparatively high in the UK, membership of the RSGB is comparable to WIA membership in Australia. Corporate (or full) membership for those over 18 years of age is 34 pounds, or just on $67 Australian, Senior Citizen membership for those over state pensionable age is 27 pounds, equivalent to a little over $53, and the same for Student membership. Junior HamClub membership is 10 pounds, just less than $20, the same for Family members who reside with existing members.

DICK SMITH ELECTRONICS

Powerful Performers

Yaesu FT-2500M 2m Heavy-Duty Mobile Transceiver

Built tough to take the rough stuff. The FT-2500M meets US MIL-SPEC 810C for shock and vibration so it'll provide years of reliable mobile operation. It sports a new easy-to-operate front panel design that has rubber coated knobs to keep the dust out. There is also a huge 'Omni-Glow' LCD screen that is teamed up with a one-piece diecast chassis to set the FT-2500M apart from all other 2m mobiles. For improved front-end performance, Yaesu's exclusive 3-stage Advanced Track Tuning feature and dual-FET mixer reduce overloads from strong signals while providing excellent sensitivity and wide-band receive operation.
Cat D-3632

Also includes:
- 31 tuneable memories
- Inbuilt CTCSS encoder
- 7 selectable tuning steps
- Various scanning modes
- MH-26 hand microphone
- Mobile bracket and DC power lead.

$699 **2 YEAR WARRANTY**

YAESU

FT-736R VHF/UHF Base Station Transceiver

Whether your interest is in talking through your local repeater, operating SSB DX, or talking to the world via satellite, this high-performance multimode base station transceiver can do it all! In its standard form, the FT-736R provides 25W output on the 2m (144-148MHz) & 70cm (430-450MHz) bands in SSB, CW, and FM modes. Can be expanded to cover the 6m (50-54MHz) & 23cm (1240-1300MHz) bands by installing optional modules.

Features:
- Digital control with keypad frequency entry
- 100 general-purpose memories
- 10 full-duplex crossband memories, 2 independent VFOs per band
- 2 full-duplex VFOs - transmit & receive frequencies (and modes) can be tuned independently or synchronously for satellite operation
- Adjustable IF Notch and IF Shift filters
- Noise blanker
- All-mode VOX
- 3-speed selectable AGC
- High-stability (+/-1ppm) PLL reference oscillators
- Speech processor and VOX for SSB
- VFO or selectable channel steps on FM
- Digital input connection for packet TNCs
- Efficient switch-mode AC power supply

Cat D-2920

Specifications:

Modes:	LSB/USB (J3E). CW (A1A). FM (F2D, F3E)
Receiver:	50, 144MHz: Dual Conversion Other Bands, Triple Conversion
Sensitivity SSB/CW:	better than 0.2uV for 12dB S+N/N
FM:	better than 0.35uV for 12dB SINAD
Dimensions:	368 x 129 x 286mm (WHD)

$2495

SAVE $500

2 YEAR WARRANTY

YAESU

For further information, orders or the location of your nearest store call:
1300 366 644 (Local Call Charge) Or Fax: (02) 9805 1986

Awards

*John Kelleher VK3DP - Federal Awards Manager**

Scanning the bands was once a joyous pastime. Almost daily it could be said that a "new" country had been heard and worked, and subsequently added to your ever growing list of DXCC countries. I personally have graduated to the 300 club, but it has not been easy, and nor will it be as we approach the turn of the century, to add to that listing.

The proliferation of DX nets seems to have fallen away, and only the hardiest of souls can be heard plying their wares for the betterment of their ever faithful followers. These, of course, are my own observations. Yours may be entirely different.

In a previous issue of this column, I gave credit for the establishment of the "Down-under County Hunters Net" to some of the wrong people. The founders were indeed Alan VK4AAR, Rex VK3ATZ, and stateside K6RLS, who is personally acting as QSL Manager and liaison in that country. VK5AQZ is attempting to piece together a high-profile VK Award, which we should be hearing about soon.

Don't forget to support your friendly Scout group during JOTA later this month.

I would like to hear from the WA Division of the W1A in regard to West Australian Shires Award, and the West Australian Post Codes Award. Also, I have had queries about the Zone 29 Award. Presented with positive information about these awards, I would have no hesitation in publishing any and all such information received.

This magazine has an international following. This office has received applications for Australian awards following their publication in this column. If there are any clubs or organisations who consider that their presentations have a hint of international flavour, then I would like to hear from them. The following are awards which have been requested by readers:

The Aruba Award

Contact three members of the Aruba Amateur Radio Club on or after 1 January 1963. GCR list and a fee of $US1.00 to: Aruba Amateur Radio Club, PO Box San Nicholas, Aruba, Netherland Antilles.

As usual, I suggest WFWL (work first worry later).

Worked All Belgian Provinces

Work or hear all nine ON provinces on not more than two amateur bands. No date limits. GCR list and $US3.00 go to: UBA-HF Award Mgr ON5KL, VanCampenhout Mat, Hospicestraat 175, B-9080 Moerbeke-Waas, Belgium.

The provinces are: AN Antwerp, BT Brabant, HT Hainant, LG Liege, LM Limburg, LU Luxembourg, OV East Flanders, NR Namur, and WV West Flanders.

The Canadaward

Confirm two-way contact with ALL Canadian provinces or territories. Endorsements for any band six to 160 metres, and on mode via Oscar satellite. Modes may be mixed, all CW, SSB, or RTTY. Contacts after 1 July 1977. Send GCR list plus $US8.00 to: CARF Awards Manager, PO Box 356, Kingston Ontario, Canada K7L 4W2.

Provinces and territories needed are: VO1/VO2 Newfoundland and Labrador, VE1 Prince Edward Island, VE1 Nova Scotia, VE1 New Brunswick, VE2 Quebec, VE3 Ontario, VE4 Manitoba, VE5 Saskatchewan, VE6 Alberta, VE7 British Columbia, VE8 North West Territories, and VY1 Yukon Territory.

The Germany Award

Commemorating the reunification of the two German states in 1990. Contact at least five stations in each State using at least two bands (80 stations total). All bands and modes. All QSOs after 3 October 1990. Following is the list of States and appropriate DOK prefixes: Baden-Wurttemburg A, P; Bayern B,C,T,U; Berlin D; Brandenburg Y; Bremen I; Hamburg E; Hessen F; Mecklenburg-Vorpommern V; Niedersachsen H,I; Nordrhein-Westfalen G,L,N,O,R; Rheinland-Pfalz K; Saarland Q; Sachsen S; Sachsen-Anhalt W; Schleswig-Holstein M; and Thuringen X.

Available endorsements are for Mixed, CW, or VHF. GCR list and a fee of DM10, 10 IRCs or $US7.00 to: Dieter Petring DL1YCA, Bruderstr 52, D-4972 Lohne 2, Germany.

There may be a query on the above four figure postcode. I do not have any information on any changes.

**PO Box 2175 Caulfield Junction 3161*

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Amateur radio - helping our community

Club Corner

Adelaide Hills Amateur Radio Society (AHARS)

Annual Electronics Sale 1996

The club's annual electronic sale is on again. The date this year is Saturday, 23 November and trading will be between the hours of 9.30 am and 2.30 pm. This is the buy and sell event for the year.

As in previous years, the venue is the Westbourne Park Memorial Hall, 390 Goodwood Road, Westbourne Park, about 300 metres south of the Cross Road intersection. All radio amateurs and others interested are invited for a day of trading fun. This is the day to get rid of that surplus gear or to find the odd special component you need. Apart from the trading, it provides an opportunity to have a friendly chat with other amateur radio colleagues. The ALARA ladies will again be there to provide refreshments.

Those interested in selling gear must book table space and this can be arranged by ringing Robert Clogg VK5ZHW on (08) 8370 7411. The doors will be open for trading at 9.30 am but vendors should present themselves at 8.30 am to prepare their tables. We have to offset the cost of hiring the hall, tables, etc and in previous years we have charged a commission on items sold. This year we have decided to simplify the process by instead charging vendors for each table booked and charging a small entrance fee. The table booking fee is $10.00 per table for radio amateurs or other non-commercial parties, and $25.00 per table for commercial organisations. The entrance fee for all parties, including vendors and club members, will be $1.00. All sales are by negotiation between the buyer and seller and, apart from any gear sold by the club itself, the club will not be involved in the sale.

This is an event you should not miss. We look forward to seeing you there.

Lloyd Butler VK5BR
Vice President AHARS

Singapore's Old Timers

On 4 August this year twelve old timers, members of the Singapore Amateur Radio Transmitting Society who are currently operating as 9V1s, met for a first informal get-together with Chee Phuay Kit 9V1SX the President of SARTS. It was a double celebration. Singapore's 31st National Day was just around the corner (9 August) and they have been amateur radio operators for at least 25 years. For the "quarter century old timers" it was a walk down memory lane and to reminisce about their experiences since the early days of amateur radio activity in Singapore after World War II. Nearly all had served in the Singapore Society with six as President.

Joseph Seah 9V1NQ
63 Lalan Ma'mor #01-59
Singapore 320063

The Singapore Amateur Radio Transmitting Society old timers. The figures in brackets indicate the years licensed as a radio amateur. Seated in the front row, left to right, are Lim Yew Yin 9V1AB (50), N Yatheendran 9V1JY (37), Chee Phuay Kit 9V1SX President of SARTS, Lim Tong Yong 9V1LG (34), Kok Leng Chong 9V1OF (29), and Ebenezer Lucas 9V1QG (28). In the back row, from left to right, are Frank S C Aw 9V1OK (29), Joseph Seah 9V1NQ (30), David H Rankin 9V1RH (42), Jeffrey Lim 9V1QN (27), Takehisa Sato 9V1UU (32), Ng Soon Kim 9V1RP (25), and Vincent Foong 9V1SA (25). Absent were Dr J Charan Singh 9V1NR (30), Tan Lian Huat 9V1OD (29), and Ong Huck Kin 9V1RA (26).

Radio Amateurs Old Timers Club (RAOTC)

We are glad to note that membership numbers are quietly but steadily increasing. One thing that puzzles the broadcast group is the smaller than expected number of members and friends that respond to our two 80 metre transmissions, especially now that conditions are so poor on HF at short to medium distances. So, it would be appreciated if more of our members and friends used, or at least reported on, these transmissions at 10.00 am and 8.30 pm.

A suggestion has been made that we consider seeking the use of a repeater to extend the range of our two metre transmission. No action has been taken on this. The committee would be interested to receive comments and suggestions on this matter.

Allan Doble VK3AMD

Mid South Coast Amateur Radio Club Inc

The Mid South Coast Amateur Radio Club, based in the Milton-Ulladulla area of the New South Wales south coast, will be holding its 20th anniversary meeting on Saturday, 2 November 1996 from 10.30 am. Original members, and those who have been associated with the Club in the past, are specially invited to be present.

The meeting place is the "H Ranch", Little Forest Road, Milton. The Club's repeater frequencies of 144.700 and 438.125 MHz will be monitored. For further details please contact Club President Peter Campbell VK2AXJ (QTRH) on (044) 540 727.

Peter Campbell VK2AXJ
President
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Contests

*Peter Nesbit VK3APN - Federal Contest Coordinator**

Contest Calendar Oct – Dec 96

Oct 5/6	VK/ZL/Oceania DX Contest (Phone)	(Aug 96)
Oct 6	RSGB 21/28 MHz Contest (Phone)	(Sep 96)
Oct 12/13	VK/ZL/Oceania DX Contest (CW)	(Aug 96)
Oct 19/20	Worked All Germany Contest (Mixed)	(Sep 96)
Oct 20	RSGB 21/28 MHz Contest (CW)	(sep 96)
Oct 20	Asia-Pacific Sprint	(Jun 96)
Oct 26/27	CQ-WW DX Contest (Phone)	(Sep 96)
Nov 1/7	HA QRP Contest	
Nov 9	ALARA Contest	
Nov 9/10	WAE RTTY DX Contest	(Jul 96)
Nov 9/10	OK-DX CW Contest	
Nov 16/17	IARU Region 1 160 m Contest	
Nov 23/24	CQ World-Wide DX CW Contest	(Sep 96)
Dec 7/8	ARRL 160 m Contest	
Dec 14/15	ARRL 10 m Contest	
Dec 26 – Jan 26	Ross Hull VHF/UHF Contest	
Dec 31	ARRL Straight Key Night	

For information this month, many thanks to VK1PJ, VK2SRM, VK3DMS, G6LX, HA5JJ, and OK2FD. Until next month, good contesting!

73, Peter VK3APN

Addendum to Results of 1996 John Moyle Field Day Contest

Due to an unfortunate combination of events, last month's results showed an incorrect score, and the wrong winner for the CW section of this contest. Advice has since been received that the winner of the CW section was, in fact, Bill Horner VK4FW who, with a score of 358 points, won the President's Trophy ahead of VK4EMM. Congratulations are extended to Bill for his fine effort!

The John Moyle Contest Manager (Phil Rayner VK1PJ) has also advised that the suggestion for a reduced duration next year was mainly intended to stimulate feedback, plenty of which has since been received. He wishes to thank all those who have contacted him, and advises that as a result of the feedback, the contest duration will definitely *not* be reduced next year, but remain the same. He says to please keep the comments and suggestions flowing, as that is the only way he knows what entrants really want!

HA-QRP 80 m CW Contest

0000z 1 November to 2400z 7 November

This international contest takes place each year during the first seven days of November, and is open only to stations *running a maximum of 10 W input power.* Use 3560-3600 kHz, CW only. Call "CQ TEST QRP", and exchange RST, QTH, and names. Score one point per QSO with own country, and two points per QSO with others. Stations can be contacted only once during the contest for points credit. The final score equals QSO points times DXCC countries worked. Logs must show date, time, callsign, reports, and QTH and name of station worked. Summary sheet must include first name and QTH sent during the contest, Tx input power, and Tx output device. Send logs postmarked by 21 November to: Radiotechnika Szerkesztosege, Budapest, Pf 603, H-1374 Hungary. All entrants will receive participatory certificates, and outstanding scorers will receive a free subscription to Radiotechnika magazine for one year.

ALARA Contest

Saturday 9 November, 0001-2359z

This Phone/CW contest is open to amateurs and SWLs throughout the world. The object is for YLs to work anyone, whereas OMs and Clubs can work YLs only. Bands are 80-10 m, and the following frequencies are suggested: 3560- 3590, 7070-7100, 14250-14280, 21170-21200, 21380-21410, and 28380-28410 kHz. Each station can be contacted twice per band; once on phone, and once on CW. No lists, nets or cross-mode contacts please.

YLs should call "CQ ALARA CONTEST" or "CQ TEST ALARA", and OMs "CQ YL". ALARA members should send RS(T), serial number, ALARA member, and name. YL non-members, OMs and Club stations will send RS(T), serial number, and name. Club stations **must** identify as a club station each contact, and cannot use personal callsigns during club operation.

Score five points for each QSO with an ALARA member, four points for each QSO with a YL non-member, and three points for each QSO with an OM or Club station. On CW, if either operator is a Novice, score double points. SWLs should score five points per ALARA member logged, and four points per YL non-member logged.

Logs should show date/time UTC, band, mode, callsign worked, RS(T) and serial sent and received, name of operator worked, status of the station worked (YL ALARA, YL non-member, or Club), and points. Attach a cover sheet showing full name, callsign, operator's address, claimed score, and a **signed** declaration *"I hereby certify that I have operated in accordance with the rules and spirit of the contest"*. Send the log to: "Mrs Marilyn Syme VK3DMS, Box 91, Irymple 3498 VIC, Australia" to be received by 31 December.

Certificates will be awarded for the following: top score overall; top phone only score; top VK YL CW; top VK YL Novice CW (Florence McKenzie certificate); top ALARA member in each country and VK call area; top YL non-member in each continent; top OM in each continent; top SWL in each continent; top VK Novice; top overseas YL CW; and top VK club station. Trophies will be awarded to the top scoring VK YL, and top scoring DX YL.

Logs must be legible (no carbon copies please), and will not be returned. The contest manager's decision will be final, and no correspondence will be entered into.

OK-DX CW Contest

9/10 November, 1200z Sat to 1200z Sun

This CW contest occurs in the second full weekend in November each year. Bands 160-10 m. Categories are: Single operator, single and multiband; multioperator, single and multi TX; QRP, single and multiband (max 5 W out); and SWL. Single operator stations operate max 20 hours, with min one hour rest periods. Multiband stations apply "10 minute band change rule" (multi Tx stations are exempt from this rule).

Send RST plus serial; OK stations will send RST plus three letter district code. DX (VK) stations score 10 points per OK/OL/OM QSO, and one point per QSO with another country. Multipliers are the sum of DXCC countries and OK districts on each band; final score is QSO points (all bands) times multiplier from all bands.

Note rest periods in the log, and use a separate log for each band. Cross-check sheets are required for 200+ QSOs. Logs can also be submitted in ASCII on DOS disk. Entries should be postmarked by 15 December, and sent to: "CSRK, Box 69, 113 27 Praha 1, Czech Republic".

IARU Region 1 160 m CW Contest

16/17 November, 1400z Saturday to 0800z Sunday

This contest is a collection of 160 m contests sponsored by several amateur societies in Region 1 (Europe), arranged to coincide on the one weekend. Although mainly intended for QSOs between European stations, non-Europeans are very welcome to enter.

Exchange RST + serial + location code (VK). Score one point per QSO, and multiply by the number of different location codes worked. This

year, send your log to: "ARI Contest Manager I2UIY, PO Box 14, I-27043 Broni (PV), Italy", postmarked by 31 December.

Results of 1996 WIA VK Novice Contest

Presented by Ray Milliken VK2SRM

Thirty four contest logs were received this year: twenty eight in Section A (Phone), five in Section B (CW), and one in Section C (SWL).

The Keith Howard VK2AKX Memorial Trophy was won by VK4LDA, the Novice with the highest score in Section A (Phone), and the Clive Burns Memorial Trophy by VK5NOT, the Novice with the highest score in Section B (CW). These are perpetual trophies held on permanent display at the Federal Office and, in each case, the winners will receive an inscribed wall plaque.

National Winners:

Section A Novice	VK4LDA
Section A AOCP	VK2ZL
Section B Novice	VK5NOT
Section B AOCP	VK2SPS
Section C SWL	L40018

= National winners
** = Highest Novice score in each state (excluding national winners)
* = Special awards

Individual Scores, Section A (Phone):

VK2ZL	(C)#	965
VK3BML	(C)*	819
VK4LDA	#	761
VK4NBC	**	668
VK2AKL	*	667
VK5MAP	**	645
VK4NWH	*	554
VK4MOJ		447
VK3PKY	**	407
ZL1BVK		389
VK3KQB		385
VK1CAR	(C)	382
VK3PMC		371
VK1KLB	**	328
VK6BIK		210
VK3MID		200
VK3MSL		172
VK4LAA		160
VK2ASK		117
VK4KCX		105
VK4NPH	**	99
VK4PVH		84
VK3LBA		84
VK3CAM		76
VK2ALS		74
ZL1AGO		59
VK2MGM		48
VK2WO		42
VK3DYF		30

Individual Scores Section B (CW):

VK5NOT	#	80
VK2SPS	#	64
VK3NCY	**	38
VK3XB		21
VK4XW		7

Individual Score Section C (SWL):

L40018	#	70

*PO Box 2175, Caulfield Junction, VIC 3175
pmexbit@melbpc.org.au

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Divisional Notes

Forward Bias - VK1 Notes

Peter Parker VK1PK

Repeater Link Extended to Wollongong

70 centimetre FM contacts between Canberra and Wollongong have become an everyday reality for local amateurs with the completion of the long-awaited Wollongong to Canberra linked repeater system. The system makes use of repeaters at Wollongong, Goulburn and Mount Ginini, allowing contact with much of south-eastern NSW. The link was activated on Saturday, August 17, thanks to the efforts of Rob VK2MT, Simon VK2XQX and Ken VK2TKE of the Illawarra Amateur Radio Society. Stations as far away as Wagga and Sydney can regularly access the link.

The system boasts several novel features, including a facility allowing local amateurs to override the link if they wish to talk locally. As well, a female voice identifier beacons every hour to advise that the link is operating.

There are a few points to bear in mind when using the system. These are: allow two seconds for the links to reset before responding to another station's transmission; hold the PTT button down for a second or so before starting to talk (this is to allow for delays in the link); and, thirdly, don't attempt to talk to the voice ident, you're bound to be disappointed!

In Canberra the link can be accessed through the VK1RGI 70 centimetre repeater operating on 438.375 MHz. The VK1 Division's other UHF repeater, ideal for contacts within the ACT, is located on Black Mountain and transmits on 438.525 MHz.

VK1ZAO Becomes VK1BBS

After a period operating as VK1ZAO, the packet radio bulletin board serving the Belconnen area has resumed operation under its original VK1BBS callsign.

John VK1ET advises that, if you used VK1ZAO as your home BBS, you should type in the command "NH VK1BBS" to change your user record to reflect the new BBS callsign. All users here are now vk1abc@VK1BBS.ACT.AUS.OC. However, don't panic, mail addressed to the old address of VK1ZAO should still get to you.

John mentions that the NOS box name has changed also. It is now known as VK1BBS-6, with radio ports VK1BBS-1 on 144.800 (4800 baud) and VK1BBS-2 on 147.575 (1200 baud). As well, TCP/IP users should note that the IP addresses have changed to 44.136.1.84 and 44.136.3.84 respectively.

Triband Beam up for Raffle

Members of the VK1 Division are in the running to win a triband Yagi in a raffle announced at the August general meeting. The wide-spaced beam antenna, made by Chimside, comes with a length of RG213 coaxial cable. Tickets for this raffle will be a dollar each (or six for five dollars), and are being sold at monthly general meetings. The winning ticket will be drawn at the November meeting.

At the August general meeting, members also saw a display of completed VK180 receiver kits and heard a very informative talk from Roger VK2SRH on hard disks and computer viruses.

JOTA This Month

A reminder that this year's Jamboree of the Air is being held on the weekend of 19 and 20 October. Volunteer operators are still required. If you can spare a couple of hours that weekend, please contact John VK1ET on telephone (06) 254 3140, by packet radio to VK1ET @ VK1BBS, or e-mail to *johnwoolner@auslig.gov.au*.

Symposium Update

A presentation on TCP/IP, an introduction to digital signal processing and a talk on empirical receiver design. These are just some of the topics planned for the Canberra Amateur Radio Technical Symposium, being held on Saturday, 23 November. The event's organiser, Mike VK1KCK, reports that other local amateurs have been asked to provide presentations on HF operating, DXing, low-signal VHF work, setting up a packet BBS, weather satellites and constructing HF equipment. Expressions of interest have also been sought from some of Australia's leading amateur radio equipment suppliers to see if they would be interested in setting up a demonstration of their equipment.

Those interested in presenting at the Symposium, or preparing a paper for the proceedings, should contact Mike VK1KCK by phone on (06) 292 0053 or by sending an abstract of their proposed presentation or paper by packet radio to VK1KCK @ VK1KCM.

Further details on the Symposium will be given on the VK1WI broadcast as they come to hand.

Broadcast Coverage Enhanced

With the extension of the linked repeater network, amateurs in Wollongong and parts of Sydney are now able to listen to the VK1WI news broadcast on seventy centimetres, thanks to the relay being performed by Phil VK1PC. To hear the bulletin, which goes to air at 8.00 pm each Sunday, tune to 438.225 MHz in Wollongong or Sydney, 438.325 MHz in Goulburn, or 146.950 or 438.375 MHz in Canberra or Wagga. Listeners outside these areas can switch to 3.570 MHz for the 80 metre retransmission by Tex VK1TX.

Committee Meeting

The Committee of the VK1 Division met on Monday, 12 August at the Mawson Primary School. The following matters were discussed: the appointment of Christopher Davis VK1DO as Public Officer (not to be confused with Publicity Officer); the WIA's submission on amateur licensing in Australia – the committee considered that more emphasis needed to be given to the financial benefits to the SMA of the proposed devolution of callsign issuing to the WIA; name tags for members at meetings; progress on the Canberra Amateur Guide, with it being decided to approach commercial advertisers to offset printing costs; and the Division's financial statements for last year – these were later accepted by members at the August General meeting.

VK3 Notes

Jim Linton VK3PC

Memorandum and Articles of Association

The 1996 Annual General Meeting carried a motion recommending that the Directors of the WIA Victorian Division take action to update the Memorandum and Articles.

A draft copy of THE MEMORANDUM AND ARTICLES WILL BE AVAILABLE FOR MEMBERS COMMENT AND INPUT FROM 15 OCTOBER 1996.

Any member may obtain a copy of the document by forwarding a manilla envelope 24 cm x 16 cm, self addressed, with an 85 cent stamp affixed, to the Secretary.

Comments and input will be accepted in writing up until 30 November 1996.

Following further revision of the draft document a Special General Meeting will be called in accord with Corporations Law, for the purpose of having the new Memorandum and Articles adopted.

Office Relocation Proposal

A motion carried at the 1996 annual general meeting recommended that Council investigate the desirability and feasibility of relocation of our office near to the central business district of Melbourne. Soon after the AGM several Councillors began working on this project and have provided considerable input.

Council considered a detailed financial evaluation of the proposal by the Treasurer, Rob Hailey VK3NC, together with quotes and estimates obtained by Jerry Viscaal VK3MQ. Statistical information obtained from the Victorian Government indicates that the current demographic centre of the population of Victoria is actually Ashburton. It was also noted that, following his own investigation, Councillor Jerry Viscaal, who was a signatory to the original motion at the AGM, had reconsidered his position and was not now in favour of such a move.

Council has passed a resolution that, to continue to pursue this matter would be an improper use of valuable time and limited resources, and that the WIA Victoria office will remain at its current location.

Federal Finances

Council has reviewed the financial performance of the WIA Federal Body, in light of the recently received Balance Sheet for the six months ending 31 June. The Balance Sheet indicates a loss of $39,869 for the first half of this calendar year. This loss is in addition to the loss of $17,500 for the year ended December 1995.

The WIA Victoria Council is dismayed and concerned at a loss of this magnitude which may well have repercussions affecting the long term future of WIA Victoria's own financial stability. This situation has arisen in spite of WIA Victoria's warning to the Federal Directors in October and November of 1995, and again in February 1996, when Victoria rejected the proposed 1996 budget which planned for an end-of-year loss of some $18,000.

Our Federal Councillor, Brenda Edmonds VK3KT, who was present at the WIA Victoria Council which reviewed the Federal finances, was instructed by Council that immediate action be taken in a further attempt to halt the losses. Correspondence received from the Federal Secretary indicates that cost cutting measures are currently being investigated. These include the downsizing and possible relocation of the Federal office, staff reductions, and the devolvement of some services to the Divisions.

We understand the method of production of *Amateur Radio* magazine is being reviewed, and that the current contract with Bill Roper VK3BR, which expires in November, will not be renewed. The WIA Victoria Council has not, at this time, been provided with full details of the proposed actions. However, we insist that, as Victoria is the largest contributor of funds to Federal coffers, we should be permitted to at least have appropriate input prior to the implementation of any proposed changes.

The WIA Victoria Council is committed to the concept of the WIA federation of states as it now exists. We will do our utmost to provide support for a restructuring of the Federal body and its finances. However, clearly our prime responsibility must be to WIA Victoria members, and the security and stability of our own financial resources.

Check Your Facts

It is of continuing disappointment that some members are readily prepared to respond on air, or in print, to the rumours or ill-informed comments of others, without verifying the facts. Often these members are apologetic when personally approached after their public actions and advised that they only have half of the story. Sadly, they have been unwittingly conscripted into the rumour mill, and often their reactions are taken as a public endorsement for some political cause or hidden agenda.

If you feel aggrieved after having heard or read something about the WIA, no matter how official sounding its source, please exercise your rights as a responsible WIA Victoria member. Should a matter be of such personal concern that you feel compelled to put out a packet bulletin, write to the editor of a magazine, or vent your beliefs about the topic on air, please wait until you have checked the facts first with the WIA Victoria secretary.

VK6 Notes

John R Morgan VK6NT

Divisional GM

The August GM was attended by 23 members. Much business was discussed, including Federal matters, the International HF Beacon Project (the callsign VK6B has been requested), and the general disgust in VK6 at the recently-announced changes to the rules of the John Moyle Field Day contest. Tony VK6TS, the Divisional Broadcast Officer, played a recent recording of the VK4 Division's regular program on

community radio stations in VK4 and P29. The audience's reaction was generally favourable.

The meeting heard of the up-coming 93rd and 90th birthdays of George VK6GM and Fred VK6FH, respectively, and the members present took pleasure in signing a birthday card for each of them.

General Meetings are held on the third Tuesday of each month in the Board Room, 3rd Floor, CWA House, 1174 Hay Street, West Perth, commencing at 8 pm. There is no meeting in December. All interested persons (members and non-members, licensed or listener) are invited to attend, and will be plied with free coffee and biscuits.

Divisional News

The President, Cliff VK6LZ, wishes it to be known that much of the VK6 Council's time is currently being occupied by important Federal WIA matters, and he urges all members to read the minutes of both the Council and General Meetings. These minutes are promptly published on packet by Don VK6HK.

Peter VK6HAO is the first of the participants in the Division's recent NAOCP Study Class to be heard on-air. Other Novice and Limited Novice callsigns will, no doubt, be appearing soon.

The Divisional Bookshop is now being operated by Roy VK6XV, who may be contacted on Perth (09) 246-3642. A complete list of titles is available on the VK6 Division's new Internet home page.

WA Repeater Group

The September GM was more like a meeting of the Committee, since only six members attended (Clive VK6CSW, Ralph VK6KRB, Cliff VK6LZ, Will VK6UU, Christine VK6ZLZ, and John VK6NT). When it was discovered that the usual meeting-place was freshly painted, those present were invited to re-locate to the comfort of the nearby QTH of Cliff and Christine. Much WARG business was discussed, including some of the essential field-work to be performed during this summer. As usual, there was despondency expressed concerning the bureaucratic difficulties placed in the way of the implementation of technically innovative repeater systems by both the current SMA regulations, and by the massive inertia of the Federal WIA.

You are invited to take part in the informative and entertaining joint WARG/WIA net, held every Sunday morning, commencing at 10.30 am. Listen for Clive VK6CSW signing VK6RRG on the Lesmurdie repeater (VK6RLM, 146.750 MHz).

Meetings are held at the Scout Hall on the corner of Gibbs Street and Welshpool Road, East Cannington, on the first Monday of every month, starting at about 7.30 pm. The odd-numbered months are General Meetings, and the even-numbered months are Technical Meetings.

If You Have Material ...

Material for inclusion in this column may be sent to VK6NT @ VK6ZSE.#PER.#WA.AUS.OC, or to PO Box 169, Kalamunda WA 6076, or via telephone on (09) 291-8275.

"QRM" News from the Tasmanian Division

Robin L Harwood VK7RH

I have been away holidaying in Queensland over August, so I must apologise for a smaller column this month. There has been a change in the office-bearers for the Northern Branch, following the resignations of the President and Secretary at the August meeting. VK7KJC and VK7ZAC also submitted their resignation from the Institute. The office-bearers elected to fill the vacant positions are: President, Bob Richards VK7KRR; Vice-President, Craig Price VK7VEE; Secretary, Robin Harwood VK7RH; and Treasurer, Ian Hart VK7KIH. The positions of Branch WICEN co-ordinator and Equipment Store Officer are also currently vacant.

A proposal to install a six metre FM repeater in Launceston was recently submitted to the Divisional Council by an independent amateur radio group. After discussing this and there being no objection from the Divisional FTAC Officer, the proposal was approved and forwarded to the Spectrum Management Agency. The repeater is not operational at the moment but could be up and running soon.

A new supply of Membership Certificates has now arrived and the backlog will be cleared as soon as possible. If you have recently joined and haven't as yet received your Membership Certificate, please write to the Divisional Membership Officer and we will endeavour to forward one to you as quickly as possible.

Meetings for this month are: Southern Branch, Wednesday, 2 October at 2000 EAST at the Domain Activity Centre; Northwestern Branch, Tuesday, 8 October at 1945 Tasmanian Summer Time at the Penguin High School; and Northern Branch, Wednesday, 9 October at 1930 Tasmanian Summer Time – venue will be advised on the broadcast.

Don't forget that Daylight Saving Time will be in again from 6 October until the end of March. The mainland states that also have Daylight Saving will not be starting until 27 October.

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Silent Keys

Due to space demands obituaries should be no longer than 200 words.

The WIA regrets to announce the recent passing of:-

J H (John)	GORE	VK1PG
P (Peter)	LINDEN	VK3AMX
S (Stan)	PORTWOOD	VK4BZO

Peter Linden P29CW/VK3AMX

With deep regret I advise of the untimely death of Pete P29CW/VK3AMX. A message from Steve VK3OT said that Pete was killed in a light aircraft crash on Thursday, 22 August whilst on a recreation leave visit to the USA, before returning to VK3 to finish his LAME Course and then return to P29.

He was a talented man and an avid six metre operator, sharing his experiences on that band with readers of *The Internet Six News*. He had so much to offer amateur radio and six metres in Oceania in particular. He was looking forward to Cycle 23 but his life has been snuffed out in his prime.

Our condolences to his family and fellow workers at Moorabbin Airport. It is ironical that Pete lost his life in a light aircraft; that he survived the PNG highlands and the dangerous flights in and out of the mission airstrips, only to lose his life on a local joy flight in the US in a Piper Tripacer.

Vale Pete P29CW/VK3AMX/WA6VDF

Eric Jamieson VK5LP

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FTAC Notes

*John Martin VK3KWA, Chairman, Federal Technical Advisory Committee**

New Records

This month there are new distance records for six bands: 50 MHz, 144 MHz, 1296 MHz (two records), 5.7 GHz, 10 GHz and 24 GHz. Of special note is a new world EME record for 10 GHz, between VK2ALU and G3WDG. Congratulations to all those involved in setting these new records.

10 GHz World Record Distance

Also regarding records, there seems to be some confusion over the distance for the 10 GHz world record between VK5NY and VK6KZ. The original distance estimate was 1911 km, but someone somewhere made a typing error which changed it to 1991 km. This incorrect distance has been given in *Dubus* and *QST*, and also made its way into the article by W3EP which was published in August 1996 *Amateur Radio*. Just to set the record straight (!), the distance for this world record has been verified as 1912.1 km.

Transmission Modes

Since the article on transmission modes was published last February, several questions have been received, all from Novices.

The first is whether Novices can use Pactor on the HF bands. The answer is yes. Novices can use F1 modes (frequency shift keying) on 80 and 10 metres, and this includes RTTY, packet, Pactor, Amtor and so on. These modes may use different shifts, protocols, or data rates, but they are all FSK modes and that is all that matters.

Another question was whether it is legal for Novices to use computer generated Morse. Again yes – the transmitted signal is still CW whether you use a hand key, iambic key, keyboard, or anything else.

There was also a query about Novices making computer generated fax transmissions. The argument was that this would be a digital mode because computers are digital devices, and Novices are allowed to use digital modes. Sorry – it doesn't work that way! The mode is defined by the characteristics of the transmitted signal, no matter how it is generated. SSTV and fax are totally different modes from RTTY or packet, and they are not included in the list of modes available to Novices.

Next question: can Novices work through satellites? The regulations do not say no, so the answer is yes. But the opportunities are limited because the only uplink band available to Novices is 15 metres. I understand that several of the Russian satellites are operating in mode K (15 metres uplink, 10 metres downlink) at present.

The final question was about the odd frequency limits of the 2 metre Novice digital segment – 144.692 to 145.208 MHz. The reason is to make it legal for Novices to use FM with 16 kHz bandwidth on any carrier frequency between 144.700 and 145.200 MHz. If the band limits were 144.700 – 145.200 MHz, Novices would be legally unable to operate on either 144.700 or 145.200 MHz.

40 Metre Band – Digital Modes Segment

Last call! Are there any strong objections to a band plan change to extend this segment? The existing segment is 7030 – 7040 kHz, but some overseas countries cannot be worked below 7040 kHz. The proposal is to change the band plan to recognise the use of 7040 – 7045 kHz for overseas contacts using digital modes.

160 Metre Band Plan

The 160 metre CW segment is 1800 – 1810 kHz, less than that in most other countries. It has been suggested that the CW segment should extend up to 1820 kHz.

Also on 160 metres, the band segment 1815 – 1835 kHz is a DX window for overseas contacts, but there is also a lot of local activity around 1825 kHz. It is suggested that the DX window should be kept clear for overseas contacts and that the band plan be changed to include a recommended local "natter frequency" of 1850 kHz.

Any comments would be much appreciated.

Time for Some House Cleaning

It is time for some action on a problem which is damaging the reputation of the amateur community and could lead to tougher rules which could inconvenience all of us. I am referring to the number of illegal bulletins which are circulating on the packet network.

We hear a lot about freedom of speech lately – especially on the packet network. But "free speech" does not mean that we can say anything we like: it is limited by law. On the amateur bands, we are subject to regulations which place clear limits on the types of messages which we can transmit.

An obvious example is advertising. How many advertisements sneak into the packet network each week? Most of them are automatically suppressed, but others get through because the originators carefully avoid using words like "Sale" in the title. It makes no difference. Our licence conditions clearly prohibit advertisements, and this includes Wanted, For Sale, Surplus, Disposal or whatever you may like to call them. The only exception is WIA Divisions which have special permission to include classifieds in their broadcasts.

The other area that I feel needs cleaning up is a small number of bulletins with insulting, offensive or filthy language. We need a more stringent system of message filtering to keep this sort of garbage out of the network.

Interference Problems from Pay TV Set Top Units

There have been several reports of interference problems from pay TV installations. The three systems – cable, satellite and MDS – use quite different set-top units and some give more problems than others. One type of STU generates carriers on multiples of 3.58 MHz or 7.15625 MHz. Another produces wide digital hash which causes serious interference to reception on amateur bands. This unit is also reported to actually cause TVI to free-to-air TV reception!

We need to tackle these problems before they become too widespread, but first we need more information. If you have a pay TV system, or if there is one near you, any reports of interference problems (or the lack of them) would be very much appreciated.

**PO Box 2175, Caulfield Junction, VIC 3161*

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Technical Correspondence

All technical correspondence from members will be considered for publication, but should be less than 300 words.

Kenwood TS-680S HF/6 m Transceivers

In order to locate the "missing 10 MHz" in the receiver tuning from 35 to 45 MHz, simply use one of the programmable band scan memories as for any band. Enter 35 MHz as the lower limit and 45 MHz as the upper limit and enter into memory. The receiver then tunes 35 to 45 MHz with reasonable sensitivity and the pre-amp is still useful.

John Bisgrove VK4KK
26 Kennedy Street, Brighton QLD 4017

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How's DX

*Stephen Pall VK2PS**

TY8Q (l to r) Peter TY1PS, Roger LA4GHA, Bjorn LA9IY, Jonny LA5IIA and (sitting) Mr S Cakpo.

Do you remember all the "hoo-ha" in August 1994 about a possible new DXCC country called Seborga (*Amateur Radio* September 1994)?

Pierpaulo I1RD and his son Paul I1RBJ were very active with the callsign 0S1A from a tiny speck of land north of Ventimiglia which is the railway border town between Italy and France. The contacts were made from an unknown principality called Seborga, which actually is a small township of about 300 inhabitants located about 25 km north-east of Monaco between France and Italy.

It was claimed at that time that the self styled "Principality" was never part of a united Italy which was created around 1860. It was further claimed in amateur cycles, specially by Paul I1RBJ that, for this reason, the possibility of a new "DXCC country" was quite on the cards. Two years have passed without any further significant news.

The other day I read a small news item about Seborga in the *Sydney Morning Herald*. It is partly reproduced here, for no other reason than to amuse you. Never for a moment think that you are reading about the birth of a "new DXCC Country". This is what the news item said in part: *"The former Principality of Seborga has proclaimed its independence from Italy.*

The self-styled HRH Prince Georgio I, a bearded flower grower and former local tourist board chief, said that he had read a declaration of the Town's independence during festivities for Seborga's Patron Saint, St Bernard, on Tuesday, 20 August.

Giorgio said the declaration was based on Italian, Vatican and French documents and international law recognising people's rights to self-determination. The only reaction was from the local Interior Ministry representative, who said he hoped it was all harmless folklore, otherwise the state "will have to intervene". But, "Prince Giorgio" protested, "We're appealing to international law. We know what we're doing, we're right in what we are doing, and we're ready to take the consequences."

Well, good luck to them!

Ashmore Reef – OC-216

Steve AA6LF, who recently operated from Ashmore Reef as VK4ALF/P/VK9, sent me a short note from Kupang City in Timor Indonesia which was his immediate destination after leaving Ashmore Reef. This is what he said: *"The conditions were very good. There was a good spot for me to set up my tent and the antenna, except that at night, huge turtles come ashore to breed, and the Park Warden was afraid they would bulldoze everything down! One did take out the radials from the vertical one night, but that was the extent of the damage.*

Unfortunately, my operating hours were limited by ANCA's policy that visitors cannot remain on the island after dark, because they would disturb the nesting turtles. Access to the island is difficult at low tide as well, and this was an additional limitation on operating hours. However, I did manage to make 467 contacts in three afternoons of operation with stations in 43 different countries." QSLs go to his manager, AA6BB.

Heard Island – VK0

The planned expedition to Heard Island from 12 January 1997 to 28 January 1997, has now reached the final organising stage. A number of guidelines have now been produced dealing with the campsite, equipment, computer networks and logs, food services, medical, power and science facilities, antennas, radios and many other aspects.

There will be two tri-band beams, two WARC beams, three mono-bander beams for 15, 20 and 40 metres, four vertical antennas for the 160, 80, and 40 metre bands, 4 Square arrays also for 160, 80, and 40 metres, two vertical arrays for 30 metres, and satellite antennas. All the antennas will be situated at Atlas Cove, the main expedition campsite next to the former ANARE huts.

The equipment was sent ahead in two 20 ft ocean-freight containers to Reunion Island, where the expeditioners will meet in the last week in December, to join the French antarctic vessel "Marion Dufrese" which

Peter TY1PS's house in Cotonou where the TY8G group stayed.

will take them to Heard Island.

The list of equipment seems endless, running into many hundreds of items including portable showers, a portable potty-house and 24 plastic chairs.

There will be five HF CW and SSB stations with three FT-1000MP transceivers and three FT-900 transceivers. There will be five Compaq 410C and two Compaq 400C computers for logging.

A paper logbook associated with each computer will be used to log all operator changes, band changes and mode changes as well as comments about operating conditions, equipment problems, etc. Special attention will be paid to general cleanliness, personal hygiene and to a clean kitchen. Apparently there is some possibility of Fecal-oral contamination. There is a very thick bird guano layer on the island mixed with fine sand. There is also the danger of the "Heard Hustle Gastroenteritis" and a variety of viruses including cold, flu and Hepatitis A. Apparently radios, headsets, computers and hand mikes are excellent sources of infection if used by more that one operator. On Heard Island there will be 20 expeditioners, among them several medical doctors.

Even birds are a personal hazard on the island. The Skua birds are gull-like birds who silently fly up behind their prey and pluck out the eyes to down their prey.

The expeditioners expect plenty of wind on the island, at least twice a week with wind gusts up to 100 mph.

If you can, please assist the expeditions $US300,000 budget with your donation. Send your donations to Bob Schmieder, Cordell Expeditions, 4295 Walnut Blvd, Walnut Creek, CA 94596 USA.

Benin – TY8G

Last year, during September, a small group of Norwegian amateurs, Bjorn LA9IY, Roger LA4GHA, Jonny LA5IIA and their host Peter TY1PS activated Benin on all the bands including the WARC bands in the CW, SSB and RTTY mode. A total of 13,076 QSOs were made out of which the Oceania region had 95 contacts. Bill VK4UA was instrumental in keeping the channel free on 20 metres for many VK and ZLs who needed Benin.

The group sent an interesting resume of their activities to Bill who was kind enough to pass the information on to me. In the early days, the area of Benin was divided into several kingdoms. The town Ouidah became the centre of slave trading, encouraged greatly by the Europeans. In 1894 the French merged Abomey, Allada and Porto Novo to form the colony of Dahomey and Dependencies. The colony become independent in 1960 and has undergone dramatic political changes. In 1975 the name of the republic was changed to Benin. The country is also known as the home of the powerful voodoo cult which later spread to other parts of the world. Today Benin is a stable country with a growing economy. Main resources are cotton, palm produce, cocoa, coffee, karitee and peanuts.

The Norwegian amateur group was located in Cotonou (6° 21' N, 2° 26' E) which is the largest city, main port and commercial centre of the country. They stayed in Peter TY1PS's house, and used his shack and equipment from 16 until 26 September. The operating licence and permission was arranged by Peter and issued by Monsieur Simon Cakpo, Chef Service des Transmissions du Commandement Territorial.

Some interesting statistics of the ten days of DXing. Oceania with 95 contacts produced only 0.7% of the total QSOs but yielded 12 DXCC countries (8.9%); whilst North America produced 27.7% of the total QSOs but only 15 DXCC countries (11.1%). If you still want a QSL, contact Jonny Johannses, LA5IIA, at PO Box 5626, N-7002 Trondheim, Norway.

Future DX Activity

* Ben OH3TY will be active from Aland Island, OH0, during the VK-ZL-Oceania CW contest on 12/13 October on all bands. He specially wants contacts on 80 metres around 3510 kHz. He suggests the 1500 to 1800 UTC time-frame for contacts with Australia. He has a Bobtail beam for 7 MHz and two phased Butternut HF2V verticals for 3.5 MHz.

* Teo EA6BH intends to be active from Cogo, Equatorial Guinea from 16 to 22 October as 3C1DX. Suggested frequencies are 3005, 7005, 14005, 21005, and 28005 kHz. The SSB frequencies are not known at this stage. QSL via EA6BH.

* Peter ON6TT, who is active in Uganda as 5X1T, will be active again on 80 and 160 metres until December when he will go on leave and join the Heard Island DXpedition.

* Special event station W4D will be activated on 1 October from the Florida "Walt Disney Magic Kingdom Park" to celebrate the 25th anniversary of the park. Activity will be on CW (40 and 15 metres) and on SSB (80 and 20 metres). QSL via KD4FQT.

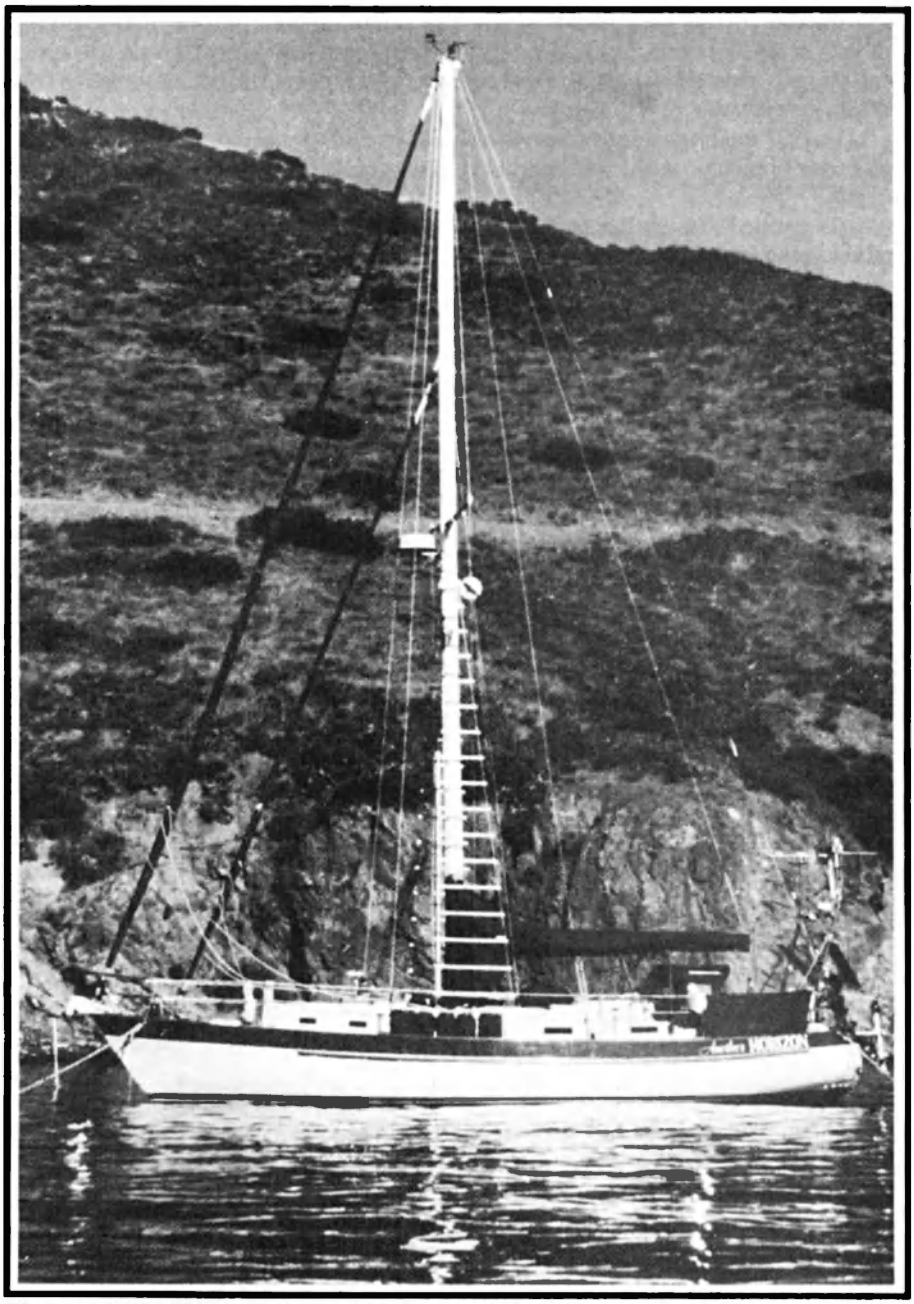
* Sergei R1FJZ made 43,000 QSOs whilst on Franz Josef Land. He is now back on Dikson Island as UA0KBZ. He will be on holiday in September but later he will return to Franz Josef Land, where he will stay until March 1997. He intends to operate also on RTTY.

* Eddie W6/G0AZT will activate the Tunisian call 3V8BB from 8-13 October in the RTTY mode. QSL direct only to Box 5194, Richmond CA 94805, USA.

* Martin 7P8/G4FUI is active on CW and SSB from Lesotho until December. QSL via home call.

* There will be another Sable Island DXpedition from 22 to 29 October with the call WA4DAN/CY0.

* The Egyptian DX net meets Fridays and Saturdays at 1500 UTC on 14220 kHz.



The yacht "Another Horizon" which carries Steve AA6LF from island to island and around the world.

* TT8SP is active in Chad mostly on CW. He was heard on 18070 kHz around 1630 UTC, on 10102 kHz around 2330 UTC, and on the low end of the 20 metres CW segment after 2000 UTC. QSL via F5OIJ.

* There will be some activity from a variety of French Polynesian Islands with separate IOTA numbers. The Lyon DX Group will be there from 9 to 14 October using the callsign FO0SUC. QSL via Bureau or direct to F5JJW, PO Box 7, 69520, Grigny, France.

* 3DA0 Swaziland will be activated by Dave WJ2O, Sam ZS6BRZ, and Andre ZS6WPX from 25 to 28 October during the CQ WW DX Contest. QSL via WJ2O.

* Sergej RW0LBW is active on Falkland Island with the callsign VP8CWI. He will be there until about July 1997. QSL direct to Box 559, Stanley, Falkland Island via UK.

* PT2NP, PT2GTI and PT2HF will be active for two days during the period from 1 to 14 October from Martin Vax island during a Navy mission to Trindade Island using the marines' helicopter support.

* Birgitta SM0FIB will move from Angola to Zimbabwe in the middle of September and will try to get an operating licence.

* Four amateurs, Pete W0AW, Mike N9NS, Joe K8JP and Vincent G0LMY will be active from Nigeria between 22 October and 3 November on CW, RTTY and satellites. They will take part in the CQ WW SSB Contest as 5N9N. QSL direct only to N2AU.

* Twenty operators from Germany will sign as YK0B from Syria during the first week in October. QSL via DL8HCZ.

Interesting QSOs and QSL Information

* 4L1ZG – Zurab – 14014 – CW – 1223 – July (E). QSL to Zurab Gigauri, POB 98, 380004, Tbilisi, Georgia, Asia.

* 9M6TL – Tony – 14037 – CW – 1310 – July (E). QSL to G0OPB, A J Canning, 261 Loddon Bridge Rd, Woodley, Reading, Berks RG5 4BL, UK.

* RF300L – 14018 – CW – 1251 – July (E). QSL to RU0LAX via W3HCW Carl F McDaniel, 2116 Reed St, Williamsport, PA-17701, USA.

* 4L7AA – Mike – 14222 – SSB – 1249 – July (E). QSL to PO Box 32, Warsaw 19, Poland.

* EY8CQ – Alex – 14016 – CW – 1142 – July (E). QSL to Alex L Rubstov, Box 1102, 734032, Dushanbe, Tajikistan.

* V63YI/Y – Yuu – 14016 – CW – 2301 – Aug (E). QSL via JA3IG, Y Yoshitani, I-17-29 Oimazato Nishi, Higashinari, Osaka 537 Japan.

* V63CO – Uwe – 14260 – SSB – 0654 – Aug (E). QSL to DJ9HX via the QSL Bureau.

* ZK1HW – John – 14022 – CW – 0424 – Aug (E). QSL via I5JHW, Giovanni Bini, Via Santini 30, 51031 Agliana, PT, Italy.

* ZK1AND – Andy – 14192 – SSB – 0529 – Aug (E). QSL via AB7FS, Andrew N Duncan, 642 Fox Glove St, Sth E Salem, Oregon 97306, USA (new address).

* HG8SDS – Tibi – 14216 – SSB – 1342 – Aug (E). QSL via HA8PH, Tibor Horvath, Ady E u 20, H-5530, Veszto, Hungary.

* BO0KS – 14009 – CW – 0724 – July (E). QSL via BV2KI, Bruce Yih, PO Box 84-609, Taipei, Taiwan.

* 5N6RDH – Dan – 14164 – SSB – 0704 – July (E). QSL via KF9TH, Don W Easterday, 9311 Parent Rd, New Haven, IN-46774, USA.

From Here and There and Everywhere

* Paul OH5UQ was active in the Pacific area as 3D2PN, A35PM, ZK2PN and ZK1PN. QSL to his home address, Paavo Miettinen, Jukank 4B 16, SF-55100, Imatra, Finland.

* A number of Americans were active in July from American Samoa and from Western Samoa with the callsigns NH8/N8CC, KH8/K8AQM, KH8/KG8CO, KH8/KG8DS and 5W0BS. All QSLs go via AA8HX.

* Alan VK8AV, the well known DXer, has moved back to his old QTH in Alice Springs. Alan is a quiet achiever. Very few of his fellow DXers know that he was active in Bahrain in 1956 as MP4BBX and in 1962 he was active as VR4CV. He operated from 4U1ITU in Geneva in 1986 and 1987, and from W1AW (ARRL HQ) in 1991. He was active from VK8SEA in 1992 and from 9M0SEA in 1994. He currently holds the calls VK8AV, VK4IV and KB8OSW.

* Alfredo 9U5CW has said that, due to security precautions and the sensitive political climate in Burundi, he has temporarily suspended his amateur activities.

* Warren VK0WH from Macquarie Island was quite active during August. He showed up a couple of times on the ANZA Net, on the 40 metre DX net on 7188 kHz and also on the IOTA Net on 14260 kHz. He was also active a couple of times on his 7009 CW spot on 40 metres, and in the middle of August he even turned up one night at 1100 UTC on 1830 kHz on CW and worked a number of VKs and ZLs. Warren is working with three wire beam antennas attached to a 75 ft. tower. The directions of his antennas are Sydney, the USA and the Caribbean. He is now able to switch frequencies but in the same mode only.

* Jim VK9NS reports that he finally got the copy of the original import certificate regarding Mani VU2JPS's intended transceiver dated 27 February 1996. He also received an official note that his Indian licence (VU2JBS) validity has been extended to 2001. Jim says that the transceiver was sent to Mani VU2JPS in the middle of August with the appropriate monetary transfer which enables Mani to pay the import duty on the transceiver.

* If you heard X5EBL, the operator was Eddy who was active from Banja Luka, an area called Srpska which is the Serbian part of Bosnia-Herzegovina. Do not rush yet to your DXCC countries list. It is not on! The prefix is a self-styled one and is not recognised by ITU or DXCC. The QSL card via YU1FW has "souvenir" value only.

* The total population of Crozet and Amsterdam Island is only 16 scientific personnel.

* It was reported that Kan JA1BK and Martti OH2BH were in Yangoon Myanmar around 23 August in the company of Warren KF7AY. There was no sign of them being on air.

* Israeli novices use the 4X9 and 4Z9 prefixes with a three letter suffix, and can operate only CW on the 15 and 40 metre bands.

* Bob KK6EK, the Coordinator of the Heard Island DXpedition, announced that one member of the team had to withdraw for professional reasons which created a vacancy on the team.

* The 1997 International DX Convention will be held in Fresno, California from 4 to 6 April.

* The combined RSGB International HF and International IOTA Convention will be held at the Beaumont Conference Centre (Old Windsor, UK) on 4 to 6 October.

* Yuki JH1NBN and others (TI5RLI, TI5KD, KI3ERV and 7L2RPY) were on Cocos Island (Pacific) from 26 April to 4 May. In a note sent by Yuki, he mentions that they had some difficulty with landing and camping on Cocos Island. Baggage, which included two rigs, was lost on the onward journey, incorrectly delivered to Brazil by the airline. They managed about 7500 QSOs.

* Sanyi HA7VK, who spent the last two and a half months in North Korea (see *Amateur Radio* Sept 96) hoping to obtain a licence, has returned to Hungary. He was heard with his home call on Zedan's net on 14250 kHz at 0500 UTC.

* Propagation has improved slightly. After many months of silence there were occasional long-path openings around 0530 to 0700 UTC to the Middle East and North Africa. At around 1200 UTC there is an occasional opening on short-path to Europe. Of course, both openings refer to the 20 metre band.

QSLs Received

VQ9DX (3 m AA5DX); ZK2ZE (4 m LA9GY); TI9X (3 m JH1NBN); 5A1A (6 m op Ali); A35MN (3 m DF8AN); ZL8RI (3 m – ZL2HU).

Thank You

Many thanks to all those who help me with information to put these notes together. Special thanks to VK2XH, VK2KFU, VK2TJF, VK2TQM, VK4UA, L40370, VK5WO, VK8AV, VK9NS, DF7RX, OH3TY, AA6LF, *The Sydney Morning Herald*, ARRL DXCC Desk, *QRZ DX, The DX Bulletin, The DX News-Sheet, The 425 DX News* and *GOLIST QSL Managers List.*

*PO Box 93, Dural NSW 2158

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International Amateur Radio Union Monitoring Service (IARUMS) – Intruder Watch

*Gordon Loveday VK4KAL**

IARU Region 3 Monitoring System

A timely report by the Region 3 co-ordinator, ZL1CVK, taken from July '96 issue of "Region 3 News".

Our Region's Monitoring System is part of a world wide network. Its aim is to detect, identify, and remove all unauthorised signals found in the amateur bands. Our bands have been allocated by ITU decree. They are for our use. This fact is completely disregarded by intruders. This is why the IARU monitoring system was instigated.

In Region 3 the societies participating in monitoring are JARL, WIA, ARSI and NZART. The monitoring co-ordinator for each society reports each month on the intruders discovered by members of the local society.

These monthly reports are sent to the Regional co-ordinator who uses that information, together with information from other sources (in VK a report is sent to the SMA in Canberra) to produce the monthly regional report. A copy of this regional report is sent to each contributing society, Region 3 HQ, Regions 1 and 2 co-ordinators, and to the International Co-ordinator.

Steps are taken to contact the source of intrusions with the object of having them removed from our bands.

Success in removing intruders is usually quite slow in coming. It is, however, very difficult for any organisation, administration or individual, to refute the enormous amount of data which can be produced by the Monitoring System. This is our strength.

There are a large number of regular intruders based in Region 3 and these are our targets. Where possible, the local society of the country where the intruder is based, is asked to assist in the removal. If this is not possible or practical, Region 3 HQ will instigate the complaint process.

Following a recent IARU ruling, the above process was used for the first time in March '96. An Iranian broadcast station, Radio Teheran, had been transmitting on 7.070

MHz for a considerable time. Repeated attempts to get this intruder to move had met with no success. Iran has no amateur organisation, so Region 3 HQ and the monitoring system co-ordinator sent a joint letter of complaint. This was accompanied with the latest world wide reports showing Radio Teheran in our bands.

The Region 3 complaint was one of many sent to the Iranian administration. The combined efforts appear to have paid off. At the time of writing Radio Teheran has not been heard since on 7070 kHz.

Each year, monitoring systems world wide are responsible for effecting the removal of a number of regular intruders. At present we are endeavouring to remove transmissions by the non-amateur Vietnamese CW station VRQ on 14.089-92 kHz, with the able assistance of our IARU Region 3 Correspondent in Vietnam.

Please help us to help you. Encourage your society to become more active in our regional Monitoring System.

It is pleasing to note that the Department of Posts and Telecoms Policy in Vietnam has been charged with creating a completely new set of regulations for amateur radio. The head of the project is Diploma of Engineering Nguyen Ngoc Canh, Deputy Director, who has a favourable attitude towards amateur radio. He and his colleagues have had a draft regulation for amateur radio ready to be presented to the head of the DGPT when some details have been finalised. In the meantime we must be patient.

Back issues of Region 3 News are usually limited, but interested readers who wish to obtain any copy, can write to: The Editor of Region 3 News, PO Box 73, Toshima, Tokyo 170-91, Japan.

Reports Required

Broadcast stations of particular interest at the time of writing are on: 7.035 MHz at 0820z; 7.070 MHz at 0230z possibly with jammer; 7.090 MHz at 0535z; 14.250 MHz Radio Pyongyang, 24 hour operation; 7.098 MHz at 2215z; 7.095 MHz at 2155z; 18.075 MHz at 0410z; 14.240 MHz at 1115z; and 14.330 MHz at 0600z.

A spurious signal has been heard on 14.067 MHz. Transmissions are heard every 30 minutes, last about five minutes and the contents are synthesised voice. If heard, please notify me. The signal originates from Volmet, Sydney, whose legal frequencies include 6676 and 11387 kHz. Please give the make and model of receiver or transceiver used to log this signal.

A signal has been heard on USB on 3614 kHz, English speaking, definitely not amateur, and not Japanese. The signal will possibly be heard best in our northern areas as the report came from Groote Island.

A new beacon frequency has been noted, "C" on 7040 kHz. Beacon "C" is usually heard on 7039 kHz! Radio Republic of Indonesia continues to be logged on 7098.3 kHz; also Radio Veritas on 7105, splattering down to 7097 kHz; more reports on these stations would be appreciated.

7070 kHz still remains a popular frequency for intruders; check it out. You may hear some jammers, but please log what you hear!

Also, when checking on the 40 m band, please log any spurious signals above 7100 kHz. The offenders possibly do not know about these intrusions into our legal bands. We can at least advise them in the first instance; if they still persist, the Monitoring Service can get a bit "heavy handed"!

Remember, at all times you should complain to the Monitoring Service about intrusions, not your contact of the moment. Doing that will get you nowhere; with the Monitoring Service you will have a better chance of success.

Successes

A few notable removals from our bands include: Radio Pakistan, from 7.080 MHz; Radio Teheran (mentioned previously) from 7.070 MHz; and Adventist World Radio from 7.100 MHz. There are several other intruders using 7.070 at present. Radio Taipei on 14.210 MHz is presumed to have vacated the frequency as it has not been heard for a number of months. The Monitoring Service does not always get notification from the offenders about vacation of frequencies! I have not included those intruders removed from Regions 1 and 2.

Remember, your complaints, logs, etc should be sent to me as below. My telephone number is 079 854 168 after 9.00 pm.

**Federal Intruder Watch Co-Ordinator, Freepost No 4 Rubyvale QLD 4702 or VK4KAL@VK4UN-1*

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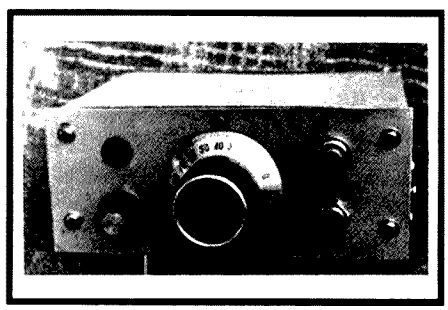
Novice Notes

*Peter Parker VK1PK**



An amateur transmitter need not be complex to be effective. Many contacts throughout VK and ZL have been made with this forty metre, VXO controlled, direct conversion CW transceiver.

Basics of Transmitters Part One

Introduction

The reason for obtaining an amateur licence is so that one can legally use a transmitter on the amateur bands. This article seeks to give the reader an understanding of the basic transmitter circuits for many of the modes commonly used by the Novice licensee. This month, CW and AM transmitters are discussed. Part Two, to appear in December *Amateur Radio*, will cover DSB, SSB and RTTY transmission. FM will be the subject of a separate article next year.

CW Transmitters

The simplest of all transmitters are those intended for CW (Morse) operation. In their most basic form, transmitters for CW consist of simply a keyed RF oscillator. Whilst contacts can be had with such an arrangement, most practical designs include at least two stages (an oscillator and a power amplifier).

A Typical Circuit

Figure 1 shows a design that is popular amongst those who build their own equipment. QRP (low-power) enthusiasts will instantly recognise it as being the "Oner" by George Burt GM3OXX. The first stage is a basic crystal oscillator. A variable capacitor has been wired in series with the crystal to permit a small degree of frequency agility. You will notice that the oscillator has been wired so that it is operating continuously while power is applied to the circuit. The reason for this is that the transmitter circuit came from a design for a transceiver that uses a direct conversion receiver. As direct conversion receivers require a local oscillator signal that is almost the same frequency as the transmitted signal, it makes sense for the transmitter's oscillator to operate during both transmit and receive. The signal for the receiver's mixer is taken (via a low value capacitor) from Point A.

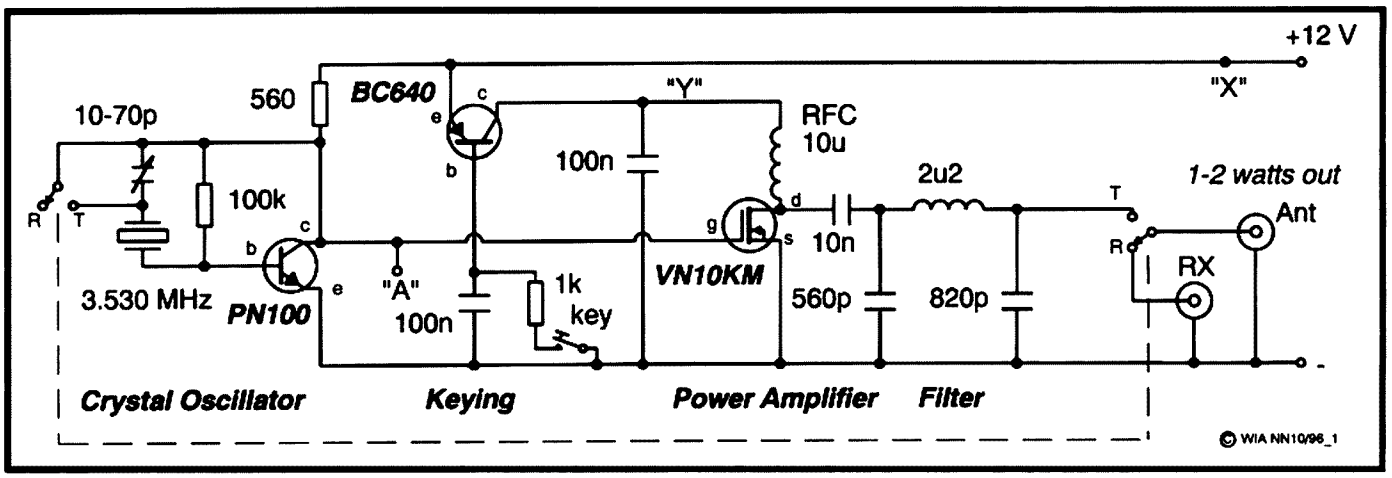


Fig 1 – Simple crystal controlled CW transmitter.

The middle transistor is the keying transistor. Note that, being a PNP device, the emitter is connected to the positive rail. As it does not handle RF, almost any audio transistor will suffice, provided it can handle the current drawn from the collector (typically 200 mA). Normally, the collector of the BC640 is at zero volts. However, when the key is pressed, current flows through the transistor, and the collector voltage reaches twelve volts. It is this voltage that powers the transmitter's power amplifier (PA) final stage, and boosts the signal from the few milliwatts generated by the crystal oscillator to a more usable level. Lifting the key will switch off the power amplifier. While the crystal oscillator will still be operating, its low power output and the isolation afforded to it by the dormant PA stage means that no signal will be radiated.

The power amplifier itself is the ultimate in simplicity, consisting of just three components. A VMOS field effect transistor is used for high power gain. The 10 µH RF choke supplies power to the FET, whilst preventing RF from being lost to ground through the 100 nF capacitor.

After the final amplifier is a pi-network low pass filter, consisting of the 560 and 820 pF capacitors and the 2.2 microhenry inductor. The function of this circuit is to attenuate harmonics (multiples) of the transmitted signal that will be present on the final amplifier's drain. This is important to prevent interference to television and radio reception.

You will notice the two-pole (or DPDT) switch in the circuit. One part of it switches the antenna between the transmitter and the receiver, while the other actually shifts the frequency of the crystal oscillator slightly. It does this by short-circuiting the variable capacitor in series with the crystal during transmit. When a small capacitor (whether variable or fixed) is wired in series with the crystal, as in this circuit, the frequency of the oscillator will increase slightly (perhaps 500-1000 Hz with a 3.5 MHz crystal). Shorting the capacitor (by switching to T) will lower the oscillator's frequency during transmit. As direct conversion receivers cannot receive a CW signal when it is exactly the same frequency as the set's internal crystal oscillator, this offset (typically 800 Hz) is required for proper transceive operation.

Note that the foregoing assumes the use of a direct conversion receiver controlled by the transmitter's crystal oscillator. If a stand-alone receiver is being used, the offset function is not required, and can be removed. However, the use of an external receiver requires that the transmitter's oscillator be switched off; otherwise it would spoil reception. This can be achieved by removing power at point X when receiving. Spare contacts on the transmit/receive changeover switch can be used here.

Other Comments

The above circuit probably represents the simplest practical transmitter for effective HF CW operation. However, additional features can be added to make its operation more enjoyable.

The use of a manually-operated switch for switching between transmit and receive may not appeal to the CW contest operator, or those who operate "break in" (being able to listen to the band in between sending Morse letters). Adding a relay to switch the antenna, frequency offset and receiver automatically is quite simple, particularly in a circuit such as Figure 1, where there is already a keyed twelve volt line (point Y). In this case, all that needs to be done is to wire the relay's coil between Y and earth, and connect the contacts as per a manual switch. Further refinements, such as receiver muting, side tone, and various time delay circuits make operating smoother still.

Frequency agility is an important feature, and unless one only used the transmitter of Figure 1 to keep regular scheds on a single frequency, one is likely to find crystal control quite limiting. The use of a variable crystal oscillator circuit (known as a VXO) can allow crystals to be moved in frequency slightly. While this is quite practical with fundamental crystals on 21 MHz (where coverage of the entire 25 kHz of the Novice CW band should be possible), it is of limited value on 3.5 MHz, as only small shifts are possible.

Similar to crystals, but capable of a much broader frequency coverage, are ceramic resonators. While less stable than a crystal, ceramic resonators are still sufficiently stable for CW and DSB/SSB transmission and reception. A 3.58 MHz ceramic resonator is capable of covering the entire Australian Novice segment (3.525 – 3.625 MHz), and is less demanding than a conventional VFO in the construction standards and components required.

A free-running variable frequency oscillator (VFO) is also a practical proposition on 80 metres. However, VFO-controlled transmitters need to include

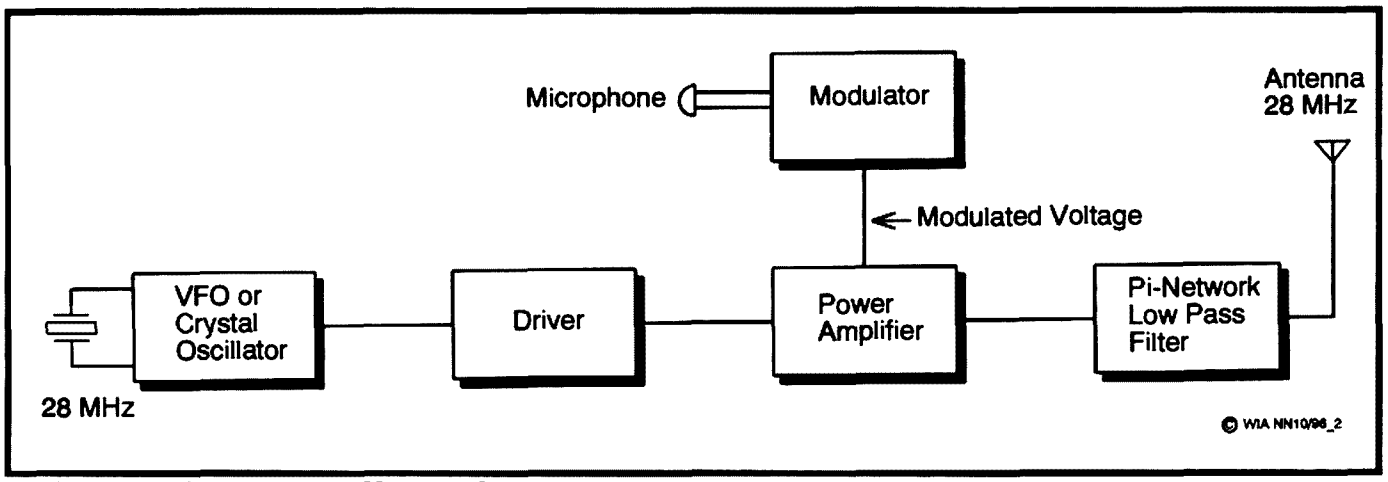


Fig 2 - Block diagram of an AM transmitter.

buffer and voltage regulation circuits, making them more complicated than the "Oner" shown here. Also, VFO transmitters demand a higher standard of construction than do crystal-controlled circuits, with voltage regulation, quality components and solid mechanical construction being vital for frequency stability.

A failure to observe the above precautions will result in the transmitter signal sounding poor on the air. Possibly the most common problem is chirp, which is caused by the frequency of the VFO or crystal oscillator shifting as the key is pressed. A chirpy signal changes its pitch during the time the key is down. This can make the signal difficult to receive, particularly if the receiving station is using a highly selective receiver with a narrow intermediate frequency (IF) or audio filter. Chirp can result from a transmitter with poor VFO voltage regulation or insufficient buffering between the VFO and the succeeding stages. Transmitter circuits where the crystal oscillator or VFO is directly keyed are particularly susceptible to chirp.

Another problem with some designs is key clicks. These are caused when a transmitter's keying pattern (which can be viewed on an oscilloscope) is too abrupt. The use of components in the keying circuit to permit a gradual turn on and turn off (albeit over a fraction of a second) will eliminate clicks, which in severe cases can cause interference to operators on frequencies far removed from the transmitted signal.

AM Transmitters

Prior to the growth of SSB in the 1960s, and VHF FM operation in the 1970s, the main voice mode used by amateurs was AM. Apart from its use by some WIA Divisions for their Sunday morning broadcasts, AM is only occasionally used by amateurs today. However, Novice licensees are permitted to use the mode, and there is merit in its continued use, particularly for local communications on 10 metres, where 27 MHz CB radio sets can be converted to amateur operation.

Figure 2 shows a block diagram of an AM transmitter. You will notice that, like the CW transmitter above, it contains a crystal oscillator/VFO, power amplifier stage and pi network low pass filter. Typically, buffer and driver stages will separate the oscillator and the power amplifier, depending on the transmitter's power output.

The distinctive stage in an AM transmitter is the modulator. The modulator is simply an audio amplifier whose output is used to vary (modulate) the supply voltage to the power amplifier. This modulation causes the amplitude (strength) of the transmitted signal to vary in sympathy with the operator's speech.

There are various ways to modulate an AM transmitter. The most effective is called plate (or collector) modulation, because it varies the voltage supplied to the plate (collector) of the final transmitting valve (transistor). This requires a powerful audio amplifier for the modulator, and an associated heavy duty power supply and modulation transformer. Where this is prohibitive, modulation could be applied to either the cathode or screen grid of a valve. However, in this case the depth of modulation is less.

An AM signal contains two identical signals (sidebands) either side of a central carrier signal. Assuming proper audio filtering in the modulator, an AM voice signal should be no more than 6 to 8 kilohertz wide. However, the carrier conveys no intelligence and can be suppressed in the transmitter if it can be replaced by a signal generated locally within the receiver. In addition, as both sidebands are identical, one can be suppressed to halve the transmitted signal's occupied bandwidth.

I am of course referring to double sideband (DSB) and single sideband (SSB) respectively. Join me in December to learn more about transmitters for those modes.

7/1 Garran Place, Garran ACT 2605
VK1PK @ VK1KCM.ACT.AUS.OC
Internet e-mail: parkerp@pcug.org.au

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Over to You - Members' Opinions

All letters from members will be considered for publication, but should be less than 300 words. The WIA accepts no responsibility for opinions expressed by correspondents.

Morse Comes of Age

A recent TV news story described how radio Morse is no longer to be used in the RAN, which brought forth yet another chorus of "Morse is dead" from various quarters. And this is added to the earlier report that the US Coastguard no longer officially uses the code ("gee, it MUST be finished world-wide, if the good ol' US Coastguard don't use it no more").

Morse is not dead, nor even ill. That it is "technically" obsolete may or may not be so. It depends greatly on the individual operational circumstances, particularly where costs are involved (for instance, official land-line Morse finished in Australia 30 years ago because machine telegraphy was cheaper, and could be worked by lesser skilled operators). The HF bands, both amateur and commercial, still buzz with the wonderful sound of dots and dashes.

I believe Morse is now entering a new phase, a mature reality, where its continuance is not dependent upon mainly commercial considerations, but rather, will be carried on and used by persons who have a genuine regard and affection for the mode. For instance, how many of us travel to work on horseback? The automobile did not spell the end of equestrian activity. The diesel has not displaced steam in model railway work (steam overwhelmingly has the greater following with model engineers because it lives and breathes and is a pleasure to the senses).

So it is with Morse. Sending it, receiving it, digging out those drifty, fading, chirpy little signals from the other side of the world, listening to old timer's music made upon a bug key, copying "copperplate" sent on a straight key, and basking in the perfection of an electronic keyer are all part of the challenge and pleasure that an enthusiast may enjoy.

So stop grumbling about the death of Morse. Just get on and USE it!

Drew Diamond VK3XU
"Nar Meian" 45 Gatters Road
Wonga Park VIC 3115

Handbook Availability

I instruct in AOCP Theory for the Southern Peninsula Amateur Radio Club at Rosebud, VIC.

SPARC (as we are known) has, since 1987, been active in the production of amateur radio operators. This year, however, despite a steady influx of candidates for all classes of licence, we find that the handbook for our Full Theory study course is no longer available.

I refer to the *Radio Theory Handbook for Amateur Operators (2nd edition)* by Fred Swainston.

This has been an excellent teaching aid and, without it, next year's students will be severely disadvantaged. If any readers have a copy of this publication for sale, please contact me as below.

In view of the new Question Bank and Regulations being shortly available, I feel that a third edition of Fred Swainston's handbook would be most welcome, not only as a teaching aid but also as an excellent reference source on radio electronics.

Max Morris VK3GMM
PO Box 222
Rye VIC 3941

Polish Appreciation

I would like to express my thanks for the possibility of attending the 2nd IARU Region 3 ARDF Championships in Townsville and for the wonderful hospitality of VK amateurs I met during my stay in Australia. I am impressed with the excellent organisation of the event, sophisticated choice of the competition courses and the fine work of the VK4 Organising Committee with its Chairman Wally Watkins VK4DO. Also the growing number of VK participants and the high level of their sporting skill is worthwhile to note.

Would you accept my sincere thanks and best regards.

Chris Slomczynski SP5HS
Chairman
IARU Region 1 ARDF Working Group
PO Box 92
PL 00-967 Warszawa 86
Poland

Morse, a Blinkered View

In *Amateur Radio*, February 1996, Steve Ireland VK6VZ wrote that he considered it unacceptable and extremely dangerous to allow amateurs HF operation without the current CW requirement.

Steve talks about amateurs sharing LF bands with professional users. The lowest frequency that Australian amateurs may use is 1800 kHz which is Medium Frequency not Low Frequency. Australian amateurs have no current allocation in the LF band.

Steve also talks about the 80 m SSB DX window. I have heard many warnings on WIA broadcasts about amateurs intruding beyond the edges of this DX window. This segment is only occupied by Full Call amateurs, people that have supposedly passed 10 wpm Morse. It is the understanding and adherence to the amateur radio regulations that stops QRM to professional users, not a knowledge of CW.

The SMA has allowed Limited Operators on HF without the CW requirement. These professionals mustn't think that it is extremely dangerous!

Why must an amateur radio operator learn CW at 10 wpm to talk on HF at 150 wpm?

Is it also totally unacceptable and extremely dangerous for an amateur Limited operator to use HF during times of declared emergency at the request of a combat agency?

I personally have undertaken a communications course with the State Emergency Service and I am also a very active member of WICEN. I am continually training and honing my communicating skills. I have passed Full Call theory and Regulations just the same as people with their AOCP. I have been in bushfires shadowing the Group captain, in amongst the widow makers, providing their only means of communication. Ever since I became an amateur I have participated in JOTA both on packet and on HF SSB (with a Full Call in attendance at all times).

I have received a certificate of appreciation from the Premier of NSW and am constantly

WIA MORSE PRACTICE TRANSMISSIONS

VK2BWI	Nightly at 2000 local on 3550 kHz
VK2RCW	Continuous on 3699 kHz and 144.950 MHz 5 wpm, 8 wpm, 12 wpm
VK3COD	Nightly (weekdays) at 1030 UTC on 28.340 MHz and 147.425 MHz
VK3RCW	Continuous on 145.650 MHz, 5 wpm, 10 wpm
VK4WIT	Monday at 0930 UTC on 3535 kHz
VK4WCH	Wednesday at 1000 UTC on 3535 kHz
VK4AV	Thursday at 0930 UTC on 3535 kHz
VK4WIS	Sunday at 0930 UTC on 3535 kHz
VK5AWI	Nightly at 2030 local on 3550 kHz
VK5RCW	Continuous on 144.975 MHz, 5 wpm to 12 wpm
VK6RCW	Continuous on 147.375 MHz, 4 wpm to 11 wpm
VK6WIA	Nightly at 1930 local on 146.700 MHz and nightly (except Saturday) at 1200 UTC on 3.555 MHz

praised for my operating manner. I have put my skills and my life on the line to help my fellow Australians, yet I still find people, mostly arm chair critics, who say I would be *extremely dangerous* on HF.

Is someone wearing blinkers?

Frank Weber VK2XVJ
41 Mill Street
East Maitland NSW 2323

EMDRC Balloon Launch

Most Amateurs in VK3 would be aware that members of the Eastern and Mountain District radio club are responsible for three balloon launches. Our first consisted of a very basic payload, just a tone generator and 2 m transmitter. For the second one, the payload had a digitised voice and measured altitude, flight time, and internal and external temperature with the mode of transmission being FM and packet. Our latest launch in late 1995 had all the second one had, plus radiation count and battery voltage, and, via a small amplifier, was capable of high or low power as required. Both the first and last payloads were recovered by members of the Melbourne fox-hunting group; the second launch sustained some damage prior to launch and was transmitting only a couple of milliwatts.

My reason for this letter is to alert the amateur community that, during late 1996 and early to mid 1997, we are inviting secondary school science students to take part in a contest for the design and, if possible, construction of an experiment. The school which comes up with the best project will able to have their experiment launched in November 1997.

We see this as a wonderful opportunity to make the youth of today aware of what amateur radio is all about. We may require interested amateurs that live near some of the schools competing to assist the students and teachers where possible. To give the schools an idea of what to expect, there will be a launch this year on Saturday, 2 November. We expect this payload to reach an altitude of at least 65,000 ft and it should be heard in Adelaide and Sydney. There also is a possibility that the 1996 launch will have a receiver on board so the weak signal operators can test their stations.

There is a web page being created, and it should be operational before this letter is published. For more information regarding this project the club can be contacted by mail to: EMDRC Balloon Launch Committee, PO Box 87, Mitcham 3132 VIC. Or via packet to VK3ER@VK3KSD.

Jack Bramham VK3WWW
EMDRC Inc
PO Box 87
Mitcham VIC 3132
ar

Pounding Brass

*Stephen P Smith VK2SPS**

What to Look for in a Paddle

CW operation to the beginner must be very confusing when you consider the variety of keys and keying equipment currently available on today's market. If you have never used a semi-auto or a single lever before, by all means start with an "Iambic Paddle" and "Keyer". You will have no habits to unlearn, and you will find iambic sending very satisfying and, most importantly, fun to use.

On today's market there are many iambic paddles available to chose from, so choosing the right one can be a very daunting experience especially for the beginner. I would highly recommend that you try several models before outlaying that hard earned cash. Perhaps you could speak to members of your local club about borrowing one for several nights so as to get a feel for iambic sending.

If you can't borrow a paddle and keyer I'll try and steer you in the right direction by giving you some helpful advice and a few general suggestions of what to look for in a good iambic paddle.

Feel

Try as many models as possible, because the feel of each paddle varies tremendously. Some paddles are stiffer than others, and some feel very sluggish, while others have a very light touch. Correct adjustment and personal experience play an important role in the feel of the paddle. A good paddle should feel very smooth and precise during use; the paddle should never make you feel like you are fighting it.

Weight

This almost goes without saying, the heavier the better. A paddle that is not heavy enough will slip and slide all over the table during use. If you are a heavy hitter go for a very heavy base. If you have found that perfect paddle and want to purchase it, but feel that it is somewhat under weight, this problem can be easily rectified. You can purchase sheet lead from most hardware and plumbing outlets for a few dollars. Fold it over a few times and glue it to the base of your paddle or you can blue-tack it to the top side of your paddle; this way you can vary the weight for personal preference.

Other methods to use include blue-tacking the paddle to the table or using double side tape. Whichever method you use, it will prevent the paddle from moving during operations.

Adjustability

Contact spacing and tension (return force) should both be independently adjustable for each side, but sadly this is lacking in some models. Most paddles allow you to adjust contact spacing and tension, but the range of adjustment varies tremendously. The ideal paddle will allow contact spacing to be easily adjusted from almost touching to a gap about 10 mm wide and tension to be adjusted from a very light touch to very heavy with some force being applied to the levers. Every operator has that perfect adjustment for their particular key. One setting you favour might be unsuitable to another operator. Again, experience plays an important role here.

Once the key is adjusted it should hold these adjustments for some time before needing re-adjusting due to normal wear and tear.

A rough guide I use for contact spacing is to use the standard size business card, which is about 2-3 mm thick. Place the card between the contacts until a snug fit is achieved by adjusting the contact spacing screw. You don't want the contacts so close that the slightest knock will activate the keyer into operation. On the other hand, you don't want the contacts too far apart; you need to achieve a medium between these extremes.

Another factor to look out for is how the paddle is to be adjusted, and whether tools are needed or not. Some paddles require medium to small Phillips-head screwdrivers while the Bencher Model uses a small Allen key which fits underneath the base in a special holder. The Allen key leaves a more permanent setting, especially if you don't want others to touch it. The disadvantage here, though, is that if you are portable and misplace the Allen key no adjustments can be carried out.

The advantage of having a paddle that adjusts without the need for tools, such as using thumbscrews, is you can adjust the key any time, any place. Again, it's up to the individual which way he wants to go. On some of the more expensive overseas models you can get interchangeable levers, with the ability to set the distance between levers and thus custom tailor the key to suit you.

Connections

Basically, you have two types of connections, "binding posts" and "soldered". Binding posts with thumbscrews

allow you to attach the cable directly to the paddle without the need for soldering. The only disadvantage I can see is losing the cable during transport. On the other hand, soldering the cable ensures it is permanently attached. The disadvantage here is, if the cable develops a fault, the whole lot will have to be replaced. This could be a major problem if you are portable without soldering equipment.

Taking the Bencher Key, for example, the cable is soldered underneath the base. You have three terminals – earth, dot connector and a dash connector. Three core cable is used for connection, but not the 240 VAC type cable.

Appearance

A good paddle will cost you. I consider it an expensive accessory item to the shack, but one which, if looked after, will outlive the operator. Depending upon personal taste they come in a range of colour, though standard models are usually with black, chrome or gold bases, and with different coloured finger levers, although some operators paint their own levers thereby giving the paddle that personal touch.

Cost

Cost, like models, varies tremendously, and can range anywhere from $100 to over $800 for a custom built paddle from the USA.

Conclusion

I hope this short article has helped you understand a little more about iambic paddles and that this style of operation can be tremendous fun for anybody willing to give it a go.

Next Month

A detailed look at the "Bencher Paddle", being the most widely used paddle in Australia; and looking at the history, mechanics and adjustments.

PO Box 361, Mona Vale NSW 2103

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Repeater Link

*Will McGhie VK6UU**

10 Metre Gateways

Shortly after e-mailing off the September issue of *Repeater Link*, I received the latest report from FTAC. It contained a small segment on the 10 metre band plan. It said, *"Still no response received from TACs, except for a message from Will McGhie to the effect that there is no problem with the band plan provided at least one channel is available for use by simplex repeater gateways"*.

What is wrong with us? No response from the TACs. Just in case you may not be informed about TACs, read the following information.

TAC

TAC stands for Technical Advisory Committee. There is a central Federal TAC called FTAC. It is run by one person, John Martin VK3KWA. John operates FTAC on his own, a job that requires considerable effort, and John puts in this effort. Each Division then appoints a representative, who provides input to FTAC on issues raised by Divisional members, Divisional Councils, the Federal WIA, or FTAC itself. These TAC divisions go under various names, all ending in TAC. For example, in VK6 it is called WESTAC.

When an issue is raised, it is FTAC's job to gather comments from as many sources as possible and, in particular, from the Divisional TACs. Once this process has taken place, FTAC then draws up a recommendation for action by the Federal WIA. Largely, the Federal WIA takes on the recommendations and it becomes WIA policy.

Flaws

I believe that the process has some serious flaws. Strong words, I know, but where the process breaks down in several instances is in the consultation process between FTAC and the Divisions.

An example is the 10 metre gateway proposal. An interesting experimental idea came along. Not everyone's idea of a useful way to spend time on amateur radio but, for some, exciting, and who knows what the idea might develop into. It is very hard to predict the future, as ideas come and go. Some result in great new aspects of amateur radio, while others go nowhere.

The 10 metre gateway is a simplex in-out FM frequency cross linked to an existing repeater. You talk into the 10 metre gateway, to be retransmitted onto a VHF/UHF repeater, and then listen to the response transmitted back to you on 10 metres, from the VHF/UHF repeater.

The idea was tried and worked very well. It showed all sorts of exciting experimental aspects. The gateways could even be automatically linked to one another, simply by them being on the same frequency on 10 metres. You could, when 10 metre propagation allowed, talk across Australia from local repeater to local repeater.

Then a snag was discovered. 10 metre gateways were not allocated spectrum space on 10 metres and probably contravened several regulations as decided by the SMA. So this line of experimental investigation stopped.

FTAC became involved due to the planning for spectrum on the 10 metre band. FTAC began consultation with those interested in the gateway idea and sought to find space for gateways. Once an initial response was available from FTAC, these ideas were forwarded to the divisional TACs for comment. After several months the only response has been from VK6, and in the initial phase VK5, which had submitted a proposal on gateway band planning. This was done by Grant VK5ZWI.

Feedback

So where is the feedback from the other Divisions? Several other states either had gateways on air, or in the building phase. These were VK2, VK4 and VK8 to my knowledge. Did the divisional TACs in these states receive the FTAC material? If they did, what happened to it? Did the Divisional Councils see or hear of this information? Did those amateurs who are involved in gateways know of the FTAC material?

This is where I believe the system breaks down. Amateurs are not seeing much of this information so they can provide input. FTAC waits for feedback and time passes by. In the gateway situation two years has now gone by.

Communications

How can we turn this delay situation around? Communications is the answer. The Divisional TACs need to be in touch with one another. I have a particular interest in gateways and if I could easily contact my TAC counterparts I could encourage comment and hopefully speed up the decision making process.

I hear you say *"so what is the problem with communicating with my fellow TACs?"*

The answer is time required and cost. I already spend considerable time on this hobby and don't have the extra time to spend writing letters, or spending money on phone calls. Even if the WIA is prepared to fund my phone calls, and I believe they would, the phone is not the answer. You try contacting several people by phone over a period of time and see how much time you waste. Electronic communications are the way to go. Packet is the best option. It is not perfect but, compared to the present situation, is way in front.

Packet

FTAC is trying to find out how many TACs are on packet. I did a search on my local BBS's white pages and found only the TAC in VK2 is on packet. There may be others that white pages is not aware of. So how many TACs are on packet? Please let FTAC know, or let me know at *VK6UU @ VK6BBR*. We need to speed up this decision-making process. Two years delay so far on gateways on 10 metres is just not good enough. We have not even begun to tackle the SMA yet over gateways. This means more delay. I will keep you informed as the years mount.

TAC Representatives

The TAC Representatives for the Divisions are: VK1, Ian Cowan VK1BG; VK2, Geoff McGrorey-Clark VK2EO (on packet); VK3, Peter Mill VK3APO; VK4, Neville Mills VK4DAT; VK5, Garry Herden VK5ZK; and VK6, Will McGhie VK6UU (on packet).

Internet

In all the years I have been writing articles for *Amateur Radio*, I have never received so many comments from any one article as I have from the article on getting on the net. The article, which appeared separately from *Repeater Link*, struck a nerve with many amateurs getting on the net. Their experiences in many ways mirrored mine. Normally installing the software and hardware for connecting to the Internet is fairly easy, but at times it can be a nightmare. Thanks to all those that contacted me about their experiences.

Internet Home Pages

Much of my time over the past few months has been involved with learning about how to write home pages for the Internet. It has all been fun and a great learning experience. For those of you with little knowledge of what a home page is, here is my explanation.

Everyone has heard about the Internet and many amateurs are on the Internet. There are several areas on the Internet; the one in particular that fascinates me at the moment is home pages. When you obtain an Internet account, usually the service provider with whom you have the Internet account, provides space on the server (computer) you are connected to for you to load your home page onto. This space is about three megs of hard disk. You don't have to have a home page, you can just look at other home pages, of which there are millions. This is the Internet in part.

All these servers (computers) are switched on all the time, barring problems. On all these thousands, perhaps a million or more, servers there are perhaps a few hundred users, people who may also have put together a home page. Millions of home pages spread all over the world on many thousands of computers. The Internet is a collective store of all sorts of information, spread all round the world.

Home pages are very colourful, with great graphics, pictures, sounds and video clips; the list goes on. There are limitations and it is all to do with speed. A home page with lots of pictures can take several minutes to display completely. The page starts to load onto your computer with a mixture of text and pictures. While the complete page is downloading there are parts of the page to read and look at, and to scroll up and down. However, at times patience is required. Download speed varies from good to poor, depending largely on the usage of the national and international data links.

When you put up a home page, you become part of this vast resource of knowledge and information. Commercial companies have a considerable presence on the Internet to promote their products and even sell their products or services via the Internet. Your home page is personal to you. What you place on it reflects what you want to present to the rest of the world via the Internet. It could be you had a great holiday, and write up your experience along with pictures of a holiday.

I have been amazed at the vast amount of information. If you want to know something, almost without exception you will find it on the Internet. To give you some amateur radio examples. There is a large amount of information on voice repeaters. Home pages with any number of repeater sites with details on equipment and performance, complete with some great photos of antennas and picturesque locations. Perhaps I will include a few from time to time in *Repeater Link*. The photos are in colour; black and white reproduction in *Amateur Radio* may not do them justice. Other examples are information on duplexers, repeater controllers and linked repeater systems. The list just goes on and on. Think of it, and chances are there are 10, 100 or 100,000 references to the topic.

Search Engines

So how do you look this information up? The Internet contains search engines. The jargon of the computer age. A search engine is clever software that runs on a computer somewhere in the world that is connected to the Internet. If you want your home page to be indexed onto a database, so others can find reference to what you have on your home page, you submit your home page Internet location to the search engine. The search engine then looks at your home page and stores key words and phrases into its vast database. Other users then access the search engine and type in a word or a phrase. The search engine then looks through its database and finds matches to the query.

Sometimes the matches are in the 100,000 category. For example I typed in "amateur radio" and found 20,000 references to it! The results are displayed 10 at a time in order of the most likely. For example, if the words "amateur radio" appear right at the start of a home page, or appear several times in a home page, it is more likely to be what you

are looking for. It is surprising how often you find what you are looking for on the first 10 finds.

So What?

What has this to do with voice repeaters, I hear you ask? Well, it has kept me away from doing much on the repeater scene for the past few months. In particular, putting together my own home page, and now a home page for the VK6 WIA.

Writing a home page is not that difficult once you learn the basics. They are written using HTML, which stands for Hyper Text Mark up Language. A command text for sending simple information to your computer via the Internet, to tell your computer what colour to make the background screen and where to put the text, what font and colour. Rather than send a screen of red via the Internet, all that is sent is a command like BACKGROUND =>RED< and the screen goes red. This equates to it all happening quicker, as there is less data to transfer.

Text Editor

Now, you can do all this in any text editor provided you know the codes. Not too hard, but not me. There are graphical editors similar to desk top publisher programs that make it much simpler. Lots of point and click. If you want the background to be red you select red and the editor screen goes red. The program writes the HTML code, you don't have to see it at all. It is a what-you-see-you-get type of operation.

Locations

I have been using Netscape Gold 2 for writing home pages and you can see my efforts on my own home page at: *http://www.faroc.com.au/~will* and the VK6 home page at: *http://www.faroc.com.au/~vk6wia*

Back on Track

Next month I hope to be back on track with more direct relevance to voice repeaters. I could write much more on the Internet and probably will from time to time, but enough for now. I believe we should be aware of the Internet and particularly how it affects amateur radio. Time will tell, but I believe there will be good and bad for amateur radio due to the Internet. Many prospective amateurs, and many existing amateurs, could be lost to the Internet.

Remember to leave a three second break between overs when using a repeater

Vertical

Over a year ago one of our repeater sites (VK6RTH) was vandalised. The large solar array was smashed by person or persons unknown, reducing the output to about one quarter. The array is 12 metres (40') above ground level mounted on top of a free-standing triangular tower. Weighing in at around 150 kg, removal and replacement of the damaged array presented a daunting, and dangerous job.

The repeater site houses a number of voice and digital systems, most of which had to be shut down due to the reduced solar capacity. A generous donation of two 70 watt solar panels was made to replace the damaged solar array. With the replacement panels available, consideration was given to how to remove the large, heavy, damaged array from atop the tower. The array is all one structure, mounted on the very top apex of the tower. The tower once housed a large wind generator which had been replaced by the solar array many years ago.

Much discussion over several months saw little resolved. Amateur radio has the capacity to chew up vast amounts of time with no progress. It was decided not to remove or replace the damaged solar array, but simply leave it where it was. It was still producing about 2.5 amps, and had been the sole source of power on the site for the past year.

The two new panels were to be placed on the main 32 metre (100') free standing triangular tower, which contained all the site antennas. The two panels would be mounted at about the 12 metre (40') level. Now came the process of working out how to install the new panels onto the main tower. Sounds relatively easy, but considerable time rolled on by. These panels are large, measuring some 1.5 metres by 0.75 metres and weighing about 20 kg. The mounting hardware had to be either manufactured or bought. Mounting a panel at the right angle for optimum output on a tapering sloping tower at 12 metres is not easy. Much discussion, including the pricing of the commercial mounting at $200 each, occupied several meetings over many months. Still the new panels lay idle.

Then some lateral thinking at yet another meeting. Seeing that the output from the new panels was zero as was, perhaps a compromise would see the new panels up and running, albeit at reduced output, a big improvement over the present situation. The idea, mount the panels at the intended location on the main tower, vertically! That's right, just bolt them to the flat side of the triangular tower, one on the North east side, and the other on the North west side. As luck would have it the triangular tower has one of its legs pointing North. The tower, being triangular, then has two faces pointing in the right directions to receive the morning sun on one face and the afternoon sun on the other. Some simple thinking showed that the morning panel would receive full sun from sunrise, and still be in sunlight right up until about 2 pm. The other panel would receive sunlight from about 10 am until sunset. Further calculations indicated that the overall output would be about 70% of what the output would be if the panels where mounted normally. The big advantage was that it would be simple to mount the panels to the vertical flat side of the tower.

This proved to be true. A metal backing plate, slightly larger than the panels, was attached to each of the solar panels. The extra area of the backing plate that extended beyond the panels was used to mount the panels to the two sides of the tower. All very easy, compared to the difficulty of the conventional mounting arrangement. The reduced solar output, if it became a problem, could be solved by adding another panel. The cost of this panel could be paid for from the money not needed to construct or purchase the mounting frames.

It is interesting to consider how important the angle of a solar panel really is. Considerable effort is spent in mounting the panels at the right angle to optimise their output. However, having played around with solar panels over many years and observed how their outputs vary with different angles to the sun, I have come to the conclusion that it is overstated. Even when the panels are at that exact angle for their location, the sun's rays are only at the true 90 degrees twice a year. The majority of the time the sunlight is at an angle, much of the time a considerable angle. All that complexity and cost may only result in a very small overall output throughout the year.

The vertical panels at our repeater site have now been in operation for a few months through mid-winter. The site, which runs two voice repeaters and a digipeater, has had ample power. To split hairs, the panels are not truly vertical due to the inward slope of the free standing tower, but tilt upwards by about 10 degrees. Perhaps this may be a solution when you next come to mount solar panels. Cut cost and difficulty for the small reduction in output and mount the panels vertically.

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VK6UU @ VK6BBR

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Spotlight on SWLing

*Robin L Harwood VK7RH**

As I was compiling this month's column, another crisis broke out in the Gulf, following Iraqi troops re-entering the special exclusion zone in Kurdistan. The Americans have responded to the re-emergence of the Iraqis in the so-called safe haven by launching Cruise missiles in Southern Iraq, targeting specific military air defence command centres there. They have also increased the no-fly zone, virtually crippling what remained of Saddam's air force. You also may remember that Iraqi pilots flew their jets to Iran to get away from the American bombardment in 1991, but the Iranians promptly seized them and last heard these had been incorporated into Teheran's arsenal.

You may recollect that, following the Iraqi defeat and the fear of possible reprisals from Saddam's henchmen, a small safe haven was created in northern Iraq under UN supervision in 1992. There the Kurdish refugees were supposed to live peacefully; but, sadly, the Kurds have mainly been fighting amongst themselves and also against the neighbouring states bordering the so-called safe haven, mainly Turkey, Iran and Iraq. The aim is to establish Kurdistan as an independent state from these three nations. This has resulted in the three nations backing various Kurdish factions against each other and an independent state known as Kurdistan does not seem likely to become a reality in the near future.

It appears that many international broadcasters have increased their Arabic broadcasts since the crisis blew up early last month. This isn't very surprising as shortwave is still the primary source of news and information to the majority in the region. Satellite television is only available to the few wealthy individuals able to afford it and it is also primarily in English. Stations in the region are well heard here at 0400z. Teheran is on 15084.3 kHz, mainly in Farsi but other Middle Eastern languages are heard. Saudi Arabia is on 15060 kHz in Turkish, whilst London is on 15235 kHz from their Cyprus relay which is also in Arabic.

Amman, Jordan is on 15290 and is extremely strong here as is Kuwait on 15495 kHz. The Arabic station on 15380 is probably in the United Arab Emirates on the Gulf. 17830 is another channel also from the Emirates but separate from 15380 kHz. Jerusalem was on 17545 at 0400 but it has since reverted to standard time and is on at 0500z in English.

Iraq is irregularly heard since the US wiped out their facilities in 1991 so don't expect to find them on. Damascus usually is on 15095 kHz, complete with a bad hum on their carrier, yet I haven't heard it during the present crisis.

Another ongoing crisis in the same region is in Chechnya, an autonomous district within the Russian Federation, which has been fighting for its independence from Moscow; there have been heavy casualties on both sides. There have been numerous cease-fires negotiated but they have barely lasted twenty four hours. The capital of Chechnya is Grozny but it is in ruins as a result of the fierce battles for control. There used to be a fairly substantial radio and television centre there but it was completely destroyed. There are reports of clandestine senders backing the Chechen separatist cause, mainly on FM, but I do expect a shortwave signal will eventually be heard in support of them, probably within the tropical allocation of 60 metres.

The American Catholic broadcaster located in Birmingham, Alabama has been well heard here on 7425 kHz virtually around the clock and now they have added another non-standard allocation. At 0700 I'm hearing WEWN on 6890 in English in parallel to 7425 kHz and even as late as 1000 it is still there. However, a Chinese station becomes more dominant on that allocation after that time.

Daylight Saving commences in Tasmania and New Zealand on 7 October whilst NSW, Victoria and SA commence on 28 October. That date is also when Europe and North America revert to Standard Time and also when most of the frequency alterations will occur. This used to happen at the end of September but a bureaucratic decision by the European Union saw this extended to be in line with the USA. So expect wholesale changes over this weekend.

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VHF/UHF – An Expanding World

*Eric Jamieson VK5LP**

All times are UTC.

New Records

John Martin VK3KWA, FTAC Chairman, has advised that a number of new records have been established as follows:

John Bisgrove VK4KK has claimed another extension to his 50 MHz state record, for a contact with GU7DHI on 15 February 1992 at a distance of 16791.3 km.

A contact between **Don Graham VK6HK** and **David Tanner VK3AUU** has broken the Western Australian and Victorian two metre records, the distance being 2816.8 km. This contact was made during the extensive tropo opening on 14 February 1996. The previous VK6 to VK3 record was 2784.2 km set in 1980 by **VK6KZ** and **VK3YLR** (now VK3KAQ).

There is a new 1296 MHz record for VK7. The previous record of 439.3 km set in 1971 by **Kevin Henricks VK7ZAH** and **Ron Wilkinson VK3AKC** (both deceased) was broken by **Joe Gelston VK7JG** and **Trevor Niven VK5NC** in March 1988. The new record distance is 674.4 km. No one can accuse Joe and Trevor of being hasty when it comes to making a record claim!

The 23 cm mobile record has been broken again with a contact between **Adam Maurer VK3ALM** and **Brett Sinclair VK3XXX** on 25 May 1996 with a distance of 278.4 km.

Russell Lemke VK3ZQB and **Alan Devlin VK3XPD** have now turned their attention to 5.7 GHz. The result is a new VK3 state record of 95.7 km set on 11 August 1996. Both stations used DB6NT transverters running 300 mW to 60 cm dishes with multi-band feeds.

Walter Howse VK6KZ and **Neil Sandford VK6BHT** have extended their national 24 GHz record to 86.4 km with a contact between Karrinyup and Darling Scarp on 7 July 1996. Both stations used **DB6NT** transverters and HEMT amplifiers. This contact was reported in full last month.

On 18 August 1996, at 0950, **Lyle Patison VK2ALU** contacted **Charlie Suckling G3WDG** on 10 GHz EME over a path of 17,000.4 km which, as far as is known, is a new world record for 10 GHz. Also, this was the first Australia to UK 10 GHz EME contact, the first Australasia to Europe 10 GHz EME contact and the first SHF contact between those areas. On the same day at

1015 Lyle also worked **Petra Suckling G4KGC,** wife of Charlie Suckling. Further details later in these notes.

With the concerted move by a number of VK stations to ever higher frequencies, it is inevitable that distances will be extended, particularly now that narrow-band equipment is the norm. There is little doubt that 10 GHz will receive much attention during the next twelve months and there is every possibility the existing world record distance between **VK5NY** and **VK6KZ** will be exceeded.

Six Metres

Six metres comes and goes for those who maintain a watch on the band. **John VK4KK** reported a good opening on 18 August from 0200 with contacts from Brisbane to ZL, VK3 and VK7. There were many signals between 50.110 and 50.120 but no VK5s.

Cliff Betson ZL1MQ reports: *ZL3s worked/heard VK4RGG and VK4AFL on 30/6; VK3LK on 9/7; VK5BC on 12/7; VK4KK and VK4AR on 13/7; VK5AYD on 16/7; VK4KPS, VK4KK, VK4GPS and VK4JKL on 18/7; and VK3OT on 30/7.*

VK9YQS on Lord Howe Island worked VK4s on 13/7 and ZL3s on 14/7. FK8GM in New Caledonia worked VK3OT and VK5BC on 13/7 and ZL3NE/1 on 16/7.

Cliff advises that **YJ8GM** at Vanuatu is now **ZL1GTB** and active on 50 MHz.

Clarry VK5KL, of many years standing on six metres, reports that on 15 August the 50.048 VK8RAS beacon at Alice Springs was 579, on 17/8 579 and 18/8 339. Clarry suggests this may indicate an early opening for Es this year.

Internet Six News

With thanks to the above source by Geoff GJ4ICD and forwarded by courtesy of **John VK4FNQ.**

2/7/96: Jose EH7KW contacted KB5IUA at 8057 km for a possible new distance record via Es.

3/7: The Season so far: This depends where your geographical area is located. If you live "on a line about 40 degrees North" on the globe then you must agree that 1996 is probably the best year for many years for Sporadic "E". We have had 15 USA openings so far this year from mainland Europe to the USA, short skip Es has been down on previous years, but there have been more multi-hop events. Once again, like several years ago, we have seen multi-multi-hops, like 4L6PA to Japan.

UK Cluster users note that your spots/messages are now appearing on the USA Cluster system via Internet! This is a new linking system along with a new Telnet/Cluster system which links most of the USA and Europe together ... this should be available generally for the 1997 Es season; it is currently on test and provides direct talk facilities in seconds with many of the well known 50 MHz DX operators like W3IWU, W3EP, KM1H, WA1OUB, WA1AYS, etc. It is proving to be an invaluable tool for the immediate discussions of propagation etc...further details later. *[Note: This has been included for readers of AR to indicate the steps being taken in the northern hemisphere to ensure contacts are made ... VK5LP.]*

10/7: At 2130 JW was worked by G3FPQ, G3WOS and G3IBI on 50.090. The distance is just over 3,000 km from IO91; that makes 171 countries worked from the British Isles in total!

11/7: News from VK de VK3ALM and VK3OT: In the week ending 5 July winter Es produced signals from the North Island of New Zealand (ZL2AGI) and Lord Howe Island (VK9YQS). Doug VK9YQS worked into VK1, VK2 and VK3 at signal levels up to S9. Times roughly around 0600z – 0700z. Doug told me that he is QRT in five weeks and hopefully will be going to the Met station on Macquarie Island in 1997. Doug was last on Macquarie in 1989 and from there he worked into JA and USA. Equipment will probably be the ever reliable TS670 and a Tokyo HiPower 180 W amp.

Cliff ZL2AGI was in on 1 July around 0200z as well as all 45 MHz TV offsets. Trevor VK4AFL was heard briefly calling on 50.110.

Beacon information: VK3RMV is currently operating on 50.053 MHz CW with the sequence as follows: Callsign Callsign QF12ah Grid followed by a carrier for as long as the callsign sequence. Rig runs 12 to 15 watts output and antenna is a Coman elevated 3dB co-linear vertical 1/4 wave with 1/2 wave stacked above and phasing harness.

The VK3SIX 10 metre beacon has been used to observe meteor scatter, aircraft enhancement and interstate Es and operates on 28.253 MHz CW, 25 watts to five element Yagi 38 m above ground. Location is 17 km west of VK3RMV in another grid square. Callsign callsign and QF02 grid repeated at 5 to 7 wpm. The VK2RSY beacon was heard this week on Es 28.262 MHz very loud. Beacon ZL2MHF on 28.230 was also heard 559.

DXpeditions are planned to H44, YJ8, C21, T31, etc for the coming cycle, also to rare grid squares in remote Australia to work into Japan and Europe. DXpeditions are planned for VK9X Christmas and VK9C Cocos Island.

12/7: News from John VK4FNQ: Some Es today: 0120 heard ZL3NE calling CQ 50.110 5/5. 0151 worked VK4APG 5x9. 0355 VK8VF beacon 419 for about 10 minutes. 0358 worked VK4SIX 5x9. 0450 VK8RAS beacon 519. 0511 worked VK4TZL 5x9. 0550 worked VK4AFL 5x5. 0555 VK8RAS beacon 599. 0610 VK8RAS beacon 599. 0738 VK4AFL calling CQ 50.110 5x2.

14/7: In Townsville at 0320 VK4BKM worked FK8GM and reported hearing VK3GJQ, VK2EMA, VK2APG, VK5BC and heard ZL television.

14/7: USA to JA de JA1VOK: KL7NO (BP54) was worked as the first North American this season on 50.110 CW/SSB by JA7QVI (QM08) at 0721, JH2COZ (PM94) at 0727 and myself (QM05) at 0729. The signal was 5x5 to 5x9 with QSB here, but the opening lasted only for 10 minutes.

14/7: During a QSO with Costas SV1DH, he informed me that he had heard KP4 in early July, the distance is about 8900 km.

16/7: Good Europe to Europe opening with 25 countries worked, best DX was 4X1IF, SV9, SV5, Z3, and the VO1ZA beacon was in and out for three hours, also worked WA1OUB on CW/phone ... de GJ4ICD

20/7: This season 76 countries have been worked in Europe on 50 MHz. Although nobody has worked them all, it shows that the activity has been there despite some countries not being active, like HV, 4U1, CU, D4, JY, OD, OJ0, TF, S0 and OX. Add those to the score that were worked in 1994/5 and the total would be in the mid 80s! Pretty good for Sporadic E only contacts! So the question is, "Could DXCC ever be achieved via Sporadic E?"

27/7: 1995/6 Es Season: Thanks to all (over 100 so far) who have sent information about the season. All comments have been noted and a general summary will be made later; thanks for also reminding us about the Dec/Jan/Feb openings on 144 MHz. One very interesting comment from Alan EA7BA was that conditions are better at solar minimum the closer you are to the equator ... yes, that has been said by many. The poll so far indicates that, including the end of last year, things are better than the cycle peak, but only just by 64 to 54. The general comment of southerly latitude has been repeated several times ... the fantastic 144 MHz openings in the USA in December were pointed out by over 20 ops ... from Finland came the report of the 144 MHz opening in February, but so far there is no feedback from VK/ZL/ZS.

[The problem with obtaining adequate feedback about Es in VK is that it is viewed by many operators as a "ho-hum" experience; it has been an annual occurrence for fifty years, with VK to VK contacts the norm. There is little six metre activity in P29, an occasional contact to FK8, the overall Es monotony for many being broken only by the readily available ZLs.

To live in the UK or central Europe and work Es must be an experience VKs can only dream about – 76 countries overall for their summer Es, 25 to 30 countries in one day, hordes of exchanges "across the pond" to the US, Canada, the Caribbean and points between. The mind boggles! Their antenna rotators must never become cold! It's all so new to Europe, but they are making the most of it and are to be commended for doing so. I would be doing the same if I lived there! VK5LP]

26/7: Opening #26 to USA last night when VE9AA was copied in G and GJ. G3FPQ worked Mike at 2054, VE1PZ was also worked in the UK.

Fax

A mystery fax arrived on my desk dated 17 August 1996. The single page has no ident, other than to say it is page 1 of 11, headed *GB2RS News – the weekly news service of RSGB which is broadcast to radio amateurs.* At the bottom of the page an arrow points to a notice that, "as part of an experiment by the RSGB Propagation Studies Committee, Chris Deacon G4IFX, of Darlington, County Durham, has been granted permission by the RA to use the callsign GB3IFX for his 50 MHz tropospheric tests. The beacon transmits on 50.275 MHz, on the hour, every hour, in 30 second bursts during which the callsign and time are sent twice."

I include the above as an indication that something arrived but I may be missing further sheets or information.

UK News

Ted Collins G4UPS had a reasonable July by working the following 40 countries: 5B4, 9H, CT, DL, EH, EH8, EH9, ES, EU, F1, GM, GW, HA, HB9, HV, I, IS0, IT9, JP1, JX7, KP4, LA, OE, OH, OK, PA, RS1, S57, SM7, SP9, SV1, SV5, TF3, UX, V47, VE, W, YO, YU and ZB2. In addition, 20 beacons were heard.

The following is a log extract from G4UPS for a reasonable day, but one without an opening to W, VE or KP; they were available on several other days!

16 July 1996: 0630 10 m/6 m closed; 0700 29 MHz OK0/DL0/EA3 bcns); 0715 SP2NJE 5x9... 0717 inband TV Europe starts strong... 0718 S57AC 5x5... 4N1SIX bcn 579... OE6BMG 559... ES6SIX bcn 559... OE6LOG 5x9... SR5SIX bcn 599... 0748 SM7AED 569... 0752 G3CCH 559... much QRM from inband TV.. SP6HEJ 599... ES0SIX bcn 559... ES1II/8 5x7... S52MQ 579... G/PE1PZS 559.

0839 SV5TS 599 Rhodes... 0841 SP5XMU 5x9... SV1SIX bcn 559... I2OKW 5x9... HV3SJ 599... 0910 SV9SIX bcn 559... IK0BAL 5x9... SP9EWU 599... IK8DYD 5x9... SP6LB 5x9... SP6NVN 5x9... SP1FPG 5x9... I2TQ 599... 0933 SP2SGZ 5x9... SR6SIX bcn 599... I5RRZ 5x9... 0947 IK5RLP 5x9... 1000 only HV3SJ bcn/l stations audible. Prop swings north... 1015 SM3EQY 5x8... 1020 OK2BGW 5x9... 1036 OM3CM 579... then SSB 5x6.

1040 HA6ZB 5x9... 1046 G7WAX 599... strong inband TV again... EH3CUU bcn 599... 1100 fade out. 1125 HA6ZB on 28 MHz... 1128 inband TV strong... SR5SIX bcn 579... 1215 EH7KF 5x9... HV3SJ bcn 579... several weak I stations... 1315 I stations... S55ZRS bcn 599... 4N1SIX bcn 599... S57AC 5x9... S51MQ 5x9... YT1AU 559... IK3/OE2UKL/p 5x9... YU1ABA 559... OEM6HS 5x9... 1422 OE1PMC/8 5x9... 9A7V 5x9... very little activity... S53VV 599... 9A3FT 599.

1501 S51UJ 599... OE6TAG 5x9... I7UNU 5x9... 1550 all faded out except EH3CUU bcn. 1558 CT0WW bcn 599... 1559 EH7KW 599... no further activity until 1645 EH1KV 5x9... inband TV starts... S59D 5x9... CT1DYX 5x9... SP6TRQ 5x9... 4N1SIX bcn 599... 1656 I0CMD 5x9... HV3SJ bcn 599... 1711 OK2PPP 5x7... 1712 YO2IS 5x9... 1737 YZ1SM 5x9... 1747 I0JX 599... 4X1IF 559... 1752 F5LHI 599... I4XCC 599... 1806 YL3AG 579... 1811 EH8ACW 5x9.

1816 9A5Y/p 5x9 small island off coast... 1830 I stations... ES5DE 559... 1830 SV1SIX/SV9SIX bcns 579... 1908 IK4MBN 5x7... 1920 heard SV1DH... 1945 only a few weak I stations – all faded out at 2015.

In addition to the above information, Ted also records the operator's name and grid square of each station! I wonder what Ted does in his spare time?

10 GHz EME

I seem to have run out of space so will leave a description of the record contacts by Lyle VK2ALU (mentioned earlier) until next month, rather than edit them too heavily.

Closure

Be aware when reading these columns that we are in the equinox and this offers possibilities for extended six metre contacts. Don't ignore the European path and listen for those 45 MHz video carriers, they may be from a greater distance than Asia.

Closing with two thoughts for the month:

1. Honesty is stronger medicine than sympathy, which may console but often conceals, and

2. To love and be loved is to feel the sun from both sides.

73 from The Voice by the Lake.

*PO Box 169, Meningie SA 5264
Fax: (085) 751 043
Packet: VK5LP@VK5WI.#ADL.#SA.AUS.OC*

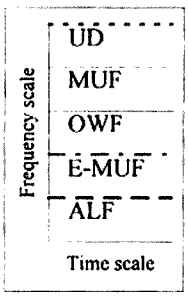
ar

Have you advised the WIA Federal Office of your new callsign? Use the form on the reverse of the *Amateur Radio* address flysheet

HF PREDICTIONS

Evan Jarman VK3ANI

T Index: 4



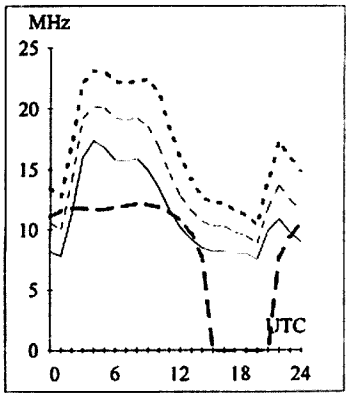
These graphs show the predicted diurnal variation in key frequencies for the nominated circuits. They also indicate a possibility of communication (percentage).

The frequencies identified in the legend are:-

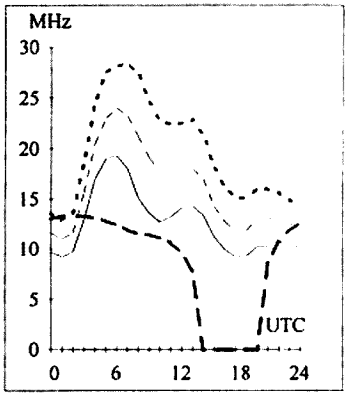
- Upper Decile (10%)
- Maximum Useable Frequency (50%)
- E layer MUF
- Optimum Working Frequency (90%)
- Absorption Limiting Frequency

The predictions were made by one of the Ionospheric Prediction Service Stand Alone Prediction Systems. The T index used is shown above the legend. The Australian terminal azimuth (degrees), path length (kilometres) and propagation modes are also given for each circuit. ar

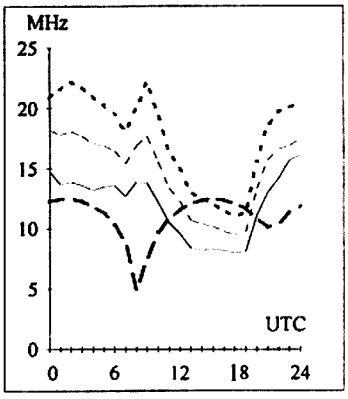
Adelaide-Lusakar 246
Second 4F4-7 4E0 Short 10788 km



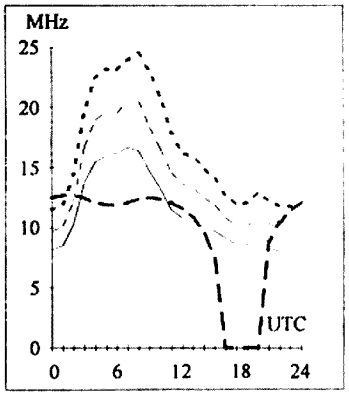
Brisbane-Budapest 312
First F 0-5 Short 15467 km



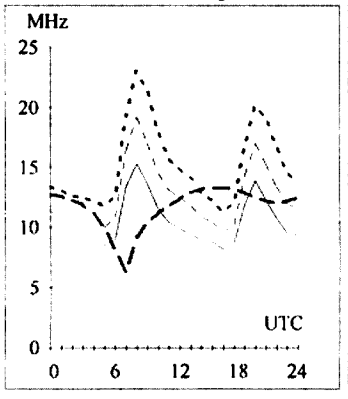
Adelaide-Montevideo 167
First F 0-5 Short 12098 km



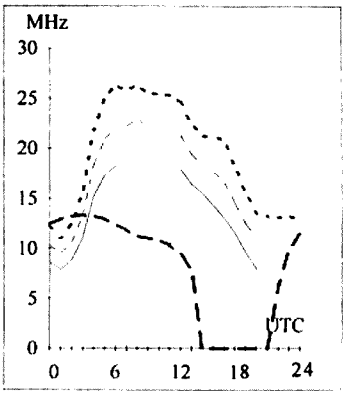
Brisbane-Capetown 218
Second 4F3-6 4E0 Short 11682 km



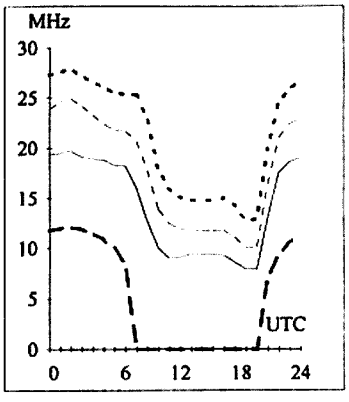
Canberra-London 136
First F 0-5 Long 23042 km



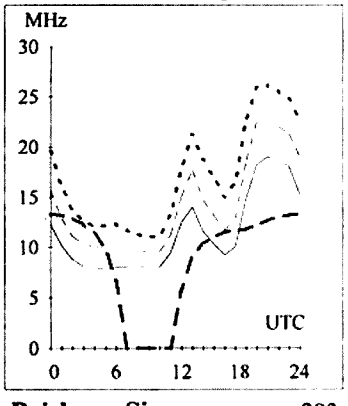
Darwin-Berlin 323
First F 0-5 Short 12945 km



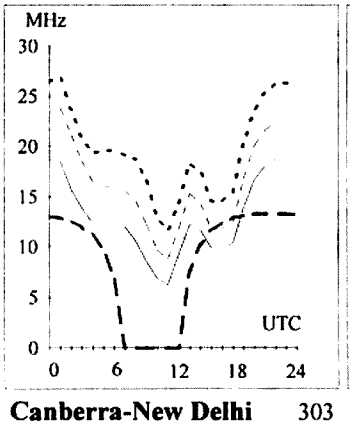
Adelaide-Tokyo 1
Second 3F4-8 3E0 Short 7855 km



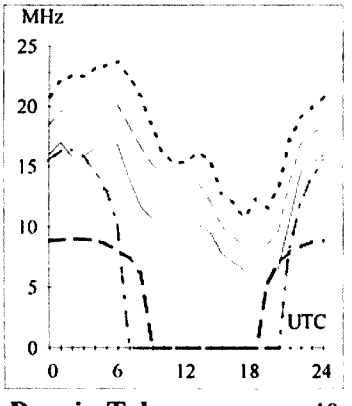
Brisbane-Montreal 51
First F 0-5 Long 15469 km



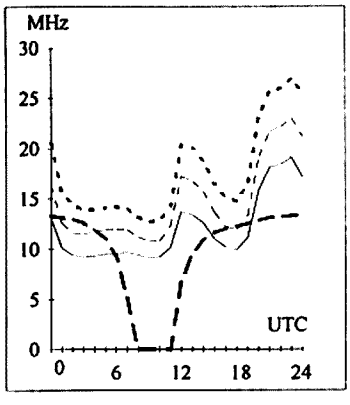
Canberra-Mexico City 85
First F 0-5 Short 13092 km



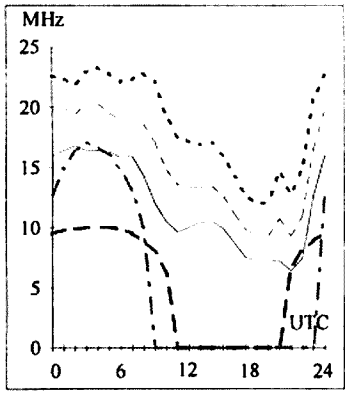
Darwin-Suva 103
Second 3F12-16 3E2 Short 5127 km



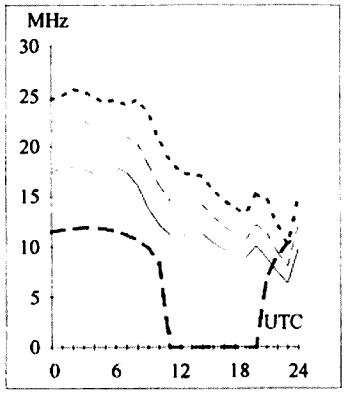
Adelaide-Washington 71
First F 0-5 Short 16833 km



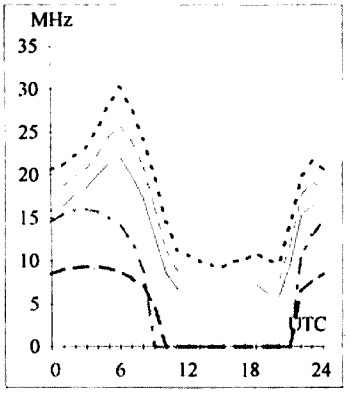
Brisbane-Singapore 293
Second 3F9-14 3E0 Short 6146 km



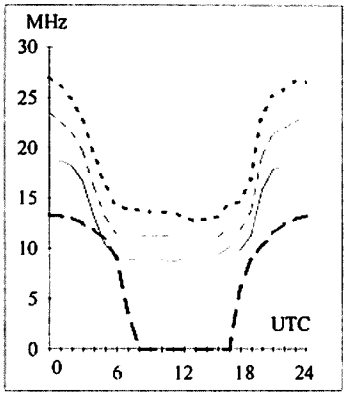
Canberra-New Delhi 303
Second 4F4-9 4E0 Short 10349 km



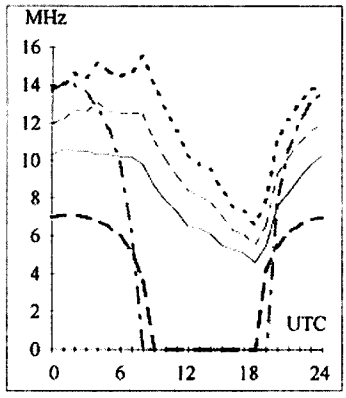
Darwin-Tokyo 10
Second 3F10-17 3E1 Short 5437 km



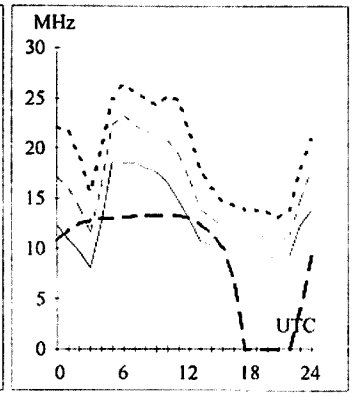
Hobart-Anchorage 28
First F 0-5 Short 12872 km



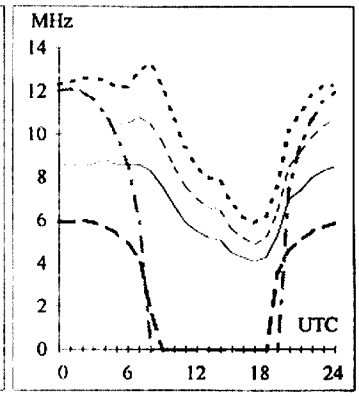
Melbourne-Auckland 97
Second 2F17-24 2E4 Short 2622 km



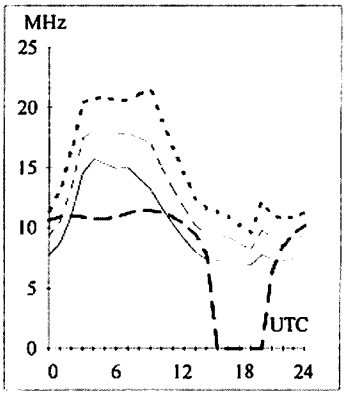
Perth-Accra 261
First F 0-5 Short 12785 km



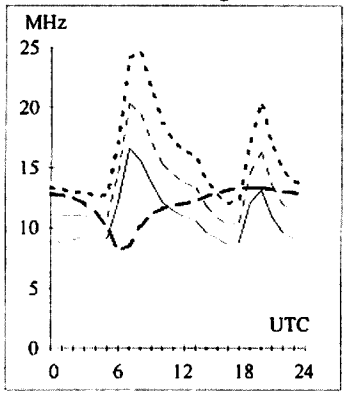
Sydney-Christchurch 127
Second 2F22-29 2E7 Short 2147 km



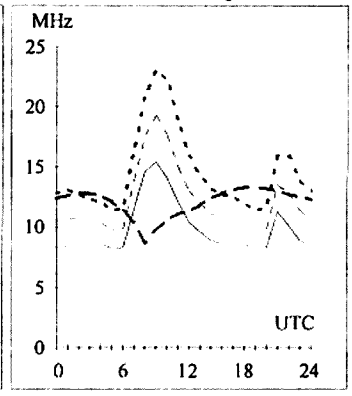
Hobart-Johannesburg 231
Second 4F5-10 4E0 Short 10141 km



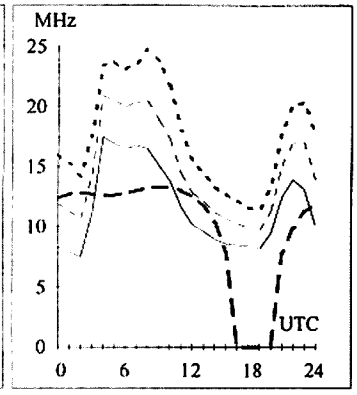
Melbourne-Oslo 109
First F 0-5 Long 23747 km



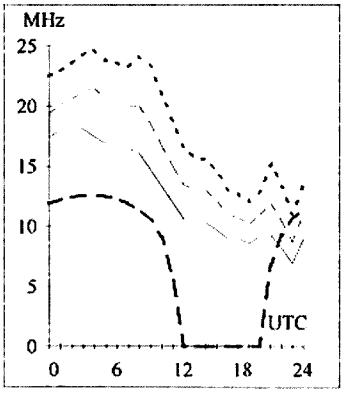
Perth-London 133
First F 0-5 Long 25544 km



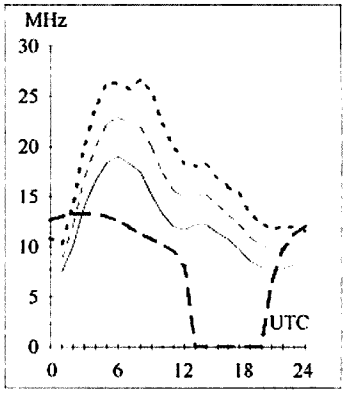
Sydney-Kinshasa 236
First F 0-5 Short 13736 km



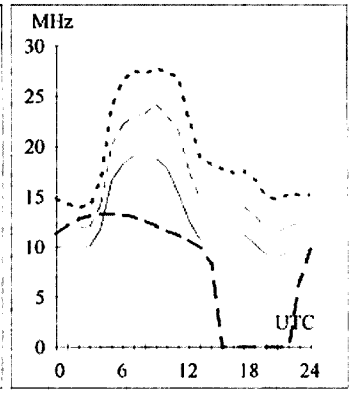
Hobart-Lahore 304
Second 4F3-7 4E0 Short 11122 km



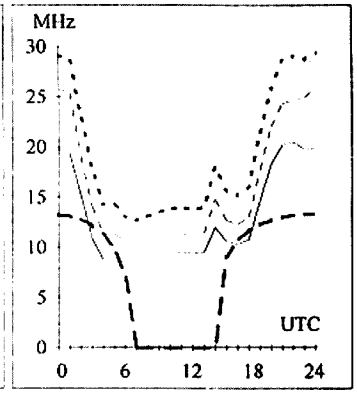
Melbourne-Riga 316
First F 0-5 Short 15267 km



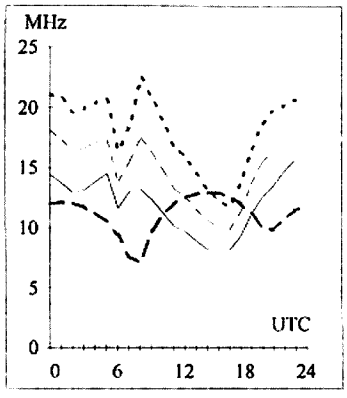
Perth-London 313
First F 0-5 Short 14480 km



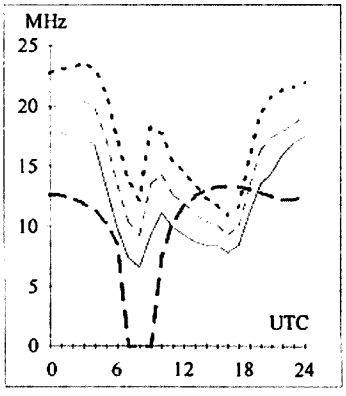
Sydney-Los Angeles 61
First F 0-5 Short 12073 km



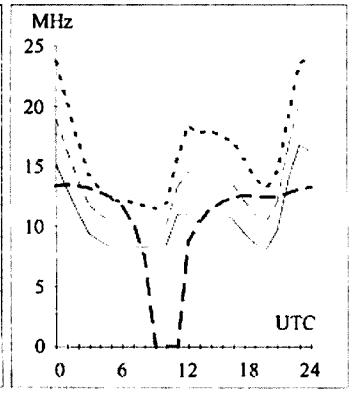
Hobart-Rio de Janeiro 169
First F 0-5 Short 12619 km



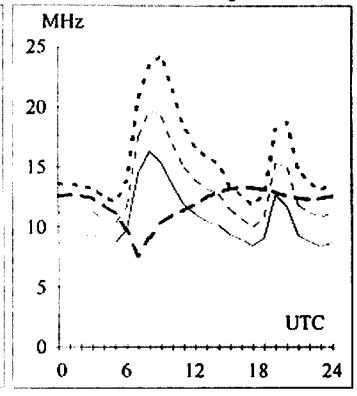
Melbourne-Trinidad 132
First F 0-5 Short 16003 km



Perth-Seattle 53
First F 0-5 Short 14877 km



Sydney-Warsaw 133
First F 0-5 Long 24434 km



HAMADS

TRADE ADS

• **AMIDON FERROMAGNETIC CORES:** For all RF applications. Send business size SASE for data/price to RJ & US Imports, PO Box 431, Kiama NSW 2533 (no enquiries at office please ... 14 Boanyo Ave Kiama). Agencies at: Geoff Wood Electronics, Sydney: Webb Electronics, Albury: Assoc TV Service, Hobart: Truscotts Electronic World, Melbourne and Mildura: Alpha Tango Products, Perth: Haven Electronics, Nowra: and WIA Equipment Supplies, Adelaide.

• **WEATHER FAX programs** for IBM XT/ATs *** "RADFAX2" $35.00, is a high resolution shortwave weatherfax, Morse and RTTY receiving program. Suitable for CGA, EGA, VGA and Hercules cards (state which). Needs SSB HF radio and RADFAX decoder. *** "SATFAX" $45.00, is a NOAA, Meteor and GMS weather satellite picture receiving program. Needs EGA or VGA & WEATHER FAX PC card, + 137 MHz Receiver. *** "MAXISAT" $75.00 is similar to SATFAX but needs 2 MB of expanded memory (EMS 3.6 or 4.0) and 1024 x 768 SVGA card. All programs are on 5.25" or 3.5" disks (state which) plus documentation, add $3.00 postage. ONLY from M Delahuntly, 42 Villiers St, New Farm QLD 4005. Ph (07) 358 2785.

• **HAM LOG v.3.1** - Acclaimed internationally as the best IBM logging program. Review samples....AR: "Recommend it to anyone"; The Canadian Amateur: "Beyond this reviewer's ability to do it justice. I cannot find anything to improve on. A breakthrough of computer technology". ARA: "Brilliant". Simple to use with full help, the professional HAM LOG is immensely popular (now in its 5th year), with many useful, superb features. Just $59 (+ $5 P & P), with a 90 page manual. Special 5 hour Internet offer. Demos, brochures available. Robin Gandevia VK2VN (02) 369 2008 BH fax (02) 369 3069. Internet address rhg@ozemail.com.au.

FOR SALE NSW

Mizuho TRX-100 40 m QRP transceiver, $100; **Altos computer,** 4 Mb ram, 260 Mb HDD, Unix. Adrian VK2ALF (064) 52 5555.

Deceased Estate of Tas McLoughlin VK2GV. **Icom IC-735** HF transceiver s/n 15879, $1,000; **Kenwood TS-120V** HF transceiver s/n 921541, $400; **Kenpro KR-800S** antenna rotator s/n MC8050, $500; **Yaesu FT-211RH** 2 metre FM transceiver s/n 7L110085, $300; **Daiwa CNW418** antenna tuner s/n D07183, $150; **Power Mate PSU**, $150; **Electronic keyer,** assembled kit, $30. All of the items on offer are available at the home of VK2GV in Scone, NSW. A range of assorted radio related equipment is available for purchase at the same source. Please contact Les VK2RJ at QTHR or on telephone (065) 43 1942; or Mr Gerrard McLoughlin on (065) 45 2499 to arrange inspection and purchase.

FOR SALE VIC

Heavy duty PSU - 13.6 volts regulated at 20 amps continuous rating. Professional cabinet with heavy duty heatsinking, metered, $275 ono. Harold VK3AFQ QTHR (03) 9596 2414 anytime.

Yaesu FLDX2000 linear, **FT480R** 2 m tcvr, **FRG7700** RX, **Hy-power HL85V** 144MHz all mode amp. **Commander 400** rotator, **Microwave modules** 432/144 converter, 1296/144 converter, 1296 preamp, 50 MHz digital freq meter. All little used and in exc cond with manuals. Ken VK3NW QTHR (03) 9808 9417.

Kenwood TS520 transceiver, s/n 231004, c/w AC/DC cables, desk mic, hand mic, manual, gc, $425. Stewart VK3NV (059) 87 3592.

Hallicrafters S27 UHF RX, fully operational now after resurrection, with spare tubes and book, $180; **Command RX** 6-9.1 MHz original but W/O dynamotor, $120; **Icom AH-2** automatic tuner and controller suitable for IC- 735 transceiver, $250. VK3IZ (051) 56 2053, 22 Hugh St, Metung Vic 3904.

Hy-gain 204BA 4 el beam, $150; **Nally tower,** 2 sections, tilt over, $250; Autoplex plated bug keyer, $100; **Solid brass Morse key**, $35; **Daiwa coax switch,** four outlet, cost $130, sell $60; **Daiwa power meter**, $65. Ken VK3TL, Montrose, (03) 9728 5350.

Shack Cleanout. **Icom IC575H** xcvr, 6 m/10 m (front panel slightly damaged, but works perfectly), $1,400; **Icom IC720A** HF xcvr, $550; **Icom IC47A** 70 cm FM xcvr, $300; **Icom IC25H** 2 m 45 W FM xcvr, $350; **Philips FM321** 70 cm xcvr, $150; **Yaesu FT101** has been modded, $250; **Kantronics KPC3** TNC with software, $175; **Yaesu FT290R** together with Mutek SLNA 145sb low noise front end (not fitted), $450. Mike Goode VK3BDL (03) 9589 5797. Licensed amateurs only.

Kenwood TS930S HF tcvr, mic, manual, original carton, $1,400; **Cushcraft R7** multiband HF vertical ant, 10 m to 40 m, brand new, $600. Ray VK3RD (03) 9726 9222.

Yaesu original **101** to **101E maintenance service manual** with mods plus schematics from Yaesu in English, used once only, best offer; **Yaesu FV101** VFO, $125 plus postage. Jim VK3YJ QTHR (03) 9315 9387.

Icom IC275H s/n 02240 2 m all mode, 100 W transceiver with built in BF981 preamp, $,1650; **Icom IC475H** s/n 01378 70 cm all mode, 75 W transceiver with Mirage KP2/70 cm GaAs-FET masthead preamp, $1,950; **Icom CT-18** s/n 0512, satellite interface free if you buy the pair, or $80; **Icom ICPS15** s/n 30003411, 13.8 V 20 A supply, $275; **Kenwood TS690S/AT** s/n 30300828, HF all band 100 W, 6 m 50 W transceiver with CW filter and b/i ATU, supplied with **Kenwood MC-60A** s/n 176 desk mic, $1,800. All items are as new and supplied with all packaging, books and leads/microphones. I can deliver to the Melbourne CBD if required. Bert VK3TU (052) 78 2374 or mobile (0412) 25 1810.

FOR SALE QLD

Cushcraft R7 vertical antenna, good condition, $725 ono. Ted VK4DBL (074) 91 2034.

Reception set No 109 WWII receiver 1.8 to 8.5 MHz, working order. Offers to Graham Bennett VK4FGB, Box 1914, Cairns Qld 4870.

FOR SALE SA

Teletype model 15 in reasonable condition, 5 cartons of original spares, original handbooks and adjustment instructions ex PMG, $100; Used 4-1000A tubes (4 of), $40 the lot. Rod VK5UV (08) 8382 3352.

RF Connectors, microphones, mic cords, antenna bases, CRO probes, 10-11 m 5 el beam, log periodic (8 el), 2x100 watt baluns, **Vectronics ATU** 1.8-30 MHz, top shelf ATU, and more. Send SASE for list. Paul VK5MAP QTHR (086) 51 2398.

FOR SALE TAS

Yaesu FT747GX 160-10 m inc gen coverage receive, CW/AM SSB filters, mint cond, boxes, manuals, $860; **Icom FL102** AM filter suit IC760 IC761 IC765 IC575 new, $65. Allen VK7AN (03) 6327 1171.

WANTED NSW

Photocopies technical data for valves 6BM8 QQC04/15 (locktal base) and JRC955 (Acorn valve), also handbook (or photocopies) manual for AVO CT160 valve tester, will pay reasonable costs. Pat VK2ABE (067) 68 1470, Box 522, Glen Innes NSW 2370.

WANTED VIC

Schematic/book for AWA base station, vintage 1962 model 2J56760 VHF. Would consider sale to best offer. Fully operational inc stand-by vibrator PSU, uses QQEO6/40 in final. VK3IZ (051) 56 2053, 22 Hugh St, Metung Vic 3904.

Kyoritsu multimeter KEW6610, any condition, need bridge rectifier for AC range, one diode blown due power surge. Bill VK3WG (03) 9592 8732.

WANTED SA

Urgent, **Operators manual** for **Kenwood TS-120S** or photocopy. Will pay all costs. Paul VK5MAP QTHR (086) 51 2398.

WANTED TAS

Hatfield RF Bridge LE300A instruction manual or any info please. Bryan VK7ZBE QTHR (004) 24 3685.

MISCELLANEOUS

• THE WIA QSL Collection (now Federal) requires QSLs. All types welcome especially rare DX, pictorial cards and special issue. Please contact the Hon Curator, Ken Matchett VK3TL, 4 Sunrise Hill Road, Montrose VIC 3765, Tel (03) 9728 5350.

• DO YOU HAVE ANY used telephone cards or stamps lying around? If so could you please send them to the Epilepsy Association of South Australia Inc, PO Box 12, Woodville SA 5011.

ar

VK QSL BUREAUX

The official list of VK QSL Bureaux. All are Inwards and Outwards unless otherwise stated.

VK1		GPO Box 600 CANBERRA ACT 2601
VK2		PO Box 73 TERALBA NSW 2284
VK3	Inwards	Box 757G, GPO MELBOURNE VIC 3001
	Outwards	40G Victory Blvd ASHBURTON VIC 3147
VK4		GPO Box 638 BRISBANE QLD 4001
VK5		PO Box 10092 Gouger St ADELAIDE SA 5001
VK6		GPO Box F319 PERTH WA 6001
VK7		GPO Box 371D HOBART TAS 7001
VK8		C/o H G Andersson VK8HA Box 619 HUMPTY DOO NT 0836
VK9/VK0		C/o Neil Penfold VK6NE 2 Moss Court KINGSLEY WA 6026

Hamads

Please Note: If you are advertising items For Sale and Wanted please use a separate form for each. Include all details: eg Name, Address, Telephone Number (and STD code), on both form. Please print copy for your Hamad as clearly as possible.
* Eight lines per issue free to all WIA members, ninth line for name and address Commercial rates apply for non-members. Please enclose a mailing label from this magazine with your Hamad.
* Deceased Estates: The full Hamad will appear in AH, even if the ad is not fully radio equipment.
* Copy typed or in block letters to PO Box 2175, Caulfield Junction, Vic 3161, by the deadlines as indicated on page 1 of each issue.
* QTHR means address is correct as set out in the WIA current Call Book.
* WIA policy recommends that Hamads include the serial numb,er of all equipment offered for sale.
* Please enclose a self addressed stamped envelope if an acknowledgement is required that the Hamad has been received.

Ordinary Hamads submitted from members who are deemed to be in 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: $25.00 for four lines, plus $2.25 per line (or part thereof) Minimum charge – $25.00 pre-payabla.

State: .....

Not for publication: ❑ Miscellaneous ❑ For Sale ❑ Wanted

Name: ..... Call Sign: ..... Address: .....

WIA Divisions

The WIA consists of seven autonomous State Divisions. Each member of the WIA is a member of a Division, usually in their residential State or Territory, and each Division looks after amateur radio affairs within its area.

	Division Address	Officers			Weekly News Broadcasts		1996 Fees
VK1	ACT Division GPO Box 600 Canberra ACT 2601	President Secretary Treasurer	Philip Rayner John Woolner Bernie Kobiar	VK1PJ VK1ZAO VK1KIP	3.570 MHz LSB, 146.950 MHz FM each Sunday evening commencing at 8.00 pm local time. The broadcast text is available on packet, on Internet aus.radio.amateur.misc newsgroup, and on the VK1 Home Page http://email.nla.gov.au/~cmakin/wiaact.html	(F) (G) (S) (X)	$70.00 $56.00 $42.00
VK2	NSW Division 109 Wigram St Parramatta NSW (PO Box 1066 Parramatta 2124 Phone (02) 9689 2417 Freecall 1800 817 644 Fax (02) 9633 1525	President Secretary Treasurer (Office hours Web:http://sydney.dialix.ozau/~wiansw e-mail address: wiansw@sydney.dialix.oz.au Packet BBS: VK2WI on 144.850 MHz	Michael Corbin Eric Fossey Eric Van De Weyer Mon-Fri 11.00-14.00 Sat 1000-1300 Mon 1900-2100)	VK2YC VK2EFY VK2KUR	From VK2WI 1.845, 3.595, 7.146*, 10.125, 24.950, 28.320, 29.120, 52.120, 52.525, 144.150, 147.000, 438.525, 1281.750 (* morning only) with relays to some of 14.160, 18.120, 21.170, 584.750 ATV sound. Many country regions relay on 2 m or 70 cm repeaters. Sunday 1000 and 1930. Highlights included in VK2AWX Newcastle news, Monday 1930 on 3.593 plus 10 m, 2 m, 70 cm, 23 cm. The broadcast text is available on the Internet newsgroup *aus.radio.amateur.misc*, and on packet radio.	(F) (G) (S) (X)	$66.75 $53.40 $38.75
VK3	Victorian Division 40G Victory Boulevard Ashburton Vic 3147 Phone (03) 9885 9261 Fax (03) 9885 9298	President Secretary Treasurer (Office hours	Jim Linton Barry Wilton Rob Hailey Tue & Thur 0830-1530)	VK3PC VK3XV VK3NC	VK3BWI broadcasts on the 1st and 3rd Sunday of the month, starts 10.30 am. Primary frequencies 1.840 AM, 3.615 LSB, 7.085 LSB, and FM(R)s 146.700 Mt Dandenong, 147.250 Mt Macedon, 147.225 Mt Baw Baw, and 2 m FM(R)s VK3RMA, VK3RSH and VK3ROW. 70 cm FM(R)s VK3ROU and VK3RGL. Major news under call VK3WI on Victorian packet BBS.	(F) (G) (S) (X)	$72.00 $58.00 $44.00
VK4	Queensland Division GPO Box 638 Brisbane QLD 4001 Phone (074) 96 4714	President Secretary Treasurer	Geoff Sanders John Stevens John Presotto	VK4KEL VK4AFS VK4WX	1.825 MHz SSB, 3.605 MHz SSB, 7.118 MHz SSB, 14.342 MHz SSB, 28.400 MHz SSB, 29.220 MHz FM, 52.525 MHz FM, 146.700 MHz FM, 147.000 MHz FM, 438.525 MHz (Brisbane only), regional VHF/UHF repeaters at 0900 hrs Sunday. Repeated on 3.605 MHz SSB & 147.000 MHz FM, regional VHF/UHF repeaters at 1930 hrs EAST Monday. Broadcast news in text form on packet under WIAQ@VKNET.	(F) (G) (S) (X)	$72.00 $58.00 $44.00
VK5	South Australian Division 34 West Thebarton Rd Thebarton SA 5031 (GPO Box 1234 Adelaide SA 5001) Phone (08) 8352 3428 Fax (08) 8264 0463	President Secretary Treasurer Web: http://www.vk5wia.ampr.org/	Peter Watts Maurie Hooper Charles McEachern	VK5ZFW VK5EA VK5KDK	1827 kHz AM, 3.550 MHz LSB, 7.095 AM, 14.175 USB, 28.470 USB, 53.100 FM, 147.000 FM Adelaide, 146.700 FM Mid North, 146.800 FM Mildura, 146.825 FM Barossa Valley, 146.900 FM South East, 146.925 FM Central North, 147.825 FM Gawler, 438.425 FM Barossa Valley, 438.475 FM Adelaide North, ATV Ch 35 579.250 Adelaide. (NT) 3.555 USB, 7.065 USB, 10.125 USB, 146.700 FM, 0900 hrs Sunday. 3.585 MHz and 146.675 MHZ FM Adelaide, 1930 hrs Monday.	(F) (G) (S) (X)	$72.00 $58.00 $44.00
VK6	West Australian Division PO Box 10 West Perth WA 6872 Phone (09) 351 8873	President Secretary Treasurer	Cliff Bastin Christine Bastin Bruce Hedland-Thomas	VK6LZ VK6ZLZ VK6OO	146.700 FM(R) Perth, at 0930 hrs Sunday, relayed on 1.825, 3.560, 7.075, 14.116, 14.175, 21.185, 29.680 FM, 50.150 and 438.525 MHz. Country relays 3.582, 147.350(R) Busselton and 146.900(R) Mt William (Bunbury). Broadcast repeated on 146.700 at 1900 hrs Sunday, relayed on 1.865, 3.563 and 438.525 MHz; country relays on 146.350 and 146.900 MHz.	(F) (G) (S) (X)	$60.75 $48.60 $32.75
VK7	Tasmanian Division 5 Helm Street Newstead TAS 7250 Phone (03) 634 42324	President Secretary Treasurer	Andrew Dixon Robin Harwood Terry Ives	VK7GL VK7RH VK7ZTI	146.700 MHz FM (VK7RHT) at 0930 hrs Sunday relayed on 147.000 (VK7RAA), 146.725 (VK7RNE), 146.625 (VK7RMD), 3.570, 7.090, 14.130, 52.100, 144.150 (Hobart) Repeated Tues 3.590 at 1930 hrs.	(F) (G) (S) (X)	$72.00 $58.00 $44.00
VK8	(Northern Territory is part of the VK5 Division and relays broadcasts from VK5 as shown received on 14 or 28 MHz).						

Note: All times are local. All frequencies MHz.

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VICTORIAN CONSUMER AFFAIRS ACT

All advertisers are advised that advertisements containing only a PO Box number as the address cannot be accepted without the addition of the business address of the box-holder or seller of the goods.

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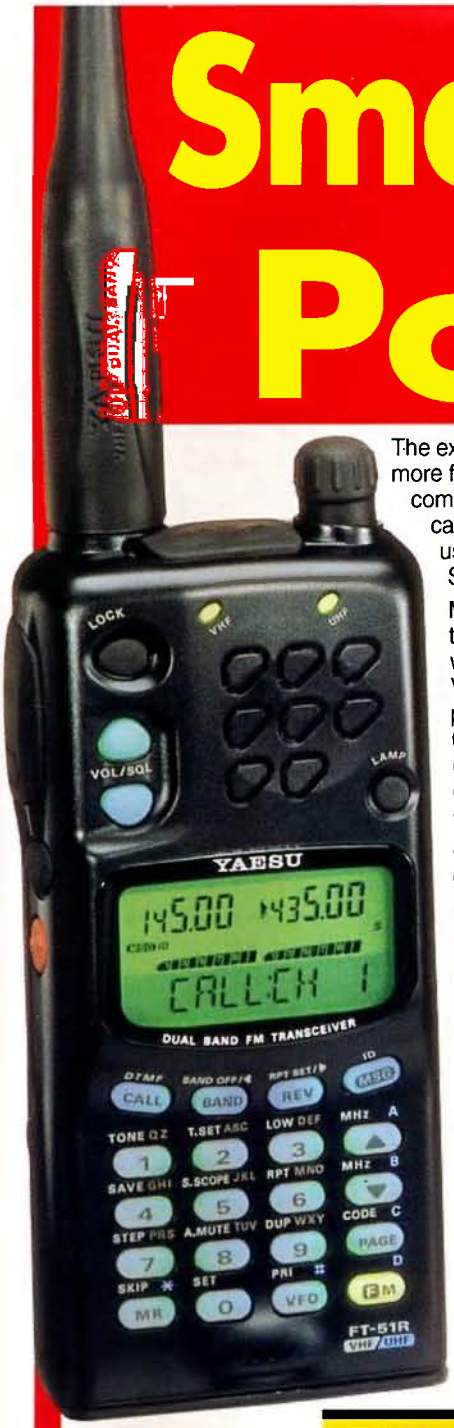

FT-51R shown actual size

The exciting new FT-51R is Yaesu's third generation 2m/70cm dual-band FM hand-held, with more features and even easier operation than ever before, and all in a size that fits comfortably into the palm of your hand. Its tough polycarbonate front panel and diecast rear casing combines cellular styling with professional grade ruggedness for reliable everyday use, while its new dual-processor design provides really useful new functions such as a Spectrum Scope and scrolling Help messages.

Measuring just 123 x 57 x 26.5mm (H.W.D), the FT-51R provides 2m/70cm Amateur transmit coverage, plus extended receiver coverage of 110-180MHz and 420-470MHz, with selectable AM for Airband reception. The FT-51's two receivers allow flexible VHF+VHF, UHF+UHF, or VHF+UHF operation, while the efficient FET technology provides 2.0W RF output on 2m and 1.5W output on 70cm from the supplied 4.8V 600mA/H Nicad battery pack. Up to 5 selectable Tx power levels are available (including an economy 20mW level), with 5W RF output available when using an optional 9.6V battery pack or mobile power adaptor.

To find local activity easily, the FT-51R's "Spectrum Scope" provides a visual indication of nearby busy frequencies, so you can keep an eye on whether a repeater or simplex channel may be in use. The Spectrum Scope can also be used in memory mode, and will even give an indication of signal strength. In addition to twin VFOs per band, the FT-51R also provides up to 120 memory channels, and alpha-numeric names (eg. repeater locations or callsigns) can be stored instead of a frequency if required.

For very straightforward operation the FT-51R provides scrolling User Help text messages that guide you through most function settings, as well as a selectable Auto Repeater Offset function to suit the Australian band plans. Other features include a range of battery life extenders (Auto battery saver, TX Save and Auto Power Off), CTCSS encode and decode, extensive DTMF-based selective paging, seven selectable frequency Step sizes, and an LCD voltmeter so you can monitor battery performance under load and estimate remaining battery life.

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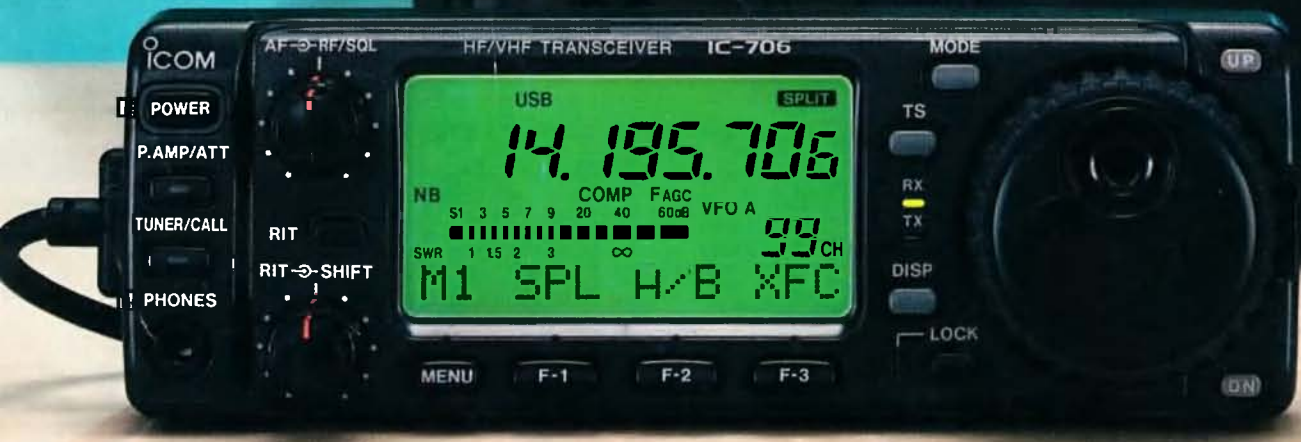

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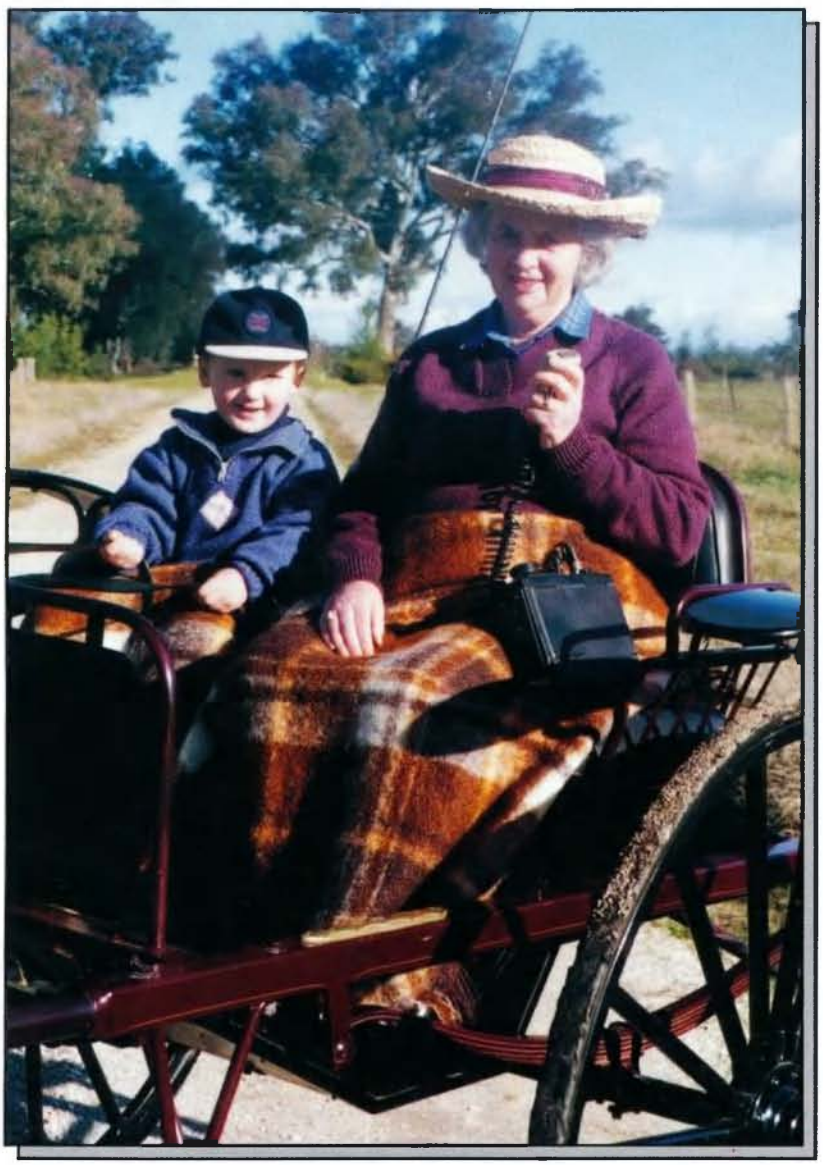
November 1996
Volume 64 No 11

Amateur Radio

Journal of the Wireless Institute of Australia



IN THIS ISSUE:

* A Micropower Two Metre FM Transmitter
* Review of Yaesu FT-8500 Dual Band FM Transceiver
* Horizontal Half Wave Dipole Above a Counterpoise

Plus

lots of amateur radio news, information, other articles and special interest columns.

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NOTE: Due to poor demand Buckmaster have indefinitely deferred the production of a 1996 Electronics Software Compendium.

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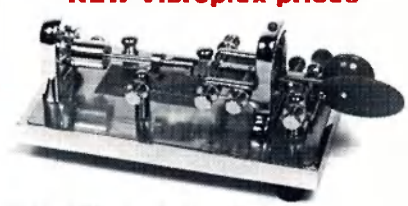

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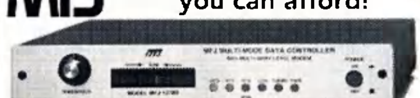

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CONTENTS

Cover

Bron Brown VK3DYF obtained her amateur licence in the early 1980s so she could talk to her son. Here she demonstrates to her three year old grandson Jason how amateur radio can be enjoyed everywhere. Bron is using an Icom 215 with a 5/8th wave whip antenna while Jason drives the Competition Jinker.

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A radiocommunication service for the purpose of self-training,intercommunication and technical investigation carried out by amateurs, that is, by duly authorised persons interested in radio technique solely with a personal aim and without pecuniary interest.

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Founded 1910

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Editor's Comment

A Hundred Flowers

I have always been intrigued by the remark attributed to the late Mao Zedong (or, in earlier form, Mao Tse-Tung) in which, told that there were many divergent views being publicised, he said, "Let a hundred flowers bloom".

History has subsequently recorded how closely or otherwise this counsel of tolerance was observed, but it has always seemed to me to be a very praiseworthy philosophy. Like another philosophy, it may be, not that it has been tried and found wanting, but that it has not been tried!

Radio amateurs have always seemed to me to be a most divergent group, their most dominant characteristic being rank individualism! To find several amateurs having the same outlook on a range of topics is an unusual situation. This is a healthy outlook, particularly in view of the transient nature of much of our technology, in which the cycle time from inspiration through development and marketing to obsolescence may be measured as only a few years.

But besides technology there are other areas, relevant to us all, in which even less is "set in stone". Change is certain, and often rapid. In all this confusion and competition let us never lose sight of the fact that no-one is wholly right and no-one is wholly wrong. Tolerance, not belligerence, is healthier for us all!

Bill Rice VK3ABP
Editor

CONTRIBUTIONS TO *AMATEUR RADIO*

Amateur Radio is a forum for WIA members' amateur radio technical experiments, experiences, opinions and news. Manuscripts with drawings and/or photos are always welcome and will be considered for possible publication. Articles on computer disk are especially welcome. The WIA cannot assume responsibility for loss or damage to any material. *"How to Write for Amateur Radio"* was published in the August 1992 issue of *Amateur Radio*. A photocopy is available on receipt of a stamped, self addressed envelope.

■ WIA News

Roger Harrison VK2ZRH, Federal Media Liaison Officer

More Concerns Over Spectrum Licensing

There is still communications industry concern over spectrum licensing, expressed by the Wireless Technology Forum of the Australian Electrical and Electronics Manufacturers Association (AEEMA).

The Forum's response to a draft proposal on auctioning spectrum at 1.8 GHz, circulated for public comment recently by the Spectrum Management Agency (SMA), raised concerns over the treatment of incumbents affected by the spectrum licensing proposal. Concern was also raised over "the lack of provision for limiting uncoordinated devices outside allocated areas" operated on frequencies within a spectrum-licensed band.

Exploitation of the process of auctioning spectrum licences was of major concern to the Wireless Technology Forum. The executive director of AEEMA, Alex Gosman, said: *"The proposed arrangements for auctioning the 1.8 GHz bands do not appear to be above exploitation by those who may have no intention of developing infrastructure or establishing a service, but who can position themselves to benefit by extracting unearned profits from incumbents or those seeking to establish a national infrastructure.*

"The stated aims of the auction process," Gosman pointed out, "is to open up communications to new competitors rather than to generate revenue, and speculation must be discouraged."

In addition, in response to the draft *Radiocommunications Amendment Bill 1996* (see *WIA News*, page 3, September 1996 *Amateur Radio*), the Wireless Technology Forum said they supported the proposal for rapid clearance and reallocation of spectrum. The Forum's major concern is that there is no up-front mechanism to guide the SMA in determining whether there is a need to consider the clearance of a band, whereas once the decision is made a clear cut process is established. To assist the SMA in considering the need to clear a band, the Forum suggested the development of a checklist.

The concern for the Amateur Radio Service on the issues of spectrum licensing and band clearance is that, as the amateur bands between 148 MHz and 10 GHz are allocated on a secondary basis, the amateur radio community does not want to be caught by a "surprise" proposal to spectrum licence a band which covers, in whole or in part, any of these bands.

The WIA maintains an active "watching brief" on all activities related to spectrum use and allocation through the resources and activities of the Federal ITU Conference and Study Group Coordinator, David Wardlaw VK3ADW, and the SMA Liaison Team (of which David is also a member).

Direction Finding on the Move

Since the Region 3 Amateur Radio Direction Finding (ARDF) Championships in Townsville in July, championship organiser Wally Watkins VK4DO and wife Dorothy went to Bulgaria for the 11th European Championships in early September, at which Wally was a referee.

Upon returning to Australia, Wally has worked on editing video footage of the Townsville Championships, copies of which are available by writing to PO Box 432, Proserpine Qld 4800.

News from across the Tasman has it that there will likely be a friendly ARDF event on New Zealand's North Island, scheduled for March or April in the new year.

While the next ARDF World Championships, the 8th, will be held in Germany during September 1997, Australia's ARDF organisers suggest local enthusiasts aim to compete in the next Region 3 Championships proposed to be held in South Korea in 1999. The date and location, however, are subject to confirmation at the International Amateur Radio Union (IARU) Region 3 meeting to be held in Beijing late next year. Local ARDF organisers are planning to field a full team of 12 to represent the WIA in 1999, comprising three competitors in each of the four categories of Senior, Junior, Women and Old-timers.

The July Championships in Townsville proved that the Australian-designed and constructed ARDF equipment was up to the mark, performing as well as seasoned, overseas-made equipment. Selection for the 1999 Championships would need to be held in 1998, to decide team composition on merit. This would need a national competition held at a reasonably central location. Dubbo, in central-west NSW, is suggested.

The eventual goal? – ARDF as an Olympic sport. That would really put amateur radio in the public eye.

IARU News

David Wardlaw VK3ADW

Region 1 Meeting Sets Scene for Future Development

The tri-annual Region 1 Conference of the International Amateur Radio Union (IARU), held over 30 September to 6 October, considered 120 papers presenting proposals for the development of amateur radio, spanning almost every facet of amateur radio activities.

Representatives from 52 countries across Europe, the Commonwealth of Independent States (the former USSR), Africa and the Middle East gathered in Tel Aviv, Israel for the week-long conference.

The future of the amateur service was a major topic of discussion, arising from the discussion paper circulated earlier this year by the IARU's Future of the Amateur Service Committee (FASC). The Tel Aviv conference was the first round of deliberations on this discussion paper and the FASC's first report (see *IARU News*, page 4, October *Amateur Radio*). Debate surrounding the discussion paper will also be considered by the Region 3 Conference in 1997 and the Region 2 Conference in 1998, in time for the IARU to formulate a response to agenda items on the Amateur Service at the World Radio Conference in 1999.

Other papers considered at the Conference covered HF, VHF and microwaves, communications techniques, contests, the monitoring system (Intruder Watch) and help for potential amateurs in emerging countries. Working Groups discussed issues relating to ARDF, EMC, common licensing, VHF-UHF beacon policy, qualifications and licensing structure of the Amateur Service; international education links, 50 MHz VK-ZL calling frequency, and HF contests, among others.

Spurious Emission Limits

A proposal has been put to an International Telecommunications Union (ITU) working group studying issues regarding spurious emission limits, that Amateur stations be excepted from meeting the Radio Regulations standard, and that less stringent emission limits apply.

Standards for spurious emission limits are to be discussed at WRC-97. The applicable standard for minimum attenuation below the power provided by a transmitter at the antenna transmission line is 43+10LogP, or 70 dB (whichever is less stringent), for all services, except for those specifically excepted who have to adhere to another standard. Such services include space services, radiolocation, broadcast, and some services operating below 30 MHz. Some of these services have to adhere to a more stringent standard, others a less stringent one.

The Secretary of the Region 3 Association attended an ITU technical group meeting (ITU-R TG 1/3) in Paris earlier this year and put the case that Amateur Services operating below 30 MHz need only meet a spurious emission level of 43+10LogP, or 50 dB (whichever is less stringent). P represents mean power at the antenna connector. The proposal was supported by the USA who submitted an information paper on measured spurious emission levels.

The final TG 1/3 meeting was scheduled to be held last month in Santa Rosa, California, over 24-30 October.

As a Matter of Record

Several errors, which we would like to correct, were perpetrated in the *WIA News* article "10 gigahertz gets a Guernsey", on page 6 of the March 1996 issue of *Amateur Radio*.

In the first paragraph, Wally Howse VK6KZ is referred to as "Wally House". At least the error is consistent, as his surname is also misspelled in the last paragraph. But to compound the problem, his call sign is then misquoted as VK6WG. For the record, it should be Wally Howse VK6KZ, in both places. VK6WG belongs to Wally Green, another well-known West Australian VHF pioneer. Apologies for that.

In writing, homonyms (words which sound alike and may have closely similar spellings) are a trap. Never let a computer word processor's spell checker have its head, as the following ditty illustrates.

SPELLBOUND

I have a spelling checker
It came with my PC
It plainly marks for my revue
Mistakes I cannot sea
I've run this poem threw it
I'm sure your please to no
Its letter perfect in its weigh
My checker tolled me so!

Have you advised the WIA Federal Office of your new callsign? Use the form on the reverse of the *Amateur Radio* address flysheet

Getting a Permit to Use Your Licence in Japan

Details of procedures for foreign amateur licensees to operate in Japan have been provided to the WIA by the Japan Amateur Radio League (JARL).

Australian-licensed amateurs holding Unrestricted, Limited or Novice qualifications can get a licence to operate in Japan. Eligibility became effective as of 1 April 1996, according to the information supplied by the JARL.

Station licences are granted for a period of 12 months, and they are renewable, but not beyond the expiration date of your Australian licence. However, amateurs holding Japanese "permission for permanent residence" (visa category 4-1-14) from the Minister of Justice, Japan, can apply for a five year licence.

Station output power is used to classify amateur stations in Japan. The 1st Class JA licence is permitted all modes on all bands, and a maximum output power of 1 kW. The Australian AOCP is equated with the Japanese 1st Class licence, according to the JARL documentation. The 3rd Class JA licence equates with the Australian NAOCP, operators being permitted all modes on all bands except 10 MHz and 14 MHz, and 50 W maximum power output. The AOLCP equates with the JA 4th Class licence, permitting the use of all modes except CW, with access to all HF bands except 10, 14 and 18 MHz, using 10 W output, and all bands above 30 MHz with 20 W output.

You may apply to operate mobile/portable or a fixed station. However, separate licences are required. In addition, mobile/portable stations are limited to 50 W or less, while fixed stations under this system are permitted more than 50 W, but less than 200 W output. An application for a Japanese station licence must be submitted at least 60 days before the date you anticipate starting operation in Japan. Applications are handled through the JARL. A different application procedure involving the Japanese Ministry of Posts and Telecommunications (MPT), which may take more than three months, is necessary if you plan to run more than 200 W output, according to the JARL, and you must go through an on-site station inspection.

Four items are required with a standard application for mobile/portable or fixed station operation. (1) A completed station information form (JARL-96-04); (2) a signed letter of authorisation (JARL-96-04A) allowing the JARL to submit the application on your behalf; (3) a photocopy of your current amateur radio operator certificate; and (4) an international money order (payable in Yen) for licence fees, or photocopy of a bank transfer confirming that the appropriate funds have been transferred to the JARL.

The licence fee for a mobile/portable station (50 W or less) is 12,000 Yen (about $105), and for a fixed station (50-200 W) is 21,000 Yen (about $180). Renewals cost about $38.

Copies of the application procedures document may be obtained through your nearest Division of the WIA. **ar**

■ Transmitters

A Micropower Two Metre FM Transmitter

Peter Parker VK1PK describes how to homebrew a useful low power VHF transmitter.*

Most home built transmitters seem to be for either eighty or forty metres. The presumption appears to be that VHF equipment is unduly complex to build and align. This need not be so. This two metre FM transmitter has just six transistors and one coil to wind. This project will provide valuable practical experience. Apart from discovering the joys and limitations of VHF micropower operation this transmitter can be put to a variety of uses such as in amateur radio direction finding, JOTA applications, small-area repeater linking experiments, or as an aid to aligning 2 m FM receivers.

If you live at, or are willing to travel to, a good VHF site, this transmitter could be a low-cost means of becoming active on two metres if you already own a VHF scanner or other suitable receiver. Another possibility is to modify the circuit for six metres.

This unit, Figure 1, is a direct FM transmitter. It borrows heavily from the *2 Watt VHF FM Exciter* described in *Amateur Radio* over 20 years ago (see refs 1 & 2). The circuit is easily reproducible. The first four stages have been successfully used in experimental FM transmitters on six, two and forty metres.

The first two transistors comprise the speech amplifier stage, the gain of which is adjustable. Audio from this stage is fed to Tr3 whose capacitance changes in sympathy with the operator's speech. This capacitance varies the frequency of the 18 MHz Colpitts crystal oscillator whose frequency is doubled and then quadrupled to reach the 144 MHz band.

With only one tuned circuit in the output, this circuit is likely to emit significant levels of output on undesired frequencies. For this reason it is desirable that a bandpass filter be fitted between the output stage and the antenna. A suitable filter is described near the end of this article.

Most of the components used in this

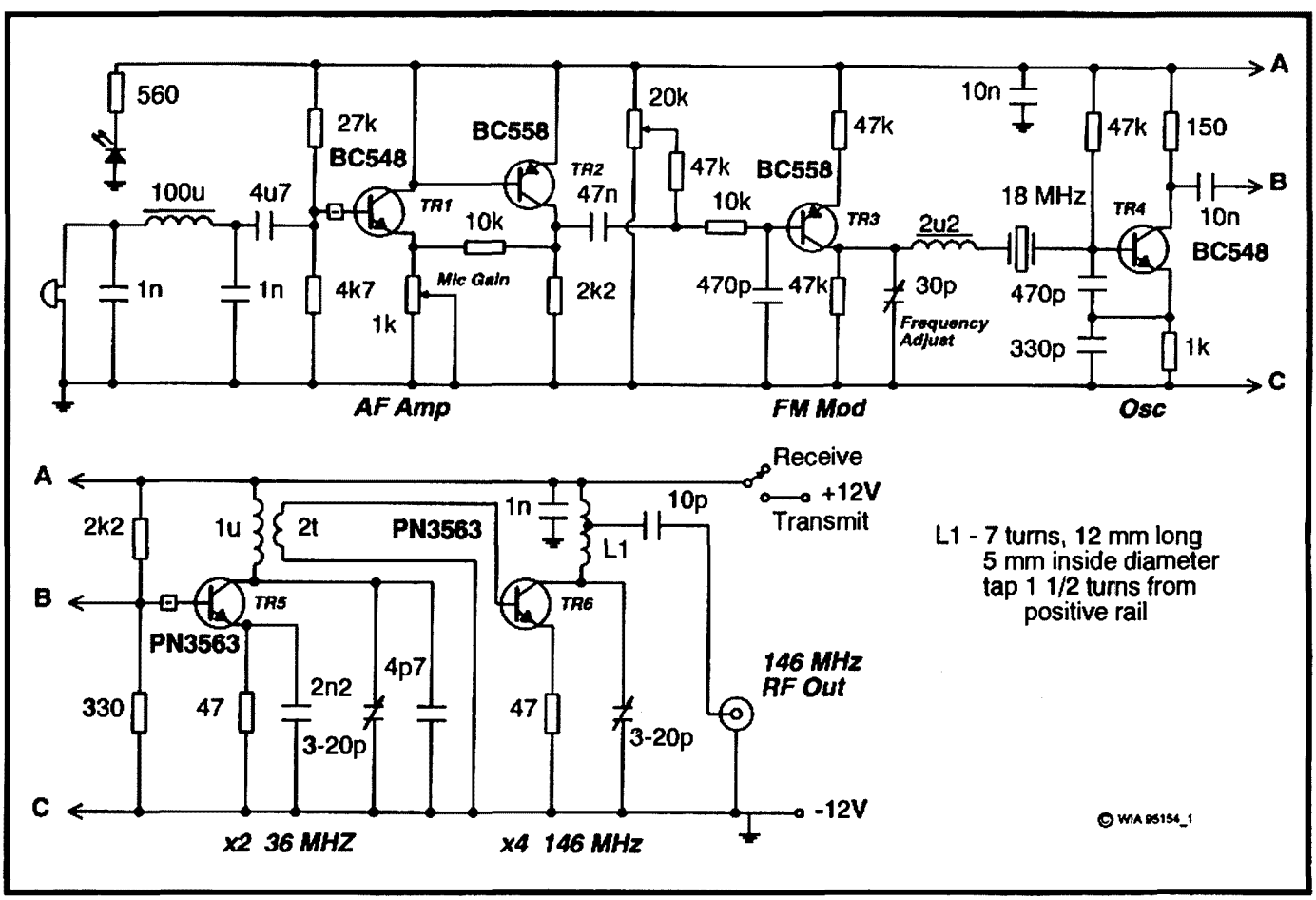

Figure 1 – Micropower two metre FM transmitter.

transmitter should be readily obtainable. Indeed, if you already have one of the older transistorised VHF high band transceivers, there will be only a few parts that need to be purchased.

Crystal

Probably the most critical and expensive component is the crystal. It should be for the input frequency of your nearest repeater. To reduce costs it is a good idea to build this circuit around available crystals. If the crystal frequency is appreciably lower than 18 MHz, an additional multiplier stage may be required. The efficiency of frequency multipliers falls as the multiplication ratio is increased.

If ordering a crystal, specify that it be suitable for a high-band Philips FM828 as this was the crystal type used in the prototype. While 18 MHz crystals from other models of transceiver could probably be used, it may be difficult to obtain coverage of the desired frequency unless changes are made to some component values around the crystal.

The microphone is a dynamic type. A receiver from a disused telephone performed well in the prototype. Alternatively, if a suitable DC voltage is provided from the positive rail, an electret insert may prove a suitable substitute.

While untried, transistors such as the BF115 or the 2N2369 should be appropriate substitutes for both multiplier stages. Be prepared to change component values for optimum results. Fortunately, with the construction technique recommended, this is a simple process.

The prototype was constructed on the copper side of an 8 x 10 cm piece of unetched printed circuit board material. Components with connections to earth are soldered direct to this ground plane, while others are wired in between. Where support is required, a high value resistor is used as a stand-off mounting point. This technique was chosen because the project's simplicity, and the possibility of component changes during its development, made conventional printed circuit boards impractical. Another suitable construction technique would be Drew Diamond's "Paddyboard" where small squares of PCB material are glued or soldered to the main board to provide anchor points for components. A 10 x 12 x 6 cm diecast aluminium case houses the complete transmitter except for the filter which occupies its own enclosure.

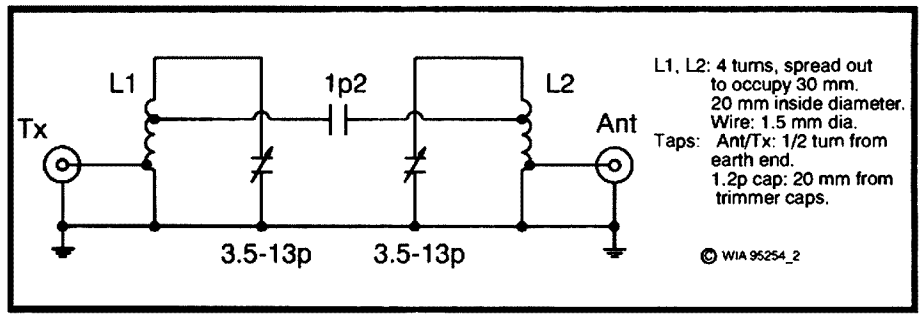

Figure 2 – Two metre bandpass filter.

As with any homebrew VHF design, some component changes, particularly in the RF stages, may be required to make your particular unit work as well as the prototype. This is why the use of a construction method that permits easy alteration is highly recommended for equipment of this type.

With a project such as this it is best to construct and test one or two stages at a time. Start by building the microphone amplifier. Note the ferrite bead on the base of the first transistor. This has been included to minimise the risk of circulating RF interfering with circuit operation. While speaking into the microphone, apply power and check the audio stages for operation. This is best done through the use of an audio signal tracer, although a pair of high impedance headphones in series with a 10 µF electrolytic capacitor is an acceptable substitute. Adjusting the 1 k trimpot should vary the audio output.

Modulator

The next step is to assemble the FM modulator and the crystal oscillator stages. Construction of this circuitry should be fairly straight forward. To facilitate frequency changing, the use of a crystal socket is recommended. A frequency counter, two metre receiver or an RF probe may be used to verify the operation of the 18 MHz crystal oscillator. Once it is confirmed that a signal is being produced it must now be shifted on to the desired frequency. This is accomplished by adjusting the 20 k potentiometer, the trimmer capacitor and the inductance in series with the crystal.

By listening to the eighth harmonic of the crystal oscillator on a two metre FM receiver, the transmitter audio quality can be checked. It should be clear and free of distortion. Adjust the 1 k audio level control so that the volume of the audio from this unit is similar to that received from other transmissions on the band.

If the audio is distorted, or it is not possible to shift the crystal to the correct frequency, some changes of component values may be required. More specifically, by changing the value of the inductance in series with the crystal as well as the nearby trimmer capacitor in conjunction with the setting of the 20 k potentiometer, it should be possible to arrive at a combination which provides a signal of good audio quality on the correct frequency.

Once this part of the circuitry is operating satisfactorily the frequency doubler stage may now be assembled. To make construction easier a 1 µH pre-wound RF choke has been used in the collector. By winding a two turn coil over this inductance this stage's output frequency can be checked with a frequency counter. The 20 pF trimmer capacitor should be adjusted for maximum output on 36 MHz. If the output signal is unstable, first check to see that the tuned circuit formed by the RF choke and the 20 pF trimmer is properly resonant on 36 MHz. Failing this there is the chance that the transistor is oscillating on its own accord. The addition of a ferrite bead on the base of the transistor, a change in component values or the introduction of emitter degeneration are examples of steps that could be taken to stabilise the stage.

Assembly of the final stage should be

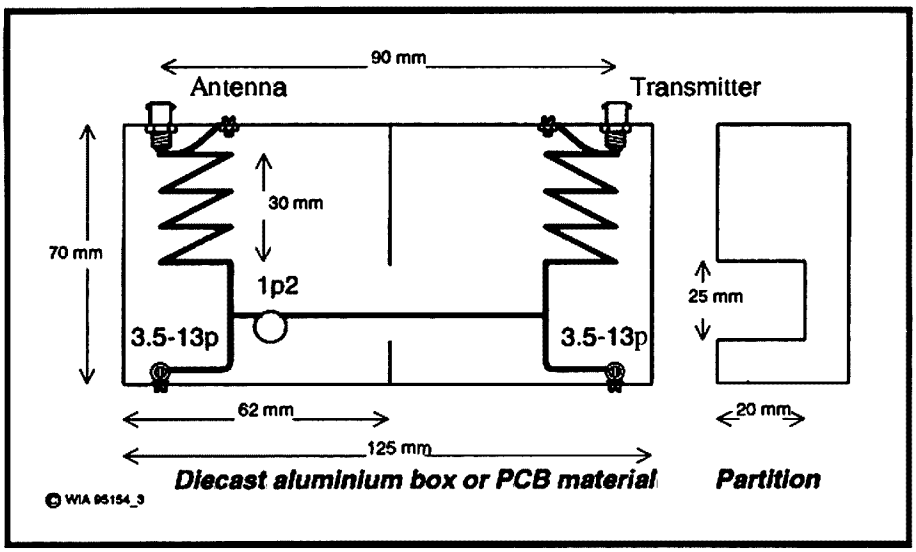

Figure 3 – Two metre bandpass filter internal construction.

straightforward. The comments made in the preceding paragraph also apply here, although particular care must be taken to ensure that the output tuned circuit resonates at 146 MHz and not some other frequency.

Filter

The filter shown in Figure 2 attenuates spurious emissions from the transmitter described above. It is built in a metal case to ensure proper shielding. Note the use of an internal partition (see Figure 3) to shield the two coils from each other. Provided there is provision made to adjust component values and coil taps, it is unlikely that the dimensions shown are especially critical.

Initial alignment of the filter can be done with it connected between an antenna and a two metre receiver. Adjust the trimmer capacitors in the filter for maximum signal strength on a signal near 147 MHz, such as a repeater output. Comparing the received signal strength with and without the filter in-line should give a rough indication of filter insertion loss. The difference in strength should be barely noticeable if the filter is working correctly. Such experiments are best done with very weak FM signals or carriers.

The filter may need further slight adjustment when the transmitter is connected to it. This test could be done with a spectrum analyser, or, alternately, by monitoring the transmission and tuning for maximum signal.

The power output of this design has not been measured but it is probably in the 10 – 30 milliwatt range. The prototype provides a reliable, almost noise free, signal into a repeater approximately 10-15 kilometres from here when a simple ground plane antenna is being used. The low power means that it is possible to hear one's own signal through a repeater without any desensing being evident.

Micropower operation has a number of advantages and it is interesting to note that some commercial transceivers have a very low power (20 mW) setting to extend battery life. When transmitting with a few milliwatts through a repeater while monitoring its output frequency, a form of full-duplex operation becomes possible. Thanks to the FM capture effect, a higher power station will override your signal and be able to break in at any time, as long as you are monitoring the repeater output while you talk by wearing headphones to prevent audio feedback. If all stations are using both micropower and conventional equipment the result will be similar to having a multi-way telephone conversation.

A two metre FM transmitter which can be readily extended and modified has been described. It is both simple and inexpensive to construct. At the end of the few hours it takes to build the rig you will have a transmitter that can be put to a variety of uses. This radio is sure to attract more attention at club meetings and on the air than the seemingly endless parade of cellular-phone look-alikes churned out by the major equipment manufacturers. Best of all it is a real AMATEUR radio you will be proud to use as it was put together with your own hands.

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**7/1 Garran Place, Garran ACT 2605*

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WIA News

Military Affiliates Drop CW

According to a bulletin from the American Radio Relay League (ARRL), all CW nets and other CW activity in the United States' Military Affiliate Radio System (MARS) were ordered to cease operation as of 1 October, 1996.

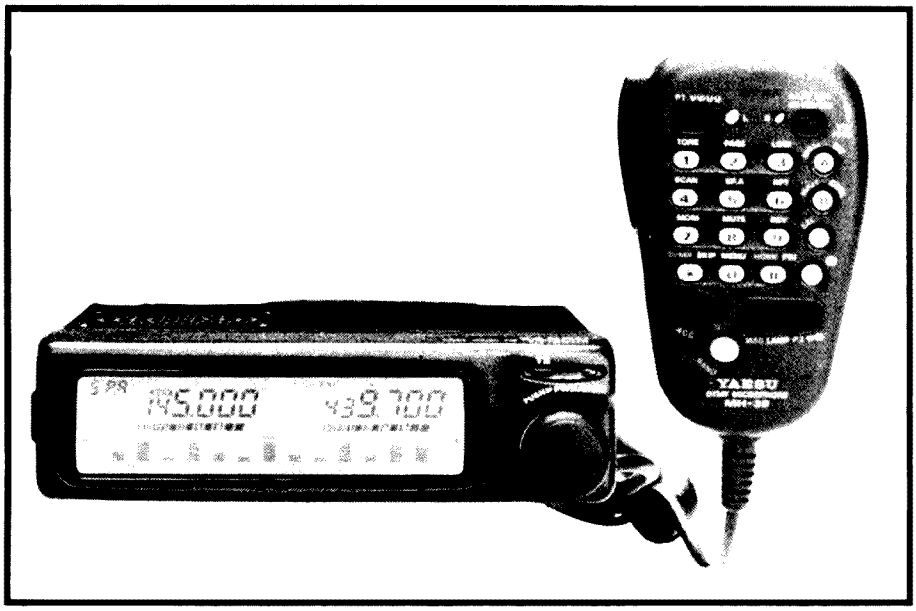
From then, the bulletin reported, no CW nets or other CW activity would be allowed on any US Department of Defence MARS frequencies. MARS in the United States has had a long association with amateur radio.

A final MARS CW message was to be transmitted simultaneously on the three forces' MARS frequencies at 1300, 1530 and 1700 UTC on 30 September.

■ Equipment Review

Yaesu FT-8500 Dual Band FM Transceiver

*Reviewed by Paul McMahon VK3DIP**



Yaesu FT-8500 dual band FM transceiver and MH-39 microphone.

What Is It?

The FT-8500 is a dual band (2 m and 70 cm) FM mobile transceiver, with up to 50 watts of Tx output power on VHF and up to 35 watts of Tx output power on UHF. The receiver coverage is 110 to 174 MHz (VHF) and 410 to 500 MHz (UHF). The unit is of mid-size (140 x 40 x 160 mm) and weight (1.1 kg). The review unit was kindly supplied by Dick Smith Electronics and had the serial number 5L110232. Retail price is around $1075.

First Impressions

There is only one knob on the box! The same, however, cannot be said of the MH-39 microphone which has a mass of buttons as well as a thumb wheel volume control. But this is only the start of the novelties of this radio. Apart from the one knob on the box, the vast majority of the rest of the front panel is taken up with a single large display. This display can show many things, as well as just the normal frequencies and signal strength meters.

One of this radio's surprising features is the ability to show a variable resolution and width graphical spectrum analyser style display of activity centred on the main band. Tuning the set with the single knob moves a marker over the display to show you where you are relative to the other signals indicated. This is the first time I have seen a set with this function, and the first time for a long time I've seen a really new feature which I have actually felt was a worthwhile step forward. Also available on the display is a host of pretty little symbols to indicate various modes, and it can even show the supply voltage level.

The microphone connector is, as usual these days, one of those pseudo phone connector plastic click-in things. In this case the connection is hidden behind the removable front panel which, by the way, can be remotely mounted. Audio quality seems good in subjective on air tests, and the receiver sensitivity seems uniform across the ranges covered.

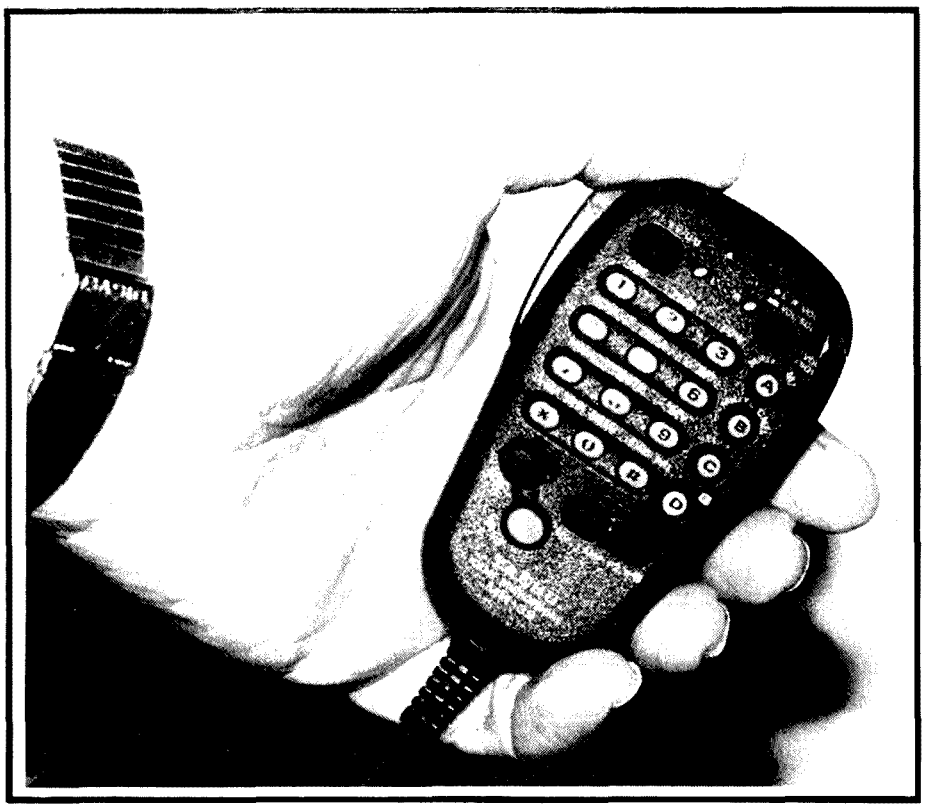
The manual is also a novelty for these days as not only did it actually seem to cover all the features of the set but, wonder of wonders, actually included a reasonably detailed circuit diagram. More on this later. Also in the standard styrofoam and cardboard box was a mobile mounting bracket, with power cable, spare fuse, and miscellaneous nuts and bolts for the bracket.

Up front I should also mention that this is the first radio for a long time where I actually had to read the manual before I could use the basic functionality. Once read, though, it was pretty straightforward, with the trickiest thing I found to be the setting of the mute and volume levels for the main and sub band. In this case you had to press one of the buttons on the microphone to toggle between two LEDs (also on the microphone and marked L and R); the LED lit indicated whether the thumb wheel was setting the main or sub band volume level; you also held the same button down a bit longer till the L or R LED was flashing and then the thumb wheel adjusted the mute. I found this a pretty clumsy arrangement, often inadvertently adjusting the volume when I intended to vary the mute and vice versa.

Technical Bits

The Rx frequency coverage of the set is 110 to 174 MHz (VHF), and 410 to 500 MHz (UHF). The segment 110-137 MHz can be set up for AM or FM via a menu option. The Tx coverage is 144-148 MHz and 430-450 MHz. The manual and circuit/block diagram are very good for a change, the manual explaining clearly how do everything, and the circuit diagrams explaining how the various bits of magic are achieved.

The specifications describe the set as a double conversion superhet with a 45.05 MHz and 58.525 MHz first IF on VHF and UHF respectively, with both bands using a 455 kHz second IF. Sensitivity for 12 dB SINAD is claimed as less than 0.18 μV for a main band but only less than 0.25 μV when a sub band. Selectivity is on a par with other similar



A lot of controls are packed into the MH-39 microphone.

boxes, as is spurious and image rejection. Rated audio output is two watts, and subjectively sounded clear and clean. For the Tx the rated power outputs were 50, 10, and five watts on VHF and 35, 10, and five watts on UHF, ie more or less the standard for this class of set these days. Peak current drain at maximum rated power out is given as 11.5 amps at 13.8 volts.

The set has a total of 112 memories. 100 of these are normal general purpose, by default arranged as five banks of ten in each band; however, the number of banks per band can be varied via the menus. As well, in each band there is a home, a priority, and four scan edge memories. Each memory can store either separate Rx/Tx frequencies or repeater offset, and can also store up to six character alpha/numeric names which can be displayed instead of the frequency. Tuning step sizes of 5, 10, 12.5, 15, 20, 25, or 50 kHz are available.

One of the neat tricks that appears to be now standard in dual band rigs is the ability to have both halves of at least the receiver operate on the same band. This so called U/U or V/V option has always intrigued me as to how it was done. Well, now the secret is out. With the provision of a circuit we can at least see how Yaesu do it. In the FT-8500's case, the set is basically two complete receivers in the same box, one for each band. The only common component seems to be the micro and control logic. Forgetting about the transmitter chains, which are basically classical textbook designs, the receivers are where the interesting things are done. RF enters the set and is split via a diplexer into VHF and UHF for the separate receivers' front ends. Both receivers are structurally pretty much the same; both provide a choice of RF stages, one for the ham part of the band, and one for the rest/whole of band. The ham band one has obviously better filtering/shaping for out of band noise, etc and would explain why the figures quoted in the specs are always noted as being for in the ham portions only.

If you like, you could think of these RF front ends as being, in one case, what you would have traditionally seen in a ham rig back in the days of the IC22S and, in the other, something found in scanners. The control circuitry selects the appropriate front end depending on what frequency you want. The output from the front end is mixed in a double balanced mixer (wideband diode bridge type) with the output of the appropriate VCO/PLL; the resultant IF flowing on to a pretty standard one IC (MC3372ML) FM receiver which includes the further mix down to the second IF of 455 kHz, mute circuitry, etc. The dual RF stages are the first bit of the V/V U/U story. In fact, the input to each DBM is switched between three inputs not two; the obvious ones are the ham and scanner type front ends for that receiver, and the third is the scanner type front end from the other receiver. This is possible because of the inherent wide band nature of the diode type DBM; it doesn't really care if the input is 110 MHz, or 500 MHz.

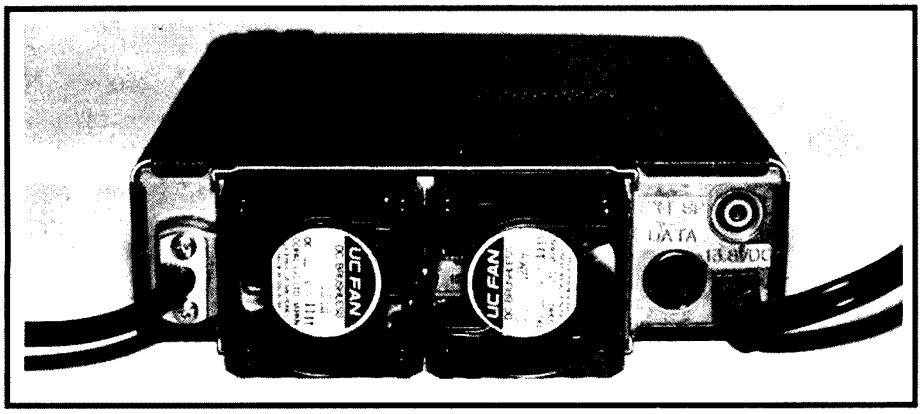
The generating of the appropriate local oscillator frequency from the VCO/PLL is the only other problem. To see how this is done we need to look at the frequency schemes used. In the VHF receiver, the first LO is on the high side not the more usual low side, ie LO = RF + IF. For example, let's say we want 146 MHz; then the LO needs to be 146 + 45.050 = 191.050 MHz.

When, however, we want to use the VHF strip with UHF, an extra frequency doubler stage is switched in the LO line. So, in the previous example, the LO will now be 2 x 191.050 = 382.100 MHZ which, if we use low side injection on UHF, gives us an effective RF input of 382.100 + 45.050 = 427.15 MHz. That is, a LO frequency point roughly in the middle of the range required for VHF gives roughly the mid point for UHF.

For the nominally UHF receiver case, the UHF loop actually has a special VCO running at roughly half the normal VCO frequency which produces a similar effect when combined with the VHF scanner type front end, and UHF DBM and IF.

Operation

The spectrum analysis feature of this radio made it really easy to quickly assess how busy the band was and where the activity was. In a contesting/ scramble situation it would be invaluable for finding other stations. In practice it works somewhat like the normal scanning modes; you can set the upper and lower limits, the step size, etc and the set will scan the frequencies.



Twin fans on the rear panel quietly keep the FT-8500 cool.

The difference in this case is that, instead of stopping when it finds a busy channel, it just keeps on going but leaving a graphical representation of the relative signal strength on the screen. The feature has much in common with the somewhat older panoramic adaptor add-ons you used to be able to get for HF transceivers.

As previously mentioned, this set requires some getting used to in terms of learning how to do things, but once you have used it for a while you will have it personalised for your preferences, via the user programmable buttons on the microphone, and various menu settings. Once this has been done, then the primary purpose of the single knob to turn the set on and off, and to vary the frequency, is probably all you need under most circumstances.

While this is a bit of work in the default case, the set does have a couple of other features that will help out. For example, via the now pretty much standard packet (1200 and 9600 baud) connector, it is possible to both fully control/program the set via an attached PC, and to clone the setup to a second set. I would assume a disk backup and restore via the PC would also be possible. This set up of PC and set would make for a pretty much ideal packet station with all control being possible from the PC; basically anything you can do from the knob or mic buttons can be done via this interface.

As usual, I was unable to test most of the fancy pseudo pager and messaging facilities as they required an add-in board and/or another compatible set. Some of the features here seem to be getting a bit silly. For example, in this set it is possible to have it, on receipt of an incoming message, either play a tune, send some CW, or play a user composed tune. In this last case you are limited to only three and a bit octaves, and only a limited subset of rests! Programming this via anything other than the connected PC option would not be much fun.

Conclusion

When I first saw this set, on superficial examination I felt Yaesu had got it all wrong and that this set would be a nightmare to operate. Then I realised I was reacting to the differences because they were not what I was used to. After more detailed usage and playing/analysis I have revised my opinion to the point that I see this as a bit of an experiment or first of a line, and a successful one at that. If you think about it you begin to see it as its designers intended. If you are going to use it mobile, the last thing you want is hundreds of knobs, etc to be playing with as you drive into the path of a semi trailer. Conversely, if you are going to use it as a base station, then you want as big a display as you can get, and who would want to be fiddling with knobs and buttons, when you could have a pretty graphical interface via your PC.

The FT-8500 has many new features. The most important, I felt, were the spectrum analysis display, and the computer control. All in all, I would be very happy to own this set. It has character, and there is no question it stands out in the crowd.

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■ Antennas

Horizontal Half-wave Dipole Above a Counterpoise

Ralph Holland VK1BRH shows why you need a counterpoise under your LF antenna.*

Introduction

All antennas that are situated close to the ground are affected by that ground to some extent.

The most obvious effect is that the ground forces the antenna's radiation pattern to appear in the half-space above the ground. This is illustrated by comparing the radiation around a monopole fed against ground to that of a dipole in free-space. The monopole has twice the power in the hemisphere above the ground compared with the power in either hemisphere of symmetry for the dipole in free-space. The nature of this reflection of energy above the ground is governed by the polarisation of the antenna and the ground effectiveness. The dielectric constant and conductivity of the ground determines how well the ground acts as a conductor and hence a reflector.

A less obvious effect is that the ground absorbs energy from the antenna; this energy is wasted in the ground's intrinsic resistance (Ref 3).

The placement of an artificial ground, or counterpoise, can decrease the ground losses and enhance the performance of a horizontal antenna. The enhancement can be investigated by performing comparative measurements of the feedpoint resistance or by performing computer simulations.

This article is based on computer simulations using NEC-2 (Ref 1) for antenna systems at 1.825 MHz over average ground with a relative dielectric constant of 13 and conductivity of 5 milliseimens per metre [13,5]. The simulations were performed for ideal (loss-less) antenna elements with a diameter of 1.22 millimetres.

Terminology

Displacement is the term used for the distance between the counterpoise (which is the antenna system's lowest element) and the ground. Separation is the term used for the distance between the driven-element and the counterpoise. Displacement, in the regular dipole case, is the distance between the dipole and the ground.

Results

Figure 1 illustrates the efficiency of the horizontal half-wave dipole at various displacements. In general, the efficiency improves as the dipole is raised higher. Note that 100 percent efficiency is not achieved at a quarter wavelength displacement because, even at this height, the ground has introduced some losses into the antenna system.

Figure 2 illustrates the efficiency for various counterpoise systems and a dipole above ground. Notice that there is a knee in the counterpoise curves, which indicates that there is an optimum displacement. Be careful when interpreting the graphs because increasing the separation suffers from the law of diminishing returns: the efficiency of a counterpoise system must be compared with that of a dipole at the same equivalent height, ie the counterpoise displacement plus the driven element separation. Observe how a counterpoise improves the efficiency of a horizontal antenna system.

Figure 3 shows the radiation pattern of a horizontal dipole displaced 0.07 wavelengths above ground.

Figure 4 shows the radiation pattern of a dipole offset by 0.05 wavelengths above a counterpoise that is displaced 0.02 wavelengths above the ground (same equivalent height as the dipole only system).

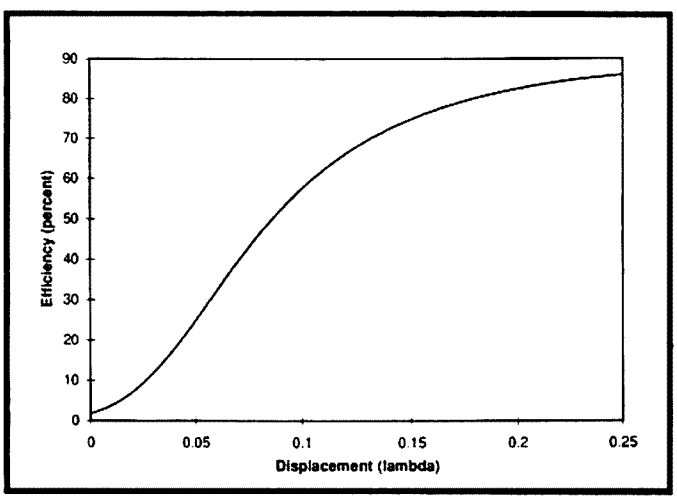

Figure 1 – Efficiency of a half-wave dipole above ground [13,5].

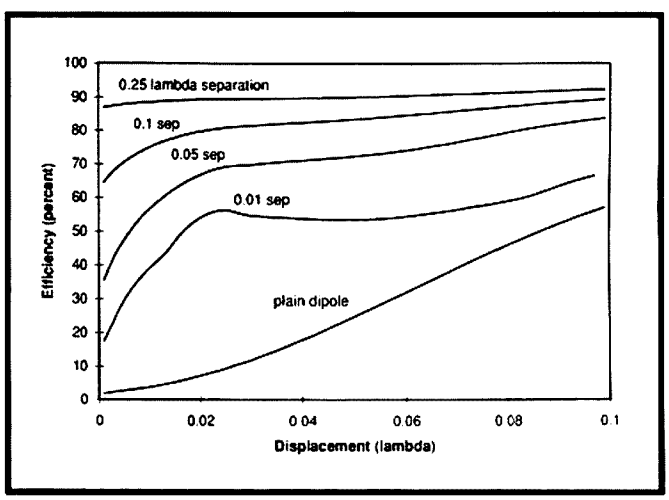

Figure 2 – Efficiency of a half-wave dipole separated from a counterpoise with various displacements above real ground.

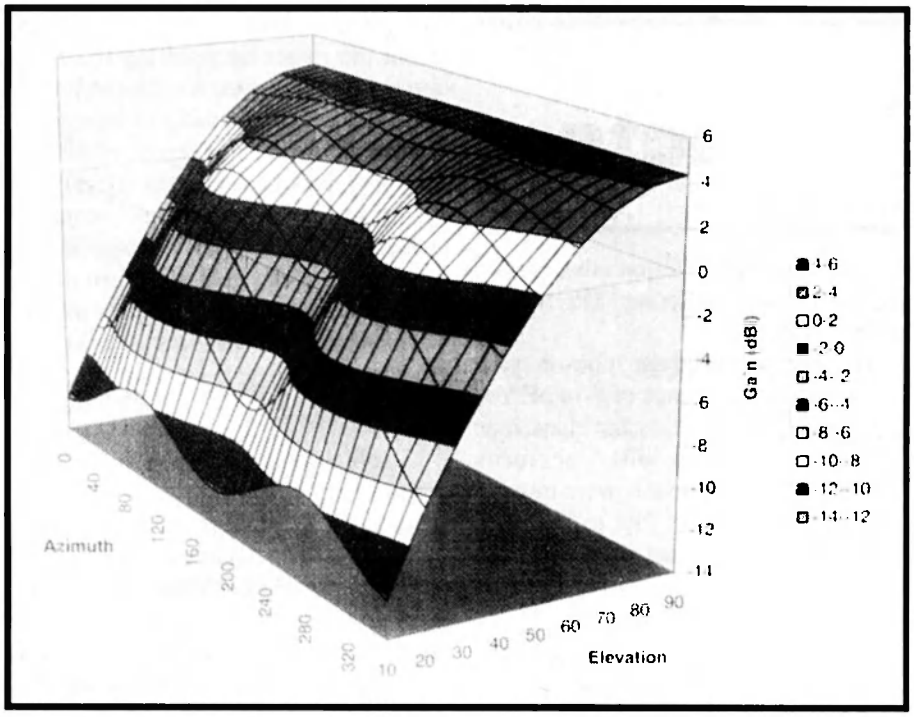

Figure 3 – Radiation pattern from a half-wave horizontal dipole 0.07 wavelengths above ground [13,5].

The horizontal dipole system has a minimum gain of 0 dBi at 51 degrees elevation, while the counterpoise system has a minimum gain of 0 dBi at about 42 degrees of elevation. Alternatively, antenna gain comparisons at all elevation angles show that the counterpoise gain is greater than the dipole system by 2.53 ±0.05 dB. This demonstrates that the counterpoise is a more effective ground system; the counterpoise reflects more energy into the half-space so less is wasted in the intrinsic ground resistance and more is radiated.

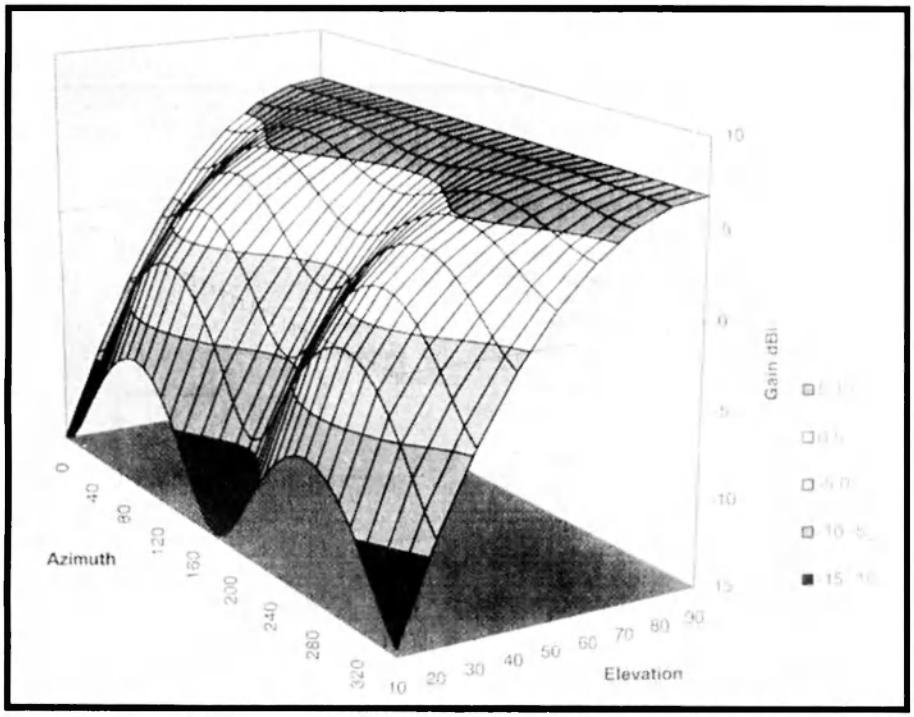

Figure 4 – Radiation pattern from horizontal half-wave dipole above a half-wave counterpoise 0.02 wavelengths above ground [13,5].

Conclusions

The placement of a counterpoise below a horizontal antenna can improve the antenna efficiency by a reasonable amount. The effect under a horizontal antenna is similar to the effect of elevated ground-planes for vertical antennas (Ref 2). You can measure this effect by observing an increase in field strength or by observing the lowering of your feedpoint resistance when adding the counterpoise (Ref 3).

At 160 m, with ground parameters [13,5], the effect peaks with counterpoise displacements of about 0.02 wavelengths above the ground.

Increasing the antenna system efficiency with a counterpoise increases the gain at all angles, effectively lowering the effective radiation angles.

References

1. Computer program NEC-2, G J Bourke, Lawrence Livermore National Laboratory, 1984.

2. Short Vertical Antennas and Ground Systems, Ralph Holland, Amateur Radio, October 95.

3 Horizontal Antennas above Real Ground, Ralph Holland, Amateur Radio, October 96.

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WIA News

New WIA Members

The WIA bids a warm welcome to the following new members who were entered into the WIA Membership Register during the month of September 1996.

L21024	MR O BERCICH
L21025	MR P HAMILTON
L21026	MR G G DAVIES
L21027	MR P ELLERINGTON
L21028	MR J PANETTA
L50350	MR B HOLLIS
L60348	MR W J KYNASTON
VK1GN	MR G G NAIRN
VK1NK	MR N PHILIPPA
VK2FZR	MR B J CAVE
VK2HCT	MR C THOMPSON
VK2PP	MR M D LEGG
VK5BIT	MR W KLOMPENHOUWER
VK6BGN	MR S R PAGE
VK6NRG	MR R GRAY
VK8TM	MR T MURPHY

Technical Abstracts

*Gil Sones VK3AUI**

Pager Notch Filter

Many have experienced disturbance from pager transmissions on frequencies adjacent to the two metre band. In the USA the same problem exists even though the pager transmissions are four megahertz higher in frequency in the 152 to 156 MHz region.

In *QST* for August 1996, a notch filter was described which could give some relief. The filter was the design of Zack Lau KH6CP/1 who is an ARRL Senior Lab Engineer. The main article was by Ed Hare KA1CV. The filter has a somewhat easier job in the USA due to the extra frequency separation, but is of interest even in Australia.

The filter consists of a series tuned notch tuned circuit with an inductive matching circuit to restore the SWR at the amateur band operating frequency. The inductance uses a length of transmission line terminated with a capacitor. By varying the capacitor the inductive component at the other end of the line is varied. The line is just over a quarter wave long. Teflon coax is used as it simplifies soldering. The filter is shown in Fig 1.

The trimmers used are Johnson types with a capacitance range of 1-14 pF. You need high Q components and I have seen these trimmers on offer at many hamfests. The coil details were missing in the *QST* article but four to five turns of 10-12 mm diameter should be OK. The coil has to resonate on the pager frequency.

The original was built in a small diecast box. Similar boxes are locally available. As an alternative to the coil you could try a length of Teflon coax line. This would operate similarly to the matching line but would need to be shorter than a quarter wavelength. Around nine to ten inches long would be suitable. In metric this is about 225 to 250 mm long.

Other techniques of reducing pager disturbance, which may be of interest, were mentioned in the article. The simplest was the use of a beam for reception to reduce the signal received from the pager by pointing the beam away from the pager. Another technique is to use an RF attenuator in front of the receiver. If you can tolerate 10 dB less signal you could reduce the effect of the pager by 30 dB resulting in contacts which would otherwise be impossible.

If filtering can help you, then one of the locally manufactured filters may be an answer. These use helical resonators.

Medium Power 23 cm Amplifier

To obtain 50 to 100 watts in the 23 cm band often means using a water or air cooled valve amplifier. In *CQ TV*, May 1993, a solid state amplifier was described by Angel Vilaseca HB9SLV and Serge Riviere F1JSR. This amplifier used four parallel hybrid power modules to give an output of 100 watts in FM mode and somewhat less for SSB, possibly 50 to 70 watts before gain compression becomes excessive.

The RF power modules are Mitsubishi M57762 types which are available locally. The hybrid combiners and the 50 ohm load resistors are somewhat specialised but the suppliers were given. One USA design uses Sage wireline couplers as the hybrid couplers.

The RF circuit is given in Fig 2 which shows the layout. The amplifier is

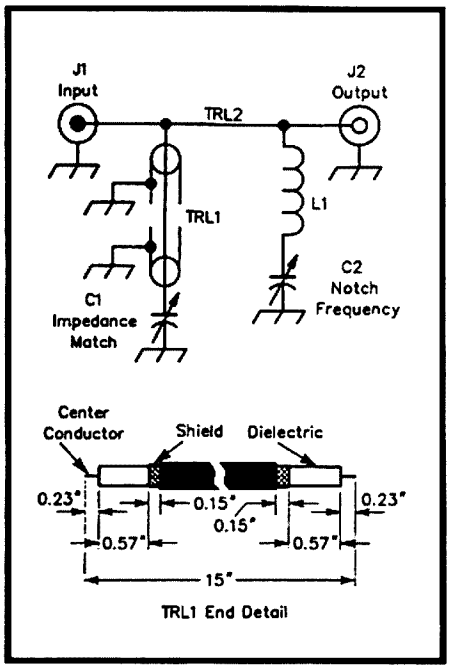

Fig 1 - Pager notch filter

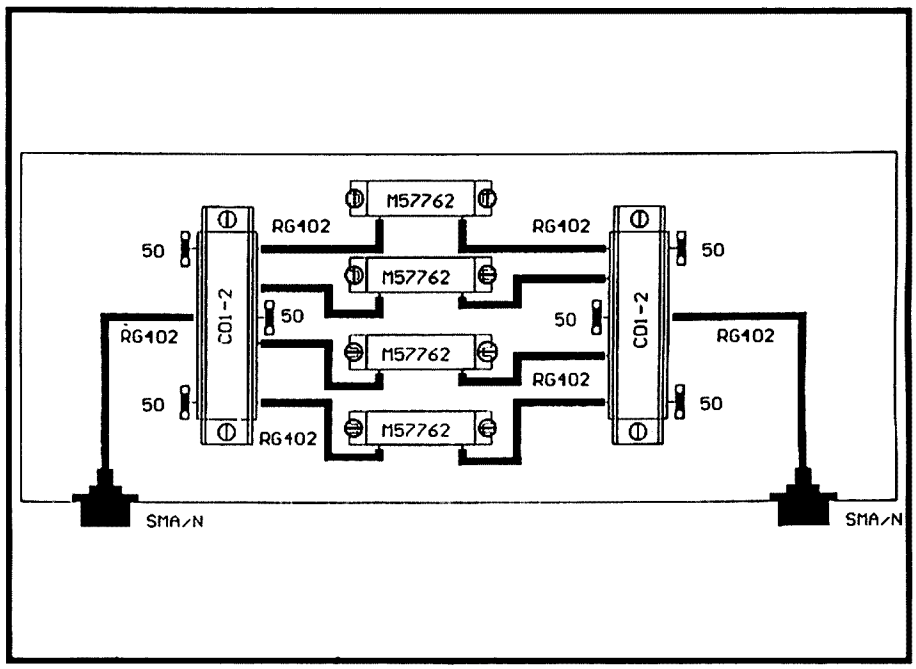

Fig 2 - RF circuit paths.

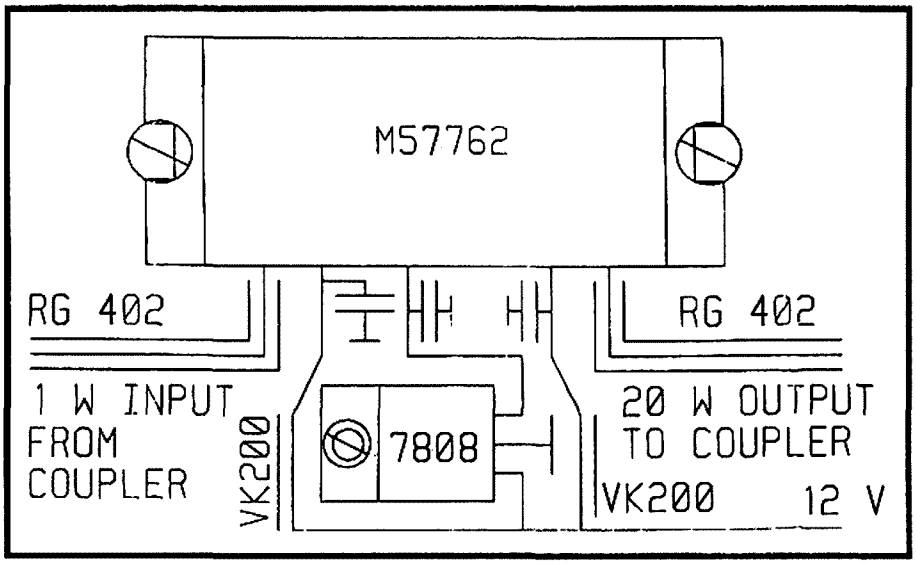

Fig 3 - Connections to Brick Amplifiers.

mounted on a copper plate which provides good thermal coupling as well as providing a good ground plane. The connections to one of the four brick amplifiers are shown in Fig 3. The DC power was run to the modules using copper bus of 2-3 mm diameter. The total current is considerable. Decoupling is very important and high quality microwave chip capacitors and ferrite beads are used.

The RF connections use RG402 cable which is soldered to the copper plate. The copper plate is bolted to a large heatsink. The potential dissipation is around 200 Watts.

The source for the 6 dB couplers was Nucletudes SCD Av du Hoggar, ZA du Courtabeuf, BP 117, 91994 Les-Ulis 2, France, Tel 16 (1) 69 07 10 20; and for the termination resistors was Resistive Loads Elhyte Sarl, BP 34, 91620 La-Ville-Du-Bois, France, Tel 16 (1) 69 01 68 51.

The results obtained are shown in Fig 4.

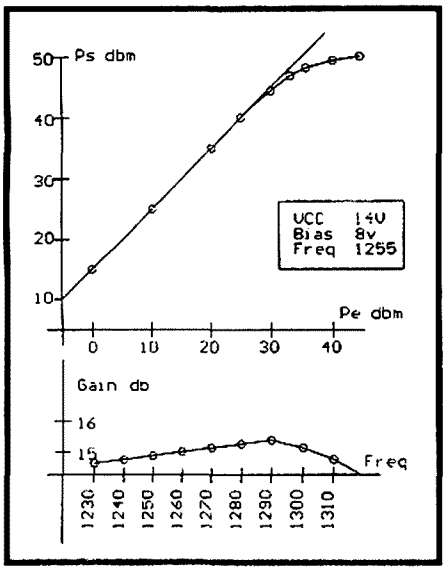

Fig 4 - Test results.

Homebrew Ladder Line

In the *Hints* and *Kinks* column in August 1996 *QST*, edited by Bob Schetgen KU7G, an item on making ladder line appeared. The author was Paul A Johnson W7KBE. Paul used scraps of G10 PCB material as the spreaders.

The spreaders are shown in Fig 5, together with the means of attaching them to the feed line. The feed lines are 12 AWG and the tie wires are 28 AWG. If heavier tie wire is used then fewer turns are needed. The feed line is secured to the spacer by a loop of wire passing through the hole in the PCB spacer. The tie wire is then wound around the feeder wires and soldered to fasten it in position and to prevent sparking. The technique is shown in Fig 5.

The size of the spacer strips is 2.25 by 0.5 inches. The copper is, of course, removed. This could be done chemically with etchant or mechanically aided by heating to induce delamination of the copper foil.

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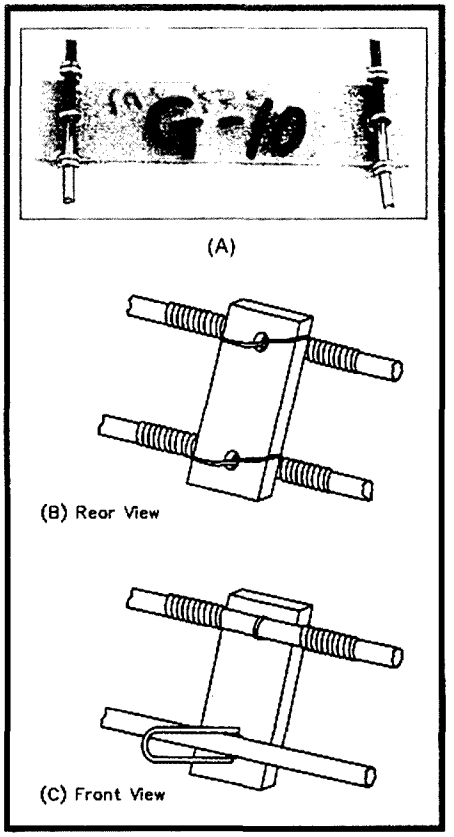

Fig 5 - W7KBE's homebrew open wire feediine.

More Early Women in Radio in Australia

Christine Taylor VK5CTY continues her series on Australian women radio pioneers.*

As most readers will realise, ALARA has been gathering together records and stories of as many of the early YLs as possible during the last few years.

We now have over 50 YLs about whom we know something with, perhaps, five or six others for whom we only have a name and a date, often from an old call book. In the early call books each amateur was given his or her title as well as name and callsign. What a shame this is no longer done; it's such a help for researchers.

Reading the stories I found it very interesting to discover what prompted the ladies to take up our hobby. Often, as you would expect, they had fathers, brothers or husbands with callsigns. It is less expected to find that there are some who belong to a family where they are the only one with this hobby or they were the first to start studying.

Joy VK2EBX, who was the ALARA correspondent for a number of years, lived in country NSW and used to listen to the truckies talking on CB. She longed to join them but resisted until her son decided to study. Once she got her full call after much study of WIA books and doing a correspondence course, she enjoyed amateur radio to the full.

She made many friends all over the world with whom she had regular "skeds", but she also used her other talents in connection with her radio. Do you remember the poems Joy used to include in the ALARA column every now and then? One of them is reproduced here because it seems to express so well what amateur radio is to a YL.

Jessie VK3VAN and Elwyn VK2DLT became interested in the radio idea when they started planning to travel; within Australia for Jessie, and on a yacht for Elwyn. With our 4WD vehicles we can get well and truly off the beaten track, and on a yacht we can be far from land, so a means of keeping in touch is vital. With amateur radio if you can't reach anyone on one frequency you can try another. You need never feel alone as long as your battery and your radio keep working.

For some YLs amateur radio was an answer to a personal problem. Margaret VK4AOE was told she might lose her sight (fortunately she didn't) so she took up amateur radio as something she'd still be able to do if it happened. Margaret VK2MV broke her ankle so took up studying as something to do while she recovered.

There are nearly as many stories as there are amateurs. So please, if you are a YL and haven't told us your story, or if you know a YL who hasn't done so yet, do put pen to paper. We'd love to hear your story, too.

**16 Fairmont Avenue, Black Forest SA 5035*

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I Like Amateur Radio

by Joy Collis VK2EBX

I like amateur radio, I really think it's fine
That I'll still be a "YL", if I live to ninety nine.
I like amateur radio and getting on the air,
Making friends around the world and contacts everywhere.
You can talk to Lapps in Lapland, Nepalese in Kathmandu,
Malays in Kuala Lumpur, or Peruvians in Peru.
You can talk to dukes and dustmen, or communicate in Morse,
Experiment with ATV, and RTTY, of course.
Put together bits and pieces, though at first the prospect baulks,
A diode here, a condenser there, and listen to that – it talks!
Experiment with aerials, it looks real good on paper,
But getting that lot in the air is quite another caper.
You can enter in a contest, gather points for an award,
Join a DX net, or "ragchew", one thing's sure, you're never bored.
Yes, I like amateur radio, and all the friendly sounds,
Removed from all the trouble and strife with which this world abounds.
It's a satisfying hobby, it will certainly do me,
'Til they write beside my name the words "Became a Silent Key"!

The Maryborough Amateur Radio Club and JOTA

Col Paton VK4BCP explains the evolution of his club's involvement with JOTA.*

The Maryborough Amateur Radio Club seems always to have been involved with Jamboree on the Air. Operations were mounted at various Scout troop dens, with little prior notice, and initiative in setting up equipment and antennas was a must. Innovation saw the use of a variety of antennas – dipoles, long wires, G5RVs, Windoms, Yagis and quads. Each location facilitated or prohibited various antennas. Results were so-so.

When the Scouting movement began developing the Scouting reserve at Aldershot, 12 km from Maryborough in the scrub, the club's activities began to settle. Our operation location became static, up to a point. We seemed to be moved around the reserve, operating from huts, sheds, caravans, tents that leaked, and tents that didn't leak only because it didn't rain!

As time passed, the Scouts' facilities improved and so too did the club's. A two-stage steel wind up tower was acquired. The tower was modified to tilt over and a permanent tower base was constructed on site, thus eliminating the breath-holding exercise of raising a loose, hand-guyed tower with a mind of its own.

Further settlement took place. A long power lead that tripped everyone replaced engine driven alternators, devices which some declared produced more AF than RF! Buildings appeared around the tower base and, when they settled at their final orientation, underground power lines brought power and light to them. So settled and organised had we become that JOTA setting up was a "Ho-hum. Same as last year, chaps." affair. Still, in spite of a rotator and a three element beam, results were not good, and we knew why. Trees! To get above the trees was beyond our capabilities and the dream went into the "wishful thinking" file in the "too hard" basket.

The Scouting movement told us that they were considering the erection of an abseiling tower on which, when built,

we could mount our antennas and be above the canopy of trees. Various ideas came and went. A steel tower from the railways, a tower from a sawmill, even a wooden forestry tower. But without anything positive from the Scouts, it was "pie in the sky", not beams!

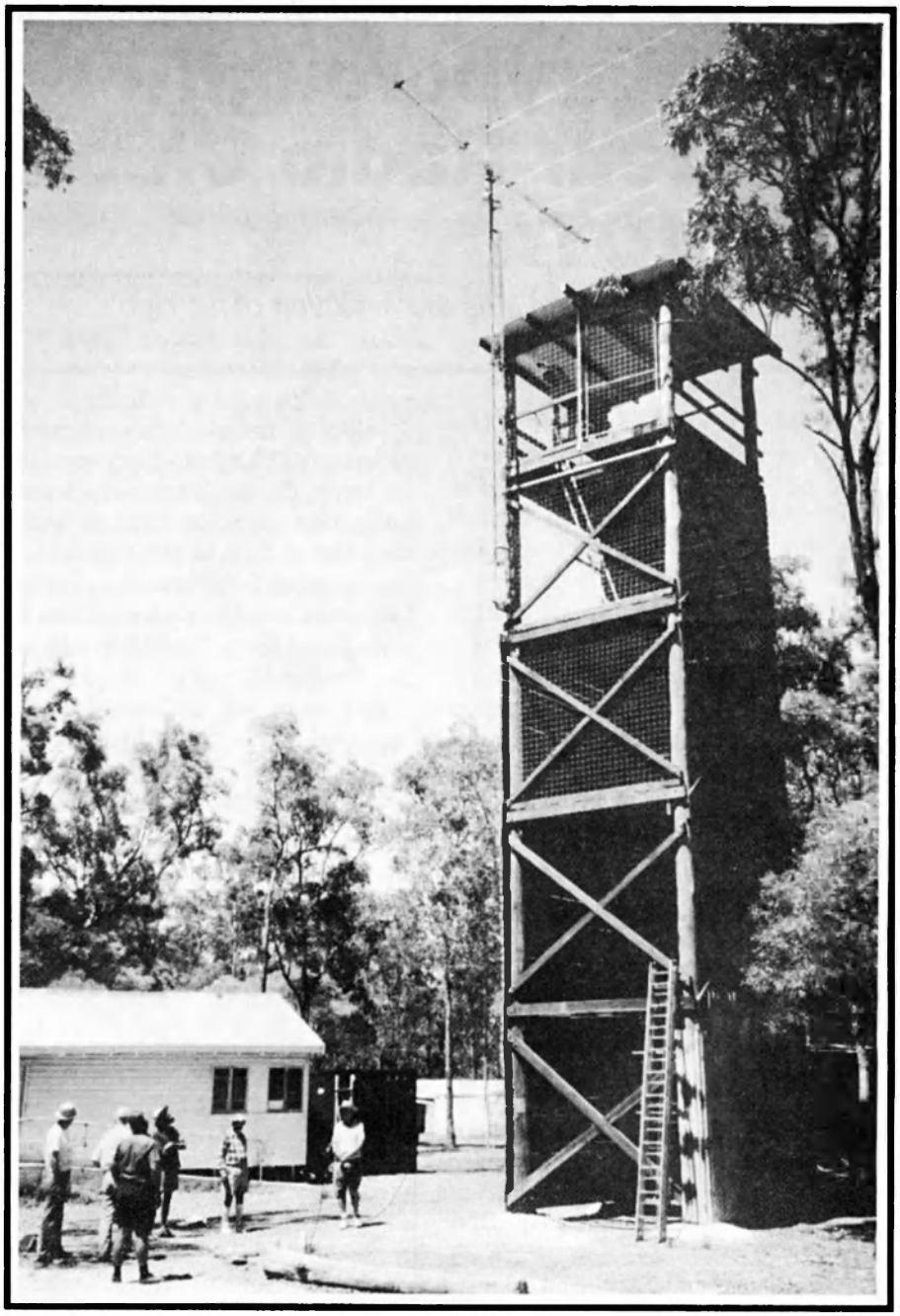
Suddenly, to our amazement, a scouting supporter who had the know-how, the equipment, the material and the motivation, built a 12 metre, five stage, square, wooden poled abseiling tower at our very door. It seemed to appear almost as suddenly as Jack's Beanstalk.

How to mount the antenna generated a flood of discussion, research and thought. It was decided to mount our wind-up tower on one of the posts. Two brackets were designed and fabricated to hold the tower at its base and near its top against one pole. The abseiling tower builder cheerfully hung in a harness from a skyhook outside the tower to drill the holes and bolt the brackets to the post. Now to get the tower and antenna into the fixtures.

A weekend before JOTA was chosen for the dummy run, and the moment of truth. Over the pulley mounted in the top bracket, a wire rope was passed from a winch to the ground and attached to the base of the wind up tower. The winch pulled the tower base to the lower bracket where a fulcrum pin was inserted and the tower hung upside down. The rope was re-attached to a point near the top of the wind up tower and the tower top rotated out from the abseiling tower. The rotator and a newly acquired six element log periodic tri-band beam were attached and, with the winch, the tower was rotated about the fulcrum pin in the base and bracket to the vertical, where it was secured in the top bracket. The inner section was cranked up and our antenna was metres above the canopy. The dummy run was perfect. No turmoil, hassle or trauma, and it was so successful we left it there.

We must have done something right. JOTA results were the best ever. Contact numbers and countries accessed far exceeded previous efforts. However, we were unable to receive the official broadcast but, from what we have since learned, that was not our fault.

Now the VHF devotees, wishing to get in on the act, want their beams on the tower above the tree canopy. This requires a rotator able to turn beams around the tower. The development of our JOTA operations still continues.



The Maryborough Amateur Radio Club's JOTA antenna installation on the abseiling tower at the Aldershot Scouting reserve.

*Maryborough Amateur Radio Club,
225 Pallas Street, Maryborough
QLD 4650

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■ Operating

VK2COF Aeronautical Mobile

David D Coffey VK2COF tells of his ferry flight across the Pacific in a single engine aircraft, VH-OVA.*

VK2COF arriving at Coffs Harbour. Note the HF radio on the seat, and the fuel drums behind the seats.

This story is of a flight I undertook to deliver a new aircraft from the USA to Australia across the Pacific in June and July 1995. The aircraft was a brand new Mooney Ovation, a fast, four place, sophisticated, single engine low wing with retractable undercarriage. The engine is a Continental, six cylinder, developing 280 hp driving a three bladed propeller.

Navigation and communication equipment as installed permanently in the aircraft included two independent VHF radios in the aircraft band (118-136 MHz), VOR, ILS, ADF, transponder, auto pilot and a Garmin 155 GPS system. What was not included, and had to be set up as a temporary installation, was HF communication. This is necessary to maintain contact with Flight Service (FS) and Air Traffic Oceanic Control (ATC) when out of VHF range. You will find some of the trials and tribulations in the HF set-up in the following narrative.

The Mooney was to be picked up from the factory in Texas, with Australian registration. Kerrville is a very pleasant and clean town, with a population of about 18000 and situated 100 km north west of San Antonio. It is in the Texas hill country, a rolling plateau about 1600 feet high with a dry climate and a fairly low rainfall. From there I was to fly to Oakland in California which is on the east side of the Bay from San Francisco. There the aircraft was to be prepared for the ferry flight by installing additional fuel tanks and the HF radio. HF radio is very uncommon in domestic aircraft in the USA as practically the whole country is linked up with the VHF comms network which is operable in most places at ground level. The same applies to radar identification.

In order to prepare myself for the temporary installation of the HF radio, I undertook some trial tests on a jury-rigged set-up on a similar aircraft that I owned at the time. I tried this out at our farm near Wellington, NSW. The aircraft's electrical system is 24 volts so the first thing was to purchase a DC/DC converter, 24 to 12 volts at 20 amps rating. I was assuming at that time that I was going to use my Kenwood TS440S. The converter, Australian made, was purchased in Sydney.

The HF antenna that was installed on my Australian Mooney, VH-JXC, was a long wire running from the side of the fuselage below the passenger's window, out to the end of the horizontal stabiliser and thence to the end of the trailing edge of the wing. The long wire was then a V shape about 18 feet long with an included angle of 100 degrees.

In the Australian scene, installation of HF radios is, or used to be, quite common because of the restricted coverage of VHF. In my case I had a Barrett HF radio made in WA suitable for 24 volts with the antenna fed through an antenna tuning unit. This is a quite bulky ATU switched by solenoids to pre-set L-C assemblies, and tuned to discrete frequencies in the 3 to 8 MHz aircraft bands.

For the Pacific region the HF channels are quite different from the Australian ones, and the Barrett installation was not a possibility, principally because of the bulk of the components. So I decided to use the Kenwood TS440S, accompanied by a "Matchall" antenna tuning unit which is a solid state device and seems to present 50 ohms to the transmitter for all frequencies. It does work, but I wouldn't like to guess as to the efficiency of the unit. So, with the TS440S sitting on the seat of the aircraft on the ground, connected to the 24 volt supply by the DC/DC converter, and hooked up to the long wire antenna by the Matchall, I tried it out and it seemed to work quite well. At least I contacted a friend of mine on 7070 kHz and he reported a reasonable signal. So, with that limited testing, I was reasonably happy that the system was OK and also with the knowledge that previous ferry pilots had apparently used similar installations.

The time eventually arrived and I picked up the gleaming new aircraft at Kerrville and flew it to Oakland via

Tucson, Arizona. There a small company of specialists in the installation of ferry tanks proceeded to take out the rear seats, wrap them in plastic, and stow them away. Behind the front seats were installed two 44 gallon (200 litre) drums side by side, one behind the other. Temporary plumbing and venting was installed and then came the HF radio.

For this I had decided that the Kenwood TS50S was a more suitable unit, being a lot smaller and with equivalent power, so I bought one in Oakland. I had brought with me the Matchall, DC converter, harness wiring suitably prepared and coaxial cable, and antenna wire and insulators and other hardware. I had also bought the ATU that goes with the Kenwood, the AT50. However, I found to my dismay that, although the AT50 can be remotely operated from the transceiver, it wouldn't tune up most of the frequencies required for aviation use.

In about an hour we had the HF radio sitting on the seat beside the pilot, the converter stuffed under the pilot's seat, the Matchall in the fuselage and ready for a trial on the ground at Oakland. The transceiver fired up and, using an appropriate 5 MHz frequency for local flight service, contact was made and so we were all happy. The main cause for concern that remained at this stage was the extremely cramped cockpit because the ferry tanks had to be kept as far forward as possible, for centre of gravity reasons. The HF radio sat on the seat beside me, along with a host of other things.

A couple of days later, after the installation of the ferry tanks was completed, a flight plan was filed for the first leg of the journey from Oakland to Hilo in the island of Hawaii, a distance of about 2100 nautical miles and an anticipated flight time of around 13.5 hours using a low power setting for economy and an expected ground speed of around 160 knots.

At daybreak I set off with the aircraft fully laden with fuel (about 20% overload), and was given clearance to fly more or less direct to Hilo at 10,000 feet, reporting every hour and a quarter at predetermined coordinates. VHF range over the ocean in this part of the world was enhanced by beam type operation and communication could be maintained for the first hour and a half. Thereafter it was on to the HF radio with frequencies as adopted by Flight Service in the 5, 6, 8, 11, 13, and 17 MHz bands.

It was requested that I call on 6673 kHz for the next reporting point. All HF communication in the aeronautical service is on upper sideband. At the appropriate time I called on 6673, with no result! I tried five other frequencies. Still no result! On quite a few of the frequencies, I had the annoying feature that, when speaking into the microphone, my own voice would come through quite loudly into the headphones so there was clearly quite a bit of feedback occurring and I didn't know why.

Luckily, on route from California to Hawaii there were many 747s and such aircraft in the air most of the time within VHF range. So I called out for assistance on 128.95 MHz, the air to air comm frequency. Instantly an American voice came back and I had to ask him to relay my position report to FS. Incidentally, FS and Air Traffic Control in the American section of the Pacific Ocean is run by a private company ARINC. There are others too, like Maclellan Radio, who operate in the same area. Anyway, the American voice, who turned out to be the captain of an United Airlines 747, gladly relayed my position report and so that was that for the next hour or so until the next position report.

I had arranged with amateur radio friends at home that we would have skeds on HF and the selected frequencies were 7097.5, 10125, 14305 and 18125 kHz. Getting on now to late morning, I tried 14305 kHz and received quite a few replies from people on the northern side of the equator, but none from Australia. I had a chat to hams in Los Angeles and Detroit and there was even a lady from Alaska.

The next position report went OK. I managed to contact FS who informed me that I was "loud and clear" so some of my concerns about HF had abated somewhat. I was still getting this wretched feedback, specially in the 5, 6 and 8 MHz range. With about 11 or 12 reporting points across the Pacific to Hilo I suppose I had to get three of them relayed by overflying aircraft.

This was alright while there were overflying aircraft, but I was concerned that, on the next leg of the flight from Hilo to Pago Pago in American Samoa, I wouldn't be able to maintain HF communication because there were very few, if any, overflying aircraft in that section of the Pacific.

After twelve and a half hours of flying I eventually landed at Hilo with a very pleasant welcome from Hilo ATC. I stayed at Hilo for a couple of days but didn't do any ham contacting as I was fairly busy preparing for the next leg of the journey, attending to customs matters and the like. I knew now that the TS50S was working OK but I was beginning to have a few doubts about the converter as, from time to time, it, being a switch mode design, would trip out when overloaded and would need to be reset by switching it off and then on. This was a bit disconcerting, especially in flight when you suddenly find you have no power to the radio. The unit had a 20 amp rating and I had checked the actual current drain of the TS50S beforehand and found that, generally, it was between 16 and 17 amps and at no time exceeded 19 amps.

There wasn't much I could do about improving the situation at that stage so I hoped for the best and set forth on the long journey to Pago Pago just before sunrise two days after I had landed in Hilo. Expected flight time was 14.5 hours. The airport was not open at that time of the morning and there was nobody in the tower. The procedure was to contact Honolulu FS on VHF. This I tried, but got no response. Luckily, under these circumstances there is a PAL system (pilot activated lighting) which operates by the pilot keying the microphone three times within five seconds on a selected VHF channel. This was done and the whole airfield burst into light with every runway and taxiway light coming on.

I had previously put in a flight plan at 4 o'clock in the morning by telephone to Honolulu FS, and obtained a very thorough Met briefing by a 24 hour weather station on the ground at Hilo airport. I taxied and took off from the appropriate runway and managed to contact Honolulu FS after becoming airborne and passing about 500 feet. Once again the position reports were required every hour at predetermined

coordinates. The first one went OK, as did the second. On the third position report, three hours out of Hilo, I was unable to contact FS on any of the frequencies and, believe me, I tried them all.

This time there was no aircraft overhead and VHF was no use either. It is expected when you are flying on full position reporting, as I was doing, that a report would be given within two minutes or thereabouts of the previously given estimated time of arrival (ETA) at that position report. If such is not received, under the Search and Rescue (SAR) procedures the first stage of those procedures is initiated, ie, the uncertainty phase.

Since about 15 minutes had elapsed from when I should have given the position report, I was concerned that FS might be activating SAR. However, I kept trying on different bands and, as a final resort, I tried 8843 kHz. Success! FS from Honolulu came in and she said she was receiving me "loud and clear" and did not seem to be in any way concerned about the missed report. Such are the vagaries of HF transmission.

Earlier on in this flight I had tried to contact my Australian friends without any luck, but I did contact some Americans, one of whom was Ray K6VX. We had a nice chat and he said that he had to leave and go to work. We said 73 and that was that. This was on 18125 kHz. Nine hours later I was taking to others on 18125 and Ray came back having spent his 8 hours at work to find me still flying up there and still contactable. That was rather nice; I had the feeling that someone was looking after me.

On passing the equator and entering the southern hemisphere, I made my first contact with an Australian friend, Graham on VK4BGC. Then followed VK2AKF, VK5ZH, VK2WBJ, VK4BAM, and thereafter a host of others came in and no further problems were had in contacting Australian amateurs. It was all very reassuring.

After 13 hours I duly arrived at Pago Pago and overnighted at the "Rainmaker Hotel" of Somerset Maugham's Sadie Thompson fame. I did not take any handheld VHF equipment with me so no contact was made on the ground there.

Next morning the flight was relatively short, four and a half to five hours to Nadi in Fiji. On leaving Pago Pago, the Flight Information Region (FIR) becomes Fijian and there a new problem arose, namely the understanding of the Fijian accent over the airwaves. I daresay they had equal problems with my accent, but sometimes I simply could not understand what they were saying no matter how many times they said it. Anyway, position reports were given and I soon arrived within VHF range of the Fijian islands where clearances were passed to me (but sometimes not understood). Nevertheless, I arrived at Nadi airport and was given a parking bay in the International Airport beside a B767. I must admit it looked a bit ridiculous.

The last leg to Australia was from Nadi direct to Coffs Harbour. About half way the FIR changes from Fijian to Australian with alterations again also in HF channels. A reader may be wondering how it was that all these frequencies were available on a TS50S. Well, that is a secret, although not a very well kept one as most amateurs would know.

After departing Nadi it didn't take long to get out of VHF range. Because of the noise level in the aircraft, headphones are a must for the TS50S, or any other amateur rig for that matter, because of the miniature loud speaker in the set. In the TS50S the headphone jack is one of those tiny 3.5 mm ones and I had an adaptor which went from 3.5 to 6.5 mm which was suitable for the aviation headphone plug. The physical size of the plug and adaptor moving around in the small jack socket soon started to break it up internally, so that apart from any other duties such as flying the aircraft, managing fuel, etc I had to physically hold the plug and jack assembly in order to make contact with the headphone. This proved to be a great annoyance and, as a matter of advice, I would recommend not using any of those adaptors. If the same situation occurs, use a single 3.5 mm plug and connect it by flexible wires to a 6.5 mm socket.

By careful nurturing, the system did stay together and was able to make contact eventually with the Australian FIR on 8867 kHz. It was a welcome sound to hear the Australian accent, which is perfectly understandable. I proceeded through to Coffs Harbour, arriving after ten and a half hours flying into headwinds and after a somewhat eventful trip.

The very first thing I did after clearing customs and being greeted by my wife was to remove the HF system.

A few weeks later, on thinking over the feedback problem that I experienced, I rang the maker of the converter and asked him if the switch mode circuitry generated spurious RF. "Yes" he said with somewhat disarming honesty. "The WA fisheries people have been complaining about that. However, we have since fixed the problem and if you would like to bring yours in we will swap it for another. Yours was from the same batch that went to WA".

I did swap it over, but felt it was all a bit too late. I haven't had the chance to find out whether it caused the feedback problem anyway.

**49 Nelson Street, Gordon NSW 2072*

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ALARA

Sally Grattidge VK4SHE, ALARA Publicity Officer*

Bev VK6DE opening ALARAmeet 96.

New Member

We welcome new member Barbara KA3VXR who was sponsored by Robyn VK3ENX.

ALARAmeet

(report from Dot VK2DDB)

Perth ALARAmeet is over and the memories will be with us forever. A total of 72 people attended the get-together and we were thrilled to have some DX YLs with us, Raija SM0HNV, Elizabeth VE7YL, and Aimee FK8FA who was accompanied by OM Michell FK8GO. From across the pond came 20 ZL1s, ZL2s and a ZL3. The rest were Aussies from VKs 1, 2, 3, 4, 5, 6, and 7.

Our venue for the activities, The White House, was a beautiful historic home (now a reception centre) and it was ours for the whole weekend.

The official photos (complete with intermittent flash), baby photo competition (with a bit of cheating), craft table, special effort and door prizes displayed, morning and afternoon teas, and two lovely meals, all took place at the Centre.

To save us from getting lost in car convoy, Bev VK6DE arranged a "bendy" bus with a very patient driver, Franz, who seemed to enjoy our shenanigans and was able to manoeuvre that vehicle through the tightest corners.

We had a tourist trip through Perth to the Wildflower Festival at Kings Park. Then a ferry trip down the Swan River (seeing where all the rich and famous live) to Fremantle where we roamed around the markets and visited some historic places.

Sunday afternoon saw the end of the formalities with prizes being awarded to those who managed to do the more bizarre things. For example, Betty ZL1UBZ, Bob ZL1BBZ, Marion ZL3TVF and Lester ZL1VF all won "Mars" awards for coming via the long path; they flew to Perth, Scotland before coming to Perth, Australia!

On Monday, our patient Franz and his "bendy" bus took us to the overflowing Mundaring Weir (along with thousands of other people) where Lester ZL1VF got lost and was returned to the bus in a Ranger's van with police escort.

Our thanks go to Bev VK6DE for all the planning and preparation she put into the 1996 ALARAmeet. Our next meet will be in Brisbane in 1999, so do try and be there for a marvellous time.

**C/o PO Woodstock, QLD 4816*
Tel: 077 788 642

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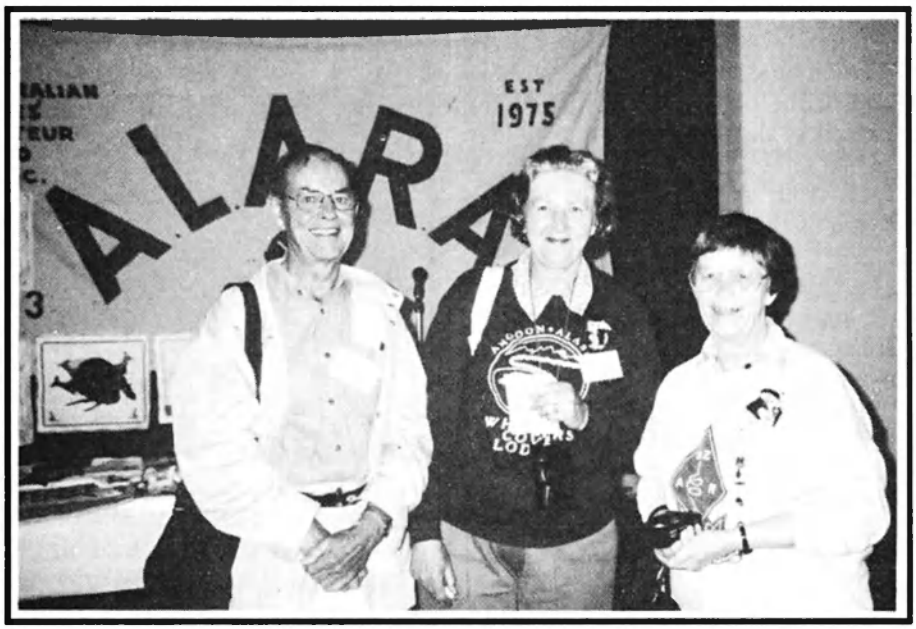

Three of the 20 ZL participants at ALARAmeet 96. (l to r) Merv ZL2AVY, Biny ZL2AZY and Celia ZL1ALK.

AMSAT Australia

*Bill Magnusson VK3JT**

National co-ordinator
Graham Ratcliff VK5AGR
Packet: VK5AGR@VK5WI
AMSAT Australia net:
Control station VK5AGR
Bulletin normally commences at 1000 UTC, or 0900 UTC on Sunday evening depending on daylight saving and propagation. Check-ins commence 15 minutes prior to the bulletin.

Frequencies (again depending on propagation conditions):

Primary 7.064 MHz (usually during summer).

Secondary 3.685 MHz (usually during winter).

Frequencies +/- QRM.

AMSAT Australia newsletter and software service
The newsletter is published monthly by Graham VK5AGR. Subscription is $30 for Australia, $35 for New Zealand and $40 for other countries by AIR MAIL. It is payable to AMSAT Australia addressed as follows:

AMSAT Australia
GPO Box 2141
Adelaide SA 5001

Big Plans for MIR – Karen RA3APW

Recently Karen RA3APW and Leo UA3CR were invited by Serge Krikalev U5MIR and Serge Samburov RV3DR to the Russian Space Control Centre. U5MIR is currently the chief of Russian Space Flights and RV3DR is the manager of the Russian space amateur radio program. They were able to have a long talk about future amateur experiments in space, particularly relating to digital radio networking.

Karen brought up the possibility of marrying the existing PACSAT protocols and hardware with amateur TCP/IP networking protocols. He suggested that, if this combination were put into place on the Orbiter and also at amateur Internet/satellite gateways around the world, perhaps one in each time zone, it could be possible to maintain full time IP connectivity with the orbiting MIR. In addition to offering continuous IP access to MIR from anywhere in the amateur world, such an experiment might be useful for discovering and developing necessary protocols for mobile IP operations; an area where amateurs might have considerable interest and one where we may be able to contribute significantly to the state of the art.

Because much, if not all, of the required hardware is already in use, the bulk of the initial task would seem to be in adapting software to allow running IP over PACSAT. Karen and other Russian amateurs are interested in this project. U5MIR and RV3DR are supportive of the concept and there would be licensed amateurs aboard the spacecraft, the ALPHA, which is an international space project. He is interested in applying this idea to ALPHA flights.

A group of Russian amateurs has begun to design low cost satellite ground station hardware for use at the gateways. They are seeking comments on the idea and others to help in making it a reality. Clearly the project will require the help and cooperation of amateurs worldwide.

Anyone interested in helping to further develop this project is asked to contact Karen RA3APW at *karen@gw.ra3apw.ampr.org* or *sysop@ampr.demos.suor* via KO-23, KO-25 satellites. Also, anyone knowing of someone else who might be interested and able to help are asked to forward this note to them.

This note was written and posted for RA3APW by N6GN.

The Last Telemetry Frames from OSCAR-13

A competition with a difference. An "Operating Event", suggested by Eric WD3Q and already in progress. Don't worry about starting too late. As I said this is a competition with a difference and certainly not one where the traditional early bird gets the worm. In a way the opposite will be true.

Eric's suggestion is that recognition should be given to the amateur who captures the last or nearest to last telemetry frames transmitted by OSCAR-13 before it burns up on re-entry in early to mid December. The reason behind this suggestion is twofold; firstly to increase awareness among the amateur community of the telemetry itself, and also to encourage more amateurs to become interested in the software and hardware necessary to copy and analyse the telemetry.

No doubt the term telemetry will put a lot of people off. It sounds too hard. You have to be a techo, etc, etc. Not so. Telemetry from some amateur radio satellites can be copied and displayed on a PC using no more than a packet type terminal program and a TNC.

DO-17 (DOVE) is an example of this type

of telemetry. UoSat-11 has had an elaborate telemetry system running for many years. It requires a special decoder but it is easy to build. Software is available from UoS for the analysis and display of this telemetry. When you do this you are monitoring the "health" of the satellite.

AO-13 telemetry uses PSK (Phase Shift Keying) modulation for its telemetry and therefore it needs a PSK demodulator. There are several available. The industry standard display program is P3C.EXE written by Charles VK5ACM in collaboration with Graham VK5AGR. Although written for AO-13, the software is not specific to that satellite. Nor is the demodulator. P3D will also use 400 baud PSK in a similar format so you will not be wasting your time and money if you set up to take part in this competition.

The most popular hardware is a plug-and-play development by James Miller of his original AO-10 PSK demodulator. The original required a bit of setting up but was very capable and outshone all the others in the way it could extract data from noise. The latest version is a true "switch on and go" unit.

There are no prizes (save notoriety) for Eric's competition, but Graham VK5AGR has offered a year's free subscription to the Amsat-VK newsletter to the person who records the last (or latest) Q block from AO-13.

At first glance it would seem that, with the perigee currently in the northern hemisphere, we in the south would not be ideally situated to do well in this competition. However, anything can happen in the last few orbits as a satellite re-enters the atmosphere. No-one knows for sure where AO-13 will be when it transmits its last telemetry. Competitions aside, it would really be something to hear those last frames!

UNAMSAT-B

At the time of writing, this new bird is undergoing commissioning. When released for general use in the near future it will be known as Mexico-OSCAR-30 or MO-30. Keplerian elements are currently being included in the NASA and Amsat sets from the usual sources. More news and technical details of this satellite next month.

MAELLE, a New Amateur Radio Satellite from France

From Bernard Pidoux F6BVP, via Amsat News Service. During the 25th General Assembly of the International Radioelectricity Scientific Union (IRSU) held in Lille, France from 28 August to 5 September, Christophe Carlier F4AAT, member of Amsat-F and also a key member of the project team now developing a French Amateur Radio satellite called "Maelle", was presented with the first place prize. The international contest was organised by the French, Belgian and Swiss Committees for Scientific Radioelectricity on radio science and technique, and was held to commemorate the 100th anniversary of the first radio transmissions.

The Maelle satellite is now under construction in France as a cooperative effort of CAC (Club Aerospatial Cellois), RACE (RadioAmateur Club de l'Espace) and Amsat-France. It is a MICROSAT-class satellite weighing 50 kg, and it is planned that Maelle will carry a 9600 BPS packet radio transponder similar to the UoSats.

JAS-2, Fuji-Oscar-29

Amsat News Service reports that FO-29 is in good health and its services are being progressively made available to users. Many QSOs have been heard and signals are strong and clear.

There was some confusion regarding keps but this is not unusual for a new satellite. Good keps are available on KO-23. By the time you read this the kep problem should be sorted out and the normal sources should be reliable. The digitalker has been tested and is working well. 9600 baud mode has been tested and is OK. It should be scheduled in shortly.

Next Month

The amateur radio satellite service must rank among the fastest moving and most exciting areas of amateur radio. Just look at the events of the last year or so. It's all a bit hard to "get your head around", to coin a modern phrase. In next month's column I'll try to bring these events together to give an overview for the benefit of any (like myself) who are finding it all a bit overwhelming. More news on Maelle, SunSat, MO-30, MIR/SAFEX, JAS- 2 and of course Phase 3D. Stay tuned and keep those antennas pointing UP!

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QSP News

Notable Amateur Also Rifle Champion

The editor recently received a letter and other information from David Thompson VK2BDT regarding the achievements of his fellow-member of the Goulburn Amateur Radio Society, Jim Andrews VK2BO.

Jim has been an amateur for many years *(I first worked him in 1948! Ed)* and for most of those years has been among the top scorers in the annual Remembrance Day Contest *(this year, 1996, I worked him on 80, 40 and 20 metres and each time his score was about ten times mine! Ed).*

But Jim is not only a notable amateur. He is also a champion rifle shooter. As published in the Goulburn "Times" during August this year, he has achieved the dual honour of being the Southern Tablelands Rifle Club's off-rifle champion and handicap champion for the 1995/96 shooting year.

These achievements are all the more notable when we realise that Jim is approaching the age of 80 years. Somehow he also finds time to be a member of the Goulburn Probus Club. Truly a man who excels in many things!

Jim Andrews VK2BO on the rifle range (photo courtesy Jackie Ranken and "The Times" Goulburn).

Awards

*John Kelleher VK3DP - Federal Awards Manager**

With great pleasure, I introduce information from Paul VK2KVY, Publicity Officer for the Wagga Wagga Amateur Radio Club.

City of Wagga Awards

The City of Wagga Award Net is run every Tuesday evening at 1030z on 3605 kHz + or – QRM.

The Basic Award consists of two points for working VK2WG/Portable Net controller, and one point for each member worked, up to a total of 10 points, or better. Applicants must submit a log extract listing time, date, the station worked, and signal reports exchanged. This log extract, along with a fee of $3.00, should be sent to: The Awards Manager, James Jessiman, PO Box 294, Wagga Wagga NSW 2650.

Silver Upgrade for City of Wagga Award

An additional 40 points is required for this award. 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. Silver and Gold certificate holders will give signal reports on request. Fee – nil.

Gold Upgrade for City of Wagga Award

The City of Wagga Basic and Silver awards must have been applied for, and received. For the Gold upgrade an additional 100 points is required. A holder of the Silver award is worth one point towards the Basic, Silver, and Gold upgrade. A holder of the Gold award is worth two points towards the Basic, Silver, and Gold award. Club stations can be worked every 24 hours. When applying for upgrades, a station which has been worked as a silver or gold certificate holder, and is not a member of WARC, his or her certificate number must accompany any application for additional points (I suggest that getting up on the Net may further clarify this last point!).

City of Wagga 360 Upgrade

You are most welcome to work for our final award. In addition to receiving a certificate, you also receive an attractive lapel badge depicting the City of Wagga Wagga coat of arms. A total of 360 points is needed for the upgrade, comprising 10 contacts with VK2WG/P at one point each, 30 contacts with Club members at one point each, 20 contacts with holders of Silver upgrades at one point each, and 150 contacts with Gold upgrades at two points each,

In all, a total of 360 points. The fee for this award is $7.00, to defray the costs for the certificate and the lapel badge.

This looks like an enterprising package for the 80 metre buffs, and may bring about some much needed activity. Personally, I would like to have seen some Certificate blanks marked as samples, as publication of these samples further enhances the award.

Croatian Telegraphy Group Awards

From the Croatian Telegraphy Group (9A-CW-G) comes news of two new awards, the 9A-CW-G Membership Award and the W-9A-CW-G-M Award.

The following are the rules for membership in 9-AC-WG.

Membership in 9A-CW-G is offered to licensed operators worldwide who are active on at least two amateur bands, using CW mode. They have to be capable of sending and receiving 30 wpm utilising a high standard as operators in technique and clarity and amateur goodwill, without the use of computers, decoders, keyboards, or other helping devices. A test QSO should be of at least 30 minutes duration.

Operators are required to obtain four proposals for membership in 9A-CW-G from 9-AC-WG members, one of which must be from Croatia. A fee of $US5.00 or 7 DEM or 10 IRCs must accompany the application, and is for life. Each new member will receive a membership diploma and number.

Worked 9-AC-WG members Award (W-9ACWG-M)

For this award, operators need to have two-way contacts with 9-AC-WG members after 1 May 1995, as follows: 9A amateurs, 10 contacts; EU amateurs, six contacts; and amateurs outside EU, three contacts.

An application in the form of a GCR list verified by one other licensed amateur with fees as mentioned above should be sent to: Mato Samardzic 9A3SM, Jure Kastelana 20, 10000 Zagreb, Republic of Croatia.

This address applies to both awards.

The members of 9-AC-WG are 9A2AJ, 9A2EU, 9A2NK, 9A2VB, 9A2WJ, 9A3PA, 9A3SM, 9A3UT, 9A5I (ex 9A2OB), 9A7AA, 9A7V (ex 9A3ER), 9A7W, 9A8A (ex 9A2VC/9A8AA), DL2HQH, DL4FDM, HA3NU, I7ALE, K1RH, K9QVB, OH4YR, OK1RR, PY1BVY, RA6AR and Z32KV, along with recent new members BV2TA, S51M, S58MU, ON5ME, and 9A3A/5B4ADA.

This information came in a letter from Daki 9A2WJ, President of 9A-CW-G, dated 12 July 1996.

RSGB IOTA Awards Program

Following is a news release from the Radio Society of Great Britain.

The RSGB is very supportive of the Islands on the Air (IOTA) program, and has been most impressed to observe its growth in recent years. The Society wishes to give full recognition to IOTA and to establish, in due course, a new IOTA Committee as a Full Committee of the Society. The recent growth of IOTA has been very significant and is undoubtedly placing unreasonable demands on those involved in the administration of the program. The Society will in future, therefore, handle all administration. This will free up members of the new IOTA committee to concentrate on strategic and technical matters.

In order to facilitate this move we have decided to disband the existing IOTA committee. This committee is, in fact, a working group, and is a sub-committee of the Society's HF Committee.

An IOTA Transition Group (IOTATG) under the joint chairmanship of Martin Atherton G3ZAY, and the Society's general Manager, Peter Kirby G0TWW, is to manage the transfer of the IOTA administration to the Society's headquarters. Mrs Eva Telenius-Lowe has been appointed HQ IOTA Co-ordinator.

The Society is most grateful to all members of the IOTA Committee for

their past support and contribution, especially Roger Ballister G3KMA, whose unstinting hard work and enthusiasm over the past 11 years is much responsible for the growth and popularity of the program world-wide. The Society is delighted that Roger has accepted the position of RSGB IOTA Manager, and will continue to manage the program on a day-to-day basis alongside the HQ IOTA co-ordinator and the IOTA Committee.

As a result of the action of the Society, the future of the RSGB IOTA program is now assured. The Society is confident that the program will continue to grow in popularity and to take its place as one of the leading amateur radio awards in the world.

All future correspondence and enquiries regarding the IOTA program should be directed to: RSGB IOTA Program, PO Box 9, Potters Bar, Herts EN6 3RH, England.

The IOTA Awards program was created in 1964 by the late Geoff Watts, a leading British short-wave listener. It was taken over by RSGB volunteers at Geoff Watt's request in 1985. Since then, it has grown enormously, with well over 8000 IOTA Directory holders worldwide and an estimated 20,000 amateurs actively pursuing IOTA contacts.

Special Event Station VK7WBF

John W Bates, Secretary of the WIA Tasmanian Division, Southern Branch, advises of a special event station, VK7WBF, which will he set up dockside in Hobart during the Australian Wooden Boat Festival. All amateur HF, VHF and UHF bands will be covered using phone and CW only from 0800 UTC on Monday, 11 November to 1200 UTC on Sunday, 17 November 1996.

One contact with VK7WBF is all that is required to qualify for the issue of a certificate, which will cost $AUS5.00. Monies are payable by either cheque or money order in Australian currency made out to the WIA, Tasmanian Division. Application should be made to: Awards Manager, GPO Box 371D, Hobart TAS 7001.

It is envisaged that this event will be a bi-annual event with this year being the inaugural year.

**PO Box 2175 Caulfield Junction 3161*

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Club Corner

Summerland Amateur Radio Club

A bigger-than-ever Grand Computer EXPO is planned for 30 November and 1 December 1996 at the Lismore City Hall. Two days, this time, by popular demand!

All the latest in computer technology will be there, plus other electronics and communications displays. Most of the region's leading suppliers will be represented at this EXPO. Come and see the Internet in action and try it out yourself!

"Bring and Buy" tables will be available for pre-loved gear. Refreshments will be on sale both days. Several lucky door prizes will be drawn over the period.

The doors will be open from 9.30 am to 4.30 pm both days. Admission will be $3.00, or $5.00 per family.

Check the club BBS, VK2SRC-2 via VK2RPL-1 668900 for more information, or phone/fax John VK2JWA on 066 215217.

Graeme VK2GJ
Publicity Officer

Radio Amateurs Old Timers Club

Members are asked to note that VKs 1, 2, 3 and 7 will be on Daylight Saving Time in November, December, February and March (no broadcast in January).

The 20 metre transmissions to the north and west will remain at 0100 and 0200 UTC respectively.

We regret to report the passing of Fred House VK3ARK on Saturday, 28 September. Fred was an early member of the Club and its committee, and also one of our broadcast operators a few years ago.

Allan Doble VK3AMD
ar

Contests

*Peter Nesbit VK3APN - Federal Contest Coordinator**

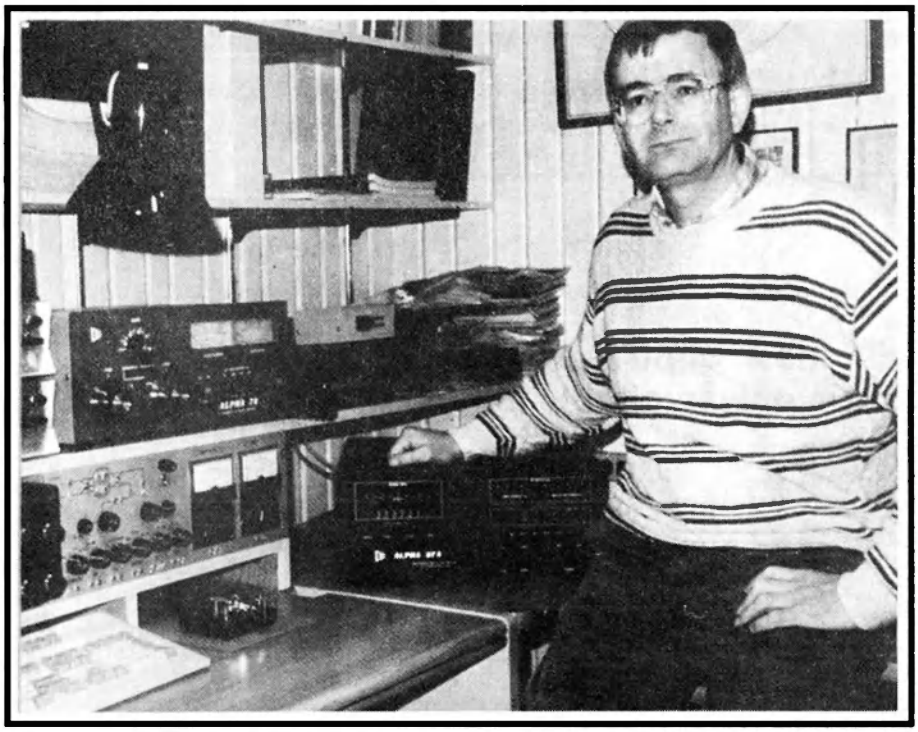
Contest Calendar November 96 – January 97

Nov 1-7	HA QRP Contest	(Oct 96)
Nov 9	ALARA Contest	(Oct 96)
Nov 9-10	WAE RTTY DX Contest	(Jul 96)
Nov 9-10	OK-DX CW Contest	(Oct 96)
Nov 16-17	IARU Region 1 160 m Contest	(Oct 96)
Nov 23-24	CQ World-Wide DX CW Contest	(Sep 96)
Dec 6-8	ARRL 160 m Contest	
Dec 14-15	ARRL 10 m Contest	
Dec 21-22	Croatian CW Contest	
Dec 26 – Jan 26	Ross Hull VHF/UHF Contest	
Dec 29	RAC Canada Winter Contest	
Dec 31	ARRL Straight Key Night	
Jan 11-12	VHF/UHF Field Day Contest	
Jan 11-12	HA DX CW Contest	
Jan 24-26	CQ WW 160 m DX Contest	

In recent times, several new contests have appeared, in which stations calling CQ must change frequency by a certain minimum amount after each QSO, making the frequency available to other stations. The idea is to prevent anyone "owning" a frequency, and to liven things up by forcing everyone to move around. For various reasons, most of these contests have been of little relevance to us VKs, which is why I haven't published details of them to date. However, I recently received a letter from Peter Parker VK1PK on this very issue, which provides food for thought. See what you think.

Peter writes: *"Having participated in many WIA contests, I wonder why more people don't participate in them. At the same time one wonders about the operating manners of some participants, and whether the rules are as fair as they might be.*

"After considerable thought, I've come to the conclusion that current operating practices (although perfectly in order) are contributing to falling participation, and the occasional squabble over frequency



The winner of the BERU Challenge Trophy in the 1996 Commonwealth Contest, John VE3EJ.

"ownership". The purpose of this letter is to suggest a way to make scores more proportional to effort, and to improve behaviour. Essentially the suggested reforms do away with frequency ownership.

"Firstly, it is useful to look at the different sorts of amateurs operating during a contest. We have what I call the Group 1 or "Hard Core Contesters", who take their contesting very seriously. They may be single or multioperator stations, and are highly likely to send in a log. They usually run the legal limit to good antennas, and can be recognised by their tendency to remain on a particular frequency, and still be there several hours later.

"Then we have the Group 2 or "Casual Contesters", who tend to run more modest stations. Although they might limit their operating time somewhat, the time and effort they put in is not inconsiderable. They are a widely mixed group, and may include QRP operators, new contesters, and those helping out others with QSOs. They are likely to submit a log, and are usually the largest single group participating in a contest. ***Their participation holds the key to the success of a contest.*** *Group 2 contesters gain most of their contacts by tuning around the band, and responding to the CQs of other stations, who are often Group 1. For this reason, many Group 2 stations never exchange numbers with other group 2 stations, even though they could easily do so if they were able to.*

"Group 3 or "Non-Contesters who Give Numbers" are those who say they are not in the contest, but will give a number if asked. Many are old timers who have "been there and done that", and are unlikely to submit a log. Some will be newcomers who are unsure about contesting or aren't familiar with the rules. Most of their QSOs are with Group 1 contesters, and very few with Group 2.

"Group 4 or "Non-Contesters who Don't Give Numbers". The only number they give is 73, so enough said!

"In a contest, a station calling CQ works others who tune on to him or her. When the QSO is finished, normal etiquette is for the calling station to QSY, and the original station to remain on the frequency. Stations with the strongest signals (ie Group 1 contesters) are very likely to operate in this manner, because it usually results in the highest possible QSO rate. In particular, these stations have the advantage of being called by the Group 2 and Group 3 contesters.

"The current convention therefore favours the "big guns". The Group 2 and 3 contesters are essentially cannon fodder for them; however, those same Group 2 and 3 contesters will have much less opportunity to make calls and work each other, especially in the middle, most-used portions of the band.

"Often, when a Group 2 station replies to a Group 1 station, there are many others on the frequency who would like also to work the Group 2 station, but can't because normal convention says the Group 2 station must QSY after the QSO. After they QSY, they can be difficult or impossible to find again.

"What I am suggesting is a partial abandonment of the current custom of frequency ownership, as it applies to contests. I propose that contest rules be amended to prohibit any station having more than (say) five consecutive QSOs on the one frequency. After that they must QSY, by at least 5 kHz on SSB, and 2 kHz on CW (with exemptions for those using crystal control). This would enable Group 2 and 3 stations to contact each other much more easily, and remove the incentive to try and steal other stations' frequencies, which can easily lead to conflict. By helping the more casual operators, who provide the bulk of contest activity, scores would be more closely related to effort, and many more contacts would result. This would encourage participation, and help stem the long-term decline in HF contest activity in Australia."

Peter makes some very interesting points, and I'm sure most of us recognise the situation he describes. As a Group 2 contester myself, many are the times I have heard other Group 2 stations, whom I have urgently needed for multipliers or just plain QSO points. I've tried every trick in the book to catch them, including calling them in unison with the Group 1's transmissions (to escape mutual interference), calling them a bit low, a bit high, way off frequency, or trying to time my CQ so they would be tuning past at just the right moment. It almost never works, however, and by the end of each contest I usually have several pages of callsigns of missed stations, and have spent far too much time on this wasted effort. There must be a better way.

The notion of having to regularly QSY during a contest will be quaint, appealing or anathema, depending on your viewpoint. It is not without its problems; for instance, how would such a scheme be policed? What if someone "accidentally" forgets to QSY at 3.30 am, after filling his quota, when he is the only local station on the band? What if he is being called by several weak Europeans and an African, whose multipliers he needs; does he abandon them? I don't mean to sound negative; however, these very real types of problem need to be solved, for the scheme to work.

What are your views? What WIA or other contests do you see as being suited to such a scheme? Please send any ideas via letter, or e-mail. I'll look forward to hearing from you.

For letters, information and assistance this

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The FT-900 is a no compromise 100w HF transceiver ideal for vehicle, shack, or DXpedition operation. Its superb front-end performance really shines through, with a quad-FET mixer to prevent overload and a Collins SSB mechanical filter for the excellent selectivity needed with improving HF band conditions. For mobile convenience the FT-900's lightweight front sub-panel can be remote mounted using an inexpensive kit, without compromising transmit audio quality like some competing models. An optional auto antenna tuner can also be installed internally and operated from the front panel. At home, the frequency/band keypad, SSB speech processor with IF Shift audio tailoring, VOX, CW keyer, 29MHz FM repeater access tones, and general coverage 100kHz to 30MHz receiver will certainly add to your operating enjoyment.

D-3280

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Our very best 100w HF transceiver, the FT-1000MP combines proven RF design with exclusive IF-based Enhanced Digital Signal Processing (EDSP) to provide a stunning new level of HF base station performance. Yaesu's exclusive EDSP facilities provide impressive IF-based noise reduction and interference rejection filters for enhanced receive operation, as well as flexible transmitter tailoring for outstanding signal clarity. New features include selectable receiver front-ends, 3 antenna connectors, tuning steps from 0.625Hz, a Shuttle-jog tuning system, and a comprehensive menu system so you can select the best transceiver settings for your operating conditions. With so many features included you'll really need to see a copy of Yaesu's 12 page colour bookiet to appreciate how an FT-1000MP could really revolutionise your HF operations.

D-3400

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2m 30W RF Power Amplifier

Boost your 2m FM handheld's output with this compact power amplifier. Provides up to 30W output with just 3W input, and over 15W output for just 1W input. Includes receive pre-amp for quiet RF areas.

Cat D-2515

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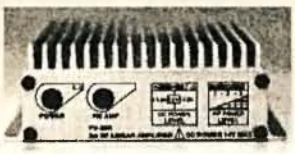
SAVE $30



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Cat D-1375

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Cat D-3635

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Cat D-2920

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*STORES IN RED ARE OPEN SUNDAYS.

Barry VK2BJ led the VK contestants and came in fifth place in the 1996 Commonwealth contest.

month, many thanks to VK1PK, VK3KWA, VK3ZC, VK4EFX, I2UIY, OZ1FTE, VE2ZP, 9A2EU, RSGB, and ARRL. Until next month, good contesting!

73s, Peter VK3APN

ARRL 160 m DX CW Contest

6-8 December, 2200z Friday to 1600z Sunday

The object in this contest is to work as many W/VE stations on 160 m CW as possible. Categories are: Single Operator (QRP to 5 W, Low Power to 150 W, and High Power above 150 W O/P), and Multioperator single Tx. Exchange RST; W/VE stations will add their ARRL/CRRL Section. /MM and /AM stations should add ITU region 1, 2 or 3 as applicable. 1830-1850 kHz is recommended for inter-continental QSOs.

Score five points per QSO. The multiplier is the total number of ARRL/CRRL sections plus VE8/VY1 worked (max 77), and the final score equals QSO points X multiplier. Logs on MS-DOS disk are welcome. Send logs postmarked no later than 30 days after the end of the contest to: "ARRL Contest Branch, 225 Main Street, Newington, Connecticut, CT 06111". Logs can also go to the ARRL BBS at 203-665-0090, or via the Internet at contest@arrl.org. Certificates will be awarded to the top scoring station in each category, in each DXCC country. Note that the use of non-amateur radio means of communication during the contest (eg telephone) is not allowed for the purpose of soliciting QSOs.

ARRL 10 m Contest (CW & Phone)

14-15 December, 0000z Saturday to 2400z Sunday

This popular ARRL contest runs on the second full weekend of December each year. The object is to work as many stations worldwide as possible on 10 m phone, CW, or mixed. Maximum operating period is 36 hours, and listening time counts as operating time. Categories are as for the 160 m contest (see above). Send RS(T) plus serial number; W/VE will send RS(T) plus state or province. CW entrants should stay below 28.3 MHz, avoiding beacon frequencies. Stations entering the mixed mode section may work stations once on CW and once on phone.

Score two points per phone QSO, four points per two-way CW QSO, and eight points for CW QSOs with US novice or technician stations signing /N or /T (28.1-28.3 MHz only). Multipliers are the 50 US states plus District of Columbia (DC), plus Canadian provinces (see below), plus DXCC countries except US and Canada, plus ITU Regions (/MM & /AM QSOs only). Multipliers are counted separately on each mode. Final score is total QSO points x total multiplier. Include a dupe sheet for 500+ QSOs. Logs should be sent as for the 160 m Contest (see above).

Croatian CW Contest

21-22 December, 1400z Saturday to 1400z Sunday

This new contest is open to stations worldwide. Sections are single operator all band, and multioperator all band. Use 160-10 m, CW only, and exchange RST plus ITU zone.

For each valid QSO with a 9A station, claim 10 points per QSO on 160/80/40, and six points on 20/15/10. For QSOs with other continents, claim six points on 160/80/40, and three points on 20/15/10. For QSOs with own continent, including own country, claim two points on 160/80/40, and one point on 20/15/10.

Multipliers are the number of DXCC/WAE countries on each band, and the final score equals the total QSO points x the total multiplier from all bands. Forward your log, summary and dupe sheets within 30 days to: "Hravatski Radio Amaterski Savez, Dalmatinska 12, 10000 Zagreb, Croatia". Logs on 3.5" disk are also welcome.

Canada Winter Contest

29 December, 0000z to 2359z Sunday

This popular contest should appeal to expatriate amateurs living in Australia Canada of which, I am assured by the contest manager VE2ZP, there are many. If you are one of them you must therefore enter, or risk losing your "preferred citizen" status (now I've kept my promise to VE2ZP to harangue you to enter)!

You can work any other station for contest credit, on either CW or phone, 160-2 m. You can enter as single operator single band, all band, or all band low power (100 W O/P); or multioperator. On CW try 25 kHz up on the half hour, and on phone 1850, 3775, 7075, 7225, 14175, 21250 and 28500 kHz. Send RS(T) plus serial number; Canadians will send RS(T) plus province. (VE0 will send RS(T) plus serial).

Score 10 points for each QSO with a Canadian station including VE0, and two points for each non-Canadian QSO. QSOs with official Canadian RAC stations (RAC suffix) are worth 20 points. Note that CW and phone QSOs must be made in the appropriate sub-band to be valid. Multipliers are the ten Canadian provinces and two territories, and are counted once per band and mode (ie 12 on 160 m SSB, 12 on 160 m CW, 12 on 80 m SSB, etc). Multipliers are listed below. Final score equals total points x total multiplier. Send logs to: "RAC, 614 Norris Court – Unit 6, Kingston, Ontario, K7P 2R9, Canada" by 31 January 1997.

Canadian Provinces & Territories

NS	Novia Scotia (VE1, CY9, CY0)
PQ	Principality of Quebec (VE2, VA2)
ON	Ontario (VE3, VA3)
MB	Manitoba (VE4)
SK	Saskatchewan (VE5)
AB	Alberta (VE6)
BC	British Columbia (VE7)

NT North West Territories (VE8)
NB New Brunswick (VE9)
NF Newfoundland & Labrador (VO1, VO2)
YU Yukon (VY1)
PE Prince Edward Island (VY2)

Results of 1996 Jack Files Memorial Contest

Presented by Peter, VK4EFX

** = trophy, * = certificate

CW, Single Operator Home:
VK4ICU * 455
VK4OD * 264
SSB, Single Operator Home:
VK4PCB ** 3973
VK4PJK * 2134
VK4ICU * 792
SSB, Single Operator Mobile/Portable:
VK4KEL * 160
SSB, Club Mobile/Port:
VK4BAR ** 2295
DX:
ZL1BVK * 1710
SWL:
Ian McGovern (Parkes NSW) * 2136
Highest Novice Score:
VK4PCB ** 3973
Check Logs: VK4PVH VK4LAA

Results of 1994 SAC DX Contest

The plaque for the top Oceania score went to VK2APK, in both the CW and SSB sections. The following results show the callsign, QSOs, QSO pts, Mult, and Final Score:

CW:

VK2APK*	112	211	46	9706
VK2ZC	40	58	23	1334
VK4TT	44	44	18	792

SSB:

VK2APK*	53	69	28	1932
VK2XT	50	50	33	1650
VK3TI	23	69	12	828

Results of the 1996 Commonwealth Contest

By Harold G2HLU & Bob G3PJT, with editing and further comments by John VK3ZC

One thing is certain: BERU is never the same two years running! But all entrants profess to enjoy it, whatever the vagaries of propagation. VE3IY/7 echoed many comments: "Delighted to work so many familiar calls".

The winner of the BERU Challenge Trophy is John VE3EJ, with his fifth win. John exploited his excellent 80 m antennas to the fullest, with a clear lead on 80 m over ZF1JT. Second was ZF1JT in the Cayman Islands (Bob G3PJT), and Nigel 6Y5HN was third once again. Barry VK2BJ led VK in fifth place, closely tailed by John VK4EMM in sixth place. Special thanks to Russ VK4XA for operating HQ station VK4WIA, and helping so many others with valuable bonus points.

One hundred and two logs were received, the same as last year. There were 375 Gs active, 126 VE, 82 VK and 37 ZL. VK stations had the highest log submission rate, at 26%. A total of 55 call areas were represented, many of them on the LF bands. Only one year remains in which VR2/VS6 will be in the Commonwealth.

Twenty logs came on disk, and three via the Internet. Eight were typed and 49 hand-written, the latter ranging from impeccable to very scruffy. About half the entries were accompanied by dupe sheets and bonus lists.

*PO Box 2175, Caulfield Junction, VIC 3175
pnesbit@melbpc.org.au

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1996 Commonwealth Contest Results

Posn	Call	80	40	20	15	10	Total
Top Ten:							
1 ###	VE3EJ	1198	1789	1802	623	25	5437
2 ##	ZF1JT	846	1801	1660	593	—	4898
3 *	6Y5HN	733	1323	1649	485	25	4221
4 #	G4BUO	789	961	1594	675	125	4144
5 *	VK2BJ	645	1615	1219	365	—	3844
6 *	VK4EMM	667	1427	1048	318	—	3460
7	G0IVZ	708	1116	1126	444	50	3444
8 *	VE3IY/7	479	856	1763	198	—	3296
9 *	9J2BO	240	640	1362	573	309	3124
10	GM3POI	591	913	1326	175	25	3030
VK:							
22 *	VK3ZC	406	983	525	—	—	1914
30	VK4XW	396	678	458	23	—	1555
32	VK2BQQ	355	976	193	—	—	1524
40	VK4OD	366	497	440	46	—	1349
44 *	VK7BC	415	500	343	—	—	1258
45	VK3XB	175	495	535	—	—	1201
46	VK2DID	150	616	415	—	—	1181
48 *	VK8HA	—	428	633	94	—	1155
51	VK4IV	25	569	449	—	—	1043
73 *	VK5HO	281	269	—	—	—	550
74	VK3KS	—	194	303	—	—	497
79	VK3IY	271	100	—	—	—	371
82	VK3AMD	—	196	—	—	—	196
84	VK3AZT	—	98	50	25	—	173
Single-Band VK:							
7MHz							
1 *	VK2APK	—	1852	—	—	—	1852
2	VK6VZ	—	1582	—	—	—	1582
3	VK2ETM	—	821	—	—	—	821
4	VK3APN	—	794	—	—	—	794
14MHz							
4	VK4TT	—	—	858	—	—	858
5	VK6AJ	—	—	653	—	—	653

Senior Rose Bowl; ## Junior Rose Bowl; # Col. Thomas Rose Bowl; * Certificate winner.

Checklogs: G0AEC, G3BPM, G3WP, GB5CC (G3NKC), VE7/GM3CIX, VK2EL, VK4WIA (VK4XA).

Divisional Notes

Forward Bias - VK1 Notes

Peter Parker VK1PK

Technical Symposium Soon

This month's VK1 Technical Symposium promises to be better value than ever. Event organiser Mike VK1KCK advises that this year's event will be held at the Charnwood Scout Hall, Tillyard Drive, Charnwood. Attendees can register from 9 am, with sessions starting at 9.30 am. As previously reported, it is being held on Saturday, November 23.

Apart from a comprehensive program of presentations and demonstrations, covering many aspects of amateur radio, other attractions have been planned. These include Daycom Communications Pty Ltd establishing a technical book display, and an opportunity to measure the performance of your radio equipment.

Presentations planned for the Symposium include TCP/IP addressing, HF receiver design, spread spectrum techniques, future trends in modulation, Radiosport, complex arithmetic for the amateur, TCP/IP protocols, PACTOR operating, communication for the ACT Car Rally, and setting up a packet radio TNC.

It will cost $25 to attend the Symposium. For this you will get a copy of the proceedings, morning and afternoon tea, plus a light lunch. For further information, or to book your place, please contact Mike VK1KCK on telephone (06) 292 0053, or by packet radio to VK1KCK @ VK1BBS.

Division Receives French Antenna

Graham VK1KGT reports that the VK1 Division has been donated a log periodic antenna, rotator and tower. The gift, organised by Greg VK1GPC, is courtesy of the French Embassy. The Division took possession of the equipment on Saturday, 31 August. Jack VK1JA, Phil VK1PJ, Tex VK1TX and Graham VK1KGT assisted in the tower and antenna removal. The Division thanks the French Embassy for its generosity.

1997 Callbooks

Our Federal Councillor, Richard VK1RJ, advises that 1997 WIA Callbooks will be coming out later this month. Subject to demand, he will be ordering a batch for sale to local amateurs. The normal price will be $14.95, though WIA members will receive a ten percent discount.

If you're interested in obtaining a copy of this year's VK Callbook, please let Richard know. He can be contacted via packet (VK1RJ @ VK1BBS), or on telephone (06) 258 1228 (ah).

Triband Yagi Raffle

Members are continuing to support the Division's Chimside triband Yagi raffle, with many tickets being sold. The raffle, which will be drawn at this month's meeting, is the biggest that the Division has held for some time.

Tickets cost just a dollar each for your chance to win the antenna. However, if you pay five dollars, you get six tickets for the price of five. For more details on ticket availability, please contact Phil VK1PJ on 292 3260.

Your Chance to Beat Fee Rise

VK1 amateurs are being given the chance to beat next year's rise in WIA subscriptions. September's committee meeting heard that the Federal component of our subscriptions will go up by $2.00 next year. The VK1 Committee has decided to hold the Divisional portion at this year's level. This means that the Federal $2.00 increase will be passed on to members. Even after the increase, full WIA membership with the magazine will cost less than 20 cents per day. In addition, VK1 members will continue to pay less than amateurs in some other states.

However, by joining the VK1 Division before the end of this year, you can beat the increase. Our current subscriptions are $70 full membership, $56 for concession holders, and $42 for membership without the magazine. Three year memberships are treble the above figures; the advantage here is that you are protected from any future subscription increases until 1999.

If you're interested in joining Australia's most progressive WIA Division, give our membership secretary a call. He is Hugh Blemings VK1YYZ, and can be telephoned on 254 7855 (ah).

VK2 Notes

Richard Murnane VK2SKY

Broadcast Volunteers Needed

As the old saying (almost) goes, "many hands make light the reading ...". As is usually the case in volunteer organisations, there are never enough volunteers to go around. At present, we have a shortage on the evening broadcast team; so, if you've been thinking the time for your 15 minutes of fame is overdue, this could be the big break you've been waiting for!

We need both engineers and announcers, so even if you are a bit shy about broadcasting your voice on nearly every amateur band from DC to daylight, you can still be an effective member of the team, running the technical side of the Dural station.

The commitment required is typically one broadcast every two or three months; you can run the morning or the evening broadcast, though at present the greater need is for the evening team!

You don't even need to have an amateur licence (tell your SWL friends!), as a full call amateur is always rostered on at the station. In any case, full training is provided to all broadcast volunteers.

If you would like to have a go, please contact Pixie VK2KPC at the Divisional office, (02) 9689 2417, between 1030 and 1530 hours Monday to Friday, or leave a message at any other time.

Looking forward to meeting you at the station!

Thought for the month:

Yesterday is history. Tomorrow is a mystery. And today? Today is a gift. That's why we call it The Present.

Babatunde Olatunji

VK3 Notes

Jim Linton VK3PC

Half Way Mark

To some of us it just seems like yesterday that the 1996/97 Council was elected, but in fact the Annual General Meeting was held six months ago. A mid-term review of Council's performance reveals it has addressed the matters arising out of the AGM, and kept members informed of progress through reports via this column, the monthly VK3BWI voice broadcast, and VK3WI packet news bulletins.

The most time-consuming of AGM initiated activities has been the updating of the Memorandum and Articles of Association. A draft copy of this document was made available last month through the mail to members requesting it. Any member wanting a copy should send a manilla envelope 24 cm x 16 cm, self addressed, with an 85 cent stamp affixed, to the Secretary. Comments and input on the draft document can be made in writing up until 30 November 1996. A further revision in consultation with our solicitors is to be put to a Special General Meeting early next year, the date and venue of which will be advised to members.

Membership Renewal

Most WIA Victoria members have their annual membership renewal due at this time of the year. The 1997 membership subscription rates were expected to be finalised a couple of weeks after the deadline for these notes. These will be in the December edition of VK3 Notes, along with other important information including the Christmas-New Year arrangements for the WIA Victoria Office and the VK3BWI broadcast.

New Callbook

The 1997 Australian Radio Amateur Call Book published by the WIA has a $14.95 cover price. Check with the WIA Victoria Bookshop for the special members discount rate, and the mail order postage and packaging costs. These details could not be finalised until initial supplies of the call book were on hand to enable an accurate check of its weight and postage rates. The member over-the-counter and mail order costs will be in next month's column.

QSL Bureaux

WIA Victoria continues to provide one of the most efficient QSL bureau services, and there's been an influx of new registered users. To use either the inwards or outwards bureau you must be a member, and also a registered bureau user. Information sheets on how the service operates, its user requirements, and registration forms are available on request.

VK6 Notes

John R Morgan VK6NT

Divisional GM

There was a better-than-usual attendance at the September GM, with 34 members enjoying a talk by Trish VK6QL concerning her son's much-publicised single-handed around-the-world voyage.

General Meetings are held on the third Tuesday of each month in the Board Room, 3rd Floor, CWA House, 1174 Hay Street, West Perth, commencing at 8 pm. There is no meeting in December. All interested persons (members and non-members, licensed or listener) are invited to attend, and will be plied with free coffee and biscuits.

ALARAmeet - Perth 96

Officially held on the week-end of 27-28 September, the Meet started (unofficially) a few days early, with a lunch on the previous Thursday, and dinner on the Friday. These events were attended by those who had already arrived in Perth, together with quite a few VK6s.

The ALARA Meets are held every three years, at various locations around Australia, and are a mixture of old friends re-uniting and everyone getting to know new friends. There were 47 VKs present (from every state and territory except VK8), and many overseas members: Raija SM0HNV from Sweden, Aimee FK8FA and Michel FK8GO from New Caledonia, and Elizabeth VE7YL from Canada, and 20 ZLs.

While the venue for much of the Meet was The White House restaurant complex in Ferndale, there were numerous excursions, including a visit to Kings Park to see the wildflowers, and a ferry-ride from Perth to the Fremantle Markets. After the week-end was over, many of the visitors continued with trips to the Mundaring Weir reservoir, which is full for the first time in about 25 years, and to Rottnest Island, 20 km off the coast.

All those involved wish to thank the organiser, Bev VK6DE, and her able helpers, including Poppy VK6YF, Joan VK6JMP, and Fiona *(when are we going to see a callsign, Fiona? – 6NT)* and photographer/guide Jeff VK6JKR. A great time was had by all.

Thanks to Tina VK5TMC for providing the above information.

WAADCA

The AGM of the Western Australian Amateur Digital Communications Association Inc (known as WAADCA, pronounced wad-kah), which is affiliated to the VK6 Division of the WIA, was held on Wednesday, 2 October 1996. The following volunteers were elected to serve on the committee: President, Phil Maley VK6AD; Vice President, Gwynne Brockis VK6AJG; Treasurer, Charlie King VK6ZCK; Broadcast Officer, Terry Leitch VK6ZLT; and Repeater/Equipment Officer, Rob Lamb VK6VP.

Phil VK6AD reports that, at the November GM, the first in a series of five training sessions on packet radio was presented. These sessions are designed to start at "raw beginner" level. Those who attend can expect to become proficient in the use of their TNC or Baycom modem, typical packet terminal software, and their local BBS. They can also expect to gain some insight into other protocols, such as TCP/IP. The next session will be presented at the February GM.

WAADCA meets at 8 pm on the first Wednesday of each month, in the Meeting Room of the Wireless Hill Telecommunications Museum, Ardross. As always, non-members are welcome to attend.

In order to reduce the congestion on what has become a very popular packet radio frequency of 144.725 MHz, the club recently purchased a pair of Tekk transceivers, in order to implement a dedicated 9600 baud UHF link between its BBS (VK6WFH) and Gateway station (VK6DLX). The latter is located at the site of "radio friendly" InterNet provider Dialix.

You are invited to take a look at WAADCA's InterNet web page at *http://www.waadca.asn.au,* and to offer ideas and suggestions concerning its content. Contact Phil VK6AD, either via e-mail to *pmaley@ozemail.com.au,* or via packet radio to VK6AD@VK6WFH.

If You Have Material ...

Material for inclusion in this column may be sent to VK6NT @ VK6ZSE.#PER.#WA.AUS.OC, or to PO Box 169, Kalamunda WA 6076, or via telephone on (09) 291-8275.

"QRM" News from the Tasmanian Division

Robin L Harwood VK7RH

The year is rapidly drawing to a close and now that the weather has improved, several outdoor activities will be held. For example, the annual "Sewing Circle Barbecue" is scheduled for mid-November. "The Sewing Circle" is the name of a long-standing 80 metre SSB net which has been meeting on 3590 kHz +/- QRM for over 40 years. I came into the Net during the days of Jack Batchelor VK7JB, Bob O'May VK7OM, Lon Jensen VK7LJ, and Crosby Walch VK7CW. Sadly these operators have all passed away yet it was my privilege to work them just when I started out in 1972.

For the past 19 years, the Net has been associated with Bob Jackson VK7NBF and the Sewing Circle has continued meeting daily at 1700 hours Tasmanian time. For details on the Barbecue call in on 3590 and find out.

The Divisional Council met in Hobart on 21 September at the Domain Activity Centre. Among items discussed was the Divisional Insurance Policy, the future of Hobart's Repeater Two, continuing problems with packet BBS forwarding plus reports on activities within the three Branches. Council also received the resignation of the Divisional WICEN co-ordinator, VK7PU. This was accepted reluctantly and we are grateful to Phil for his input in drafting guidelines for future WICEN operations within Tasmania. Our Divisional President VK7GL will be acting co-ordinator for the time being. The next Divisional Council meeting will be held this month and the venue will be given over VK7WI.

The future of VK7RHT on 146.700 MHz, the second FM repeater established in VK7, has been debated of late, after a draft agreement was finally given to the Southern Branch, by the NTA. Although the annual site fee has been scaled down, the installation costs would be still beyond the scope of either the branch or Division as the rules only permit this installation to be done by Telstra. The repeater is presently situated on the old tower, which is scheduled for demolition in late January/early February.

The performance of the repeater has not been satisfactory for some time, because the receiver overloads on the huge amount of RF present on Mount Wellington. This has been a cause of frustration for many who can hear it but cannot get in as the mute is heavily wound on. VK7RAF, a privately maintained repeater on Mount Faulkner on 147.075 MHz, does provide some coverage yet there are blank spots, particularly south of Hobart. The Branch also has been looking at alternative sites for VK7RHT and the possibility of having several remote receiving sites linked to the mountain. A general meeting was arranged to discuss the options regarding the repeater's future on 9 October but, as this is being written prior to this, I will be reporting the result in the December issue.

The Southern Branch went to the Antarctic Division at Kingston on 2 October instead of having their monthly meeting at the Activity Centre. The Northern Branch, which is now meeting at the Alanvale campus of Launceston TAFE, had a speaker from the Telstra National Communications Team. The topic was "Communications into the 21st Century". The Branch is grateful to Telstra for making this presentation.

Meetings for the month of November are: South – Wednesday, 6 November at 2000 hours EDT, Domain Activity Centre; Northwest – Tuesday, 11 November at 1945 hours EDT, Penguin High School; Northern – Wednesday, 12 November at 1930 hours EDT, Launceston TAFE Block "C".

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How's DX

*Stephen Pall VK2PS**

In between writing my monthly column for the October and November issues of this magazine, I organised my time in such a way that I was able to get away from amateur radio, DXing and column writing for two weeks.

"Get away" is the proper expression to use, as I was travelling with a small group of people in two four wheel drive mini-buses into the middle of our vast country; to places of which I had heard but never seen. Here's just a few names to whet your appetite: Tibooburra, Camerons Corner, Strzelecki Track, Innamincka, Birdsville, Birdsville Track, Flinders Ranges, Broken Hill, Menindee Lakes, Lake Mungo, and the Mid-Western Highway back to Sydney.

We had a marvellous two weeks, travelled 6000 kilometres and experienced rolling sand dunes, deep tracks, "greening" deserts (the result of the April-May rains in Queensland), some creek beds with water in them, the flowing of the Cooper and Diamantina in some places, spectacular displays of wildflowers (the best for many years), a multitude of birds and animals (but only one solitary dingo), and the immense flatness of some areas with a 360° circular view and not a tree or bush in sight, only the "gibber" (milliards of small, shiny, dark brown, sharp stones as far as the eye can see). This is Central Australia!

Surprisingly, there are people there everywhere. Not only the four wheel drive travellers, but those who choose to earn their living in these remote areas of the land. Communications? Yes, School of the Air is there, and broadband multi-wire antennas everywhere serving the Royal Flying Doctor Service and the outlying stations of the "never-never". But signs of modern technology are also there.

Tall Telstra towers are standing on the edge of the horizon as guardians of the empty landscape with their microwave dishes pointing to the four directions of the compass and with solar cells as the source of power.

In Innamincka there are three buildings and 14 residents. There is the Hotel, the General Store and the Park and Wildlife Offices in the recently restored former Inland Mission hospital building. In front of these buildings there is a large parking area where at 8 am each morning dozens and dozens of four wheel drive vehicles line-up for the opening of the petrol pumps to fill their empty tanks with 98 cents per litre petrol. On the other side of this open area, with the silhouette of a huge Telstra tower on a nearby sand hill, there are two solar-powered public telephone booths. You walk in, put your coins or phonecard into the slot of the apparatus and you dial up your radio amateur friend in Germany and tell him that you are talking to him from the middle of the Australian "outback". He does not believe you!

The contact station for the Flying Doctor Service is attached to the General Store. To my question of how often did they use their radio for emergencies, the reply was: "Only three times during the past 12 months. Since the arrival of the Telstra towers, we use the phone; it is more convenient".

Times have changed since the "Flynn of the Inland" era, but the beauty and challenge of the outback remain the same. Go and see it for yourself, before it is too late.

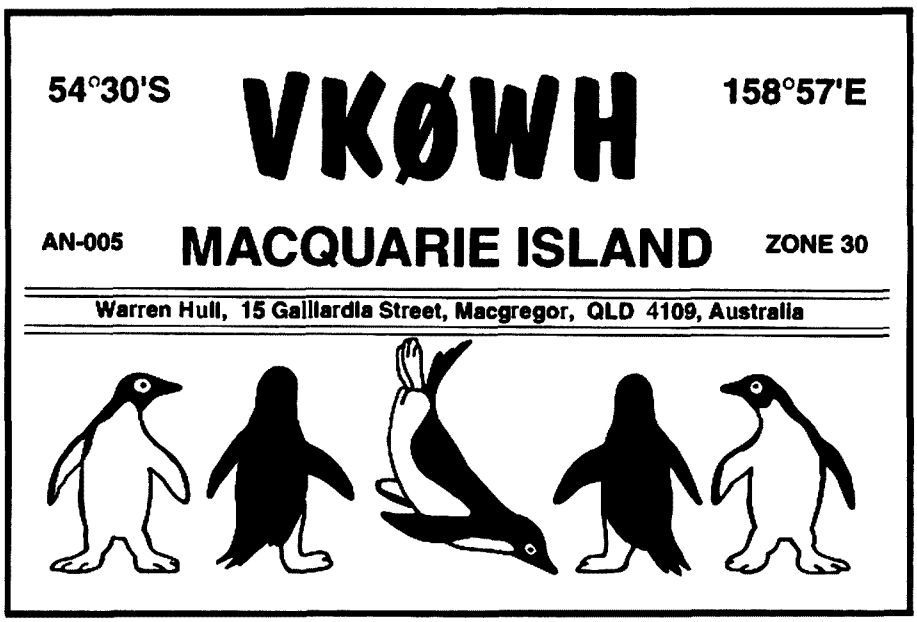
Macquarie Island – VK0WH

Warren VK0WH has not been very active since 19 August. He has indicated to his friends that, after August, he had to curtail his radio amateur activities as the re-supply boat arrived on 25 August bringing in a new group of scientists to the Island. Early in September Warren sent a number of e-mail messages to USA and German amateurs which made his position clear. *"I am busy helping a boat-load of scientists with IBM net-working problems, so I am not really in a position to get on (the bands) at the moment. Due to my greatly increased workload at present it is unlikely that I will be able to get on very much now and, as the old RACAL transmitter now has an ATU fault, it is not worth spending time on it, as I am about to decommission it in a few weeks time anyway. I will have to declare QRT on CW. Amateur radio for me was a last minute thing and my original intention was only a weekly sked with a couple of friends and not any DX, hence me not bringing in any equipment. I have made 1200 QSOs with about 50 DXCC countries. A modest figure but at least 1200 people got the country they wanted. I leave on the next ship so any mail should now go to my home address."*

Warren also said: *"I hear via the grapevine that one of the "met" guys coming in, will operate amateur radio and may be more into DX than I was; so those who missed me, will get another chance."*

Rumour has it that the "met" (meteorology) person is Graham VK5WG who was on Willis from December 95 to June 1996. Let's hope that Graham will be more active than he was on Willis. In the first four months of his stay on Willis, he made only a dozen or so QSOs and, after a number of contacts in April and May, his work commitments did not allow for more activity (see June 1996 *Amateur Radio*). It is hoped that Graham will use the callsign VK0WG and will be at least as active as Warren was.

***LATE NEWS:** Quite unexpectedly I had a new and longer contact with Warren on 29*



September at 0050 UTC. Conditions were atrocious, with not another DX station in sight (ie hearing distance), so he was able to verify the above news with some modifications. The total number of QSOs has grown to about 2500 but the number of the DXCC countries remained around 50. Warren leaves Macquarie Island on 25 November after he dismantles the old RACAL transmitter/receiver which was installed in 1972. All the surplus equipment will be taken back to Hobart for disposal. He confirmed that Graham (ex VK9WG) is at present in Hobart undergoing some training and will arrive on 25 November 1996.

Myanmar – XZ

It was not so long ago the amateur world learned that the door to amateur radio in Myanmar was closed (May 96 *Amateur Radio*). However, it seems that persistent lobbying by Kan Mizoguchi JA1BK, Martii Laine OH2BH and Warren Hill KF7AY has produced results with the Myanmar Government. The above delegation of amateurs was in Yangon the capital of Myanmar and has met with Government officials to finalise the licensing and operating arrangements for an upcoming large scale operation to be conducted by members of the Central Arizona DX Association.

As part of that meeting, permission was granted to conduct a limited operation using the callsign XZ1N for several hours each day between 27 and 29 August.

In the middle of September came the big news. A press release issued by Warren Hill KF7AY said, among other things: *"The door to amateur radio in the Union of Myanmar has been re-opened! The stage is now set for a well organised large scale operation by members of the Central Arizona DX Association from 16 to 25 November 1996. This will be an all-mode operation and will even feature a special event station during the official opening ceremonies of "Visit Myanmar Year 1996". Participants to be AB6ZV, AA7WP, JA1BK, K5VT, KC5AYR, N6BT, WA6CDR, KF7AY, N7NG, N7WTU, NZ7E, OH2BH, WA7LNW and WY7K."*

This activity has the approval of the Myanmar Government at the highest level and will conclude with a special multi-multi entry in the CQ World Wide CW DX Contest. The crew will operate three Yaesu FT-1000MPs, plus Alpha linears to monoband Yagis at above 80 feet, and various special low band antennas from the New World Inya Lake Hotel on the outskirts of the capital city Yangon (96° 17' East and 16° 78' North) formerly known as Rangoon. The main mode of operation will be CW but there will also be extensive RTTY and SSB activity on the usual DX frequencies.

There will be special emphasis on the low bands by AB6ZV and N6BT and every effort will be made to work the sunrise and/or sunset terminator as it passes through regions where propagation is supported.

A unique aspect of this operation will be that bureau QSLs can be requested in two ways: the usual method, routed as XZ1N via W1XT; or via the Internet by sending e-mail to *xz1n@qrz.com*. For a quicker reply, direct requests with return envelopes and sufficient postage are encouraged and should go to W1XT at PO Box 17108, Fountain Hills, AZ 85269, USA. Because of the time needed to print QSLs, the mailing of the XZ1N cards will begin in late January or early February. Bureau cards will be sent out at least twice monthly. Propagation to Myanmar during this time of the year may differ significantly on an day-to-day basis. All three stations will simultaneously be on different bands.

Future DX Activity

* Jon EA2KL and Louls EA3ELM will be active from Rodrigues Island (IOTA AF-017) from 31 October to 5 November. QSL via home calls.

* John K4BAI will be active from Barbados as 8P9HT from 15 to 22 November; and during the CQ WW Contest on 23-24 November will use the call 8P9Z. QSL via home call.

* TL8MS is active again from Central Africa. QSL via DL6NW.

* Jorma OH2KI will be active from Gibraltar as ZB2X during the CQ WW CW contest (23-24 Nov). QSL via home call.

* Rolf XV7SW has returned from his holiday in Sweden and is active again from Hanoi.

* JX7DFA on Jan Mayen will be active until April 1997.

* Wally R1ANZ is at the Russian Antarctic Base of Mirny, 66° S and 94° E on the Queen Mary Coast. He will be there until July/August 1997.

* C6-Bahamas. John K3TEJ and Ed WA3WSJ intend to operate in the Bahamas in the CQ WW CW contest, from Abaco Island (IOTA NA-080). QSL via K3TEJ.

* Bill VQ9WM will be in Chagos for at least 10 months. QSL via K7IOO.

* Togo. A large group of amateurs will be active during the coming CQ WW DX Contest with the callsign 5V5A.

* Paul A35RK has moved to his permanent location on Lifuka Island (IOTA OC-169). QSL via W7TSQ. Paul says that the A35 QSL Bureau is now totally defunct. QSLs to A35 stations to be sent only via QSL Managers.

* Louis VE2BQB is currently active from Iqaluit on Baffin Island (IOTA NA-047) until 15 December using the callsign VE8TA. Baffin Island lies in the much sought after Zone 2. QSL to home call.

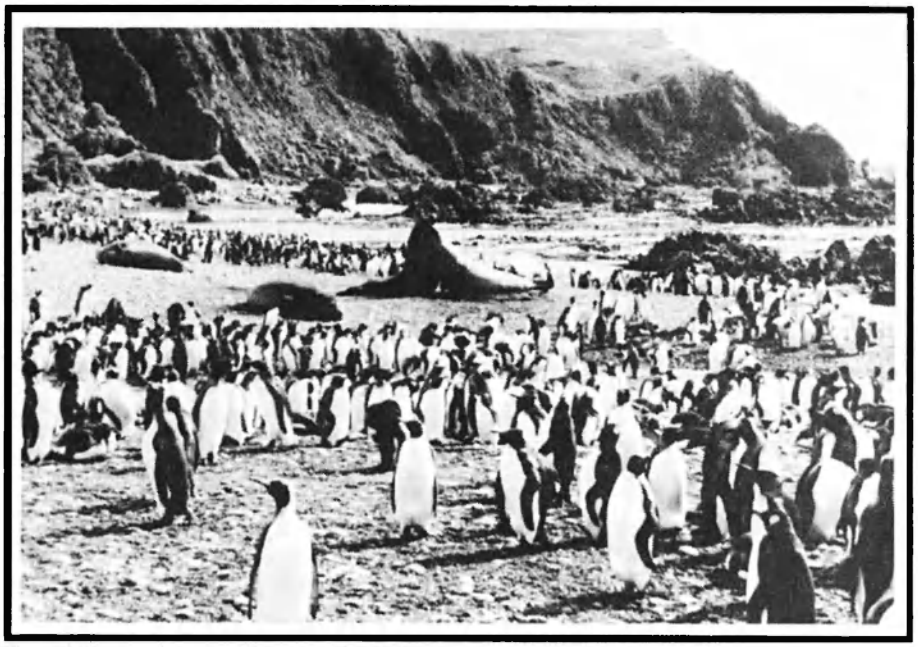
* Fernando EA4BB will be working in Zaire for the next 12 months. He is operating from Rwanguba with the callsign 9Q5BB. QSL via his home call.

* Father Kevin Burke A35KB returned from a holiday in England and is now living on Eua Island (IOTA OC-049).

* Tony A45ZN is active on 160 and 80 metres at his evening times with 400 watts and a trap dipole.

Interesting QSOs and QSL Information

* AH4/AH0W – 10.1 – CW – 0638 – Aug (E). QSL via KE7LZ, Robert W Johnson,



Royal Penguins on Macquarie Island – photo by Warren VK0WH

5627 W Hearn Rd, Glendale, AZ 85306 – 4213, USA.

* 5N0T – Pat – 7041 – SSB – 0655 – Aug (E). QSL via F2YT, Paul Herbet, 9 Rue de L'Alouette, Estree Cauchy, F-62690, Aubygny en Artois, France.

* 9Y4VU – Frank – 14160 – SSB – 0526 – Aug (E). QSL via W3EVW, Roger D Causse, 313 Pontiac St, Lester, PA 19029, USA.

* YI1AS – Ali – 14250 – SSB – 0559 – Aug (E). QSL via PO Box 55072, Baghdad, Iraq.

* YI1HK – Haider – 14250 – SSB – 0607 – Aug (E). QSL via PO Box 55072, Baghdad, Iraq.

* CN8BK – Filali – 14250 – SSB – 0646 – Aug (E). QSL via Abderrahmane Filali, 18 Rue de Casablanca, Rabat, Morocco.

* 8R1Z – Len – 14195 – SSB – 0600 – Aug (E). QSL via Lennox Smith, POB 12111, Georgetown, Guyana, South America.

* JT1KAA – Chuluru – 14017 – CW – 0444 – Sept (E). QSL via PO Box 639, Ulan Bator, 13, Mongolia.

* R1ANZ – Wally – 14164 – SSB – 0544 – Sept (E). QSL via UW1ZC, Valentyn Mykitenko, Akademgorodok, 21, 184340 Loparskaya, Russia.

* VR6PAC – Jay – 14246 – SSB – 0505 – Sep (E). QSL to Pitcairn Island Amateur Club, PO Box 73, Pitcairn Island via New Zealand.

* T91EAM – Almir – 14019 – CW – 0611 – Sept (E). QSL to Radio Club Nikola Tesla, Oslobodjenja bb, Zivinice, Bosnia Herzegovina.

* FT5XL – John – 14164 – SSB – 0623 – Sept (E). QSL via F5NZO, Dididier Bruriaud, Le Bourg, Vitry sur Loire, F-71140, Bourbon Lancy, France.

From Here and There and Everywhere

* Brad K7ZSD, in a note sent out with the KC6SD QSL card, apologised for the two year delay. Moving house and establishing a new business were the reasons given for the delay.

* Canadian amateurs are commemorating the 60th anniversary of the Canadian Broadcasting Corporation. From 26 October to 29 December the following special prefixes may be used (regular prefix/special prefix): VA2/XM2, VA3/CJ3, VA7/VX7, VE1/CG1, VE2/C12, VE3/C13, VE4/X14, VE5/XM5, VE6/VA6, VE7/XK7, VE8/CH8, VE9/VB9, VO1/XO3, VO2/CZ6, VY1/CK5 and VY2/XN2.

* Alan VK8AV reported that he worked Martii OH2BH from Myanmar who was using the callsign XZ2BH on 80 and 40 m CW. Incidentally, Martii has a new address: Martii Laine, Nuottaniementie 3D 20, 02230 Espoo, Finland.

* KH7 callsigns have been appearing on the bands. These are Hawaiian amateurs issued with the new prefixes.

* The Danish QSL Bureau changed its address to: EDR QSL Bureau, Klokkestoeber Vej 11, DK-5230, Odense M, Denmark.

* To commemorate the transfer of sovereignty of Hong Kong from the United Kingdom to the Peoples Republic of China on 1 July 1997, Hong Kong amateurs are allowed to change the numeral in their callsign as follows: during 1996, VS96 or VR96; until 30 June 1997, VS97 or VR97; from 1 July to 31 December 1997, VR97; and during all of 1998, VR98.

* During the recent activity from Midway, the AH4/AH0W team logged 15,000 QSOs. QSL via KE7LZ.

* The ownership of *The DX Bulletin* and *DX Magazine* has changed hands. As from 23 August 1996, Chod Harris VP2ML, who was the editor-owner of the publications for the past 11 years or so, retired and the new publishers are Paul and Nancy Smith, AE4AP and KB4RGW respectively, who already produce the *GOLIST QSL Managers* list and the *DX Reporter*. We wish Paul and Nancy all the best of success in their new venture.

* The UK prefix system has undergone some changes. To help you to identify the various countries here is an update. England: G, GX, M, MX, 2E. Wales: GW, GC, MW, MC, 2W. Scotland: GM, GS, MM, MS, 2M. Northern Ireland: GI, GN, MI, MN, 2I. Isle of Man: GD, GT, MD, MT, 2D. Jersey: GJ, GH, MJ, MH, 2J. Guernsey: GU, GP, MU, MP, 2U. The M calls were started this year after the G calls were exhausted. The calls starting with the numeral 2 prefix are novice calls. UK Club stations are: MX, MT, MN, MH, MS, MP and MC. GB calls can be anywhere in the UK.

* UK prefixes according to licence types: G, GD, GI, GJ, GM, GU and GW indicate a full licence issued before 1 April 1996; GX, GT, GN, GS, GP and GC indicate Club stations issued before 1 April 1996; and M, MD, MI, MJ, MM, MU and MW indicate full licences issued after 1 April 1996 (at present all M full licences have 0 as the digit); MX, MT, MN, MH, MS, MP and MC indicate club stations issued after 1 April 1996; and GB indicates special event stations. A one by one call may be used in major contests. At present these are in the G6 and M6 series. The digit indicates the year so, in 1997, it will change to 7.

* Paul I1RBJ, famous for his past "Seborga" activities, is now active as LX2AA. He has a new address in Luxembourg and is not using his I1RBJ callbook address.

* Jack K7EHI is no longer the QSL manager for T32AF, T30A, T30BC and T32BC. Henry, the operator for T30A, T30BC and T32BC, has been a silent key since July 1993.

* Carl WB4ZNH reports that he has spoken to the Director General of Communications in Sana'a (Yemen) and was told that amateur radio is still not permitted there.

* Rolf XV7SW is a low band fan and a dedicated CW operator. He is using 1 kW power on fixed frequencies of 1827, 3506, 7007, 14016, 14021, 21016, 21019, 28016 and 28019 kHz. He cannot operate on the WARC bands and he does not own a microphone. He uses Drake equipment with a TL922 linear. On 40 metres he uses an inverted V, on 80 metres a ground-plane with four elevated radials, and on 160 metres an inverted L with three elevated radials. QSL bureau cards should be sent to his manager SM3CXS. Direct cards with one *"reasonably fresh green stamp (banks do not accept crumpled or dirty notes)"* to Rolf T Salme, Embassy of Sweden, Box 9, Hanoi, Vietnam.

* Gary NH2G will be moving to the Philippines soon. His QSL manager is WF5T.

* According to Rolf XV7SW, there are now only five licensed stations in Vietnam, 3W5FM, 3W5RS, 3W6AR, XV7SW and XV7TH. XV1A is a pirate.

* According to Paddy S79MAD, who will be in the Seychelles for another year, there is no QSL bureau on the island and QSLing should be direct to the QSL managers indicated by the operating station. The current licensed stations and their QSL information are: S79BBC, Annamalai, PO Box 96, Victoria; S79JBM, Joel, PO Box 156 Victoria; S79KMB, Keith, QSL via KN2N; S79MAD, Paddy, QSL via GW4WVO; S79NB, Keith, PO Box 448, Victoria or via G6LQL.

* There is a possible record here. W8RV received a QSL card from VS9AJM via W7KCN after 29 years of waiting. The prefix VS9A was used by the Aden Protecorate in 1967.

* Neil VK6NE, QSL manager for the VK9/VK0 QSL Bureau, wants to remind everybody that only the following five VK9 amateurs collect cards from the Bureau: VK9CB, VK9LA, VK9LH, VK9XN and VK9XX. Cards to all the other VK9 calls should be sent direct to the operator's home call or to the QSL managers indicated by them. None of the VK0 stations collect cards from the Bureau; all of them use QSL managers.

* The DXCC desk received 376 applications (27,400 QSLs) during July, and 655 applications (36,367 QSLs) during August, for the DXCC awards.

* Gioia Marconi Braga, Gugliemo Marconi's daughter, died in New York on 17 July at 80 years of age. Born in London she had studied in Italy. After marriage to G A Braga she settled in the US and worked for the NBC.

* For many months (for some of us for more than a year) no one has heard any activity from Mt Athos SV2/A. It came, therefore, as a total surprise when Monk Apollo appeared on the ANZA net on 28 September and made many VKs and ZLs happy by being their first contact with this very rare DXCC country.

* Jim VK9NS has reported that the Kenwood TS680 transceiver, the antenna rotator, the Cushcraft antenna and necessary cabling left Norfolk Island on 10 August and, after an adventurous journey, arrived in Delhi. However, Mani VU2JPS has not yet received the equipment. Hopefully the mystery will be solved by the time you read these lines and Mani will be on the air.

QSLs Received

KC6SD (24 m K7SSD); C91CB (1 m op); 7Q7RM (2 w G0IAS); 5N0MVE (3 m ON7LX); 9N1ARB (14 d KV5V); 3DA0MA (6 m DK8FS).

Thank You

Many thanks to my fellow amateurs whose assistance is always very much appreciated. Special thanks to VK2XH, VK2KFU, VK2TJF, VK4AAR, VK6NE, VK8AV, VK9NS, WIA L40370, ZL4MV, YJ8AA, ARRL DX Desk, *QRZ DX, The DX Bulletin, The DX News Sheet, The 425 DX News and GOLIST QSL Managers List.*

*PO Box 93, Dural NSW 2158

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Over to You - Members' Opinions

All letters from members will be considered for publication, but should be less than 300 words. The WIA accepts no responsibility for opinions expressed by correspondents.

Amateur Radio to the Rescue

I write this letter in the hope that it may encourage "would be" amateur operators and those amateurs who sometimes might feel that all is not what it should be in this low part of the sun spot cycle.

On 12 July I was involved in an SOS situation on 14.198 MHz at 0700 hrs. After finishing a QSO with a "W" station, I received an SOS call from a sail boat heading for Hawaii from Seattle, USA. He asked me if I could inform the coastguard of his position. Rick Jordan KB7NYN was aboard the "Pacific Adventurer" which was 300 nautical miles North of Hawaii and taking on water at 2000 gallons per hour.

I rang the police at Victor Harbour who asked me to stand by while they telephoned Canberra and gave them the relevant information. Canberra then rang Honolulu. At that time the skipper told me the bilge pumps were not keeping up and he was running an emergency pump. If the batteries gave up they would be in serious trouble. They had the life raft and all gear on deck just in case. At 0858 Honolulu came on frequency and also WA7MA in Alaska.

The Honolulu coastguard could not copy the boat on 20 m so I and the WA7 station had to relay between the boat and Honolulu. Honolulu then asked if he could QSY to 7.078 MHz. We did this but Honolulu could only work USB and the skipper could only work LSB, so that did not work.

We then went back to 14.198 MHz (the boat did not have a marine frequency). At 0930 she was still doing six knots and hoped to get to Lahaina Dock in three days!

We then arranged to keep in contact every hour, but I lost contact at 1030 UTC, maybe due to propagation or something worse. I hope not the latter.

So I would like to say to all those "would be" amateurs out there, this is much more than a hobby. It can and does help save lives. I know I helped; and it's about time the SMA gave us some credit for that when they put up our licence fees.

P J Ptolomey VK5LR
RMD 510
Parawa SA 5211

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Packet World

*Grant Willis VK5ZWI**

Introduction

One of the biggest problems many amateurs face is working out how to use all the different gadgets accessible on many packet radio networks. Last time I gave a brief introduction to the NET/ROM protocol and how general users can utilise the NET/ROM systems to connect from point A to point B. This month I will take a look at the ROSE networking system, which is commonly used in several states around Australia, and give some examples of how to use ROSE Switches to connect to different things, as well as what services are available from Rose switches.

ROSE – A Brief Overview

The ROSE packet radio protocol is simply a different way of passing packets from point A to point B via stations C, D, E, etc. It has some characteristics that are similar to NET/ROM in the way the packets are exchanged between repeaters; however, ROSE presents a different "user interface", or method for users to access the network. The other major difference is that ROSE uses the X.25 computer networking protocol between repeaters, where NET/ROM uses a proprietary protocol that is unique to NET/ROM.

As in a NET/ROM network, there are two main advantages to running a ROSE network. These are that you can automate how packets are switched from point A to B and thus remove the need for everyone using the system to know all the intermediate repeaters the packets flow through. ROSE also provides some reliability between repeater hops for the transmissions (as does NET/ROM) which is something that simple digipeating cannot do.

Unlike NET/ROM, training a ROSE network to know where all its repeaters are is not an automated process. ROSE switches are configured by people known as switch managers. These people pick which routes are the best for any particular destination based on the quality of the radio signal between the sites and on the speed of the interconnecting link. Alternate routes for use in the event of a switch breaking down can also be programmed in. This manual programming avoids problems that can arise in NET/ROM networks where false routes can be learned by the network during DX band openings. However, it does result in greater delays in opening new routes, as it relies on the switch managers manually reconfiguring the switches.

Example (1) - Getting Switch Information

```
cmd:C VK5RAD-3      <**
*** CONNECTED to VK5RAD-3
<Enter>             <**
-- VK5RAD-3 Rose Switch - 144.925 1200 baud - Crafers, Adelaide --

To use VK5RAD ROSE Switch disconnect and issue a connect command
like:

    C dest v VK5RAD-3,nnnnnn

Where  "dest" is the callsign of the station which you wish to
connect to, and the nnnnnn is the numerical address of the switch
used by the station to whom you wish to connect.

You may only use 1 normal DIGI to access the switch and one as you
leave the switch.

The Following Rose Switches are operational:-

VK5RAD-3  883390  Crafers/Adelaide             144.925 MHz
VK5RLH-3  888600  Lochiel/Central North        144.725 MHz
VK5RMN-3  886360  Pt Pirie/Mid North           147.575 MHz
VK5RAC-3  886840  Pt Lincoln/Lower Eyre        144.725 MHz
VK5RPM-3  887330  Millicent/South East        147.575 MHz

The Following Services be accessed using connect commands like:-
 (Replace VK5xxx-x with your local switch's callsign)

 C VK5WI v VK5xxx-x,883521     (Adelaide Central BBS)
 C VK5WI-2 v VK5xxx-x,883521   (Adelaide NET/ROM Gateway)
 C VK5ALE v VK5xxx-x,886821    (Pt Lincoln BBS)
 C VK5SU v VK5xxx-x,886331     (Pt Pirie BBS)
 C HEARD v VK5xxx-x,nnnnnn     (Rose Heard Lists)
 C USERS v VK5xxx-x,nnnnnn     (Rose User Lists)
 C INFO v VK5xxx-x,nnnnnn      (This Information Page)

(nnnnnn is the switch address where you want this information from)

You will now be disconnected. Reconnect to your required station
using a command similar to those shown above.
*** DISCONNECTED
```

How is a ROSE Switch Identified?

ROSE switches are given two forms of identification. The first type is their callsign, eg VK5RAD-3, VK2RPH-2, VK6RMS, etc. The second is an X.25 Network Address. This address is normally a six digit number and is assigned to the switch based on the local telephone network numbering system. Some examples of ROSE switch numbers are 883390 (for VK5RAD-3 in Adelaide) and 247600 (for VK2RPH in Sydney). The relationship to the telephone numbering system is given by these examples:

* Adelaide Phone Numbers in the Crafers area start with (08) 8339 xxxx which leads to ROSE switch number 883390.

* Sydney Phone Numbers in the Hornsby District start with (02) 476 xxxx which leads to ROSE switch number 247600.

Some ROSE network areas may be considering renumbering their network addresses in line with what is happening within the Australian telephone network. SA for example has already done this.

There is also an extension to the address when connections are crossing International boundaries. An extra part of the ROSE address is added, known as a DNIC. This is a four digit number which is unique to a country. Some Examples are "5050" for Australia, and "3100" for the USA.

How Do You Use a ROSE Switch Network?

ROSE networks are relatively easy to use once you have the address information for your local area. The combination of local switch callsign and remote network address identification systems must be used to

Example (2) Rose HEARD List Function display

```
cmd:C HEARD v VK5RAD-3,883390                    <**
*** CONNECTED to HEARD v VK5RAD-3, 883390
Call Being Setup
Call Complete to HEARD-0 @ 5050883390
ROSE X.25 Packet Switch Version 3.7 (951010.64K) by Thomas A. Moulton,
W2VY
VK5RAD-3 5050883390 Crafers, Adelaide - 144.925 1200 Baud
Heard List for VK5RAD-3  5050883390
                          Last    First (How long ago)
Port Station    Destination Heard   Heard  RXCnt FType Path
  0  VK5ZWI-1   HEARD       00:00  02:56     84  RR   VK5RAD-3,883390
  1  VK5RAD-5   VK5RAD-3     00:02  02:53   1311  RR
  0  VK5CS-2    ID          00:07  02:47     10  UI
  0  VK5BAD     VK5WI       00:17  02:36     56  UI   VK5RAD-3,883395
  0  VK5ADV-8   ID          00:28  00:57      4  UI
  0  VK5RQ      MAIL        00:34  01:34      6  UI
  0  VK5RQ-13   NODES       00:34  01:34      2  UI
  0  VK5KDW     VK5WI       00:40  02:13    113  UI   VK5RAD-3,883395
  0  VK5HJP-1   VK5WI       00:43  01:04     28  DM   VK5RAD-3,883521
  0  VK5CS      VK5HB       01:01  02:53    194  UA
  0  VK5BRS     VK5WI       01:11  01:11      1  UI   VK5YX

Type H to redisplay, * for ALL or B to Disconnect
HEARD @ 5050883390 >

EOT de HEARD @ 5050883390

*** Call Clearing *** 00F1  Remote Station cleared connection
```

specify where your packets enter and exit a ROSE network. For example, if I am in Adelaide on 144.925 MHz (the user frequency for the VK5RAD-3 ROSE switch) and I wanted to connect to someone in Port Pirie, I need to know that my local ROSE switch's callsign on 144.925 is "VK5RAD-3" and that the network address (based on the telephone numbering in Pt Pirie) is "886360". I then issue a connect command that looks like I am about to digipeat through two stations like: *C [callsign] Via VK5RAD-3,886360*

VK5RAD-3 will receive my connect request and answer it, and then proceed to make the rest of the connection steps required to reach the switch with address "886360". To add the DNIC number to a connect request when connecting to international destinations, the command looks like: *C [callsign] Via VK5RAD-3,3100,455632* (in the case of connecting to the USA). The Examples were recorded "off air" from the ROSE network in Adelaide. Commands typed into the switches are indicated with a "<**" mark.

Finding Out About Your Local ROSE Network

With ROSE Networks, it is often hard for someone who is new to an area to find out information about a local switch. To help newcomers learn about switch facilities, it is possible to simply connect to the ROSE switch callsign. Once connected, hit <Enter> and the switch should send a page of text giving details about its local area, addresses that are available etc (see Example 1). This is also the response received when the INFO function is activated on a Rose switch (which I will explain shortly).

ROSE Network Services

As shown in the switch information, Example (1), there are a number of services that a ROSE switch may provide (depending on what your local switch manager has configured). These services include a "HEARD" function (Example 2) which allows you to obtain a listing of all stations heard by the local switch. Also included is a "USERS" function (Example 3), which lists all the current users of a switch. The other most popular function is the "INFO" function, which is a way of obtaining the text as shown in Example (1) from any switch in the network. This INFO function is particularly useful for finding out more about a remote switch and the services offered in its local area.

All of these functions are accessible by replacing the callsign of the station with which you wish to connect, with the name of the function you wish to connect to as part of a ROSE connect command (see the command Examples (2) and (3)).

Making a Connection to a Remote Station

The command to make a connection via a ROSE switch looks like connecting through two digipeaters. However, the connections

Example (3) Rose Active USERS function display

```
cmd:C USERS v VK5RAD-3,883390                    <**
*** CONNECTED to USERS via VK5RAD-3, 883390
Call Being Setup
Call Complete to USERS-0 @ 5050883390
ROSE X.25 Packet Switch Version 3.7 (951010.64K) by Thomas A. Moulton,
W2VY
VK5RAD-3 5050883390 Crafers, Adelaide - 144.925 1200 Baud

User List for VK5RAD-3  5050883390
Memory Size is:  24820 Bytes
Memory Used is:   9021 Bytes
EFROM Checksum: E6h

0 AX25  User VK5ZWI-1    Connected to               USERS     @
5050883390
0 AX25  User FBB         Connected to  (TXUI)       VK5WI     @
5050883395
1 X.25 Trunk VK5RAD-5  1 5050883395      R1 Online
        TXUI VK5WI     @ 5050883395       1 P4 D1 > FBB       @
5050883390

There are no calls Pending.

Type U for new display or B to Disconnect.
USERS @ 5050883390 >

EOT de USERS @ 5050883390

*** Call Clearing *** 00F1  Remote Station cleared connection
*** DISCONNECTED
```

Example (4) - Connecting to a Remote Station

```
cmd:C VK5WI v VK5RAD-3,883521    <**
*** CONNECTED to VK5WI v VK5RAD-3,883521
Call Being Setup
Call Complete to VK5WI @ 5050883521
Welcome to the VK5WI Packet BBS, Adelaide's Central LAN BBS
Type ? for list of available commands.

This Packet BBS is Operated jointly by SAPUG & WIA(SA)

WIA(SA) Internet Web Site: http://www.vk5wia.ampr.org/

VK5WI BBS (A,B,C,D,E,F,G,H,I,J,K,L,N,O,R,S,T,U,V,W,X,Y) >
```

work far differently from what would normally occur when using digipeater stations. The steps the connection goes through are:

1. Once you have established what your local switch callsign is, and what the destination address is that you want to go to in the ROSE network (using the information obtained in Example (1)), you can issue a connect command from your packet station.

2. The switch will receive your connection request, and before the circuit is completed to your destination, your station will receive an acknowledgment and you will receive a connected message on your terminal. 3. Following step (2), you will receive a message saying "Call Being Setup". This message is sent to you by your local ROSE Switch. The connection to your destination is now being made.

4. Once the connection is complete, you will receive a message saying "Call Complete to [callsign] @ [remote address]". You are then in direct communication with your destination.

In Example (4), I connected to the local packet BBS station, fed from switch address "883521" via the VK5RAD-3 Packet Repeater. This one-step connection gives me direct access to the station I want to connect to. I am blissfully unaware that my packets travelled over a 4800 baud UHF link to reach VK5WI, nor do I get any indication of how many switches are between VK5RAD-3 and the switch addressed by "883521".

You can also add an extra digipeater on the input to a ROSE switch connection, and one on the output if you are not in direct range of a switch. This means that the following connections are possible:

C VK5SR v VK3RMV, VK5RPM-3, 887330
C VK3RPG-2 v VK5RPM-3,887330,VK3RMV
C VK6ABC v VK6RAA,VK6RAP-3,965540,VK6RPK

ROSE Network Messages

During the course of your connection, the ROSE switches will report any link errors that are detected. These error messages are sent to the user so that they know of the problem. Messages received can relate to radio paths failing, network congestion or errors that might occur when trying to set up the connections in the first place. Each error is reported with an error code, a description (if the INFO function has been enabled on your local switch) and the switch address number which reported the fault. Such information can be useful to diagnose problems in your connections. In Example (5) (extracted from the Rose System manual) I have listed all of the error codes and also the disconnect codes that may be reported by a ROSE switch network. For further information, contact your local ROSE Switch managers.

Linking via ROSE to Other Networks

ROSE repeaters allow you to connect to any other type of network repeater, BBS, node, wormhole or whatever. It is very easy to connect to, say, a NET/ROM node via a ROSE network, simply by linking to the NET/ROM node's callsign via a ROSE switch, just as if you had connected to a BBS or any other station. Likewise, it is possible to connect to other stations via a ROSE network when the first leg of your connection is carried over a NET/ROM network. In the NET/ROM case, the ROSE leg of the connection just looks like you are connecting via a couple of digipeater stations.

ROSE repeaters are also capable of carrying TCP/IP station traffic, and the later versions of ROSE which are capable of carrying packet "UI" (un-numbered information or beacon) frames make TCP/IP operations very easy, and add less overhead than transporting TCP/IP over something like NET/ROM. For information on how to use these advanced aspects of Rose, contact your local ROSE network manager or look around on your local packet BBS to see if they have a copy of the ROSE Network User Manual.

Example (5) - ROSE X.25 Packet Switch Messages

"* Disconnect *** nnnn"**

This message is sent when your connection to the other station is cleared. The four-digit number (nnnn) describes the reason for disconnection. For your convenience the following table is a list of the codes that are normally seen. The first two digits are only important to this table. If the local system manager has loaded the "INFO" application these messages will be followed by a text explanation.

X.25 Name	Value	Explanation
DTE Originated	0000	The other station disconnected
Number Busy	0100	The other station is busy
Congestion	0500	Retry Count Exceeded
Out of Order	0900	Network link not operating
Not Obtainable	0D00	No known path for address specified
Ship Absent	3900	No response from station

Appendix 3 contains a complete list of codes used by the ROSE X.25 Packet Switch.

"* Reset *** nnnn"**

This message is sent when a RECONNECT command was issued or the link went through a level 2 "Link Reset", to notify you that there may have been some data lost. For the complete list of X.25 Cause and Diagnostic codes see Appendix 3. If the local system manager has loaded the "INFO" application these messages will be followed by a text explanation.

X.25 Name	Value	Explanation
DTE_Orig	0092	The other user issued a REConnect
Congestion	0792	A Network Link issued a REConnect

Optimising Your Use of Rose Networks

One trick that I have found very helpful when using Rose networks is to modify your FRACK parameter in your own station. FRACK is the "Frame Acknowledgment time" parameter, which sets the time delay between sending a packet, and then retry the same packet following no response. Due to the delays your TNC will add, because it "thinks" it is working through two digipeaters when you access a Rose switch, retries become much slower. The solution to this is to reduce your FRACK time back to 1 or 2 seconds compared with more standard 4 to 5 seconds on direct hops. This ends up being effectively 3-6 seconds anyway because the TNCs add extra delays to account for the "digipeater hops" which are not actually there.

One point to remember, however, is when you finish using Rose repeaters, to reset your FRACK to normal, otherwise you will become very unpopular with other stations!

Conclusion

I hope this has helped some people with the basics of using a ROSE packet network. There are many more aspects of this protocol and the NET/ROM protocol that I could explain, but I have found that it is easier to learn more by exploring than reading! Hopefully, this month's column and the August column on NET/ROM have given people more of an idea of how to use some of the packet facilities available to them.

If you would like to find out more about the ROSE system, the Radio Amateur Teleprinter Society in the USA (the developers of ROSE) has an Internet World Wide Web site available at URL *http://www.rats.org/* which contains software, manuals and other documentation.

C/o GPO Box 1234, Adelaide SA 5001
Packet: VK5ZWI @ VK5TTY.#ADL.#SA.AUS.OC
Internet: gwillis@dove.mtx.net.au

ar

Pounding Brass

*Stephen P Smith VK2SPS**

The Bencher Paddle History, Mechanics and Adjustments

Bugs were all the rage for operators who sought to send at speeds greater than could be achieved with the simple hand key, but technology superseded them in the 1950s. These mechanical marvels were soon to be replaced by the paddle and electronic keyer circuits which were to revolutionise code sending speeds.

Keys of the time had a pivoted shaft held in bearings. Early paddle designs copied the vertical bug mechanical mechanism which was quite complex to adjust and took some time to master.

Then Joseph A Hills W8FYO from Ohio revolutionised paddle design. His radical design saw a single paddle mounted on a ring. This ring rested on two bearings which could be pivoted from side to side. The ring was pulled on to the two bearings by means of a spring. He called his design the "FYO Single Lever Paddle"

Hal Communications Corp changed Hill's design by splitting the ring into two halves. Each half was fitted with a lever, but this design was on the market for only two years, 1975 and 1976.

Other manufacturers followed suit, Teletek in 1975 and Bencher in 1977. Hamco incorporated magnetic tensioning into their dual lever models, the "Carson and Scotia" in 1978. Vibroplex bought out Hamco and re-designed the Scotia model and called it the "Blue Racer". Today only Vibroplex, with two models, and Bencher, with several models, keep the Joseph A Hill "FYO" design alive.

I will concentrate on the Bencher range. Bencher paddles are offered in two types, the **Iambic BY** series, which consists of four models BY-1 to BY-4, and the **non-Iambic ST** series, again consisting of four models. I will look at the BY dual lever range of paddles.

The mechanism is mounted on a solid steel base, the dimensions being 10 x 9.4 x 1.5 cm. Total weight of the paddle is 1.25 kg. Four finished options are available: BY-1 consists of a black base with a chrome mechanism; BY-2 has an all chrome base and mechanism; BY-3 has a black base with a gold plated mechanism; and the BY-4 deluxe model is completely gold plated.

Adjustments

Keyer lever tension adjustment is achieved by varying the length of a small screw 17 mm long attached to a spring on each of the split rings. The lightest touch, or minimum tension, is achieved with these screws all the way in, that is turning them clockwise. I measured lever tension at 56 gm. To increase tension, turn the screw anti-clockwise; fully out, the lever tension measured 152 gm.

The tool I use to set and adjust the lever tension is a Haldex model LMV1097, a 259 gram gauge, as used to measure spring tension in relays.

Next, adjust the contact gap, which is individually adjusted for each lever by the position of a 20 mm long contact screw which is fixed to a split vertical post. The contact screw is held in place by a small, 8 mm Allen key grub screw which, when tightened, draws in the top sections of the split vertical post together and prevents the contact screw from moving. The maximum amount of horizontal movement of the contact screw is about 4 mm. As mentioned last month, a good rule is to adjust the contact gap to about 1.0 – 1.5 mm, about the thickness of a business card.

The contact points are solid silver with a gold plating, requiring little or no cleaning under normal operating. After some months the contacts should be inspected and cleaned if necessary. Run a small business card through the contacts a number of times until clean. Under no circumstances use sandpaper or a file as this will remove the protective coating on the contacts.

Some Points to Look For

When I first purchased my BY-1 model, I found that the split vertical post had moved somewhat and that the contact screw face was not in line with the contact paddle bracket. To rectify this, I loosened the split vertical post screw underneath the base and moved the split vertical post either right or left until the contacts were aligned then re-tightened the screw (an easy adjustment).

Another problem encountered, similar to the one just mentioned, is when the contacts don't line up and are not flush with one another when the contact screw is adjusted all the way in (no gap); even moving the split vertical post small amounts right or left cannot rectify this problem. The contact paddle bracket must be bent to correct this error. Take care when bending that no damage to the rest of the mechanism happens. Use a pair of long nose pliers for this adjustment, one to hold the contact

paddle bracket steady and the other to do the bending.

Adjustments should be checked regularly, depending on how often you use the paddle. Springs should be replaced every few years. If you don't do much paddle operating, remove the tension from the springs. It only takes a few moments to adjust your paddle and get on air. I know of some operators who apply "lock tight" to all screws. This permanently sets the paddle; I don't recommend this to beginners.

At this stage I have not mentioned the position of the hand in relation to operating. I believe photographs speak better than a thousand words, and I'm in the process of preparing one for publication.

Price Range

The BY-2 standard black model sells for $151.00; the BY-2 chrome model for $187.00; and the BY-3 deluxe iambic gold paddle for $US250.00. If you are lucky you may be able to purchase a Bencher paddle from the *Amateur Radio* Hamads.

MFJ Enterprises have brought out their own model iambic paddle, model MFJ564, which has a chrome plated base with metal mechanism. At this time I have no further information about this model.

Next month, a look at the Index LAB QRP rig and a new NATO military key.

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Repeater Link

*Will McGhie VK6UU**

Tasmania Left Off the Map

In my last article relating to TACs and the poor response to FTAC material, I left VK7 off the list of TACs. I had copied the list from a FTAC list, that just happened to have left off VK7. I had the bad luck to find the only FTAC document that did not have VK7 on the list. My apologies to VK7. For the record the VK7 TAC representative is Tony VK7AX.

TACs On Packet

I have had considerable success in tracking down TACs on packet. At this time all but VK3 have been located on packet. If keeping in touch via packet proves successful, then perhaps FTAC will receive more feedback and all will be better informed, and decisions made in considerable less time.

10 Metre Gateways

During a lengthy phone call with John Martin, Chairman of FTAC, he confirmed that 10 metre Gateways are now permitted, as the band plan has been changed to accommodate them. At this point the band segment 29.1 to 29.3 is where Gateways can be located, as far as FTAC is concerned. As for the SMA, who knows?

It is suggested that only one frequency at this time be used for all Gateways in Australia, and 29.120 MHz is the possible frequency. It is also suggested that all Gateways be decode/encode, in/out. All Gateways require a CTCSS signal input to operate, and have the same CTCSS signal encoded on their transmissions. This should solve many problems on 29 MHz, and allow several Gateways to operate in Australia, all on the same frequency. All Gateways are to use different CTCSS tones, so no linking between gateways will occur, at least for the moment. Linking Gateways is the next hurdle with the SMA.

If you want to put a 29 MHz Gateway on air, what are your thoughts on 29.120 MHz? In order to co-ordinate their use, different CTCSS tones for each Gateway will have to be allocated, or first on first choice of CTCSS frequency. The next Gateway to use any CTCSS tone, other than those already in use. Sounds like a good idea. Note, the users will have to encode their 29 MHz transmissions. They will not have to install a decoder, however, and could monitor 29.120 MHz and hear any Gateway that propagation allows. If the user installs a CTCSS decoder, then selective monitoring can occur.

When putting your application into the SMA for a 29 MHz Gateway, include the information that it complies with the WIA band plan. Best of luck.

CAD Drawing

I have wanted for a long time to write about Computer Aided Drawing, CAD for short. Like most who have been involved in repeater development in Australia, I have spent many hours trying to make it all come together when it comes to putting a repeater on air. There is a constant renewal of amateurs involved in putting a repeater on air. Many of these amateurs struggle all over again, doing what has been done by many before, but where is all this past knowledge?

It, of course, resides in the ageing brains of amateurs, and little of this knowledge is accessible or recorded. Amateur radio is a technological hobby and as such is under constant change. Documenting our hobby and, in particular, voice and digital repeater systems, is important if the maximum is to be gained, without re-inventing the technology all over again, at the expense of real advancement.

For too many years my efforts in establishing repeaters were frustrated by my reluctance to spend the time to document the repeaters that were put into service. Circuits did not reflect accurately the repeater design. When a problem occurred with a given repeater, the lack of good circuits increased the difficulty in repairing or modifying the repeater.

However, faced with an ever increasing problem as the number of repeaters grew, there seemed little that could be done without a big sit down and commencing drawing with paper and pencil. I never liked or disliked drawing. It was just a chore that, at best, was never very satisfying or much fun. Then I took the plunge and bought a computer and my first CAD program.

Easy?

It might be worth saying that CAD is not easy, but it's not hard either. It is about as difficult to learn as a modem word processor. You don't have to know all there is in a CAD program to use it successfully. Just like a word processor, much of it remains a mystery and yet you use it all the time. If you are not into computers, then all I can say is you should be. One day you will be, so why not now? Computers are, at times, an endless source of frustration, but as they can do so many things there is no alternative to becoming involved.

Back to my beginnings with CAD. My first computer was an Amiga 500 and the CAD program I started with was Intro Cad, a very good CAD program. This program taught me what CAD is. The first effort was a simple one stage transistor amplifier, and it took eight hours to draw it, some 12 components. The main difficulty I had was how to join lines so they met perfectly. Try as I might, no matter how careful I was, they would never join seamlessly (is there such a word?). But rather than recount my lengthy introduction to CAD, some CAD fundamentals first.

Simple to Start?

Drawing circuits using CAD is about the simplest requirement that you can put a CAD program to. Most circuit drawings are two dimensional and the lines are at right angles to one another. Unlike many other forms of drawing, which require to be three dimensional, and have lines that are at all

sorts of angles to one another, circuit drawing is easy. It is important to mention that trying to describe CAD circuit drawing using words is not easy, or very effective. The best way is to watch someone do it. As we don't have this available, words will have to do.

How do you start a CAD drawing? You have booted up the program and there it sits on the computer screen, a blank piece of "paper". Blank is not quite true; most CAD programs have a single line border in landscape form, long side horizontal and short side vertical, a rectangle. This border contains the drawing space and prints out onto paper with your circuit. Most aspects of CAD programs can be configured. For a start the colour of the blank bordered screen. It can be any colour you like, but white with black lines, (the circuit) or black with white lines is the option most people use. So let's say we have a white screen with a black single line as a rectangular border around the outside.

A circuit, by and large, is made up of single straight lines of varying lengths, with the odd circle, arc and zig zag (resistor). To draw a line using CAD, you use the mouse to select line drawing from the pull-down menu, or icon. You then move the mouse to where you want the line to start and click the left button once. As you move the mouse to where you want the line to end, a line is drawn following the mouse. This line is not a freehand line; it is at all times a dynamic straight line from where you first clicked the mouse. As you move the mouse, the straight line grows in length. You decide where you want the line to end and click the left mouse button again. Then you have a perfectly straight line starting from where you wanted it to start, and ending where you wanted it to end. The line is clean with no smudges or imperfections.

Only Lines

Before we continue on, let's describe this line that has just been drawn. It is what is called a vector line. It has two sets of co-ordinates and is represented, for example as 1,2 – 4,2. This means the line starts at X=1, Y=2 and ends at X=4, Y=2. It is a straight horizontal line starting up from the bottom left corner of our rectangular border, two units (Y), and in from the left border one unit (X). The line ends three horizontal units along. The word vector means the computer defines the line as having, in our example, a length of three units with no width. Lines drawn using CAD vector based programs have no width. They appear on the screen as a thin line, and if you zoom in on the line, it maintains its width, ie the line does not get thicker. This is different from other types of drawing programs that are pixel based. As you zoom in on a line in one of those types of drawings, they become wider and you start to see the individual pixels.

Zoom

This brings us to the next useful aspect of CAD programs, the zoom function. Some of the FM828 drawings I have done on computer contain over 2,000 individual drawing elements. When such large and complex drawings are viewed on the computer screen, little detail can be discerned. The components are too small to view and the component text details cannot be read. The zoom function allows you to pick a portion of the drawing, by placing a box around it using the mouse, and displaying the magnified portion only on the computer screen. Now the individual components can be as big as you like. You only see a small portion of the overall drawing, but it is of a size that can be viewed, and worked on. Most of the drawing that is done on a computer is done in the zoomed-in situation. Fine circuit details are added or edited with only a few components filling the computer screen. And remember, the line thickness always remains the same. No matter how far you zoom in, the lines maintain the same thickness.

Just how far can you zoom in? The answer is a long way. So far that all you would see is a tiny part of a line, or two intersecting lines, filling the computer screen. Individual resistors can be viewed filling the whole computer screen. Not that this degree of magnification is needed, but it is possible.

Snap

Before going any further, the "snap" facility must be mentioned. As I commented earlier, my first attempt at CAD took a long time to do very little. I could have used a pencil and paper and drawn the simple circuit a hundred times over. What was missing, apart from CAD experience, was using snap. Snap allows lines to join perfectly. This is done by breaking the drawing area up into a grid of intersecting points. These intersecting points are called snap points. You define the grid size, this meaning how far apart the snap points are. Lines then can only begin and end at a snap point. The more fine detail you require to place on the drawing, the more snap points you require. The grid can be visible or not. With the grid off, the screen shows no evidence of snap or not, but as soon as you start to draw a line with the mouse, it only allows the line to start at one of these snap points. The big advantage is that any line that is drawn can have another line drawn to it, be it start, end, or any snap point along the line, perfectly. Lines now meet spot on and drawing a line to meet another is easier, as the computer only requires you to move the mouse to about where you require the line, and hit the mouse button. The computer draws the new line perfectly to the original line.

Starting

So how do we actually draw a circuit? If you have seen any computer drawn circuits, it is easy to wonder where do you start? It does require a degree of perspective in your own mind first and, most important, a decision on scale. Scale is what a given distance on the computer screen means in terms of distance. One centimetre on the screen can equal any real distance, for example one metre. With circuit drawing this is not particularly relevant. The scale often chosen is one to one. One centimetre on the computer screen equals one centimetre on the printed page. What is important is that a common scale is decided upon so all drawings are interchangeable with one another. If you want to import one drawing into another, all aspects match. This is even more important to maintain compatibility with drawings others produce.

Back to Starting

Back to starting a drawing. If the circuit has few components, then these components are drawn to roughly fill the drawing space. Hence symbols are drawn larger than in a circuit with many components. This brings in the subject of symbols. Symbols are pre-drawn drawings of things like transistors, resistors, etc. These symbols can be selected and placed anywhere into your drawing. The symbols can be sized to match your requirements. Simple drawings require the symbols to be larger. This is done on selection of the symbol, as you can scale the symbol up or down. The symbol, once placed on the screen, and with snap on, snaps to the nearest snap point, where you require the symbol to be. Now, when you draw a line to connect this symbol to the rest of the circuit, the lines all meet easily and perfectly.

Copy

Any object placed on the drawing screen can be copied. Symbols are put on the drawing space as a single object. If you want to move a symbol, all the component parts of the symbol (lines, circles, etc) move or copy as one. It is faster to copy an existing symbol already on the screen, than select the symbol from the symbol library again. Select copy from the menu or the copy icon, select the symbol that is already on the screen you wish to copy, and a copy is made that you can place where you want it. The process is fast and easy. Until you cancel the copy of the symbol, you can place as many copies as you like, one after another.

Copy Copy

While on the subject of copy, this is one of the most used commands. Many circuits have repetition in them. For example, a 10 input audio mixer with 10 input level controls, and associated components, all identical to one another. You simply draw the first one and then copy it so you end up with 10 inputs. Many times faster and neater than using pencil and paper. The mechanics of drawing to make up a circuit become very fast.

How Fast

One question often asked by people not familiar with CAD is, "Is it faster than using paper and pencil?" The answer is yes. Even designing a circuit from scratch, CAD is faster. I do all circuit design work using CAD now. You have a circuit idea and start drawing it on the computer. Circuit mistakes and design changes are easy on CAD. To remove or relocate a component is simple. Select the component, line, symbol, or whatever and delete it or move it. To describe the process would not do it justice. It is a case of a picture being worth a thousand words.

More About Symbols

Another question asked about CAD is, "Where do you get the symbols." The answer is, you draw them. I have looked at many symbol libraries and most I have found are not to the style we use. Non-technical people often draw symbols different from the way we like to see them. There are Australian standards on electronic symbols, and it is best to try and use these standards. However, it is up to personal taste as well. For instance, I prefer zig zag resistors to rectangles.

Drawing of symbols can be difficult. It often depends on the particular CAD program you use. I have used many CAD programs, from the very expensive, to the cheap shareware ones. Where the problem occurs is in the degree of options a particular program provides. Circuit drawing is one of the simplest types of drawings that can be done on computer. If you end up using a CAD program that gives you many options, most of which you don't require, the difficulty of using the program increases. For example, try making a symbol using AutoCad and then using Draft Choice.

For a start, AutoCad does not call a symbol a symbol. Symbols are called W Blocks. I have no idea why, but if at the first attempt to draw a symbol I have to fight with a new set of words, I start to dislike the program. It may do the program an injustice, but I like programs that are intuitive. If you want to make a symbol, select the make symbol icon and the program leads you through a simple, easy to understand, process.

Draft Choice

As the size of this article grows, I can see it could become larger than Ben Hur. What I hoped to do was to find out if there is any interest in CAD drawing for amateurs. An article to whet the appetite and, if I receive encouragement from you the reader, then more information could be provided.

This leads me to the "best CAD drawing program in the world." For all you CAD users out there, I'm sure that I have your attention. After years of trying many, Draft Choice (PC) is the best for circuit drawing. I have tried some really terrible CAD programs. They are slow, non-intuitive, difficult and, all in all, a waste of time. Draft Choice is cheap (the number one amateur requirement) as it is shareware. You can obtain a copy for nothing. If you like it and use it, then register it.

To list some more likes about Draft Choice. It is DOS based, and will run on any DOS based computer. It is fast, even on the old 286. It is mouse and/or key board driven. It is in 16 colours, unless you are using a very early computer. Draft Choice's biggest plus is that it is easy and intuitive to use. There is a Windows version as well, but I find the DOS version better.

Growing

As your library of circuits grows, you find parts of one circuit are just what you require in the new circuit you are drawing. Rather than re-draw this part of the circuit, it can be imported from one circuit into another. No re-drawing; just place it in the new circuit under construction and add the new circuit around it. Fast and fun.

Fun

This brings me to the best part of CAD. It is fun to do. Circuit updates are fun and easy to do. The latest modification to your repeater can be added to the existing CAD circuit easily. The result looks good. I find it no longer a chore to put updates onto the circuit.

Available

Another big plus with CAD is that it is transportable. Being a computer file it is easy to send anywhere in the world, be it on computer disk, packet, the Internet, or e-mail, the list goes on. And, when it gets to the destination, it can be easily modified, and the modification sent back to you for your reference. Just in case you are wondering, all CAD circuits can be printed out. Once the drawing is on the computer screen, printing it is only a button push away.

Interchangeability

Big word, big problem. Can a CAD drawing done using a given program be loaded into a different CAD program? The answer is yes, but; and it is a big but! Compatibility is not a strong point with CAD or, for that matter, any computer program. All CAD drawing programs like to save drawings in their own format. Format is simply the way a file is written. A bit like writing a document in French or English. The same information but different language.

There are import/export functions in most CAD programs. The drawing you have can be saved to another file format. There are a couple of "universal" file formats, DXF being one of them. By and large this works fairly well, but not always. Your drawing might import into another CAD program, but the text may be in a different font, or arcs (part circles) drawn 180 degrees rotated. The solutions can be easy or hard.

The real solution to interchangeability

problems is to all use the same CAD program. A difficult result to achieve. As you know my choice is Draft Choice.

Much More

This article has only scratched the surface of CAD for circuit drawing. Topics not covered, for example, are rotating objects, drawing lines using Ortho, breaking lines, layers (very useful), etc; the list is very long.

It is a lot of fun once the fundamentals have been mastered. The benefits are many and, in particular, enable a free, easy exchange of circuits between amateurs. If you want to know more about CAD drawing, I may add more to this article. Perhaps you found the article difficult to understand and it requires a different presentation. All this aside, if you require a copy of Draft Choice Version 2 for review, along with some circuit examples, I can send you a copy on disk, or via E mail. The program size is about 360 kB.

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VK6UU @ VK6BBR

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Education Notes

Brenda M Edmonds VK3KT Federal Education Coordinator*

A couple of months ago I gave notice that work was proceeding to update the Regulations Examination papers to take into account the recent changes to licence conditions. This has entailed considerable liaison with the SMA over proposed questions, and some consideration of the draft Regulations Question Bank.

Unfortunately, an unforeseen health problem has held this work up for several weeks, and so has postponed the introduction of the updated papers.

However, I am assured that the SMA has continued work on the revision of the brochures RIBs 70, 71 and 72 and that new versions will be available shortly, possibly by the end of the year. It will be convenient if both the new brochures and revised examination papers can be introduced at the same time.

Part of the revision has included a close look at the theory syllabuses (I have mentioned this previously) and preparation of a Regulations syllabus. These will be included in the revised RIB 70.

Be assured that plenty of notice will be given via this magazine, Divisional broadcasts, and notes to examiners before changes are made to the current Regulations Bank.

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VHF/UHF – An Expanding World

*Eric Jamieson VK5LP**

All times are UTC.

Activity on 24 GHz

David VK5KK reports: *Winter has not been the most ideal time to experiment with 24 GHz due to the high absorption rate of 80% plus humidity or 100% humidity, ie, rain or fog means absorption of 3 dB per km!*

On 8/9/96 at 0801, VK5DK/p and VK5KK (QTHR) established what is thought to be the first two way VK5 contact on 24.150 GHz over a path distance of approximately 1 km. Signals 5x9++. Equipment identical each end using 40 mW Gunn diode transmitters with 100 MHz wideband FM IFs into small horn feeds with approximately 13 dBd gain.

Further experiments on 10/9 between VK5NC/p and VK5DK/p established contact over 5.5 km, with work now being carried out on higher gain antennas to extend the range to cope with the less than ideal "damp" conditions.

Six Metres

Virtually no six metre activity has been reported to me this month; everything of importance appears to be occurring in the northern hemisphere.

John VK4FNQ said he heard Joe VK4JH working VK2EU at 0254 on 20/8, so it's been relatively quiet even in North Queensland.

Internet Six News

The *"On-Line" Six Metre Magazine* prepared by **Geoff GJ4ICD** is provided to me by John VK4FNQ. Thanks John.

1/8: After a long delay the V51 beacon is back on air, following a rebuild by GJ4ICD. It runs at 60 watts to a 5/8 vertical, V51VHF callsign, locator JG87, 50.018 MHz. Reports to V51DM, Derek Moore, PO Box 22951, Windhoek, Namibia, or e-mail *dpbm@iwwn.com.na*

2/8: 50 MHz DX Challenge Result. Congratulations to Jose EH7KW and KB5IUA on winning the 1996 50 MHz Challenge at 8057 km. The prizes of Infra-Red Communications Headphones will be posted to both soon ... now its the turn of VK/ZL/ZS stations in December/January. *[What about some specific details please Geoff so that I might better inform the VKs ... de VK5LP.]*

4/8: Good opening in Europe: 5B, SV, Z3, UX, 9H, EH, IT9, OZ, CT, YU, 9A, I, DL, HB9, PA and F were all worked/heard from the UK (14 countries). Both double hop and single hop was observed.

5/8: News from Japan de JA1VOK: JA0GLM (PM97) worked VK6JJ (OF88) near Perth on 50.112 CW with RST 539 at 0529 on 4 August in suddenly improved conditions for south. "I found the QSO by scatter and quickly called VK6JJ after the QSO, but no response was received". BV was heard by scatter beaming 200 degrees. JD1BJP and VR2ZXY were open as well as very strong 9M 48.24/48.25 video. Has autumn TEP come?

5/8: Another good day in Europe and 27th Transatlantic opening for summer. Today's highlight was KP4EIT working UK and PA. Lots of other single hop stuff through the day in Europe, including CU7BC. Frank PA3BFM also worked KP4; G to OH, CT, F, EH7, I; EI to GJ and DL; GM to GJ ... most of the day. At 2010 KITOL reported CT video.

7/8: VK Es opening, double hop in winter ... de VK3OT: Opening from here (VK3) to Eric FK8GM in New Caledonia. Interesting because no one can remember ever getting a double hop that way in July before; he was quite weak and we had a path to VK4 at the same time.

7/8: Another great day in August! Plenty of single hop in Europe once again, G to SP, YU, 9A, YO and ES in the morning, plus Bob WA1OUB copied 48 MHz EA video at 1020 which is quite early, especially in August. GM to Italy in the afternoon; Emil W3EP also reported video in all morning at his location. JL4GTO worked HL1LTC via Es today at 0300. CT0WW in for two hours at GJ4ICD. GI6ATZ also repotted OM and Italy showing how widespread the event was. Also EA to CU7 was reported early evening.

10/8: 1930 to 2100: Bo OX3LX worked G, GI, GM, GW, DJ, F, PA, ON, SP, OK ... 27 QSOs into Europe. 1941 HI0VHF into GJ weak, the first time we have ever heard it in Europe!

11/8: Big European opening today and

#30 Transatlantic opening! Single hop started very early between G and most of Europe. Superb conditions to JX, TF at GJ4ICD, worked JX7DFA for country #157 and GJ first, grid #673 and new major grid #76. Also worked TF3T/HP93 for 71st country in 1996 and #674 grid ... de GJ4ICD.

12/8: USA to Europe #31 opening: W1/2 worked I, CT, EH and VE1RAA worked IK8MKK from 1840 (nice haul). Also Steve W2CAP/1 had 65 QSOs and worked HB0. Stations heard in G/GJ were W1/2/3/4. Certainly a big opening for August lasting over two hours. Bob WA1OUB had 50 QSOs and best DX from FN43 was I8KRO in JM88 at 7125 km. What a year!

13/8: Another widespread European Es opening and Transatlantic #32: CT0WW/b into EM95 at 1350, EH into USA again and G, etc into W1/2/3. CT3 and EH8 to USA.

17/8: Yet another opening across the pond, #35! 2306: VE1PZ worked EH1YV. Also single hop most of the day in Europe.

It is quite incredible the number of double hop Es contacts between Europe and North America during the northern summer. Their August contacts are equivalent to VK doing the same in February, which normally would be rare on such a scale. Our lack of countries to the east and west make it difficult for us to even approach the European efforts.

The contact at 0529 on 4/8 (mentioned above) between JA0GLM and VK6JJ near Perth on 50.112 at 539 is interesting but not unusual as the equinox often brings TEP contacts.

The following reports came via *Internet/UKSMG/JA1VOK FIVENINE Magazine:*

Yvon FR1GZ on Reunion Island is expected to be active on six metres running 10 watts to a five element Yagi. *[FR1GZ was reported in the August notes as the station to have heard the Bunbury beacon VK6RBU on 144.560 MHz in June. Based on the multi-hop Es contacts made this year in the northern hemisphere, the distance of around 6000 km from Perth should not be beyond expectations for a six metre contact ... VK5LP].*

During the recent expedition to Georgia as 4L6PA, by Tjerry PB0ANX, Willem PD0OHW, Pim PA0TLX, Kees PA3EQK and Allard PE1NWL, over 500 contacts were made with 47 countries on six metres including:

16/6: 4X6UJ 0410, SV1UN 0917, CT3FT 1014, YO7VS/p 1029, LZ2HM 1043.

18/6: SV1SIX/b 0900, SV1AHX 0900, SV5/DL8SET, JA6QGG 0944, JA6IMJ, JA5GJN/4, JK6PAC heard, PA3DWD 1757, DK2PR 1757, PE1LCH, PA0COR.

19/6: SV1UN 0619, 4Z5JA, 4Z5DB, S59A 1747.

20/6: VS6XMT 0619, JR6HI, JR6VSP, SV1EN, SV1DH, SV1AHP, 9A2DI 0810, ER5OK 0945, IK0FTA 1134, Z32FC 1134, SP3UCA 1247, OM3PC 1318, YU1EU 1935.

21/6: GJ4ICD 1204, G4JCC 0932.

22/6: RA3YO 1002, HA8BE 1154, SM7AED 1223, ON9FCB 1354, EW1AA 1432.

23/6: UX0FF 0646, OZ1IEP 0721, OK9NI 0739, F5JKK 0745, GW0GEI 0805, EH1DDU 0914, 9H5EE 1227, OH3NLP 1627, LA8WF 1652, OE6BMG 1659.

25/6: EA6/OK1GW, HB9DBM 1923 and 27/6: 9K2CA 0900.

The above shows the spread of contacts and the ease with which so many countries can be worked in a few days with a well organised DXpedition surrounded by a mass of countries. The operators of 4L6PA donated a TS-690 to Omari 4LO plus a five element Yagi which is mounted four metres above Omari's roof.

Arctic Beacons

The following beacons have been set up to investigate the trans-polar paths: JW7SIX 50.047, JQ88; JX7DFA 50.079, IQ50; LA7SIX 50.051, JP99; OH9SIX 50.067, KP36; OX3VHF 50.045, GP60; TF3SIX 50.057, HP94; and VE8BY 50.048, FP53.

Trans-polar paths have already been observed:

20/5/96 G3HBR copied JW7SIX/b 579 between 2119 and 2132 at 3030 km; OZ4VV copied VE8BY/b between 2105 and 2130 at a distance of 4305 km.

25/5: VE8BY/b into SM3BIU between 2048 and 2052.

27/5: VE8BY/b into SM4POB 2025 to 2050.

No satisfactory QSOs have yet occurred, but the distances are considerably shorter than those over the Antarctic from Australia to South America, which is also the subject of scrutiny.

High Power Permits

The provision of written permits for the use of high power on 50 MHz appears to be a thing of the past, in the light of a letter from the SMA to Steve VK3OT, who had requested a renewal of his high power permit for 50.0 to 50.105 MHz EME tests.

The SMA advised that: *Many apparatus licences (including amateur) are now covered by a Technical Licence Specification (TLS) which specifies many things including permitted frequency bands and transmitter output power. The amateur TLS now prevents the SMA from approving high power operation or operation outside of amateur bands by means of a letter of authority. Approval for any operation outside the parameters set down in the TLS would now have to be granted by means of a separate Scientific Assigned licence.*

As you may be aware, the segment 45 to 52 MHz is designated primarily for broadcasting purposes and the SMA can only issue licences in this spectrum if approval from the Australian Broadcasting Authority is obtained. The ABA have advised the SMA that they do not agree to high power operation in this segment due to the high likelihood of interference to Channel 0 television operation.

I am therefore unable to accede to your request to approve operation at a power level greater than 100 watts in the segment

VK2ALU's 3.7 metre 10 GHz EME dish in its operating position at the front of VK2ALU's QTH during a 10 GHz EME test with G3WDG. The dish is looking towards the western horizon window with G3WDG.

50.0 to 50.105 MHz. I will also be writing to the Wireless Institute of Australia in regard to this matter. (Signed) Fred Gengaron, Manager, Technical Services, Customer Services Group, 6 September 1996.

In order to continue to preserve our use of 50 MHz, it behoves everyone to operate strictly within the terms of their licence and the power levels that are permitted, particularly in those areas which are designated for Channel 0 coverage.

If by any chance you are not conforming to the rules, then your selfish actions may lead to everyone losing that "magic" portion of six metres, 50.0 to 50.150 MHz in particular, which gives us a chance to operate in the same segment as other countries with 50 MHz privileges. I appeal to everyone, please play the game as it should be played and accept your responsibilities towards your fellow operators.

Please remember that another solar cycle peak is approaching and with it the many long distance contacts which are possible via F2 propagation. Let us be there when the time comes – it's up to everyone!

Ten Gigahertz EME

I refer to my mention last month that, on 18 August 1996 at 0950, **Lyle Patison VK2ALU** contacted **Charlie Suckling G3WDG** on 10 GHz EME over a path of 17,000.4 km which, as far as is known, is a new world record for 10 GHz. Also, this was the first Australia to UK 10 GHz EME contact, the first Australasia to Europe 10 GHz EME contact, and the first SHF contact between those areas. On the same day at 1015 Lyle also worked Petra Suckling G4KGC, wife of Charlie Suckling.

The promised further details are as follows. VK2ALU gave G3WDG an "O" report and received an "M" report which later was changed to "O" as the 25 minute test proceeded. The moon was rising over the UK, commencing with the moon at about four degrees elevation and finishing at approximately eight degrees, thus G3WDG's antenna side lobes would have been seeing some ground noise at the lower elevations.

It took only 7.5 minutes for VK2ALU and G3WDG to complete the required procedure for a valid contact, with "O" copy both ways, leaving five minutes to spare in the common window period.

Weather conditions have a much greater effect on 10 GHz path loss when very low elevation angles are used. VK2ALU reported rain scatter effects on G3WDG's signal from showers in the Wollongong area though it was fine at G3WDG.

As a matter of interest, a previous attempt between these stations was disrupted by rain scatter in a thunderstorm on the path near G3WDG.

Another view of VK2ALU's EME dish, showing the trailer on which it is mounted and several of the four levelling jacks which are bolted to concrete plinths set below ground level once the trailer is positioned for a test.

With the moon closer to apogee than perigee during this test, and the other losses associated with the lower elevation angle, the total path loss was probably over 290 dB.

Both stations used linear (vertical) polarisation and a spatial polarisation shift of approximately 20 degrees was involved, causing a further degradation of some 0.3 dB.

Equipment

VK2ALU – A 3.7 metre Andrew dish of low sidelobe design, with Gregorian sub-reflector and substitute pyramidal feed-horn; 25 watt TWT and a G3WDG004 HEMT preamp.

G3WDG – A three metre Andrew dish with 10.7 – 11.7 GHz feed; 2 x 20 watt TWTs (40 watts combined) and a G3WDG004 HEMT preamp.

Both stations used moon noise to provide accurate tracking and VK2ALU had the added facility of an auto-track system during the 2.5 minute transmit periods (a "home-made" system.)

VK2ALU's 3.7 metre dish had to be mounted on a trailer to allow it to be moved to a position on his property to take advantage of the one and only very restricted take-off towards the west, trees completely blocking anything below approximately 30 – 45 degree elevation at all other places! The trailer mount is a permanent facility, being purpose built with welding assistance from Mike Keech VK2DFK.

Two or three members of the Illawarra Amateur Radio Society assist at test times, placing the dish trailer in position so it can be hitched to the front of the car for guiding into position, setting up levelling jacks on concrete pads which are on either side of the front driveway. After the tests they assist in placing the dish as far from public scrutiny as possible!

The position of the dish is about 25 metres from the EME operations area at the rear of the garage, with remote control via some 60 cores and three coaxial cables.

One of those present (on 18/8 it was Bob Maughan VK2CRM) acts as second operator and his job is to operate the azimuth and elevation buttons on the control unit during the 2.5 minute receive periods in order to maintain moon noise at a maximum (dish pointed accurately at the moon, within 0.1 degrees). The auto tracking unit then takes over during the intervening 2.5 minutes transmit period. The half-power beam width of the dish is less than 0.6 degrees!

Lyle is grateful for the assistance provided by the local amateurs plus that from amateurs both in Australia and overseas who have provided various specialised bits and pieces and helped with their knowledge in the EME field and construction of microwave equipment. Several non-amateurs have also been very helpful.

In summing up, EME work is never for the faint-hearted and even more so when undertaken at 10 GHz. Copies of the confirmation QSLs from G3WDG and G4KGC have been provided with the information. Good work Lyle.

The UK and Europe

Ted Collins G4UPS in his August report says that Tony Selmes has returned to Oman for another two year tour and is active on the bands using his old callsign of A45ZN. While he awaits an experimental licence for the six and 30 metre bands, he operates from a friend's yacht using the callsign ZS1D/mm. Locator is LL84. Hopefully he will still be there when F2 returns.

Ted has asked that it be made known that Tony's QSL Manager is G4UPS, 27 Parklands, Hemyock, Cullompton, Devon EX15 3RY, UK.

From 5 to 17 August Ted took a short holiday and operated as G4UPS/p from a caravan site three miles west of Evesham IO92, using a TS-680S and a 25 watt linear to a two element HB9CV antenna at 18 feet. He maintained his daily skeds with SM7AED and G3CCH, which generally were at good strength.

It is of significance to note that throughout August, both from his home and holiday site,

that no mention is made of hearing or working stations from North America.

That the summer Es was waning is shown by the following countries worked. 9H, CT, D, EH, G, GW, HB, I, IS0, LA, OE, OH, OK, OZ, PA, S53, SM, SV, YO, YU, Z32, ZB. I suppose 22 countries is not a bad effort for an "off-month!"

North America

Emil Pocock W3EP writes in *The World Above 50 MHz* in *QST* that: Jimmy Treybig W6JKV and Mike Staal K6MYC operated as V47KV and V47YC from St Kitts (FK87) from 1 to 9 July, with big power on six metres and an EME station on two metres. They logged 700 stations on 50 MHz, 150 of which were with Europeans. Amongst their longest QSOs were those to the Pacific Northwest in the 6000 km range, comparable to many of their European contacts! N7DB worked V47KV after 1430 on 2 July at 6300 km for one of the longest reported QSOs. On 144 MHz, the pair logged 90 EME stations, starting with W5UN, KB8RQ and KN6M, and including 20 Americans in all. They also made two metre sporadic-E contacts in the US southeast.

Conclusion

November should see increased Es activity throughout the Australian and Pacific regions, mostly on six metres but also two metres. Operators are again reminded to keep 50.110 MHz clear for possible contacts beyond VK and certainly not for VK to VK, VK to ZL and ZL to ZL.

Please keep me informed of your contacts so an overall picture of the degree of activity may be apparent. Packet messages addressed directly to me appear to get through, but general information relating to VHF and six metres seems to become lost in the system most of the time. I am still waiting to have my e-mail up and running!

Closing with two thoughts for the month:

1. Where does the family start? It starts with a young man falling in love with a girl – no superior alternative has yet been found, (Winston Churchill), and

2. Sometimes the best helping hand you can get is a good, firm push.

73 from The Voice by the Lake.
**PO Box 169, Meningie SA 5264*
Fax: (085) 751 043
Packet: VK5LP@VK5WI.#ADL.#SA.AUS.OC
ar

Spotlight on SWLing

*Robin L Harwood VK7RH**

In last month's column I referred to a crisis that had erupted following the movement of Iraqi troops into the Kurdish regions, close to the Iranian and Turkish borders. This region was regarded as a safe haven for the thousands of refugees fleeing Saddam following the Gulf War in 1991.To protect these Kurdish refugees and the Shiite minority in southern Iraq, the victorious allies imposed two no-fly zones at opposite ends of Iraq and enforced it. Resulting from the Iraqi troops moving into Irbil and other Kurdish towns, the Americans increased the two no-fly regions, the southern being extended into the suburbs of Bagdad, the Iraqi capital. Saddam also ordered his troops to defy the no-fly restrictions, which led to the Americans briefly raiding several small aerial command centres in the south.

The Iraqi troops eventually pulled back as they had made an agreement with one of the Kurdish factions, fighting against an Iranian backed militia. The Kurds were expecting material support from the Allies in the form of aerial support yet this did not eventuate because of differences amongst them. The Americans had also been trying to mediate between the two Kurdish factions without success and not surprisingly did not intervene militarily after the Iraqi-backed faction gained control of the region.

As mentioned last month, there was an increase in broadcasting to the region at the height of this crisis, which has decreased since other events have now taken centre stage. The clandestine operation of one of the unsuccessful Kurdish factions has also disappeared from within the safe haven region. It was in the 60 metre tropical allocation and was easily heard as far away as Sri Lanka, but Iraq still does not possess a shortwave sender capable of broadcasting well beyond the region.

However, the major troop movements, including that of the USAF to the Gulf, was easily logged on HF. 11175 kHz is a primary HF channel for worldwide communications by the American Defense Department and is a good barometer to what is happening. It is never quiet.

On 30 September, several HF radiotelegraph stations ceased operating. The German coastal stations at Elmshorn, Norddeich and Kiel closed at 1800z. Sadly, we will no longer hear DAM, DAN or DAL on CW. The HF radio telephony station at Norddeich will also be QRT as from 31 December. Also, the HF coastal stations, VCS in Halifax, Nova Scotia and PCJ at Curacao, Netherlands Antilles are no longer operational. Another mode which is rapidly disappearing is RADFAX.

The Russian Meteofax network suddenly disappeared in mid-September and the US Coastguard has notified users that the HF FAX service will shortly disappear. Australia's AXM on 5100 and 11030 kHz from Melbourne via Belconnen is still there, as is AXD Darwin on 10555 and 18060 kHz.

"Radio Free Asia", a stablemate of Radio Free Europe/Liberty, commenced on 29 September at 2300z. The broadcasts come from Washington but they were not giving away what channels, or from where they were broadcasting, until just before they commenced operations. However, it now is apparent that they are using sites in the former Soviet union, adjacent to the PRC, as well as leasing the Monitor Radio International site in Saipan. At 1500z they are on 7495 and 9430 kHz, whilst at 2330z they are on 6205, 7495 and 11825 kHz. Initially programming will be in standard Chinese (Putonghua) but I expect other dialects such as Cantonese and Hakka will shortly be added. I believe that this new clandestine will also be in Korean and the various languages of Myanmar (Burma). Vietnamese and Khmer will also be added later. I personally have not heard it yet but expect it will soon attract the jammers.

On 27 October, the BBC closed down a long standing frequency. I have been listening on 15070 kHz for over 40 years and I am informed that it goes back further to the forerunner of the BBC World Service, the famous Empire station in the mid-twenties. Apparently there have been complaints to the BBC from other European administrations wishing it to adhere to the broadcasting plan and cease operations on non-standard allocations. I believe that 15575 kHz is where the Beeb has gone to from 15070, yet signals are not as strong there compared to 15070.

Did you hear Radio St Helena on 26 October? This is one of the rarest and difficult DX catches, as it only operates once every two years. With the current Solar cycle minimum, it was difficult to hear it. I will have more news on that in the December issue. Until then the best of 73 and good listening!

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ar

Ionospheric Update

*Evan Jarman VK3ANI**

Solar Activity

Solar activity was at low to very low levels during the last quarter. For a fortnight (14-27 July) the observatory at Culgoora reported that the solar disc was without spots. The solar flux on 18 July was 64.9, which is below the theoretical minimum. When the earth's orbit was adjusted from the normal elliptical to the theoretical circular path the solar flux value returned to 67.0, the theoretical minimum.

There were three solar flares in July, the largest being a class X2.6 flare from 0905 till 0915 UTC on 9 July. This is the first X-class event reported by the IPS since November 1992. The others were M-class events about a day each side of the X flare.

Ionospheric Activity

The greatest deviations in ionospheric activity during the quarter occurred in Darwin. Activity was depressed in the early UTC day by approximately 30% for most days. Some days, like 26 September, were volatile when activity was enhanced by 30% (0100 to 0400 UTC), then depressed by 30% (0400 to 0800 UTC), then enhanced by greater than 30% (1500 to 1700 UTC). Hobart also had some deviation from predicted values with 15% to 30% depression but on far fewer days than Darwin. Hobart also had some spread F and sporadic E activity reported during local evening hours.

The graph of ionospheric indices for the quarter shows that activity continued to decline. The monthly average of observed T index values being the best indicator.

Geomagnetic Activity

Geomagnetic activity was quiet to unsettled for the first two months of the quarter. Activity rose late in August and again during September to active and minor storm levels. This has continued into October. The plot of the Learmonth A index best demonstrates this activity.

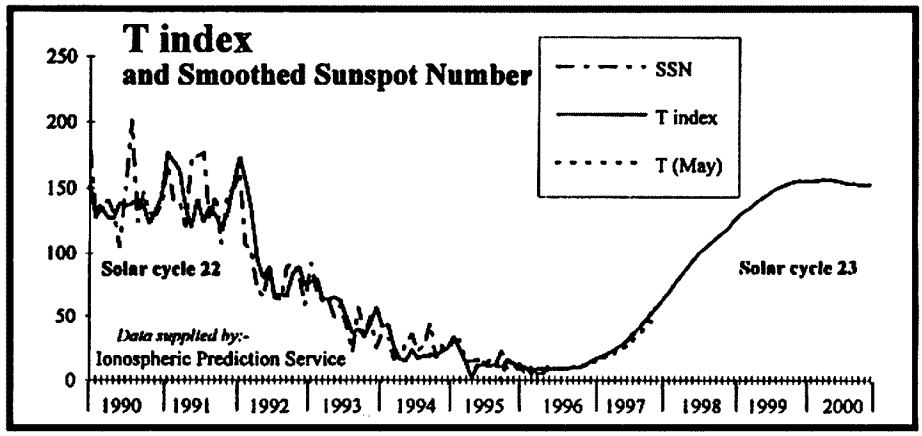
T Index

The Ionospheric Prediction service revised the T index values twice during the last quarter. The predicted values now run to the year 2000, the next predicted maximum in the solar cycle. The accompanying graphs demonstrate the expected trend. The previously published values (*Amateur Radio* May 1996 page 47) are included for comparison. They appear as a dotted line (T May) where they differ. The smoothed monthly sunspot number (SSN) is also graphed to demonstrate that undefinable correlation between the two indices.

Status of the Solar Cycle

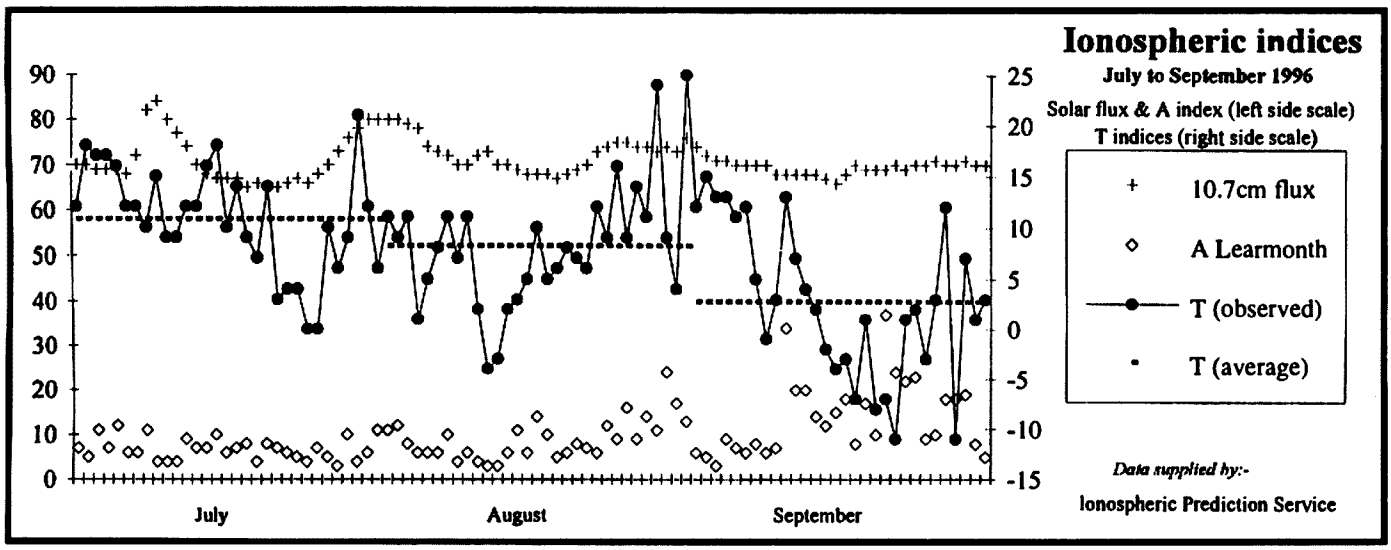
The Ionospheric Prediction Service issued this update during September, quoted in full:

We are now close to the beginning of a new solar cycle. For HF communications this means that the frequencies available for circuits are at their minimum; for geophysical exploration it is a period of "quiet" conditions with very few disturbances.



As the new cycle gets under way during 1997 the frequencies available to HF circuits will increase, as will the number of disruptions arising from events such as solar flares and disturbances to the ionosphere.

Solar cycles vary greatly in amplitude; recent cycles have been large but earlier cycles were of smaller size. IPS predictions for the coming solar cycle indicate that it will be a large cycle comparable with the last one. The cycle should reach its peak at a sunspot number of around 165 in the year 2000.



For HF communications this will mean a wider spectrum of frequencies available for communications but more frequent disturbances. Conditions in 2000 should be very similar to those experienced in 1989-1992.

ASAPS V3.0

The Ionospheric Prediction Service has revised its Advanced Stand Alone Prediction System (ASAPS). The program, version 3.0, is now also Windows compatible (Microsoft Windows 3.1 or later). It is anticipated that from January 1997, the HF predictions will be prepared using ASAPS V3.00.

**C/o PO Box 2175, Caulfield Junction VIC 3161*

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WIA MORSE PRACTICE TRANSMISSIONS

VK2BWI	Nightly at 2000 local on 3550 kHz
VK2RCW	Continuous on 3699 kHz and 144.950 MHz 5 wpm, 8 wpm, 12 wpm
VK3COD	Nightly (weekdays) at 1030 UTC on 28.340 MHz and 147.425 MHz
VK3RCW	Continuous on 145.650 MHz, 5 wpm, 10 wpm
VK4WIT	Monday at 0930 UTC on 3535 kHz
VK4WCH	Wednesday at 1000 UTC on 3535 kHz
VK4AV	Thursday at 0930 UTC on 3535 kHz
VK4WIS	Sunday at 0930 UTC on 3535 kHz
VK5AWI	Nightly at 2030 local on 3550 kHz
VK5RCW	Continuous on 144.975 MHz, 5 wpm to 12 wpm
VK6RCW	Continuous on 147.375 MHz, 4 wpm to 11 wpm
VK6WIA	Nightly at 1930 local on 146.700 MHz and nightly (except Saturday) at 1200 UTC on 3.555 MHz

Don't buy stolen equipment - check the serial number against the WIA Stolen Equipment Register first

Stolen Equipment

The following equipment has been reported stolen. If you have any information that may lead to the recovery of the equipment, please get in touch with the advised contact as soon as practicable.

Make:	Kenwood
Model:	TR-2500
Serial Number:	3080575
Type:	2 metre handheld
Accessories:	Mobile mount and speaker/mic
Stolen from:	Coolangatta QLD
Date:	29 March 1995
Owner:	Steve VK2KFJ
Contact details:	VK2KFJ QTHR, or Coolangatta police

Make:	Alinco
Model:	DR-590T
Serial Number:	0001880
Type:	2 m/70 cm mobile
Accessories:	Frayed microphone cable
Stolen from:	Coolangatta QLD
Date:	29 March 1995
Owner:	Steve VK2KFJ
Contact details:	VK2KFJ QTHR, or Coolangatta police

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Silent Keys

Due to space demands obituaries should be no longer than 200 words.

The WIA regrets to announce the recent passing of:-

O (Oswald)	THOMSON	L30859
AH (Alf)	WASS	VK2AHW
K C	OLDROYD	VK2BOC
K J	DRAPER	VK2VVV
F J (Fred)	HOUSE	VK3ARK
R (Richard)	GOSLIN	VK3SV
H W (Harold)	FRENCH	VK3ZRM
G O	MILLARD	VK6GK

Richard Goslin VK3SV

Richard Goslin died in Box Hill Hospital on 7 September 1996 at the age of 83 years.

Dick had wide interests, including cinematography in which he made some significant 8 mm films. His documentary of the filming of some of the scenes of "On the Beach" is in the State Film Archives. Dick's father was the founder of the Hawthorn City Band and Dick had a love of music and took pleasure in making tapes for his friends.

Radio was his life-long interest which he followed from the 1920s. In a busy life it was only when he saw retirement approaching that he devoted the time necessary to obtain an amateur licence. The first Novice licence in Victoria was issued on 20 August 1976 to Dick with the callsign VK3NAY. He commenced operation the same day with a home brew transceiver. He upgraded to his full call VK3SV on 17 January 1978.

Dick was one of those who manned the WIA Victorian Division office during the period it was in Brunswick Street, Fitzroy and he met many amateurs there.

Dick will be well remembered for many lively QSOs in which his keen mind and brilliant memory kept us all on our toes.

Ellis Pottage VK3FG

Vernin Jones VK3YE

Vernin Jones, VK3YE sadly passed away on August 28. Vernin taught Morse code for the Navy during the Second World War and conducted a class for the Victorian Division.

Aged 83, he was active on CW and an ardent builder of equipment until he relinquished his licence last year.

WIA Victoria extends condolences to Vernin's wife, Melva and to his daughter Lorraine.

Barry Wilton VK3XV

Stan Portwood VK4BZO

Stan VK4BZO became a Silent Key on 12 July. Licensed only a few years ago, Stan quickly made numerous overseas friends via amateur radio. As a result he travelled overseas both to Europe and Japan. In Europe he attended FIREC (amateurs involved with railways) Convention.

Stan was only three weeks into his retirement after 39 years service with the railways.

Ron Graham VK4BRG

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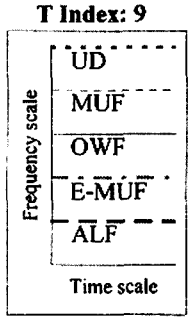
HF Predictions

Evan Jarman VK3ANI

T Index: 9



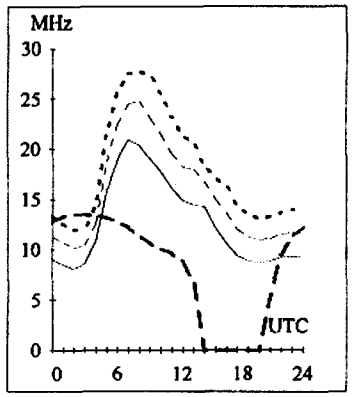
These graphs show the predicted diurnal variation in key frequencies for the nominated circuits. They also indicate a possibility of communication (percentage).

The frequencies identified in the legend are:-

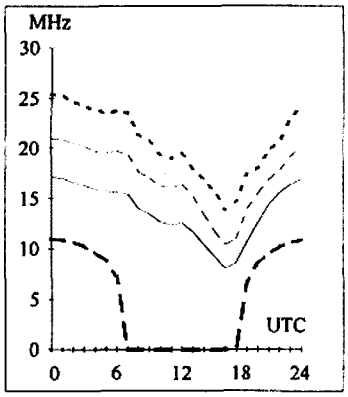
- Upper Decile (10%)
- Maximum Useable Frequency (50%)
- E layer MUF
- Optimum Working Frequency (90%)
- Absorption Limiting Frequency

The predictions were made by one of the Ionospheric Prediction Service Stand Alone Prediction Systems. The T index used is shown above the legend. The Australian terminal azimuth (degrees), path length (kilometres) and propagation modes are also given for each circuit. ar

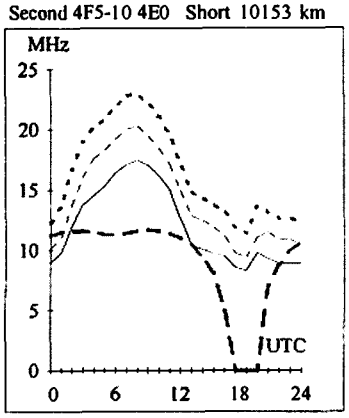
Adelaide-Amsterdam 313
First F 0-5 Short 15908 km



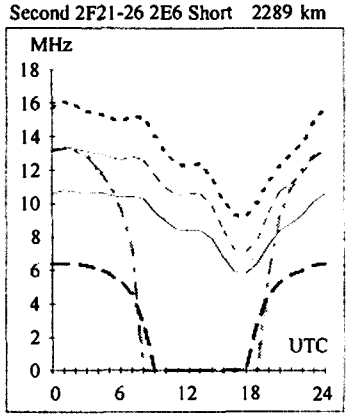
Brisbane-Auckland 123
First 1F7-10 1E0 Short 2289 km



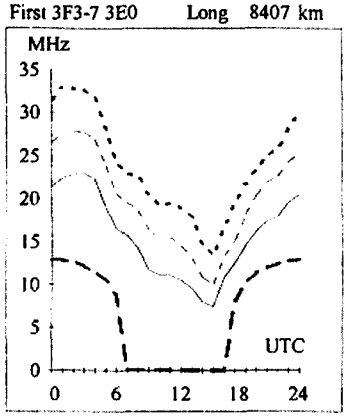
Adelaide-Capetown 226
Second 4F5-10 4E0 Short 10153 km



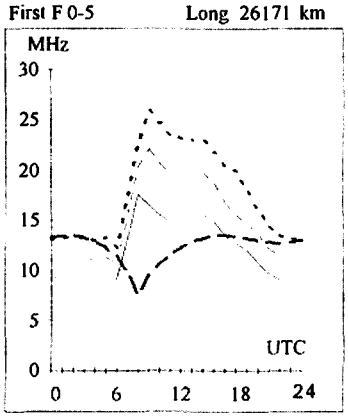
Brisbane-Auckland 123
Second 2F21-26 2E6 Short 2289 km



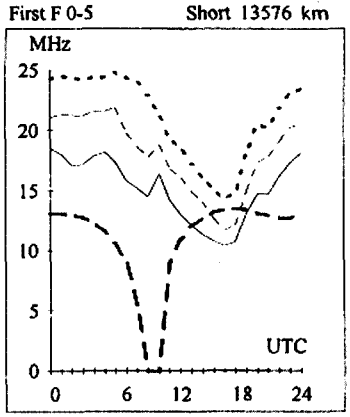
Canberra-Honolulu 50
First 3F3-7 3E0 Long 8407 km



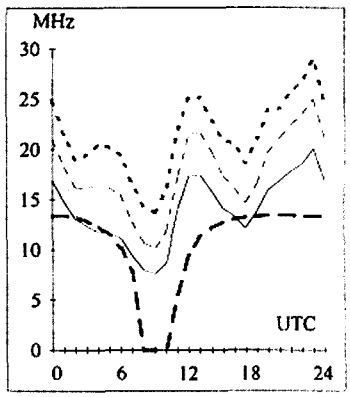
Darwin-London 145
First F 0-5 Long 26171 km



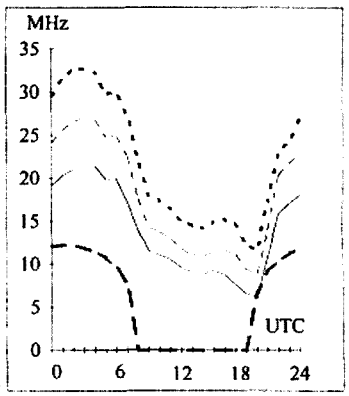
Adelaide-Lima 138
First F 0-5 Short 13576 km



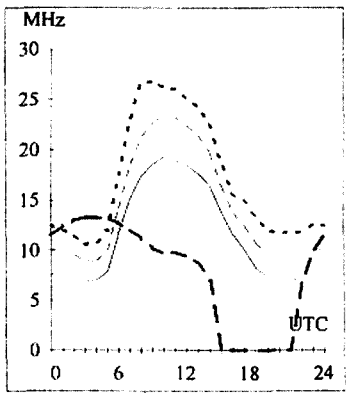
Brisbane-Barbados 109
First F 0-5 Short 16280 km



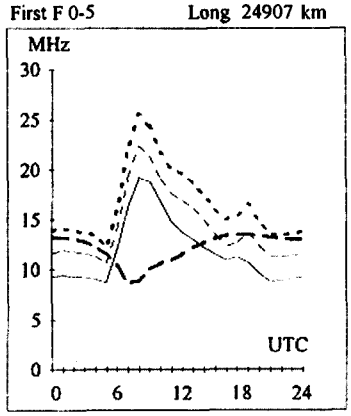
Canberra-Tokyo 352
Second 3F4-7 3E0 Short 7948 km



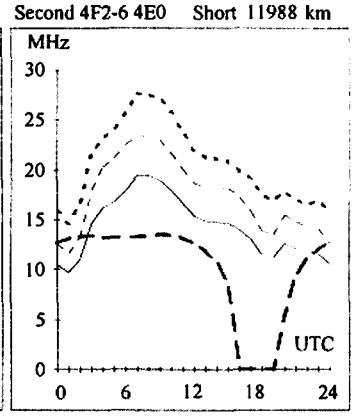
Darwin-London 325
First F 0-5 Short 13853 km



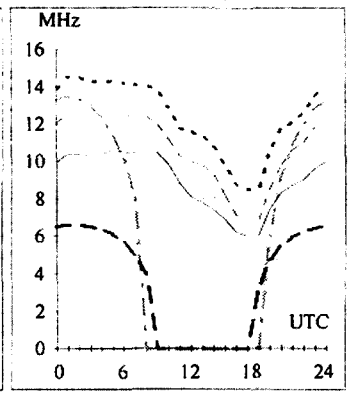
Adelaide-Vienna 126
First F 0-5 Long 24907 km



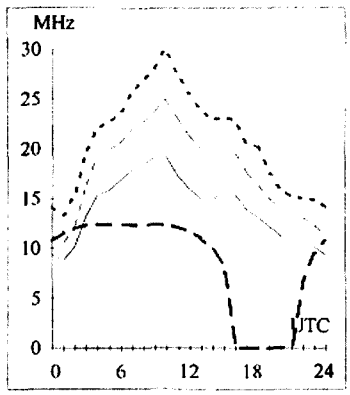
Brisbane-Harare 238
Second 4F2-6 4E0 Short 11988 km



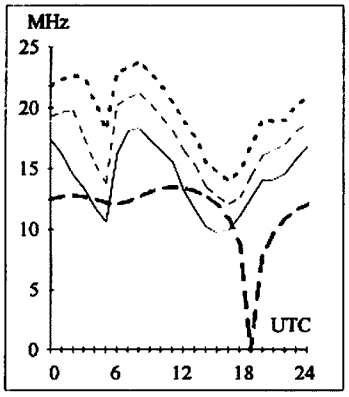
Canberra-Wellington 115
Second 2F20-27 2E6 Short 2324 km



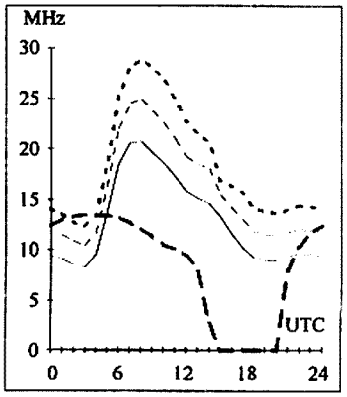
Darwin-Pretoria 242
Second 4F4-7 4E0 Short 10639 km



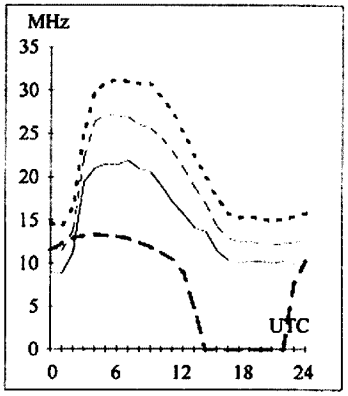
Hobart-Dakar 209
First F 0-5 Short 16556 km



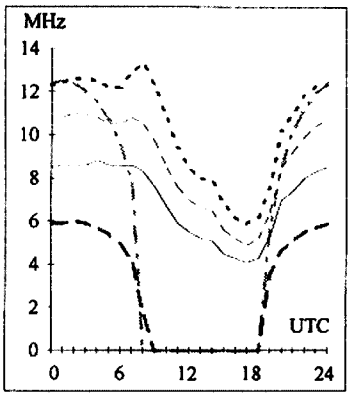
Melbourne-Berlin 310
First F 0-5 Short 15973 km



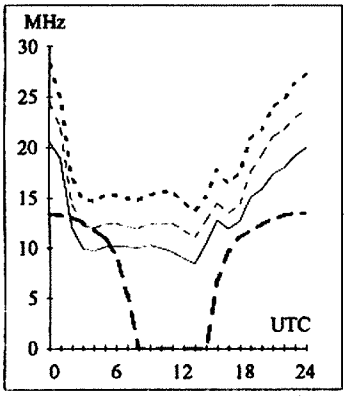
Perth-Ankara 308
Second 4F2-6 4E0 Short 11684 km



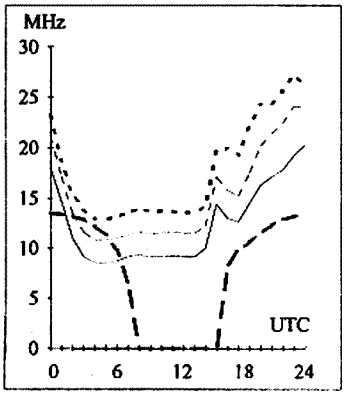
Sydney-Christchurch 127
Second 2F22-29 2E7 Short 2147 km



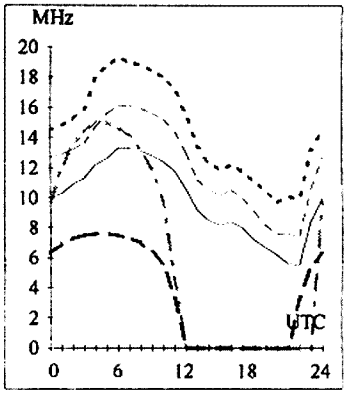
Hobart-San Francisco 61
First F 0-5 Short 12764 km



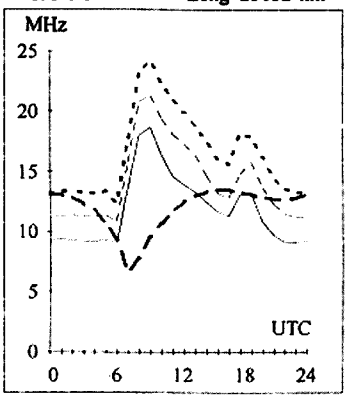
Melbourne-Calgary 49
First F 0-5 Short 13879 km



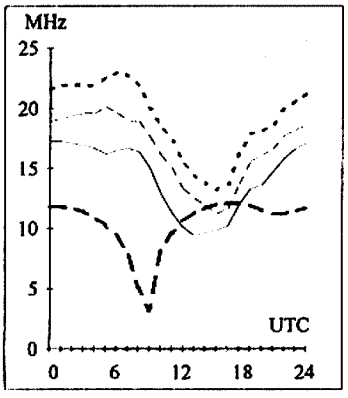
Perth-Kuala Lumpar 336
Second 3F16-25 3E4 Short 4179 km



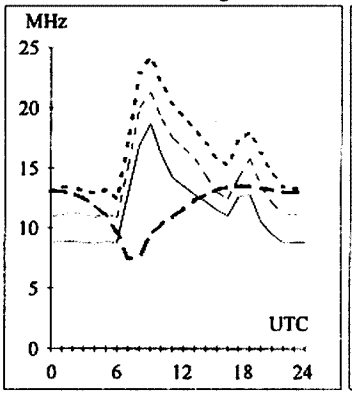
Sydney-London 139
First F 0-5 Long 23032 km



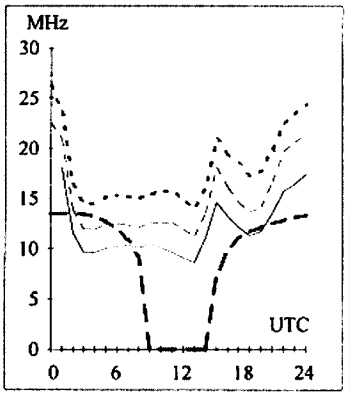
Hobart-Santiago 149
Second 4F4-7 4E0 Short 10687 km



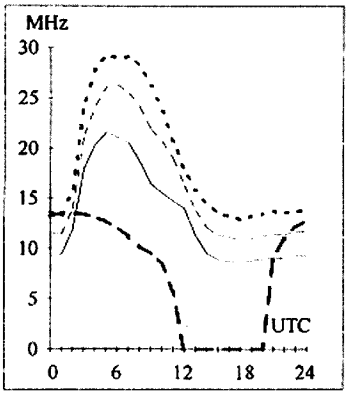
Melbourne-Paris 125
First F 0-5 Long 23232 km



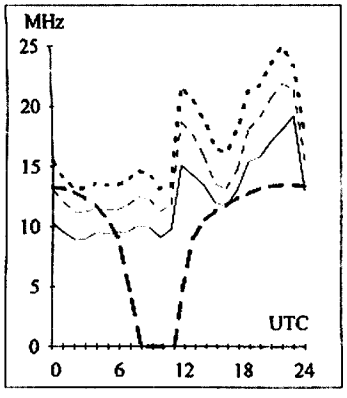
Perth-Los Angeles 72
First F 0-5 Short 15020 km



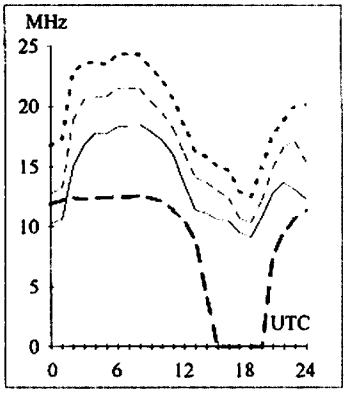
Sydney-Moscow 317
First F 0-5 Short 14494 km



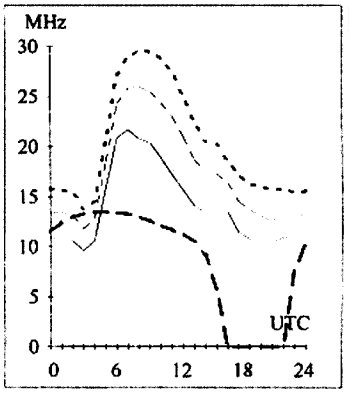
Hobart-New York 80
First F 0-5 Short 16610 km



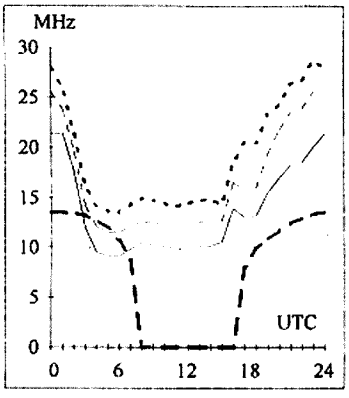
Melbourne-Zanzibar 255
Second 4F4-7 4E0 Short 10952 km



Perth-Madrid 298
First F 0-5 Short 14612 km



Sydney-Seattle 47
First F 0-5 Short 12470 km



HAMADS

TRADE ADS

• **AMIDON FERROMAGNETIC CORES:** For all RF applications. Send business size SASE for data/price to RJ & US Imports, PO Box 431, Kiama NSW 2533 (no enquiries at office please ... 14 Boanyo Ave Kiama). Agencies at: Geoff Wood Electronics, Sydney: Webb Electronics, Albury: Assoc TV Service, Hobart: Truscotts Electronic World, Melbourne and Mildura: Alpha Tango Products, Perth: Haven Electronics, Nowra: and WIA Equipment Supplies, Adelaide.

• **WEATHER FAX programs** for IBM XT/ATs *** "RADFAX2" $35.00, is a high resolution shortwave weatherfax, Morse and RTTY receiving program. Suitable for CGA, EGA, VGA and Hercules cards (state which). Needs SSB HF radio and RADFAX decoder. *** "SATFAX" $45.00, is a NOAA, Meteor and GMS weather satellite picture receiving program. Needs EGA or VGA & WEATHER FAX PC card, + 137 MHz Receiver. *** "MAXISAT" $75.00 is similar to SATFAX but needs 2 MB of expanded memory (EMS 3.6 or 4.0) and 1024 x 768 SVGA card. All programs are on 5.25" or 3.5" disks (state which) plus documentation, add $3.00 postage. ONLY from M Delahuntly, 42 Villiers St, New Farm QLD 4005. Ph (07) 358 2785.

• **HAM LOG v.3.1** – Acclaimed internationally as the best IBM logging program. Review samples....AR: "Recommend it to anyone"; The Canadian Amateur: "Beyond this reviewer's ability to do it justice. I cannot find anything to improve on. A breakthrough of computer technology". ARA: "Brilliant". Simple to use with full help, the professional HAM LOG is immensely popular (now in its 5th year), with many useful, superb features. Just $59 (+ $5 P & P), with a 90 page manual. Special 5 hour Internet offer. Demos, brochures available. Robin Gandevia VK2VN (02) 369 2008 BH fax (02) 369 3069. Internet address rhg@ozemail.com.au.

• **HAM RADIO SOFTWARE** – WJ20 Logging Program $NZ76.95*; Super DX Edge, a program to improve DX performance $NZ35.60* (*includes postage to Aust). Check out our web page at *http://www.netlink.co.nz/~maxsys* or send for brochures. All major credit cards accepted. Murray ZL2IQ, Maxsys Corp Ltd, PO Box 31-227, Lower Hutt, NZ. Phone/fax: +64 4 565 1250, e-mail: *maxsys@netlink.co.nz.*

FOR SALE NSW

Yaesu FT726 2 m & 70 cm all mode rig; **Icom IC761** HF all mode with internal auto ATU, desk mike, internal power supply; **Yaesu FT680R** all mode 6 m mobile; **FC700** manual ATU; **Icom IC730** HF rig, mike, etc; **Emotator 501XX** rotator; **Kenpro KR400** rotator new bearings and pot. All in excellent condition and working order. Clive VK2UTS QTHR (064) 54 6263.

Power Supply **VK Powermaster**, new condition, 13.8 V 15 amps cont, 20 A peak, $100. Gordon VK2AVT QTHR (02) 9580 4325.

KDK 2025A/E Mark II 2 m FM txcvr, s/n 1026, 25 W, large dig display, memories, manual; **AZDEN PCS 300** 2 m HH, s/n 14602, 3 W, LCD, 8 memories, bat charger, c/case, manual. Both rigs exc cond. $240 each, ono. Ben VK2DLB QTHR (02) 9623 4032.

Yaesu FT209RH 2 m handheld, new battery, case, YH2 headset with VOX, vgc, s/n 180658, $290 ono; **Alinco ALX2T** 2 m handheld s/n 31073328 new battery fitted, charging cradle, $180 ono. Bruno VK2BPO QTHR (02) 9713 1831.

FC707 Ant Tuner in exc cond, $150. Casey VK2CWS QTHR (02) 9520 4424.

Yaesu FT990, ec, s/n 1L090231, all optional filters, ATU, desk mike MD1C8, original packing, $2,350. Ian VK2UG (043) 92 1234. Not QTHR.

Hy-gain DB 10, 15 metre 3 element beam in vgc, $195 ono; **Hustler** mobile antenna 3.5/7/14/21/28 resonators, all in excellent condition, $185 ono; **Kenpro KR500** elevation rotator, side mounting hardware, $375 ono; **Sharp PC1246** pocket computer c/w tape recorder and printer c/w satellite program, all manuals, etc vgc, $145 ono. Art VK2AS (02) 9416 7784.

Satellite Equipment, dishes, receivers, LNC, C & KY band from $20 to $350. Terry VK2XAS (02) 9724 9770 after 7pm.

Yaesu FT290R 2 m all mode, cradle, s/n 2M220349, $390; **Uniden 100XL** scanner, s/n 95000592, $185; **2 m/10 m Rx converter**, $45; **Gecol** 2 m H/H, s/n 000051, $175; **Electrophone TX474** UHF CB H/H, s/n 508410, $250; **Tandy M100** plus disc drive, $190. Randall VK2EFA (080) 87 5285.

Yaesu FT101E HF transceiver, AC/DC leads, CW filter, s/n 8H351750, manual, spare pair finals, gc, $475; **Yaesu YD-844** desk mike, $40. Gordon VK2AJI QTHR (044) 76 2436.

Philips RF power amplifier type AM17, 100 watt linear, 250 watt class C, 70-175 MHz, as new, $325; **Hewlett Packard** power meter **431B** with 478A head, $375; **Distortion analyzer** model **332A**, 5 Hz to 600 kHz, as new, $275. Peter VK2CPK (02) 9605 4799.

Kenwood TS930S, good condition, no mods, just back from Kenwood service original packing, manuals, hand mic, $1,200 ono; **Katsumi iambic elect keyer**, $100; **Drake low pass filter**, $50; **Hustler 5BTV** vertical, $150; **MC60** mic, $60. All ono. Fred VK2DHC QTHR (02) 9913 7712.

Free printer; 2 off 32 ft **lattice masts** with 2 1/2" pipe extensions; **Daiwa rotator; TH6DXX** antenna; **Hustler** 5 band vertical ant; 3 **band vertical** ant; **CB vertical** ant; **G-Whip** mobile ant; Trio Ant tuner **AT130** for mobile Tx; **Datong FL2** (QRM) filter; 6 ft transmitters; Two linears, monitor, swr/power meter, switches and jacks; **FT-One; FT-901DM;** Deluxe CB Tx. Due to bad health everything must be sold, no matter now cheaply. What offers? Gordon VK2DGS (02) 9416 1329.

FOR SALE VIC

Philips radiogram LA-RONDE model RF6/01 working order excellent condition, $250; **Marconi signal generator** TF1446/4 working order, very heavy, suit museum/collector, $200; **AR 1970-1990**, mostly complete years, sundry other, 73, etc. Free. You collect the lot, no foraging. VK3WW QTHR (054) 33 3654, 1800-1900.

Development system Oztechnics, **68HCO5 micro-controllers**. Does circuit emulation, $300; Development system for Phillips 87C750/751/752 micro- controllers, does in-circuit emulation, $50. Russell VK3KRS, 8/62 Wellington Rd, Clayton Vic 3168.

Icom AH2a HF auto antenna tuner, suits IC735, with OPC137 cable adaptor to IC751 or IC745, new in carton, $600. Brian VK3KQB QTHR (054) 53 1300.

IBM Compat 286 computer, EGA colour, 20 Mb HDD, 5.25 & 3.5 FDDs, 640 k ram, keyboard and monitor, includes Baycom packet modem and much comms and other software. Just add a Tx/Rx to be a goer on packet, $250 ono; 13.6 volt 20 amps continuous **heavy duty power supply**, $250 ono. Harold VK3AFQ QTHR (03) 9596 2414.

ICOM IC725 HF all band transceiver, very good condition, $1,100 ono. Bill VK3WK QTHR (055) 61 1376.

ATN 13-30-8 8 element log periodic antenna, 13-30 MHz, complete with all parts and accessories inc balun, manual, vgc, $500. Bruce VK3WL (052) 82 2664 AH, (03) 9480 0111 BH or mobile (018) 67 6199.

Icom IC736 HF/50 MHz transceiver, mint condition, with orig packaging, accessories, etc and service manual, $2,900. Adam VK3ALM (03) 9794 7873 or (015) 36 2799.

Yaesu Linear amp **FL2100B** and manual, $600; Emtron antenna tuner **EAT1000A**, $275; **Kenwood TS680S**, $900; **Power supply PS50**, $250 (can't separate); **Dummy Load**, $50; **Hy-gain 204BA**, $150; **Daiwa power meter**, $65. Ken VK3TL (03) 9728 5350.

Cushcraft R5 multiband vertical antenna 10, 12, 15, 17, 20 metres, 5 years old, as new condition, $350 ono. Ralph VK3KDD QTHR (051) 76 2431, packet VK3KDD@VK3BVP.

FOR SALE QLD

Yaesu FT411 2 metre handheld, s/n 9L162577, vgc, refurbished battery pack, 5/8 antenna, DC converter, $350 or swap similar age 2 metre mobile rig. David (07) 3802 0662.

FOR SALE SA

Yaesu FL7000 linear, s/n 8M180088, needs new power transistors and tuner card, lots good parts, incl 48 V 25 A power supply or could be repaired, $1,000 ono. VK5RI QTHR (08) 8893 4001.

FOR SALE WA

Icom IC-W2A extended Rx with BP-90 battery pack. s/n 02121. $650. Renzo VK6ZAQ (09) 453 3054 or email renzo@acslink.net.au.

FOR SALE TAS

Sangean ATS808, $200; **45 memory shortwave receiver**, keypad entry, clock, alarms, antenna socket, never used since new. Phil VK7PU (03) 6431 3020.

Bencher low pass filter 1.5 kW, 1.8-30 MHz, $65. Andrew VK7AAA (03) 6229 6334.

WANTED NSW

AM17A VHF amplifier **circuit diagram or manual** all expenses paid etc. Ray VK2FW QTHR (063) 65 3140.

Info required on 150 MHz aerial diplexer made by Nippon Electric Co, model MPS-F-135-A. Tx 147.6-149.4, Rx 152.8-154.6. I would like to convert unit to a 144-148 band pass filter if this is possible. Art VK2AS QHTR (02) 9416 7784.

Mecrograph or McDonald pendograph or any unusual Australian keys or semi- autos, pay top dollar for any of the above. Steve VK2SPS (02) 9999 2933 after 6pm.

T1154 parts for restoration, front valve cover (panel), aerial, earth, microphone, HT, plugs. Bathtub Morse key, microphone, mounting rack. Power supply. R1155 loop aerial, and valve shields. Ray VK2ZON QTHR (02) 9489 8561.

WANTED VIC

Yaesu FL-100B MKI copy of manual or any circuit details. All costs met. Peter VK3DU QTHR (03) 9489 1385.

Yaesu YC601 digital readout suit FT101. Maurice VK3AZB QTHR (03) 9890 8038.

Ham M rotator. Hal VK3AVH QTHR (059) 84 3897.

WANTED TAS

TVR 7000 TV and FM unit for Icom R7000. Martin L70067 (03) 6331 8705.

Army VHF RF power amplifier units, type AM-4306GRC. Require several units, any condition. Trevor Briggs VK7TB, (03) 6398 2118 after 6pm or mail info to 9 Norfolk St, Perth Tas 7300.

Icom IC2KL linear or similar in very good order; Kenwood desk mic **MC85** or similar; Multi position antenna switch and 23 cm antenna. John VK7CCC (03) 6391 2211 or JMcculloch@Vision.net.au.

MISCELLANEOUS

• THE WIA QSL Collection (now Federal) requires QSLs. All types welcome especially rare DX, pictorial cards and special issue. Please contact the Hon Curator, Ken Matchett VK3TL, 4 Sunrise Hill Road, Montrose VIC 3765, Tel (03) 9728 5350.

• DO YOU HAVE ANY used telephone cards or stamps lying around? If so could you please send them to the Epilepsy Association of South Australia Inc, PO Box 12, Woodville SA 5011.

ar

VK QSL BUREAUX

The official list of VK QSL Bureaux. All are Inwards and Outwards unless otherwise stated.

VK1		GPO Box 600 CANBERRA ACT 2601
VK2		PO Box 73 TERALBA NSW 2284
VK3	Inwards	Box 757G, GPO MELBOURNE VIC 3001
	Outwards	40G Victory Blvd ASHBURTON VIC 3147
VK4		GPO Box 638 BRISBANE QLD 4001
VK5		PO Box 10092 Gouger St ADELAIDE SA 5001
VK6		GPO Box F319 PERTH WA 6001
VK7		GPO Box 371D HOBART TAS 7001
VK8		C/o H G Andersson VK8HA
		Box 619 HUMPTY DOO NT 0836
VK9/VK0		C/o Neil Penfold VK6NE
		2 Moss Court KINGSLEY WA 6026

Hamads

Please Note: If you are advertising items For Sale and Wanted please use a separate form for each. Include all details: eg Name, Address, Telephone Number (and STD code), on both form. Please print copy for your Hamad as clearly as possible.

* Eight lines per issue free to all WIA members, ninth line for name and address. Commercial rates apply for non-members. Please enclose a mailing label from this magazine with your Hamad.
* Deceased Estates: The full Hamad will appear in AR, even if the ad is not fully radio equipment.
* Copy typed or in block letters to PO Box 2175, Caulfield Junction, Vic 3161, by the deadlines as indicated on page 1 of each issue.
* QTHR means address is correct as set out in the WIA current Call Book.
* WIA policy recommends that Hamads include the serial number of all equipment offered for sale.
* Please enclose a self addressed stamped envelope if an acknowledgement is required that the Hamad has been received.

Ordinary Hamads submitted from members who are deemed to be in 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: $25.00 for four lines, plus $2.25 per line (or part thereof). Minimum charge -- $25.00 pre-payable.

State: .....

Not for publication: ❑ Miscellaneous ❑ For Sale ❑ Wanted

Name: ..... Call Sign: ..... Address: .....

WIA Divisions

The WIA consists of seven autonomous State Divisions. Each member of the WIA is a member of a Division, usually in their residential State or Territory, and each Division looks after amateur radio affairs within its area.

	Division Address	Officers			Weekly News Broadcasts		1996 Fees
VK1	ACT Division GPO Box 600 Canberra ACT 2601	President Secretary Treasurer	Philip Rayner John Woolner Bernie Kobler	VK1PJ VK1ZAO VK1KIP	3.570 MHz LSB, 146.950 MHz FM each Sunday evening commencing at 8.00 pm local time. The broadcast text is available on packet, on Internet aus.radio.amateur.misc newsgroup, and on the VK1 Home Page http://email.nla.gov.au/~cmakin/wiaact.html	(F) (G) (S) (X)	$70.00 $56.00 $42.00
VK2	NSW Division 109 Wigram St Parramatta NSW (PO Box 1066 Parramatta 2124 Phone (02) 9689 2417 Freecall 1800 817 644 Fax (02) 9633 1525	President Secretary Treasurer (Office hours Web:http://sydney.dialix.ozau/~wiansw e-mail address: wiansw@sydney.dialix.oz.au Packet BBS: VK2WI on 144.850 MHz	Michael Corbin Eric Fossey Eric Van De Weyer Mon-Fri 11.00-14.00 Sat 1000-1300 Mon 1900-2100)	VK2YC VK2EFY VK2KUR	From VK2WI 1.845, 3.595, 7.146*, 10.125, 24.950, 28.320, 29.120, 52.120, 52.525, 144.150, 147.000, 438.525, 1281.750 (* morning only) with relays to some of 14.160, 18.120, 21.170, 584.750 ATV sound. Many country regions relay on 2 m or 70 cm repeaters. Sunday 1000 and 1930. Highlights included in VK2AWX Newcastle news, Monday 1930 on 3.593 plus 10 m, 2 m, 70 cm, 23 cm. The broadcast text is available on the Internet newsgroup *aus.radio.amateur.misc*, and on packet radio.	(F) (G) (S) (X)	$66.75 $53.40 $38.75
VK3	Victorian Division 40G Victory Boulevard Ashburton Vic 3147 Phone (03) 9885 9261 Fax (03) 9885 9298	President Secretary Treasurer (Office hours	Jim Linton Barry Wilton Rob Hailey Tue & Thur 0830-1530)	VK3PC VK3XV VK3NC	VK3BWI broadcasts on the 1st and 3rd Sunday of the month, starts 10.30 am. Primary frequencies 1.840 AM, 3.615 LSB, 7.085 LSB, and FM(R)s 146.700 Mt Dandenong, 147.250 Mt Macedon, 147.225 Mt Baw Baw, and 2 m FM(R)s VK3RMA, VK3RSH and VK3ROW. 70 cm FM(R)s VK3ROU and VK3RGL. Major news under call VK3WI on Victorian packet BBS.	(F) (G) (S) (X)	$72.00 $58.00 $44.00
VK4	Queensland Division GPO Box 638 Brisbane QLD 4001 Phone (074) 96 4714	President Secretary Treasurer	Geoff Sanders John Stevens John Presotto	VK4KEL VK4AFS VK4WX	1.825 MHz SSB, 3.605 MHz SSB, 7.118 MHz SSB, 14.342 MHz SSB, 28.400 MHz SSB, 29.220 MHz FM, 52.525 MHz FM, 146.700 MHz FM, 147.000 MHz FM, 438.525 MHz (Brisbane only), regional VHF/UHF repeaters at 0900 hrs Sunday. Repeated on 3.605 MHz SSB & 147.000 MHz FM, regional VHF/UHF repeaters at 1930 hrs EAST Monday. Broadcast news in text form on packet under WIAQ@VKNET	(F) (G) (S) (X)	$72.00 $58.00 $44.00
VK5	South Australian Division 34 West Thebarton Rd Thebarton SA 5031 (GPO Box 1234 Adelaide SA 5001) Phone (08) 8352 3428 Fax (08) 8264 0463	President Secretary Treasurer Web: http://www.vk5wia.ampr.org/	Peter Watts Maurie Hooper Charles McEachern	VK5ZFW VK5EA VK5KDK	1827 kHz AM, 3.550 MHz LSB, 7.095 AM, 14.175 USB, 28.470 USB, 53.100 FM, 147.000 FM Adelaide, 146.700 FM Mid North, 146.800 FM Mildura, 146.825 FM Barossa Valley, 146.900 FM South East, 146.925 FM Central North, 147.825 FM Gawler, 438.425 FM Barossa Valley, 438.475 FM Adelaide North, ATV Ch 35 579.250 Adelaide. (NT) 3.555 USB, 7.065 USB, 10.125 USB, 146.700 FM, 0900 hrs Sunday. 3.585 MHz and 146.675 MHZ FM Adelaide, 1930 hrs Monday.	(F) (G) (S) (X) (F)	$72.00 $58.00 $44.00 $60.75
VK6	West Australian Division PO Box 10 West Perth WA 6872 Phone (09) 351 8873	President Secretary Treasurer	Cliff Bastin Christine Bastin Bruce Hedland-Thomas	VK6LZ VK6ZLZ VK6OO	146.700 FM(R) Perth, at 0930 hrs Sunday, relayed on 1.825, 3.560, 7.075, 14.116, 14.175, 21.185, 29.680 FM, 50.150 and 438.525 MHz. Country relays 3.582, 147.350(R) Busselton and 146.900(R) Mt William (Bunbury). Broadcast repeated on 146.700 at 1900 hrs Sunday, relayed on 1.865, 3.563 and 438.525 MHz; country relays on 146.350 and 146.900 MHz.	(G) (S) (X)	$48.60 $32.75
VK7	Tasmanian Division 5 Helen Street Newstead TAS 7250 Phone (03) 634 42324	President Secretary Treasurer	Andrew Dixon Robin Harwood Terry Ives	VK7GL VK7RH VK7ZTI	146.700 MHz FM (VK7RHT) at 0930 hrs Sunday relayed on 147.000 (VK7RAA), 146.725 (VK7RNE), 146.625 (VK7RMD), 3.570, 7.090, 14.130, 52.100, 144.150 (Hobart) Repeated Tues 3.590 at 1930 hrs.	(F) (G) (S) (X)	$72.00 $58.00 $44.00
VK8	(Northern Territory is part of the VK5 Division and relays broadcasts from VK5 as shown received on 14 or 28 MHz).						

Note: All times are local. All frequencies MHz.

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December 1996
Volume 64 No 12

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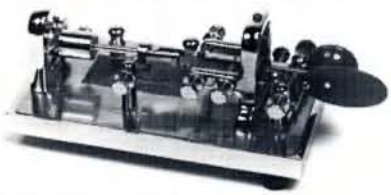

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CONTENTS

Cover

The impressive antenna farm of PA3EPN. The two element beam in the foreground is a full size 80 m Yagi, 36 metres high. Wouldn't it be nice if Santa left an antenna farm like this in our Xmas stocking (complete with planning permits, of course).

BACK ISSUES

Available, only until stocks are exhausted, at $4.00 each (including postage within Australia) to members.

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When back issues are no longer available, photocopies of articles are available to members at $2.50 each (plus $2.00 for each additional issue in which the article appears).

The opinions expressed in this publication do not necessarily reflect the official view of the WIA, and the WIA cannot be held responsible for incorrect information published.

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A radiocommunication service for the purpose of self-training, intercommunication and technical investigation carried out by amateurs, that is, by duly authorised persons interested in radio technique solely with a personal aim and without pecuniary interest.

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Editor's Comment

Problems and Possibilities

Frequently members ring the Federal Office, or write a letter of complaint, because of the apparent late arrival of *Amateur Radio*. Quite often there is no cause for alarm. The magazine is on time, but different times are normal each month!

The reason is that the date of publication is the **last Friday of the preceding month.** This has the very useful result that each stage in the production process occurs on the same day of the relevant week. This simplifies the whole procedure, particularly for the typesetters and printers, so they can give us a useful discount, thus saving you money!

But there is a disadvantage. The last Friday of the month could be as early as the 22nd (for some Februarys) and as late as the 31st, so there is a span of nine days possible between the earliest and the latest publishing dates. *Amateur Radio* can be nine days later in some months than it is in others, and yet **it's still on time.**

Postal transit time can introduce several more days delay, so we recommend that you wait until the 15th of the publication month before concluding your *Amateur Radio* is lost.

To change the subject completely, from time to time we have wondered where all the people are, mostly young, who could become amateurs, but just don't! What are they doing instead?

Many are probably using the Internet to give another kind of world-wide interpersonal contact which once was possible only by amateur radio. Now we find there is at least one way of linking these similar but different systems. Will McGhie VK6UU gives us the details in his *Repeater Link* column this month. It makes fascinating reading. Look for **Internet Repeaters** about half-way through Will's column.

Since this is the December issue, may I, on behalf of the Publications Committee and all those who help produce *Amateur Radio*, wish you all a Merry Christmas and a Happy New Year.

Bill Rice VK3ABP
Editor

CONTRIBUTIONS TO *AMATEUR RADIO*

Amateur Radio is a forum for WIA members' amateur radio technical experiments, experiences, opinions and news. Manuscripts with drawings and/or photos are always welcome and will be considered for possible publication. Articles on computer disk are especially welcome. The WIA cannot assume responsibility for loss or damage to any material. *"How to Write for Amateur Radio"* was published in the August 1992 issue of *Amateur Radio*. A photocopy is available on receipt of a stamped, self addressed envelope.

■ WIA News

Roger Harrison VK2ZRH, Federal Media Liaison Officer

Spectrum Tax Rises But Licence Fees Fall

New amateur licence fees apply from 11 November 1996, with the Spectrum Access Tax and Spectrum Maintenance Component rising slightly, but the Administrative Charge falling so that licence fees are now $50. Five-year licences will now cost less, falling to $170 from $211.

The Spectrum Management Agency (SMA) issued a general circular on revisions to Apparatus Licence fees and charges in late October, advising that the revisions would apply from 11 November. As this did not spell out specific details, the WIA asked the SMA for the changes relating to Amateur Licence fees. The SMA said that the Spectrum Access Tax and Spectrum Maintenance Component, which previously represented $13 of the licence fee, would rise slightly to $13.54, while the Administrative Charge would fall from $38 to $36. The $49.54 total has been rounded up to $50 under SMA policy to round up amounts over 50 cents and round down amounts below 50 cents, where the charge is not a whole dollar amount.

The lower charge for five-year licences results from discounting four lots of the Administrative Charge for renewal, which is now $20, up from $11 previously. The discount is now $80, where it was $44 previously. So the fee for a five-year licence works out like this: Five years' fees at $50 per year is $250, less $80 (four lots of $20) comes to $170.

For amateur beacons and repeaters, it's a different story. There is good news for those wanting to license new beacons and repeaters, or change frequencies, but bad news for everyone who wants to keep them running. The fee to issue new licences for beacons and repeaters is now a flat $50 per frequency, in the case of beacons, or frequency pair in the case of repeaters (link frequencies being excluded). The previous renewal fee of $24 per frequency or frequency pair is now $50. Gone is the frequency assignment fee for new beacon or repeater licences, which was a minimum of half an hour at the SMA's hourly rate of $91 per hour.

Full details are available in the revised *Apparatus Licence Fee Schedule*, publication RIB 68A, available from the Spectrum Management Agency.

The October circular from the SMA foreshadowed a number of areas where charges were to be varied. These included a Consumer Price Index (CPI) rise of 2.7% since 1994, the need to fully recover costs associated with Australia's membership of the International Telecommunications Union, funding from licence fees from a government decision to set up a research and public information program on health issues associated with electromagnetic radiation (see separate *WIA News* item), and a review of actual costs involved in issuing and renewing licences.

The SMA said that overall revenue from licence fees and charges was estimated to increase by approximately 3.4% in 1996/97, with individual licence fees varying depending upon the particular type of service.

The SMA and a working group from the Radiocommunications Consultative Council (RCC) earlier this year completed a post-implementation review of Apparatus Licence fees under the new fee structure. (See *WIA News*, page 20, August issue). Separately, this year the SMA reviewed their charges, including those for issuing and renewing licences. The SMA said they had also moved to standard charging for licence issue wherever possible, to provide licensees with greater certainty when applying for new licences.

Impact on Some Services

The WIA is concerned that the more-than-doubling of the beacon and repeater renewal fee puts an unreasonable impost on those Institute divisions, WICEN groups and local clubs who have established and maintain these facilities as a service to the amateur radio community. The recurrent cost of licence fee renewals will be beyond the resources of many as a result of this revision in amateur beacon and repeater licence fees, and there is concern that a number of services will likely cease to operate.

The WIA is aware that the high cost of obtaining new repeater and beacon licences since the SMA's new Apparatus Licence Fee regime was instituted in April 1995 has led to the abandonment of a number of experimental systems and services. Previously, the fees for issuing a new beacon or repeater licence, or varying the frequencies involved, attracted a frequency assignment fee in addition to the $24 licence fee for each transmitter frequency.

The frequency assignment fee was a minimum of half an hour at the SMA's hourly rate of $91 per hour. However, quotes amounting to hundreds of dollars to issue a repeater licence were reported to the WIA by a number of clubs and groups. The WIA was recently quoted an amount of $520 to issue a licence for the proposed five-band International Beacon Project HF beacon for Perth. That was $104 per frequency, one licence per frequency, although only a single call sign is needed. The SMA's Perth Area Office quote listed a cost of $91 to issue and assign each licence, plus $13 in "spectrum charges".

While the removal of the time-based assignment fee for new beacons and repeaters from 11 November is welcome relief in that it lowers the cost and provides certainty, the WIA has previously indicated to the SMA that renewal charges on a per-frequency or frequency-pair basis placed an inordinate cost burden on established sites which carried multiple services. The rise from $24 to $50 now makes matters much worse.

The WIA has already raised with the SMA the issue of having beacon and repeater licence fee renewals charged on a per-site basis, rather than the present per-frequency basis, particularly where one call sign is used by all or a number of transmitters. The WIA will continue to pursue this issue vigorously.

IARU News

David Wardlaw VK3ADW

World Radio Conference Strategies Decided

Meeting in Tel Aviv, Israel, in early October following the Region 1 Conference, the Administrative Council of the International Amateur Radio Union (IARU) considered issues relating to the 1997 World Radiocommunications Conference of the International Telecommunications Union, WRC-97 and the 1999 Conference, WRC-99.

The IARU delegation attending WRC-97 has been announced as a result. The delegation will consist of IARU Vice President, Michael Owen VK3KI; Region 1 Vice Chairman Wojciech Nietyksza SP5FM; and IARU Secretary, Larry Price W4RA, who is also the American Radio Relay League (ARRL) International Affairs Vice President. The IARU Administrative Council agreed at the Tel Aviv meeting on instructions to be given to the delegation.

As allocations relating to the 7 MHz band may be on the agenda of the WRC-99 ITU Conference, the Administrative Council discussed a comprehensive report from the 7 MHz Strategy Committee and updated the strategies guiding IARU preparations for 1999. As the approved action plan is being distributed to IARU member societies, the WIA will publish details in due course.

In addition, the Administrative Council received the recent report from the Future of the Amateur Service Committee (FASC). (See *IARU News*, page 4, October issue). The FASC is preparing a further paper on the subject of possible revisions to Article S25 of the International Radio Regulations, which defines the Amateur Radio Service, anticipated to be considered at WRC-99.

Anticipated future requirements for radio spectrum allocations to the Amateur and Amateur Satellite Services were reviewed and updated by the Administrative Council. This covered the low frequency range, the 7 MHz band, the lower VHF range and microwave allocations.

An extensive report on the utility of beacon stations in the Amateur Service was received from an ad hoc committee, and their recommendations adopted.

The council reappointed for new terms the team of international coordinators and advisers who report to them on specialised areas of interest. They are:

- EMC Adviser: Christian M. Verholt OZ8CY;
- International Beacon Project: John G. Troster W6ISQ;
- Monitoring System (Intruder Watch): Robert E. Knowles ZL1BAD; and
- Satellite Adviser: Hans van de Groenendaal ZS5AKV.

In other decisions taken at Tel Aviv, the Advisory Council is to appoint a public relations committee to publicise the work of the IARU, and the theme for **World Amateur Radio Day**, 20 September 1997, will be "35 Years of Amateur Radio in Space."

At the IARU Region 1 Conference preceding the Administrative Council meeting (see *IARU News*, page 4, November issue), Region 1 decided to move the six metre SSB "centre of activity" to 50.150 MHz, considered frequencies on 144 MHz for use by Shuttle Amateur Radio Experiments (SAREX) and the future International Space Station (ISS), and initiated a project to obtain a new common low frequency band allocation.

IARU identity SK

IARU President-Emeritus, Noel Eaton VE3CJ, died at his home on Ontario, Canada, on 28 September. He was 86.

Eaton served as IARU President from 1974 to 1982, and was inducted into the Canadian Amateur Radio Hall of Fame in 1993. He built his first receiver in 1922 and gained his amateur licence in 1937.

Before gaining the seat of IARU President, he served as Treasurer of the IARU Region 2 Association for the decade before 1974. He also held a number of positions on Canadian amateur groups and with the American Radio Relay League. As IARU President, Eaton attended many ITU and other international conferences, and visited national member societies of the IARU in 48 countries. He was presented with numerous awards and honorary memberships from amateur societies and organisations throughout the world.

With a BSc in Textile Technology from the University of Manchester in England, he worked in the Canadian textile industry, retiring in 1959 from the Eaton Knitting Company of Hamilton, Ontario, as President and General Manager. During World War 2, Eaton served in the Royal Canadian Air Force, retiring in 1945 as Chief Signals Officer HQ, No 6 Group RCAF, with the rank of Wing Commander.

IARU Region 2 President, Tom Atkins VE3CDM, honoured Eaton as "a highly respected and widely known personality in the international amateur radio community." The Editor of *The Canadian Amateur*, Rob Ludlow VE3YE, said he was "probably the greatest ambassador for Amateur Radio in the world. He worked tirelessly for the betterment of radio amateurs everywhere."

[Details courtesy of the ARRL's *The ARRL Letter* and the Web sites of the Radio Amateurs of Canada and the Radio Society of Great Britain].

Government Launches Study Into Electromagnetic Energy Health Hazards

Public concern over possible adverse health effects arising from long-term exposure to radiofrequency electromagnetic energy spurred the government into announcing in October plans for a five-year study costing $4.5 million to be managed by the National Health and Medical Research Council.

The announcement was made in a joint release by the Minister for Communications and the Arts, Senator Richard Alston, and the Minister for Health and Family Services, Dr Michael Wooldridge.

To be known as the radiofrequency electromagnetic energy (EME) program, the decision to launch the study was sparked by an AGB McNair public survey of more than 750 people which found there was strong support for more information on the issue to be made available from the government and for further research into EME health issues.

The $4.5 million cost of the study will be funded by about a 1% increase in radiocommunications licence fees, commencing from 11 November.

Senator Alston said: *"Sections of the public are concerned about possible adverse health effects from long-term exposure to RF EME, especially in regard to children, with the increased use of radio-based communications technologies, such as mobile phones."*

The AGB McNair survey also revealed that other health issues, such as skin damage from sun exposure, breast cancer and death or injury from road accidents, were of greater concern.

Dr Wooldridge said while there is no substantiated evidence available to date of adverse health effects associated with RF EME exposure, within the standards that apply in Australia and overseas, there is still a need for further research and to provide more information to the public.

"An important part of this project will be the provision of factual information about the use of mobile phones and about exposure levels," Dr Wooldridge said.

"A committee of health, scientific and communications officials has already been established to examine and advise the government on RF EME-related matters, including national and international research findings and the potential for further research.

"The RF EME risk management and communications program is concerned with implementing practical measures to address RF EME public health issues," Senator Alston said.

The program involves: the establishment of an Australian research program to examine RF EME issues of particular relevance to the Australian environment, to complement overseas research activities; public dissemination of contemporary information about RF EME public health issues; and continuing participation in the World Health Organisation's project to assess the health and environmental effects of EME exposure.

Standards Australia has a published standard on RF (non-ionising radiation) exposure levels, AS 2771, and for some years has had a joint Australian-New Zealand standing committee studying the subject. The WIA is represented on this committee.

Some reportedly reputable statistical studies have been used to link the incidence of cancers in the community and the location of power lines and transmitters. Television "grabs" of a variety of "experts" from the pro and anti sides leave a disquieting impression. The scientific community has been variously charged with ignoring "the problem" to conspiring to generate a whitewash.

There is understandable suspicion of scientific reports which contradict one another over assertions that electromagnetic radiation from power lines, cellphones and the like are a hazard to health. In the past, various vested interests and public authorities have failed to give adequate warning of the hazards of asbestos, insecticides, radioactivity and nicotine, for example, despite the hazards being well understood for many years.

Public concern over health hazards from radio transmitters is not well founded. Research on the biological effects of electromagnetic waves goes back a few decades. One of the most authoritative sources which reviews the scientific and technical work up to 1993 was produced by the World Health Organisation (WHO), titled *Environmental Health Criteria 137, Electromagnetic Fields (300 Hz to 300 GHz).*

Controversial studies on cells prepared from chickens' brain tissue have shown that calcium ions are released above a certain level of RF radiation, which is well below that attributed to heating. But it only occurs when a special "modulated" signal is used. Exchange of calcium ions between cells is important in biological processes, but there is no evidence that the observed effects are relevant outside the isolated cells studied. The WHO study makes the cautious conclusion that the reported effects cannot be seen as a potential health hazard as there is little or no evidence that it occurs in animals or humans.

Studies on humans have necessarily had to look at populations of people exposed to radiofrequency radiation, looking for health effects (death rates, cancer rates), compared against a "control" population. One such looked at 40,000 US Navy people for 20 years after two-years-on-the-job exposure to radars.

One of Australia's foremost researchers in the field, Australian

Radiation Laboratory chemist, Dr Colin Roy, said in Perth recently that while general scientific opinion was that the risk from mobile phones was very low, more research should be done. He said that the best study to date had found no difference between laboratory animals exposed for a lifetime compared with those that hadn't. The problem was, he said, that no study could prove there was positively no risk. However, there are other Australian researchers who differ on the likelihood of health hazards from electromagnetic radiation.

A European Commission (EC) study by a special expert group to initiate research into possible health effects related to mobile telephony reported in September that there is no evidence that a health threat exists for millions of mobile phone users. The expert group chairman, Alastair McKinlay, said: *"The group is quite clear that there is no existing scientific evidence of a cancer risk."*

The group has identified, however, that gaps do exist in knowledge of this area. The explosion in use of mobile phones was quite recent, McKinlay said, and that such research makes sense to quell any public concern.

The Australian Mobile Telecommunications Association (AMTA) endorsed the government's announcement, saying that more public information would help counteract alarmist tactics which promoted adverse health effects related to mobile phones and cellular base towers.

AMTA executive director, Alex Gosman, said: *"These claims have not been based on any substantiated evidence and the government's action will allow the separation of health and environmental issues which are often confused in public discussion."*

The RF EME program in Australia will be coordinated jointly by the Communications and the Arts and Health and Family Services portfolios through the Committee on EME Public Health issues. Program functions will be contracted out to appropriately qualified government and non-government bodies, such as the CSIRO, universities and hospitals.

Federal Council Plans for 1997 and Beyond

Plans affecting the Federal WIA's operations and activities from 1997 through the year 2000 were high on the agenda during discussions at the meeting of the Federal Council, held over the weekend of 26-27 October.

It was the Council's third, and last, meeting for 1996.

Among a series of major resolutions concerning the future operation of the Federal WIA were: that there would be a budget surplus in 1997; a decision to return to a common membership renewal date; that the production, printing and posting of *Amateur Radio* magazine would be "outsourced"; that Examinations would be held eight times a year, each on the same day nationwide; decisions on preliminary planning for WIA representation to the ITU conferences WRC-97 and WRC-99, and the International Amateur Radio Union Region 3 Conferences in 1997 and 2000.

The 1997 budget for the operations of the Federal WIA and the Federal Secretariat was a key agenda item, with the Federal Council deciding that the Federal Directors should run the operations to produce a small surplus in 1997, after a loss in 1995 and another loss forecast for 1996. Some restructuring of WIA operations will be necessary to achieve this, but the Federal Council determined that essential services should not suffer.

Membership renewals will return to a common date from 1997, which will be 1 July. The Federal Directors anticipate that this will reduce the cost/member of maintaining the centralised, Division membership database.

Queensland Division members are unaffected by this change as the Division manages its own membership database operations. Members whose renewals fall due in January will receive a renewal notice for six months' membership, followed by another renewal in June for the next 12 months' membership. New members joining throughout the year will pay a pro-rata membership up to the common renewal date of 1 July.

Following a decision made at the annual general meeting in May, directing the Federal Executive to seek expressions of interest to tender for the production, printing and mailing of *Amateur Radio* magazine as a single "outsourced" operation, the directors tabled responses for the Federal Council's consideration. The current production contract expires in December. The Council moved that the directors select a suitable contractor, in the meantime securing continuity of production if necessary until a contract commenced.

This does not mean that *Amateur Radio* magazine is being "sold off" to a private publisher. The magazine remains the property of the WIA. It simply means that one firm will be responsible for doing the physical work necessary so that material presented for publication each month by the Editor and Publications Committee is assembled for printing, and that it is then printed and posted by the due date each month. It is anticipated that there will be some worthwhile cost savings to the Institute from this change to outsourcing *Amateur Radio* magazine's production in this way, compared with the existing operation.

In a move to maintain the general cost of providing amateur examinations at present levels, the Federal Council decided that examinations would be held on eight fixed dates throughout the year, applicable Australia-wide. This was in response to a situation which had developed where the number of individual or small examination events had reached a proportion where the costs of running the WIA Exam Service had become too high to continue in the same way. From 1997, single-event examinations will attract an "event fee" of $50. Exam Service invigilators are being advised of the changes. Dates for the eight examination days are to be decided.

Changes to High Power Operations

Permission to use transmitter output power levels above the authorised maximums of 400 W for SSB and 120 W for CW were previously granted by a letter of authority to successful applications from individual amateurs. The SMA has changed this procedure since the introduction of the new Technical Licence Specifications (TLSs).

Now, amateurs seeking to conduct experiments using transmitter power levels above those specified in the TLSs have to apply for a separate Scientific Assigned Licence, according to information supplied recently by the SMA. This also applies where amateurs wish to operate on frequencies outside those specified in the TLSs. Generally, amateurs have sought high power permits for moonbounce work, and some individuals have sought permits to transmit in the low frequency (LF) range, below 200 kHz. Amateurs experimenting on LF were previously licensed under the Experimental licence type, which disappeared with the new Apparatus Licence regime introduced in 1995.

However, the SMA advises that high power operation will not be granted for experiments in the 50.0-50.3 MHz Eastern States "DX Window" segment of 6 m. Following a recent application from a Victorian amateur seeking approval to use 1 kW in the 50.0 – 50.105 MHz segment for moonbounce experiments, the SMA has advised the WIA that, because the band 45-52 MHz is designated primarily for broadcasting purposes and the Radiocommunications Act prohibits the SMA from issuing licences in this band without consent from the Australian Broadcasting Authority (ABA), they sought approval from the ABA. The ABA said that operation could not be approved in this band in the Eastern States of Australia, under any type of licence, for a power higher than that authorised under the Amateur TLSs owing to the high likelihood of interference to Channel 0 reception.

While Channel 0 continues to be used, the SMA is unable to approve high power operation in the 50.0 – 50.3 MHz band segment in New South Wales, Victoria, Queensland, Tasmania, the ACT and the Jervis Bay Territory. The present transmitter output power limits for this band segment in these areas are 100 W (pY) for CW, 100 W (pX) for SSB and 30 W (pY) for FSK (narrowband digital signals).

International Obligations

A World Radiocommunications Conference is being organised by the International Telecommunications Union (ITU), WRC-97, to be held late next year in Geneva, Switzerland. As a number of issues affecting the Amateur Radio Service will surface at this conference, the Federal Council decided that the Federal Coordinator responsible for this area, David Wardlaw VK3ADW, is to attend. The anticipated $10,000 cost will be funded from existing reserves created for the purpose from the $2 International Levy component of each membership fee. David foreshadowed that two delegates would really be needed at the next conference, WRC-99, at which Article S25, which defines the Amateur Service, is scheduled to be on the agenda for discussion.

The Federal Council considered the delegation to be sent to the International Amateur Radio Union (IARU) Region 3 meeting to be held in Beijing, China, in September next year. It was agreed that the IARU Liaison Officer, David Wardlaw VK3ADW, must attend along with three additional WIA representatives. Planning for agenda items and discussion papers to be proposed by the WIA for the Beijing conference is under way. This conference will consider the region's view on the issues raised by the IARU Future of the Amateur Service Committee's discussion paper and first report, circulated during this year. The following Region 3 conference will be held in Australia in the year 2000, planned to be immediately after the Sydney Olympics. It will be held in Queensland. The Queensland Division is investigating preliminary planning and logistics.

In addition to the above, the WIA Federal Council laid plans for three meetings next year. The annual general meeting is mandatory under the Corporations Law, and this will be held in May. The other meetings, or Extraordinary Conventions, will be held in early February and late September. Ways and means of reducing convention costs are being looked into.

A new Federal Coordinator position was created, that of **WIA Federal Radio Sports Coordinator.** Wally Watkins VK4DO was appointed to the new position. Wally organised and vigorously promoted the 2nd Region 3 Amateur Radio Direction Finding (ARDF) Championships held in Townsville during July. (See *Amateur Radio,* page 7, September issue). Wally's brief is to initiate, coordinate and promote radio sports activities within Australia and internationally.

Further news of WIA Federal Council decisions from the October Extraordinary Convention will be in *WIA News* in the January 1997 issue.

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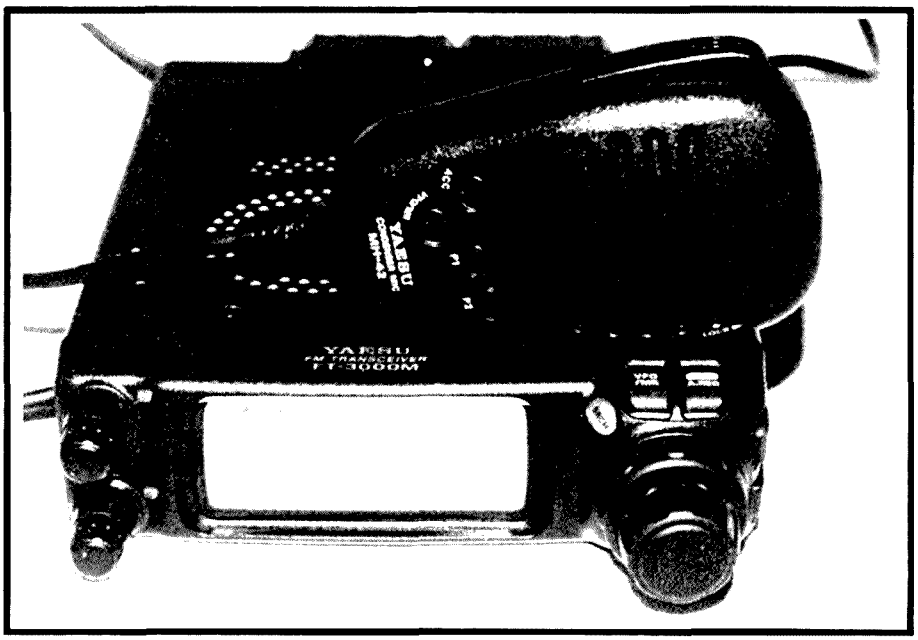
■ Equipment Review

Yaesu FT-3000M

*Reviewed by Paul McMahon VK3DIP**



The Yaesu FT-3000M. Comparison with the microphone shows the compactness of this high power rig.

What is it?

The FT-3000M is what some call a one-and-a-half-band box. It is basically a 2 metre FM mobile transceiver with a separate wideband receiver. It has up to 70 watts of transmit output power on 2 m, with receiver coverage of 110 – 180 MHz, 300 to 520 MHz, 800 to 869 MHz, and 894 to 999 MHz. The chunk missing in the later range is basically the mobile phone band. The unit is of mid size (140 x 40 x 180 mm, not counting the big, sticking-out knob) and is perhaps a little heavier than normal with a weight of 1.25 kg. The review unit was kindly supplied by Dick Smith Electronics and had the serial number 5N010231. Retail Price is $799.

First Impressions

Someone at Yaesu is getting adventurous; this box was obviously designed to at least look different. Instead of having the controls and buttons spread evenly over the front panel, most of the knobs and buttons live in an area on the right of the panel. This control cluster is obviously designed to be able to be operated with one hand with the minimum of finger travel. Some ergonomist has given these controls a lot of thought, and once you had had a bit of practice you could probably do just about any function by feel, and very quickly. I must admit, though, it does look a bit strange to have this mountain of controls sticking out of the box. Yaesu calls them dual concentric multi-purpose selector knobs and associated control buttons.

This sort of design could well be very good for some hams who have problems with the more normal arrangements of controls. It would be interesting to know if Yaesu had this market in mind when it was designed. Apart from this control cluster, the rest of the front panel contains only two knobs, one for volume and one for squelch, and a large multi-function display panel.

This display shows the frequencies of the main and sub-band simultaneously, along with a multitude of other things such as the prompts for the menu system, and even the supply volts if required. The latter could be very useful in this case, as the set draws a hefty 15 amps continuous on high power transmit which will make wiring in the car and the condition of the car battery very important.

The box also offers the little brother of the Spectra-Analyser feature I reviewed last month in the Yaesu FT-8500. In this case it is called a Spectra-Scope, with the main difference being that, instead of a true graphical display, activity either side of the centre frequency is indicated via a clever arrangement of standard character segments.

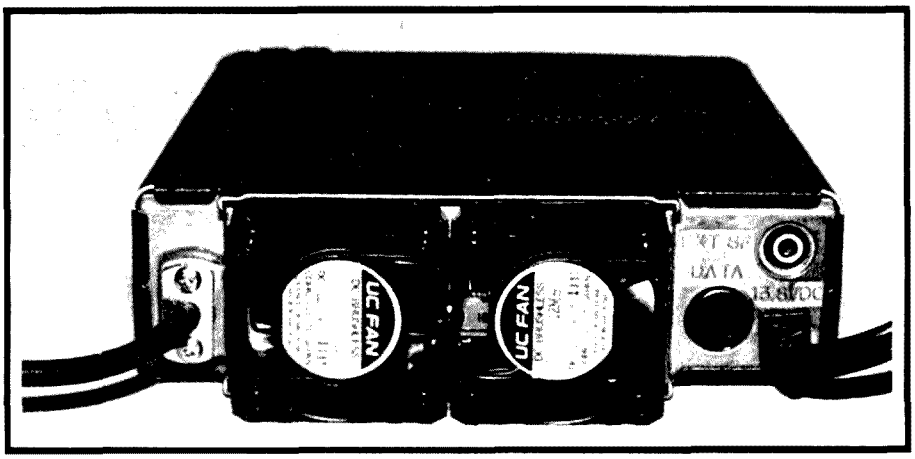
Audio quality seems good in subjective on-air tests, and the receiver sensitivity seems uniform across the ranges covered. The noise from the dual fans was not as loud as expected, though again the increased airflow needs may complicate mobile installation.

Again similar to the recently reviewed FT-8500, the manual actually seemed to cover all the features of the set, and yes, there is a reasonably detailed circuit diagram. I hope this is now a Yaesu standard which will be adopted by others. Also in the standard styrofoam and cardboard box was a mobile mounting bracket, power cable, spare fuse, and miscellaneous nuts and bolts for the bracket.

Technical Bits

The receiver frequency coverage of the set is as mentioned above, 110 – 180 MHz, 300 to 520 MHz, 800 to 869 MHz, and 894 to 999 MHz. The segment 110 – 137 MHz can be set up for AM or FM via a menu option. The transmit coverage is 144 – 148 MHz.

The specifications describe the set as a double conversion superhet with a 45.05 MHz first IF and a 455 kHz second IF. Sensitivity for 12 dB SINAD is claimed as less than 0.2 µV for the main 2 m band but only less than 0.25 µV everywhere else. Selectivity is on a par with other like boxes, as is spurious and image rejection. Rated audio output is 2 watts and, subjectively, sounded clear and clean. For the transmitter the rated power outputs were 75, 50, 25, and 10 watts. Peak current drain at the



Rear view of the FT-3000M showing the efficient twin cooling fans.

various power outputs is given as 15, 10, 7, and 5 amps at 13.8 volts.

The set has 70 normal general purpose memories arranged as seven banks of ten. As well, there are eleven special purpose memories including a home, a priority, and scan edge memories. Each memory can store either separate receive/transmit frequencies or repeater offset, and can also store an up to five alpha/numeric name which can be displayed instead of the frequency. Tuning step sizes of 5, 10, 12.5, 15, 20, 25, or 50 kHz are available in all segments except 800 – 999 MHz where some of the smaller steps are not available.

The set also has a function that I must admit caused me to laugh when I first read of it in the manual. The ARTS, or Auto Range Transpond System, can automatically poll other similarly equipped sets to see if they are in or out of range with appropriate indication on the front panel and melody sound effects. The tones are ascending for in-range and descending for out-of-range indication. It just shows you that memory space in the control processors must be cheap and that people are scratching for ideas, or alternatively there is some real reason why someone would want this function that just totally escapes me.

The set also has the usual complement of scanning options and pager and message systems available with an optional module. It is possible to page the set and leave either one 16 second voice message or two 8 second messages (configurable via the menus). Also, as is becoming standard, the set has a connector at the rear for packet operation (1200 and 9600 baud).

Other features include DTMF remote control, and transceiver cloning where the setup of one transceiver can be loaded into another. These latter two features should imply that the set could be computer controlled in a similar manner to the FT-8500, but no mention of this possibility is made in the handbook. However, a check with Dick Smith Electronics discovered that Yaesu produce a software/interface package, called the ADMS-1B, which is available for use with both the FT-8500 and the FT-3000M.

The bit I enjoy most about doing these reviews is the chance to, at least when provided, study the circuit and block diagrams to see how the sets tick. Over time we have gone through an evolutionary period where initially the bulk of the innards were taken up with the RF side with all discrete circuits just about out of the same basic text book. We then went through a period where this shrank away into a couple of ICs and the control electronics began to predominate. Now this too has begun to shrink in the number of ICs, if not in power, and we are seeing some real variation and inventiveness in the RF side again. In many cases the designers are doing things that just would not have been practical before the advent of high powered control microprocessors.

In particular, I have noticed what appear to be hybrids of narrow range receivers and circuits that would seem more at home in a scanner. The set construction technique seems to reflect this hybrid, too, with the ham bits usually being on the mother boards and the scanner bits being separate small daughter board modules. This set is a good example of this. It has four separate receiver front ends, each optimised for different band portions or uses. Two of these provide separate tracking narrow range front ends for the 2 m and 70 cm bands, the more complex of the two being the 70 cm one which can also double as a wide range UHF front end. The other two front ends provide wide band VHF coverage and the 800 – 999 MHz getting-on-for-SHF range. This sort of thing would have been very unwieldy to manage and control before the micro controller.

The basic receiver operation is pretty straightforward. The appropriate front end is selected by the micro, using simple biased diode switches and fed into a wide band double balanced mixer made using a pair of dual gate mosfets along with the appropriate first local oscillator frequency derived from either

the VHF or UHF VCO. The output of the mixer is fed via a monolithic crystal filter (45.05 MHz) through an IF amp and into a single IC FM/AM receiver IC, a TK10930V for those interested. The SHF front end is quite interesting, consisting of just two transistors, one an RF amp and the other a mixer. For SHF there is not a special VCO off the PLL; instead, the UHF one is reused twice! For example, at, say 900 MHz, the signal is amplified by the RF amp stage then mixed with the UHF VCO at 427.475 MHz to give 472.525 MHz which is fed into the main mixer and again mixed with the 427.475 MHz UHF VCO to finally give the 45.05 MHz IF.

Effectively, the UHF local oscillator is being doubled, which explains why, for SHF, the small step sizes are not available as they too will be doubled by this process. This same trick should be also possible as an add-on mod for existing UHF receivers both scanning and amateur. The frequency display would, of course, be wrong, but for the cost of two extra transistors and some switching you have SHF coverage.

Operation

I found the smart search feature a useful operating aid. With this you can scan a range between limits set in some special memories, and up to 20 frequencies, where activity was found, will be stored sorted by either frequency or signal strength order (selectable via menu) in a special set of memories. For contesting/scrambling this could prove invaluable, effectively giving you a list of where the other stations are, or have been, which you can quickly step through and exchange a number, etc.

The Spectra-Scope was also not bad, but I felt it was let down by the lack of resolution in the display, at least in comparison with the FT-8500 with its finer detail.

As has been said, the audio quality on transmit and receive was, as is usual these days, well received from on-air reports, etc.

General use of the set was straightforward, though I must admit to finding some things easier to do using the keypad on the microphone rather than the front panel controls. The ability to user-program the four function keys comes in handy here. As to the dual concentric multi-purpose selector knobs and associated control buttons, I can't say I ever got really used to them, but again I'm sure that for some people they will be just perfect.

One caveat I would make with this rig is that you should watch the current usage on high power. I found it hard to find a power supply that would deliver the 15 amps continuously for any length of time. In most cases in the race to see who got hottest, the rig with its dual fans stayed reasonably cool, but the power supplies got very hot. The standard power supply I use for a normal 200 watt HF box, which is rated at greater than 20 amps peak, was much better at heating up than the rig, and I wouldn't have wanted to use it on high power for, say, a full day contest. However, Dick Smith Electronics advise that their D-3800 power supply is quite suitable for use with high power transmissions from the FT-3000M.

Likewise, in a mobile/car installation, you will have to watch how long you talk; sucking 15 amps continuously out of your car battery, even with the engine running, will lead to a flat battery, and you can't call for help on 2 m if your new transceiver needs 5 amps, even on the lowest power setting, out of a flat battery.

Conclusion

If you need a high power 2 m box, and/or the unique control arrangement of this rig suits you, and you have a good high current supply, then this rig seems good value at the price.

47 Park Avenue, Wattle Glen VIC 3096

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WIA News

Cat's Whiskers

Explaining radio communications to non-technical people is now much easier, thanks to the late, world-renowned physicist, Albert Einstein.

According to *The ARRL* Letter Electronic Update for 25 October, when Einstein was asked to describe radio, he is said to have provided this eloquent description: "You see, wire telegraph is a kind of very, very long cat. You pull his tail in New York and his head meows in Los Angeles. Do you understand this?" Einstein then continued: "Radio operates exactly the same way – you send signals here, they receive them there. The only difference is that there is no cat!"

New WIA Members

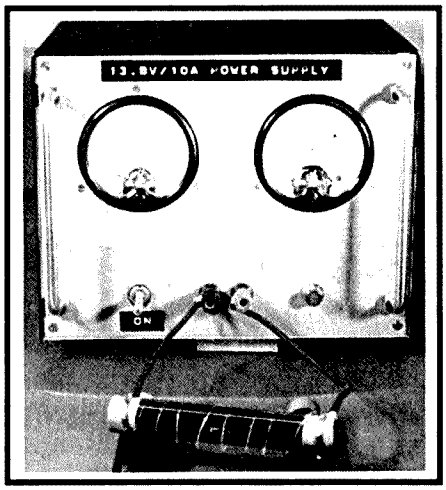
The WIA bids a warm welcome to the following new members who were entered into the WIA Membership Register during the month of October 96.

L21029	MR C J LORD
L30941	MR D SMIDT
L30942	MR R THIEDEKE
L30943	MR R SMITH
L40299	Mr K FULLER
L50351	MR T KEENAN
L60349	MR L BRYSON-HAYNES
L60350	MS S L KEOGH
VK2ATY	MR A THUMA
VK2ENT	MR N W TURNER
VK3DLE	MR L ENRIQUEZ
VK3FGN	MR N FERGUSON
VK3FGO	MR R BOUWMAN
VK3GRT	MR G TAYLOR
VK3KDR	MR D PARSLOW
VK3UE	MR M LE MAISTRE
VK4AJO	MR J LEE
VK4BMJ	MR J MCQUIRE
VK4BQG	MR Q GREENE
VK4FO	MR G TIBBITS
VK4GLD	MR T SOLLART
VK4KLT	MR M MARSHALL
VK4PGD	MR P DILLEY
VK4PJK	MR J JOHNSTON
VK4SFK	MR K STEEL
VK4UGS	MR G SMITH
VK4WW	MR N WALDEN
VK4YIX	MR R AUER
VK4AKI	MR K JONES
VK5CCA	CONCORDIA COLLEGE
VK6JS	MR J G SWINEY
VK6YGC	MR M H TELLING

■ Power Supplies

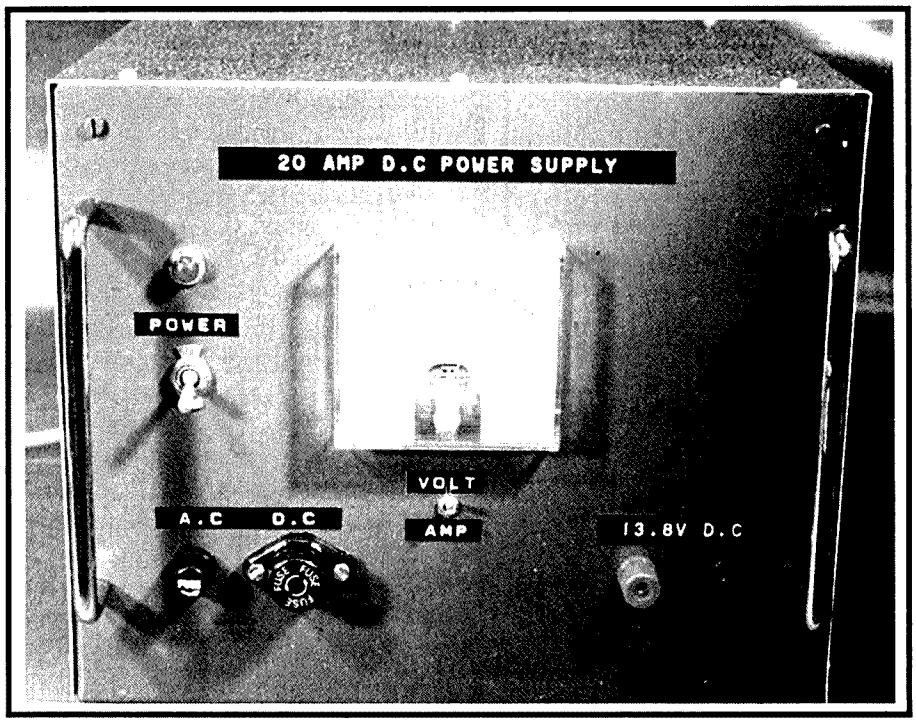
"Miser's" 13.8 volt 10 or 20 amp Power Supply

Drew Diamond VK3XU and Ray Dean VK3RD** explain how to build a very useful and relatively cheap power supply.*



Drew Diamond's 10 A PSU delivering 11.5 A.

When it is necessary to operate a 12 V DC device from an AC mains outlet, a DC power supply unit (PSU) is required. Generally, a fully regulated, quiet PSU with a continuous capacity of more than a few amps is a costly item. However, amateurs take pride in being able to make things at minimum material cost, and certainly the construction of a home-made PSU is an ideal project for the resourceful builder. It is over ten years since the late Des Greenham described his popular home-brew power supply *[Reference (2)]* in *Amateur Radio*. Unfortunately, the UA78MG regulator chip used in that design has become hard to get, so what follows is offered as a workable, and hopefully improved, pattern using presently obtainable components.



Ray Dean's 20 A PSU.

For many of us, the most expensive item would probably be the power transformer, a component costing anything up to $100 at present. However, as is well known *[see References (1), (2) and (3)]*, a practical solution is to re-wind the secondary of a transformer rescued from a junked TV set. Filter capacitor(s), diodes, heatsinks, meters and other components can be purchased at hamfest sales, bartered with radio friends, or bought new if necessary. More later.

Performance

Output Voltage: Nominally 13.8 VDC (ie that of a good car battery, engine running).

Output Current: Conservatively 10 A or 20 A at 60% duty cycle.

Line Regulation: Less than 10 mV change in output from 230 to 250 VAC mains input voltage.

Load Regulation: Less than 10 mV fall in output voltage from no-load to full load.

Ripple & Noise: Less than 5 mV p-p at full load.

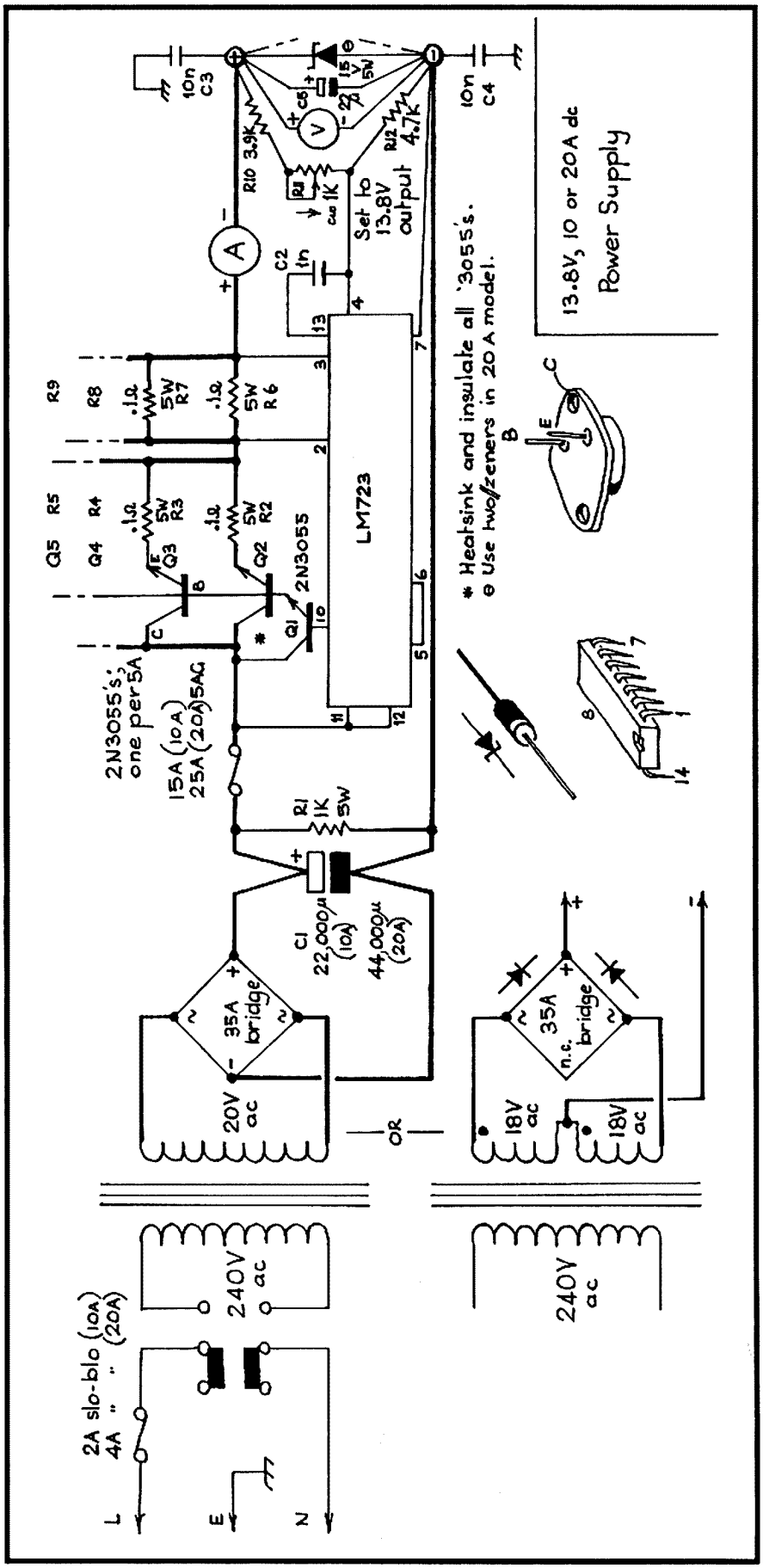
Current Limit: Set at 10 A or 20 A

Output Protection: Reverse voltage and over-voltage.

Circuit

The circuit is conventional. The 20 VAC output from the transformer is rectified, and the "raw" DC is applied to filter capacitor C1, which supplies smoothed, but as yet, unregulated DC at about 25 V with no load. C1 has a 1 k bleed resistor R1 connected to discharge C1 when mains power is removed. An LM723 (an oldie but a goodie, and readily available) performs the regulating function.

Output voltage is sampled right at the output terminals, and is injected into the invert input at pin 4. Error signal at pin 10 sources a Darlington connected 2N3055 at Q1, which drives the parallel connected 2N3055 pass transistors Q2 – Q3 (and Q4 – Q5 in the 20 A version).



Circuit diagram of the "Miser's" 13.8 volt 10 or 20 amp power supply.

To force current sharing (up to 5 A each), 0.1 ohm resistors are connected in the emitter lead of each pass transistor.

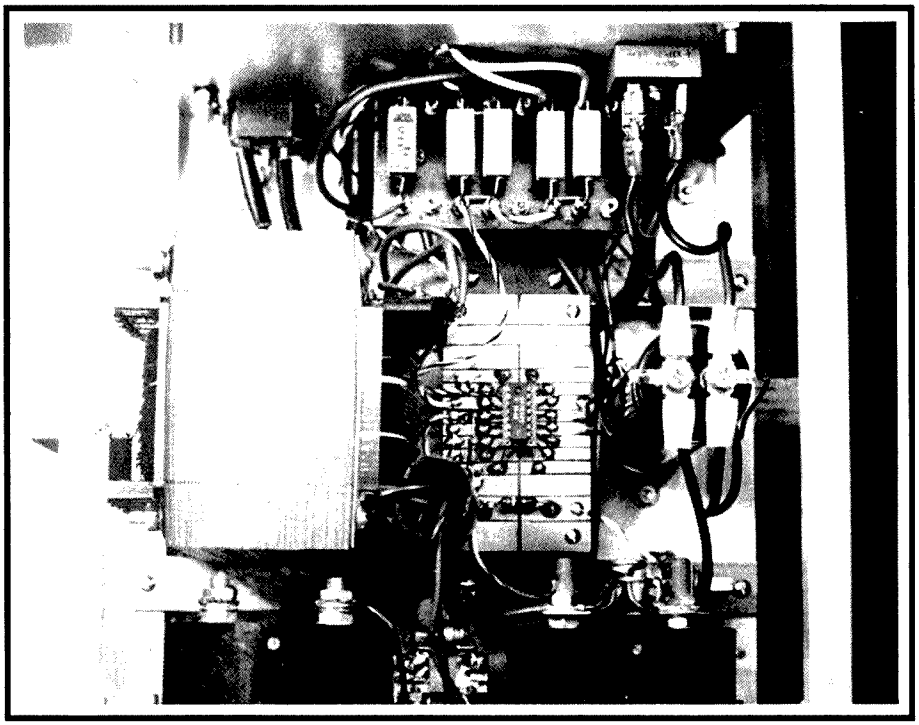
The voltage developed across the sense resistor comprised of two (or four) 0.1 ohm resistors in parallel at R6 – R7 (and R8 – R9) supplies the current limit signal into the '723 at pins 2 and 3. So, as the voltage developed across the effective 0.05 ohm (or 0.025 ohm) approaches 0.6 V, the '723 will cause the supply to go into the constant current mode, automatically limiting in response to any attempted demand beyond about 12 A (25 A).

HF instability is suppressed by inclusion of the 1 nF capacitor C2 between pins 4 and 13. RF is discouraged from entering the supply by inclusion of RF by-pass capacitors C3 and C4 connected from each output terminal to chassis ground. The output "floats" so that positive-earth devices may be powered if necessary.

Reverse voltage and over-voltage protection is provided by the simple trick of connecting one or two 15 volt 5 W "sacrificial" zener diodes at the output terminals (much simpler than crowbar, and not prone to false triggering). Should one of the pass transistors unfortunately fail, and short between collector and emitter, the diode(s) will zener at 15 Volts. The DC fuse will blow, disconnecting DC power and thus protecting the load. The zener(s) will probably be destroyed (tests on numerous diodes, by deliberately shorting one pass transistor always caused a 5 W diode to short), but replacement of this part is nothing compared to the damage which would almost certainly result from the application of perhaps 20 V. or more to your valuable transceiver.

Construction

To assist in heat transfer, and improve immunity to external RF fields, a metal case, box or cabinet is to be preferred. Actual size and shape is largely dictated by the major components, the transformer, heatsink and filter capacitor. The 10 A model is housed in a home-made aluminium box measuring 220 x 226 x 170 mm WDH. Front and rear panels are of 3 mm thick material, connected with 220 mm



Internal view of the 10 A PSU.

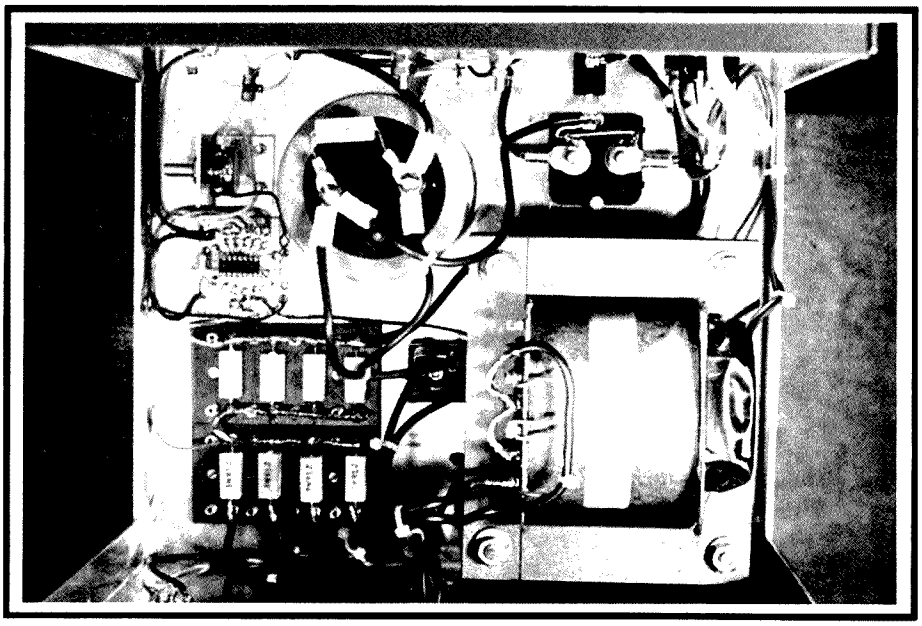
lengths of 10 mm square section aluminium rod. The 20 A model measures 300 x 250 x 250 mm WDH, using the classic U style aluminium box chassis.

The job of re-winding a suitable transformer has been well covered in references (1), (2) and (3). We would just add the following; wind on two or three more turns than calculated. If there has been some small error, it is easier to remove turns, rather than add, after the lamination stack has been re-assembled and tested. If a choice of "re-windable" transformers exists, use one that is perhaps larger than necessary. The well-known split-bobbin B&W TV types are certainly easy to work with but, in reality, these may not be capable of sustaining a 200 VA load (that's 20 VAC at 10 A effective secondary load for the 10 A model) for very long without overheating.

A workable estimation of the VA rating may be calculated from VA = (a x 0.865)^2, where a is the area of the bobbin window in square cm. For example, say the window measures 4 x 5 cm = 20 sq cm, then (20 x 0.865)^2 = 299 VA. A core of this size should be adequate for a 10 A supply. An extra clue is to measure the DC resistance of the 240 VAC primary winding; a reading of about 3 to 5 ohms is typical for a 300 VA, and about 7 to 10 ohms for a 170 VA. A 500 VA would suit the 20 A model. By the way, when measuring the primary resistance of a good transformer, note how sluggishly an analogue meter needle moves off zero then creeps towards final reading. When you reverse the leads it is even more sluggish, indicating a large inductance of the primary winding.

If you want to buy new, some of the usual electronics retailers have transformers which should suit the 10 A model. The secondary voltage must be at least 18 VAC, and preferably 20 VAC (but not much higher than 20 V.). Because, in normal working, we only transmit for up to half the time, it might be assumed that a 5 A winding will do for a 10 A transmitting load. However, much improved regulation and reliability will be obtained if the transformer is matched to the actual maximum current demand.

The transformer primary must be fused and switched as shown. Use a 2 A or 4 A slo-blo fuse in the line (brown wire) side. All mains connections **MUST** be adequately insulated or covered to prevent accidental contact, and the mains earth connected to chassis ground with a dedicated (ie not shared



Internal view of the 20 A PSU.

with any other function) screw, lug, lock-washer and nut.

A linear power supply, when worked hard, generates a considerable amount of waste heat, which needs to be effectively dissipated. Do not skimp on heatsinking for the pass transistors. The two (10 A) or four (20 A) pass transistors must be fitted to an appropriately sized heatsink or sinks. That shown for the 10 A model measures 160 x 110 x 60 mm, and must be at least twice as big for the 20 A model. Always incline on the side of largeness, it will not be wasted. Remember, your PSU must give long, reliable service.

Quite good heatsinks may be obtained from junked colour TV sets, old mainframe computers, etc. Fins should run vertically for best effectiveness. Include the necessary insulating hardware and apply a safe heatsink compound or vaseline at the interface. Do not overtighten the fixing screws. After assembly, with your multimeter on ohms, check that no shorts exist between the '3055 collectors and the heatsink. The Darlington driver Q1 may also be fitted to the main heatsink, or the rear panel as desired.

A 4-diode bridge will drop a total of about 1.2 V in each direction (0.6 V per conducting diode). If your transformer has, say, two separate 18 V/5 A or 8 A windings (giving 10 or 16 A DC output), then improved efficiency will be had by using the windings in series, the centre tap being negative common, then one diode in each leg as shown as an alternative on the circuit. The diodes may be separate, or two diodes of a 4-diode bridge. Use a bridge with a rating of at least 25 A, and preferably 35 A at only slightly higher cost. The bridge assembly must be bolted to the bottom or rear panel, to act as a heatsink for this part.

An accepted rule of thumb for the main filter capacitor is about 2000 µF per amp of maximum current demand. A safe working voltage rating in this instance would be 35 V. "Computer grade" capacitors are the preferred type. If necessary, the required capacitance may comprise several smaller capacitors connected in parallel.

For ease of construction, the '723 may be fitted into a wire-wrap IC socket which, in turn, is soldered to a home-made circuit board. A rectangle of circuit board may be divided into lands or pads with a junior hacksaw, leaving spare lands for sense resistors R10 and R12. The lands form convenient tie points for wiring to other components. Carefully flare the IC socket pins to fit.

Make every joint a good one. Connections shown on the circuit with thick lines are those carrying substantial current, and should be made with insulated wire of at least 2 mm diameter copper. Ordinary hook-up wire will do for the remaining connections. For best regulation to be obtained, the sense resistor connections must be wired away directly to the output terminals as shown on the circuit.

The 22 µF electrolytic, zener diode(s), voltmeter, and RF by-pass capacitors should be connected right at the output terminals. We suggest you make larger brass solder lugs for your terminals to accommodate these components. For an extra level of output protection (particularly for the 20 A model), use two zeners in parallel.

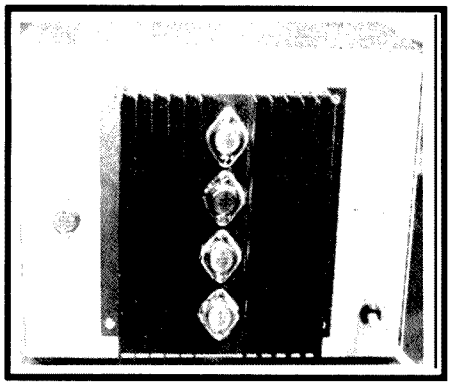
Meters are optional, although it is handy to know that the voltage is correct, and the amount of current being drawn. However, they are expensive items if purchased new. Those shown were obtained at modest cost from recent hamfests. Naturally, newer modem types command a higher price. Only the ammeters required the home-construction of a suitable shunt using Manganin resistance wire to convert a 1 mA meter to read 15 A or 25 A full scale deflection.

The 0.1 ohm (recent manufactured and marked R1, R being the decimal point) 5 W resistors may be mounted on an ordinary tag board or similar. Allow plenty of space between resistors, and make sure no other component or wire can come into contact with them.

Testing

Go over your wiring and confirm that all is correct. Pay particular attention to polarised components, including the filter capacitor, diode bridge, transistors, etc. With your multimeter on the highest ohms range, check that no stray grounds have occurred. When measuring between the positive terminal and chassis, then the negative terminal and chassis, you should read open circuit. The cause of a lower than megohms reading must be traced and rectified before applying power.

Remove the 15 or 25 A DC fuse, then apply mains power. Carefully measure the DC voltage across the main filter capacitor; it should be about 25 to 28 V. Switch off, then replace the DC fuse. Some output voltage should immediately appear due to the charge held by the filter cap. Apply power again. You should have about 13 or 14 V output. The voltage potentiometer



A typical heatsink arrangement on the 20 A PSU.

adjustment range is from about 13 to 14.2 V. Adjust the pot for 13.8 V.

Some sort of dummy load will be needed if you wish to test the PSU current capacity and voltage regulation. About 1.2 ohms (10 A) or 0.6 ohms (20 A) worth of resistance wire (probably nichrome) from an old heater element, and wound on a ceramic former, should do. Connection of the load should cause little or no change in output voltage, right up to, and probably a little beyond, the nominal maximum current capacity. Take care! The resistance wire glows red hot.

If desired, check the current limit function by temporarily applying a dead short across the output terminals. Voltage will fall to nearly zero, and current should limit at about 12 or 13 A (25 A). Removal of the short should restore output voltage, with no damage to the PSU.

Parts

The frugal procurement of the main components has already been mentioned. None of the parts is rare, but may seem costly if needed to be purchased new (and amateurs are notoriously penny-pinching aren't we?).

Near Melbourne we have the usual Dick Smith, Jaycar, Rod Irving, Altronics, TECS, etc electronics suppliers, and additionally Stewart Electronics and Rockby Electronics who can supply most of the required components. Rockby's (at writing) have a supply of reasonably priced 15,000 µF/35 V caps. For heavier hook-up wire, try auto parts shops. The larger 5AG style fuse and holder (for the DC fuse in the 20 A model) are known to be available from Dick Smith Electronics.

Our 0.1 ohm 5 W resistors were purchased from Rockby and Stewarts. Sheet aluminium and square rod may be bought from Capral (Alcan) outlets (check their off-cuts bin). For transformer winding wire, look up "electric motor and generator repairs" in your Yellow Pages™. If you need some Manganin resistance wire for your ammeter shunt, or dummy load, drop a line to Drew at the address shown below (free plus postage).

References and Further Reading

1. Home Brew Regulated Power Supply – Greenham, VK3CO, AR Jul 87.

2. Power Supply Transformers – Switzer, VK2SR, AR Apr 87 (simple how to re- wind).

3. Power Supplies on a Shoestring – Case, GW4HWR, Rad Com, Jul 86 (transformer re-winding).

4. 13.8 V Power Units – Hatch, G3ISD, Rad Com, Jul 83 (typical '723/3055 design methods).

5. VK Powermate – Simpson, Electronics Australia, May 78 (probably the one that started it all).

6. VK Powermaster – Electronics Australia, Mar 84 (became Dick Smith Kit 3448).

7. "The Serviceman" – Electronics Australia, Mar 92 (handy PSU troubleshooting tips).

8. The Foolproof Power Supply – Eunson, VK4SO, ARA, Vol 8 No 10.

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WIA News

US President Clinton Recognises Amateur Radio

The US President, Bill Clinton, sent greetings to radio amateurs in America in the lead up to the Simulated Emergency Test held over 12-13 October, recognising amateur radio's value to the community, particularly during emergencies, according to *The ARRL Letter Online.*

Referring to 7-13 October as "Amateur Radio Week", the text of the message, signed by President Clinton, said: *"In the past century, the medium of radio has changed the way we live and the way we view our world, and Amateur Radio operators have played a vital role in this communications phenomenon. Sharing knowledge and technological expertise, connecting computers via radio equipment, and linking people all across the globe, ham radio operators have helped to make our world a true global village. But even more important, they have provided a crucial lifeline of relief in times of disaster and hardship, ensuring that hope and help are on the way to those in need.*

"Amateur Radio Week offers us a welcome opportunity to thank our nation's amateur radio operators for their commitment to excellence and their willingness to work for the well-being of others. Best wishes for a wonderful week."

Special Prefixes for Hongkong

Hongkong hams have gained permission to change the numeral in their call signs to commemorate the transfer of sovereignty over the territory from the United Kingdom to the People's Republic of China (PRC) on 1 July 1997.

From September, they've been able to use 96, for 1996. Next year, they will be able to use 97, and in 1998 they'll be able to use 98.

According to the Hongkong Amateur Radio Transmitting Society (HARTS), Hongkong amateurs previously holding VS6-prefix call signs are allowed to continue using them up to 1 July 1997, while VR2-prefix licences have been issued for several years now in anticipation of a prefix change after 1 July 1997.

The VRA-VRZ block allocated by the ITU to the UK will be transferred to the PRC at that time and will be used by the Hongkong Special Administrative Region of the PRC after the changeover date.

HARTS said that details of a new award for amateurs contacting stations using the special prefixes will be announced in the future.

■ Computer Program

Maidenhead Locator Program

John Martin VK3KWA describes a simple computer program to calculate the increasingly used Maidenhead Locator squares.*

For those who are not yet familiar with it, the Maidenhead Locator system is in common use on VHF and UHF, to enable positions to be identified using a combination of letters and numbers.

The first two letters of the identifier refer to coarse squares, measuring 20 degrees longitude by 10 degrees latitude. These squares start where the international date line meets the South Pole, and move north and east from there. The starting point is therefore 180° W 90° S, at the lower left-hand corner of square AA. The first letter increments as you move east, and the second letter increments as you move north. The highest letters are RR.

Each square is divided into 100 smaller squares, arranged 10 high by 10 wide. The square at the lower left is 00, and the one at the upper right is 99. As with the letters, the first number increments as you move east, and the second increments as you move north. The letters and numbers form the four digit locator, eg QG62 for Brisbane.

These locators cover a north-south distance of around 111 km, and an east-west distance ranging from 222 km at the equator to zero at the poles. Although handy for locating another station on a map, four digit locators can only provide very rough distance estimates.

For increased accuracy, each four digit locator is subdivided into 24 x 24 "sub-squares", which are identified by two additional letters. Each sub-square covers 5 minutes of longitude by 2.5 minutes of latitude, or about 9.28 by 4.64 km at the equator. Six digit locators can therefore give a distance measuring accuracy of around plus or minus five km, which is good enough for most purposes.

The following program provides a quick and easy way to:

(a) convert latitude and longitude to a six digit Locator;

(b) convert a four or six digit Locator to latitude and longitude;

(c) calculate the distance between two lat/long positions; and

(d) calculate the distance between two Locators.

For the sake of simplicity, the program uses a straightforward formula which assumes that the earth is a perfect sphere. The accuracy is limited to a few km and results are rounded off to the nearest kilometre. If you enter station co-ordinates in the form of Locators, the margin of error is greater. The program calculates the distance between the centres of the two Locator squares, but of course the two stations could be located anywhere within their respective squares.

The original version was written in 1990, and has now been updated and runs under GWBASIC or QBASIC.

Be careful when typing the program in, especially with the mathematical and punctuation symbols. Be especially careful with brackets, commas, colons and semi-colons. In lines 85 and 505, there should be no space between the pairs of quotation marks. Also, ensure that in lines 120 and 130, the letters "S" and "W" appear once in upper case and once in lower case.

If the program crashes, it will almost certainly be due to a typing error. To keep the program simple, it has no error trapping. You can get ridiculous results if you enter impossible figures such as latitudes greater than 90 degrees, or locators with any digit greater than RR99XX.

For those who do not like typing

Program Listing

```
10 REM  DISTANCE – LOCATOR PROGRAM
12 REM  WRITTEN BY JOHN MARTIN, VK3KWA, NOVEMBER 1996
16 REM
20 DEF FNA (X) = ATN(ABS(SQR(1 – X ^ 2) / X))
25 DIM C(6): DEFDBL E, N: PI = 3.14159265#
50 CLS : PRINT "Distance – Locator Program: Amateur Radio December 1996"
55 PRINT "=========================================================="
60 PRINT "1  Convert Lat and Long to Locator"
65 PRINT "2  Convert Locator to Lat and Long"
70 PRINT "3  Find Distance between 2 Lats and Longs"
75 PRINT "4  Find Distance between 2 Locators"
80 PRINT "<1 – 4> your choice  <ANY OTHER KEY> to quit": PRINT
85 K$ = INKEY$: IF K$ = "" THEN 85
90 K = VAL(K$): IF K < 1 OR K > 4 THEN END
95 ON K GOSUB 100, 200, 300, 400: GOTO 60
100 PRINT "DMS TO LOCATOR CONVERSION"
105 PRINT "Enter the latitude and longitude in degrees, minutes and seconds."
110 PRINT "Type the three figures separated by commas."
115 INPUT "Latitude            "; ND, NM, NS: NM = ND * 60 + NM + NS / 60
120 INPUT "North or South (N/S) "; NS$: IF NS$ = "S" OR NS$ = "s" THEN NM = -NM
125 INPUT "Longitude           "; ED, EM, ES: EM = ED * 60 + EM + ES / 60
130 INPUT "East or West (E/W)  "; EW$: IF EW$ = "W" OR EW$ = "w" THEN EM = -EM
135 ER = EM * PI / 10800: NR = NM * PI / 10800: E = 10800 + EM: N = 5400 + NM
140 C(1) = INT(E / 1200): E = E – C(1) * 1200
145 C(3) = INT(E / 120):  E = E – C(3) * 120: C(5) = INT(E / 5)
150 C(2) = INT(N / 600):  N = N – C(2) * 600
155 C(4) = INT(N / 60):   N = N – C(4) * 60:  C(6) = INT(N / 2.5)
160 L$ = "": RESTORE: DATA 65, 65, 48, 48, 65, 65
165 FOR N = 1 TO 6: READ D(N): L$ = L$ + CHR$(D (N) + C(N)): NEXT
170 PRINT "Six digit locator is "; L$
175 IF K = 3 THEN RETURN
```

```
180 GOSUB 500: IF Q = 1 THEN 105 ELSE RETURN
200 PRINT "LOCATOR TO DMS CONVERSION"
205 INPUT "Enter the 4 or 6 digit locator:  "; L$: L$ = LS + "MM"
210 FOR X = 1 TO 6
215 C(X) = ASC(MID$(L$, X, 1))
220 IF C(X) > 96 AND C(X) < 123 THEN C(X) = C(X) - 32
225 NEXT
230 E = -180 + 20 * (C(1) - 65) + 2 * (C(3) - 48) + (C(5) - 65) / 12
235 N = -90 + 10 * (C(2) - 65) + (C(4) - 48) + (C(6) - 65) / 24
240 ER = E * PI / 180: IF E < 0 THEN E$ = "West" ELSE E$ = "East"
245 NR = N * PI / 180: IF N < 0 THEN N$ = "South" ELSE N$ = "North"
250 ES = 3600 * E - 150 * (LEN(L$) = 8): ES = ABS(ES): ED = INT(ES / 3600)
255 ES = ES - ED * 3600: EM = INT(ES / 60): ES = CINT(ES - EM * 60)
260 NS = 3600 * N - 75 * (LEN(L$) = 8): NS = ABS(NS): ND = INT(NS / 3600)
265 NS = NS - ND * 3600: NM = INT(NS / 60): NS = CINT(NS - NM * 60)
270 PRINT "Co-ordinates at the centre of the square are:"
275 PRINT "Latitude ", ND; " deg "; NM; " min "; NS; " sec  "; N$
280 PRINT "Longitude ", ED; " deg "; EM; " min "; ES; " sec  "; E$
285 IF K = 4 THEN RETURN
290 GOSUB 500: IF Q = 1 THEN 200 ELSE RETURN
300 PRINT "DISTANCE BETWEEN TWO DMS CO-ORDS"
305 PRINT "Co-ordinates of Station 1:"
310 GOSUB 105: E1 = ER: N1 = NR
315 PRINT "Co-ordinates of Station 2:"
320 GOSUB 105: E2 = ER: N2 = NR
325 AN = COS(E1 - E2) * COS(N1) * COS(N2) + SIN(N1) * SIN(N2)
330 AC = FNA(AN): IF AN < 0 THEN AC = PI - AC
335 D = INT(AC * 6367)
340 PRINT "Approx. distance (km):  "; D
345 IF K = 4 THEN RETURN
350 GOSUB 500: IF Q = 1 THEN 300 ELSE RETURN
400 PRINT "DISTANCE BETWEEN TWO LOCATORS"
405 PRINT "Station 1"
410 GOSUB 205: E1 = ER: N1 = NR
415 PRINT "Station 2"
420 GOSUB 205: E2 = ER: N2 = NR
425 GOSUB 325
430 GOSUB 500: IF Q = 1 THEN 400 ELSE RETURN
500 PRINT "<RETURN> to do another one  <ANY OTHER KEY> for menu"
505 Q$ = INKEY$: IF Q$ = "" THEN 505
510 IF Q$ = CHR$(13) THEN Q = 1 ELSE Q = 0
515 PRINT : RETURN
```

programs, a more sophisticated version is available as an .EXE file. It uses a more complex method of calculation, and has an accuracy of 100 metres. It calculates both short and long path distances and beam headings, has full error trapping, and will beep politely at you if you try to enter anything that would cause a wrong answer. To receive a copy, send a disk (any IBM format) in a suitable mailer with return postage to John Martin VK3KWA (QTHR).

For interest, here are the locators for the capital cities around Australia (where two locators are shown, you will have to determine whether you are north or south of a 1 degree latitude line passing through your city):

Canberra	QF44
Sydney	QF55/56
Melbourne	QF22
Brisbane	QG62
Adelaide	PF94/95
Perth	OF77/78
Hobart	QE36/37
Darwin	PH57

References and Further Reading

1. "Maidenhead Locators for Austrlaia", Chris Dimitrijevic VK3FY, Amateur Radion (p28), January 1985.

2. "Finding One's Maidenhead Locator", Frank Beech VK7BC, Amateur Radio, November 1987.

3. "Using Locators", John Martin VK3ZJC/VK3KWA, Amateur Radio, December 1990.

4. "Distance Estimating Program", John Martin VK3ZJC/VK3KWA, Amateur Radio, January 1991.

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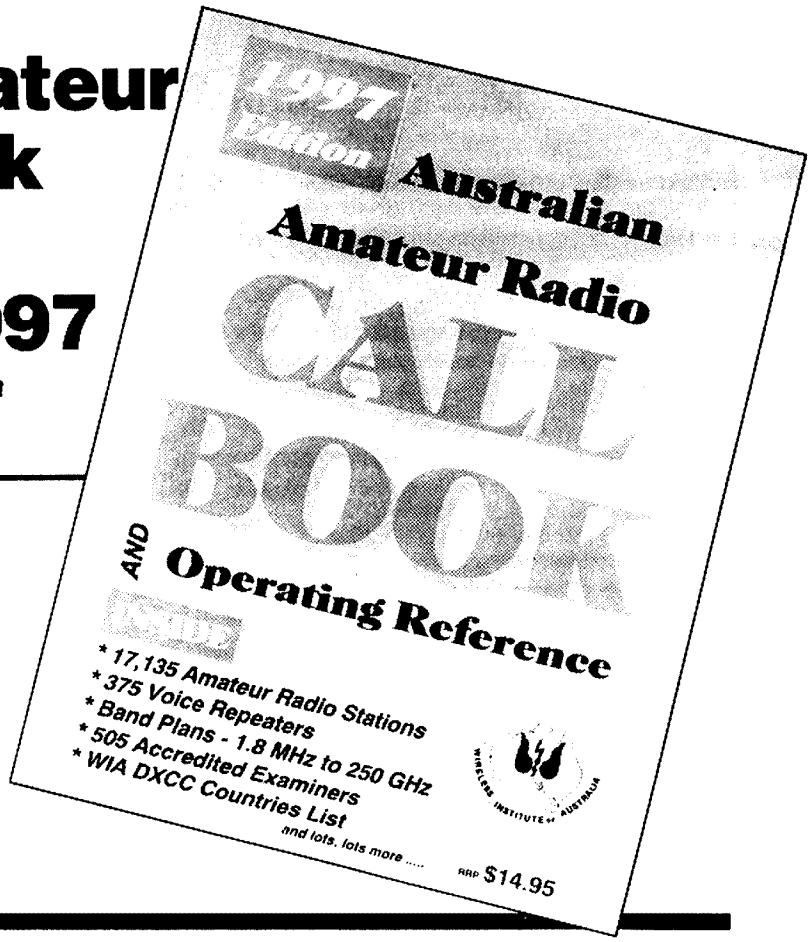
■ Book Review

Australian Amateur Radio Call Book and Operating Reference – 1997

Publisher: *Wireless Institute of Australia*

Reviewed by: *Bill Rice VK3ABP*



You've just heard a rare prefix on 20 metres. What country is it? Of course, look it up in the latest *Call Book*!

Prefixes keep changing these days, with all the political changes going on, so you need a recently updated list. In the *1997 Call Book*!

You're driving somewhere on holiday far from home. What repeaters are within range on your FM mobile? What band and channels? They're all listed in the *1997 Call Book* (packet too!).

One of the family who has just moved in across the road sees your antennas and calls in to ask what they are. What do you tell him/her about amateur radio? How can they find out what it's all about? How do they get a licence? It's all in the *Call Book*.

Which part of what band can you use for which mode of transmission? All the Band Plans are there, from 1.8 MHz to 250 GHz!

And, of course, the names and addresses of all Australia radio amateurs are listed (except for a few who prefer them suppressed). Over 17,000 licences, with hundreds of changes since last year, hundreds of new call-signs (maybe even thousands!).

How can you maintain an amateur station without a current Call Book? Only $13.00 at your Divisional Bookshop, or $14.95 at your favourite radio/electronics store.

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■ Antennas

Random Radiators

*with Ron Cook VK3AFW and Ron Fisher VK3OM**

Bytes and Pieces

Some time ago I had a few moments to spare and looked at a News Group on the computer mail system. It went by the name of rec.radio.amateur.antenna. I've not had the time to look at it recently, but here is a sample of some of the information that can be gleaned from there.

CB Whip Mods

Chris Moore said it occurred to him that he should be able to get a CB magnetic mount antenna and trim it a bit to use on 10 m. Brian N5PSS replied that a better bandwidth would result if the coil were shortened rather than the whip.

Comment: This may be true, although the difference may not be very great. A CB antenna is a good starting point for an inexpensive 10 m antenna. The critical part of a loaded whip is the bottom section. This carries the highest current and radiates the signal. The lower the losses here and the greater the fraction of a quarter wave, the higher the efficiency and the better it will work. The loading coil and the top whip provide the inductance and capacitance to make the whole resonant.

Reducing the size of the coil will reduce its losses, but the Q may also be reduced and so increase the bandwidth. Why will taking a few turns off a coil decrease its Q? The theory goes like this. The inductance of a coil is proportional to the square of the turns and Q is proportional to the ratio of inductance to resistance. The resistance will be proportional to the number of turns. So, reducing the turns by half will reduce the resistance to one-half, but it will also reduce the inductance to one quarter. So, the Q will

reduce to half and the bandwidth will double. In practice there will be other complications so that the change might be a lot less.

If a CB whip is altered to resonate on 28 MHz, then adjusting the coil is likely to be the most satisfactory option. Any change in its performance will be slight and may be for the better. Don't forget to use heat shrink tubing or plastic tape to waterproof the modified coil.

For reduced size antennas, increased efficiency normally means reduced bandwidth. Therefore, if a signal comparable with a full size antenna is desired, some loss of bandwidth must be accepted. If you have a small antenna that has a flat VSWR it is likely to be lossy and might make a better dummy load that an aerial.

Attic Antennas

In response to a request for ideas on an antenna that could be hidden in an attic and had to be less than 50 feet long, Bob KF8PH replied as follows. *"I have four indoor HF antennas in the rafters. You could make a good 20 m dipole. You might also consider making a loading coil using some PVC pipe."*

He goes on to say, *"Indoor antennas are fun to experiment with. They do not compare with outdoor antennas, but that makes them no less fun."*

Comment: Chapter 6 of The ARRL Antenna Book, 17 Ed, has an excellent treatment of single coil, two coil and linear loading of dipoles to reduce their length with minimal reduction in performance. While a full size 40 m dipole supported on 30 m masts might be excellent, it is not practical for most of us. A shortened dipole at 8 metres (25 ft), or one in the roof, is infinitely better than none at all. An antenna that is only 10% efficient and not placed in an optimum situation still can be within 2 to 4 S units of a full size dipole at a moderate height.

Brazing Rod Elements

In reply to a query as to whether brazing rod was a good material to use for antennas, Doug VK4ZDR replied: *"Be aware that normal brass brazing rod has a high proportion of phosphorus and other materials in its composition. These all help to make it a better welding rod; however, they increase the resistivity of the material and degrade the antenna performance. Even aluminium welding rod contains some silicon and/or magnesium and so has increased resistivity. Normal aluminium has a much lower resistivity and, provided you make joints that do not oxidise over time, should provide better performance. I use a eutectic aluminium brazing rod "Techni-2000" to braze all aluminium-aluminium joints on the antennas I fabricate. Only a normal gas torch is needed for this. The rod melts at about 200 degrees less than aluminium does, but care must still be exercised."*

Open Wire Feeder

Jim W2XO comments on making open wire feeder. *"I have constructed "ladder line", ... from electric fence materials. You can get three foot rods of fibre glass used as insulators for electric fences from farm stores. They also stock some wire. Hopefully you can find copper-clad steel, but aluminium will work and is usually sold in 1/4 mile spools. #14 is about $25.*

"I made six inch spacers by cutting up the fibre glass rods and drilled a hole near each end for the wire to pass through. I then drilled a hole on axis and threaded in a sheet metal screw to clamp the spacer on the wires. It is easy to assemble, just cut two lengths of wire and lay them side by side across the lawn. Fasten them at one end and thread on the spacers, about two per foot. Walk the spacers down the wires to get an even spacing and tighten the sheet metal screws.

"I am going to try a simpler construction next time. I'll put a saw slot in the ends of the spacers and use epoxy to hold them in place. This will eliminate the need to walk the spacers down the wires.

"The result is a line with about 550 ohms impedance. I currently use a 120-foot dipole fed with the stuff that works fine from 160 through 10 metres. It's probably not significantly better than the store bought stuff with the #18 wire, but it does resist degradation from snow and ice better due to the wide spacing. Most of all it LOOKS NEAT, just like a 1938 QST cover picture!"

Elevated RF Ground

In reply to a question from Chris N8PBI on how to get a good ground when on the second floor, Cecil KG7BK replied: *"Attach a 1/4 wavelength of wire for each band you want to run to the ground lug of your equipment. These wires may be routed around the edges of your room. The ends of these wires are high RF voltage points, so insulate them well. This scheme is known as a counterpoise and will give you an excellent RF grounding system. Please note the caution about insulating the ends. At 1 kW the voltages are lethal. Even at 100 watts the voltages present at the ends of the wires can burn you badly."*

Comment: For the lower frequencies the wire length is inconvenient. A much shorter wire can be used if resonated using an ATU. In fact, such units are available from commercial sources.

Bill W7LZP commented: *"If a properly balanced antenna was used an RF ground would be unnecessary. RF in the shack is RF that is not being radiated and, rather than use an RF ground, it is better to pay more attention to the antenna."*

For safety purposes a good mains ground is always required.

El-Cheapo Low Profile Antenna

In conclusion, a comment from James WY9F about inexpensive and low profile antennas.

"I have a home built, 7 band (10, 12, 15, 17, 20, 40 and 80 m) ground-mounted wire vertical; 40 and 80 m are "loaded". I used a piece of 2.5" PVC pipe about 9" long to wind a substantial loading coil. I used PVC end-caps on both ends, with a ground rod protruding through the bottom one. A female coax connector is located near the bottom, with the "shell" connected to the ground rod, and a dozen or so radial wires that also come out of the bottom. The centre conductor goes to the bottom of the loading coil.

"The top PVC end-cap has five holes drilled around the circumference, through which nylon line is tied. The other ends of the lines are tied to a similar sized disk mounted (via a spring) to the peak of my house with a screw eye. Thus, I have a 5 "string" trellis running from the ground to the peak of the roof.

"Along these strings I have tie wrapped some 18 gauge wires, each cut to quarter wavelengths for the five bands, 10 to 20 m. They are bonded at the bottom to the top of the coil.

"Inside the pipe are relays that allow shorting the coil for 10 – 20 m operation. The full coil resonates the 20 m wire for 80 m CW. Taps on the coil are used for the phone section of 80 m, and also the CW and phone sections of 40 m. The taps are selected by combinations of the relays.

"Tuning is a bit tricky as there is some interaction between the wires. If you use the standard 234/f formula, you are most certainly going to be "long", so trim down from there.

"I've had good luck with it although I have no experience with "store bought" antennas. If I had to do it again, I'd probably spread out the wires more (less interaction?), and use real RF relays instead of the Bosch 30 A automotive relays. I think RF burned one of them out – shouldn't have switched it while talking.

Final Comment: Well, even with RF relays it is not a good idea to switch with RF applied. Apart from giving the contacts a hard time it is not good for the transmitter.

73 from him and 73 from me.

*C/o PO Box 2175, Caulfield Junction, VIC 3161

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ALARA

Sally Grattidge VK4SHE, ALARA Publicity Officer*

Apres ALARAmeet

The ALARAmeet in Perth is now part of our history, and was a very enjoyable and successful event from what I have heard. Bev VK6DE can relax knowing she has done a splendid job helping old friends meet again and new ones discover each other, all with many happy memories of their time in WA. Meanwhile, there must be some nice little side stories waiting to be told, so if something amusing happened to you, or you spotted someone doing, wearing or eating something unusual, do tell. Here is your chance to give national coverage to those embarrassing moments and let the rest of us have a good laugh at your expense.

After the meet, Dot VK2DDB travelled south to Pemberton where she not only saw the famous Gloucester tree, but climbed it! This giant Karri at 60 m is the highest lookout tree in the world; it was pegged in 1946 and named after the Duke of Gloucester. Dot will have a hard time persuading the OM to climb the tower for her after that.

Even further south near Albany, Dot's OM John VK2ZOI had missed a turning and was heading for a roundabout to do a U turn, when the hired van containing the ZLs from the ALARAmeet was spotted. John sent CQ on the car horn as they followed the van round the roundabout to attract their attention.

Gwen VK3DYL enjoyed the trips organised for the Meet and the opportunity to see something of WA. Elizabeth VE7YL stayed with Gwen in Melbourne for a few days attending the monthly VK3 luncheon and a party in her honour as well as meeting old friends among the local DXers. Please note that there will be no VK3 luncheons in December or January.

Welcome New Member

Ruth VK1YL joined at the ALARAmeet. It looks like Ruth will be VK1 Rep unless she can persuade another VK1 YL to join her.

Silent Key

The members of ALARA extend sympathy to Jenny VK5ANW, whose OM Bill VK5AWM passed away suddenly on 27 October.

Congratulations

Marilyn VK3DMS has won another Vermeil medal for her stamp collection. Last year she was one off the gold in a national competition, and this year she is two off the gold in an international event. Most people drop two places when they go international, but then Marilyn is not most people.

JOTA

I know many YLs take part in JOTA, so if you had an interesting time, please let me know about it. I had an enjoyable weekend, apart from minor panic after discovering I had left a vital bit of coax back at the shack, but a replacement was found and all went smoothly. I was introduced to a culinary delight known to the Scouting fraternity but new to me. That is the cooking of a hot dog in a milk carton. You assemble a cold dog, wrap in foil, place in empty milk carton, ignite (not on the kitchen table, kids!) and within a few minutes you have – a cold sausage in a burnt bun.

ARDF ZL Style

Hot news from Anne ZL3VR is that the First NZ Radio Orienteering Championships will be held in Christchurch at Easter 1997 on 28 to 31 March. If there are sufficient YL competitors of mature years, sections will be arranged so you do not have to run against 20 year olds!

There will be HF and VHF courses, and $50 covers both events, lunches transport and the final dinner. Accommodation at very reasonable cost is available at Christchurch Boys High School. Those without their personal "sniffers" will be able to hire equipment on a first come basis.

Registration forms should be in December *Break In*, or contact Ron Godkin ZL3TO, phone 03 3388 0043, or Ann McMaster ZL3VR, phone/fax 03 327 8278.

Rockhampton Rocks

Robyn VK4RL and her District Radio Ladies kept their usual high profile at the Central Queensland Amateur Radio Convention in September. A display table was set up with a craft section with prizes donated by Mary VK4PZ and judged by Dianne Kavanagh. Later that night the ladies dressed in Shirley Temple costumes complete with lollipops and sang "The Good Ship Lollipop" as part of the after dinner entertainment. The DRLs are also meeting for lunch once a month and celebrating birthdays and any other excuse for a party; so, if you are in the area any time, contact

Robyn and she will probably organise one for you.

CLARA 97 Gala Celebration – September 26, 27, 28

Come and join us for a great weekend! Great prizes, great fun, great people. We are CLARA. OMs are welcome. Registration by 31 January 1997 attracts a discount. Activities include a visit to the Fred Hammond Radio Museum, dinner theatre, home brew and entertainment (what can you contribute?), three forums, dinner and dance, plus the Yavir Ukrainian Dance Group and a Sunday morning Bon Voyage breakfast. If you are planning to visit Canada in 1997 make sure you are in Aurora, Ontario in September. Dot VK2DDB has more details, or contact Cathy Hrischenko VE3GJH, 13451 Concession 1, RR 1 Zyphyr, Ontario LOE-1 TO Canada.

Christmas Greetings

Christmas greetings from the YLs of ALARA to those who talk and those who listen, and all those OMs who come to our aid with ladders and soldering irons. Enjoy the festive season and drive safely so that we can all meet again in 1997.

**C/o PO Woodstock, QLD 4816 Tel: 077 788 642*

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Back row: Bev VK6DE, Myrna VK5YW, Raija SMOHNV, Christina VK5CTY, Lynda Francis, Trish VK6QL, Joan VK6JMP, Mariana VK3WQ, Poppy VK6YF, Val VK6VR, Marion ZL3TVF, Batty ZL1UBZ, Biny ZL1AZY, Judy VK3AGC, Tina VK5TSK, Christina VK6ZLZ, Cathy ZL2ADK, Shirley (daughter of Norma VK6PNS).
2nd row: June VK4SJ, Gwan VK3DYL, Margaret VK3DML, Robyn VK4RL, Eileen ZL1BRX, Win ZL1BBN, Aimee FK8FA, Norma VK2YL.
3rd row: Helena VK7HD, Pat ZL1LD, Peggy VK6NKU, Celia ZL1ALK, Elizabeth VE7YL, Aola ZL1ALE, Ruth VK1YL, Norma VK6PNS, Pam VK3NK.
Front row: Dot VK2DDB, Tina VK5TMC, Muriel XYL da VK3KNM, Jill ZL2DBO, Carol ZL2VQ, Fiona XYL de VK6JKR, Bev VK4NBC, Ann VK4ANN.

AMSAT Australia

*Bill Magnusson VK3JT**

National co-ordinator
Graham Ratcliff VK5AGR
Packet: VK5AGR@VK5WI
AMSAT Australia net:
Control station VK5AGR
Bulletin normally commences at 1000 UTC, or 0900 UTC on Sunday evening depending on daylight saving and propagation. Check-ins commence 15 minutes prior to the bulletin.

Frequencies (again depending on propagation conditions):

Primary 7.064 MHz (usually during summer).

Secondary 3.685 MHz (usually during winter).

Frequencies +/- QRM.

AMSAT Australia newsletter and software service
The newsletter is published monthly by Graham VK5AGR. Subscription is $30 for Australia, $35 for New Zealand and $40 for other countries by AIR MAIL. It is payable to AMSAT Australia addressed as follows:

AMSAT Australia
GPO Box 2141
Adelaide SA 5001

Things are Hotting Up!

Evidence of OSCAR-13 perigee heating is obvious in the whole-orbit-data extract published by James G3RUH last month (Fig 1). The trace covers two perigees on 21 October and it's quite easy to see the sharp rise in temperature as OSCAR-13 ploughs through the upper reaches of the atmosphere on its closest approach to earth each orbit.

A week after the telemetry shown in Fig 1 was recorded, the satellite encountered eclipses around perigee. It will continue to enter the earth's shadow each perigee until its final re-entry. Fig 2 shows that the cooling effect of the lack of sunlight was more than enough to counteract the heating effect of the pass through the upper atmosphere. Control stations are monitoring the rate of change of this heating and indications are that, by the time you read this, OSCAR-13 will be very close to re-entry, which has been predicted for some time now to be around the first or second week in December.

At the time of writing, InstantTrack was reporting the perigee height of AO-13 as less than 100 km. This is critical and things will start to melt before too long. If you've left it till now to have that last QSO through OSCAR-13, chances are you've left it too late. Don't expect the satellite to remain operational until the moment of re-entry. Relatively flimsy items like antennas will be the first to be destroyed by the heating and no antennas mean no signals in or out. Once that happens we will have to rely on NASA's radar tracking to tell us when OSCAR-13 is no more.

Of course, it may all happen rather quickly. No-one knows for sure; the demise of man-made satellites is a notoriously unpredictable business. Remember Sky Lab? It wasn't until the last orbit that accurate data could be obtained. I've been listening and operating AO-13 as much as possible for the last few weeks and recording the telemetry. I must say that it's been good to see lots of activity to send our old friend off.

AO-10 has been there also with good signals, often rivalling AO-13 in signal level and activity. In next month's column I should be able to give some details of the final hours of AO-13. The January column traditionally includes the latest summary of active OSCARs. It will be rather sad not to see AO-13's listing there. It had been hoped to extend the useful life of AO-13 a little longer by re-orienting the satellite to 90,0 but it proved too difficult due to very fast perigee fly-bys and crippling Doppler shift. A very slow change to 180,0 was agreed upon as the best possible solution and this was to be implemented in early November.

1996 And All That

What a year it's been in the amateur radio satellite business. It began with the appointment in February of Graham VK5AGR to the post of IARU AMSAT Frequency Co-ordinator. The importance of this post cannot be overstated. Graham was chosen because of his extensive experience as southern hemisphere control station for AO-10, AO-13 and P3D. In March it was announced that the replacement for JAS-1b, the new JAS-2, was nearing completion.

April saw the creation of AMSAT-France, a new amateur radio satellite body in France. It was also in April that Ron Parsons K5RKN introduced his full Doppler control program. April was a busy month. It saw the launch of "Project Argus" by the SETI League. This project is designed to allow amateur radio operators and amateur astronomers to participate in SETI, the recently re-formed Search for Extra-Terrestrial Intelligence.

In May the announcement was made that the launch date was set for "SunSat", a new amateur radio satellite built in South Africa. SunSat will have a strong educational role.

June saw details published of the SCOPE camera to fly on P3D. SCOPE is being developed in Japan.

July gave us the introduction of another station control program, this time for the ubiquitous FT-736 transceivers.

Yet another prestigious award was announced in August. Karl Meinzer DJ4ZC was awarded the Horkheimer prize for his

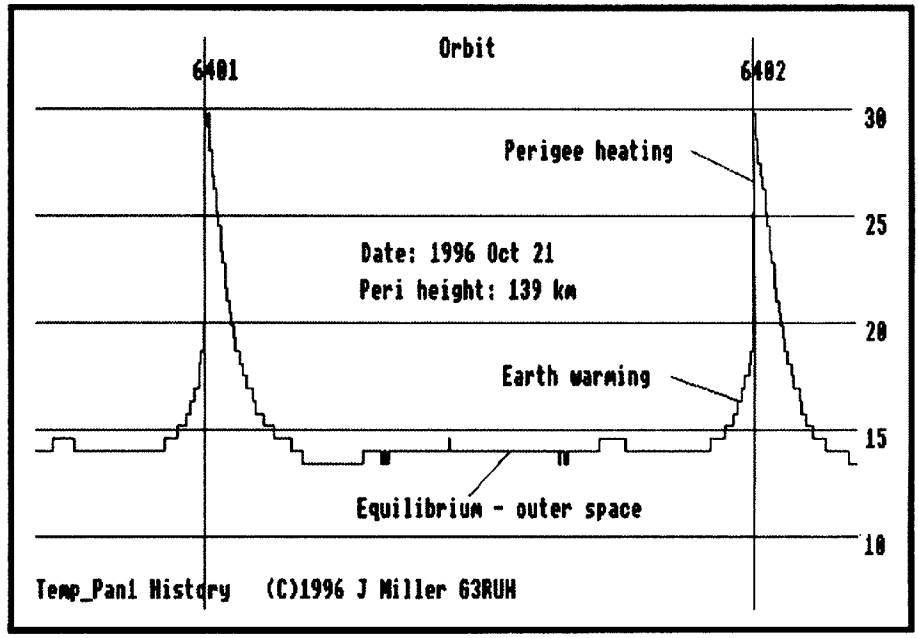

Fig 1 – A whole-orbit-data extract of OSCAR-13 showing perigee heating.

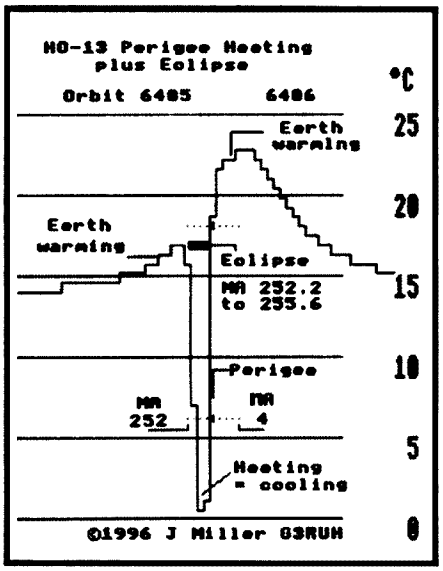

Fig 2 – A data extract from OSCAR-13 showing that the cooling effect of the lack of sunlight was more than enough to counteract the heating effect of the pass through the upper atmosphere.

contributions over time to the technical art of amateur radio satellites. August also saw the successful launch of JAS-2.

The long awaited MIR 70 cm operations began in September and plans were announced in October for an ambitious project to include MIR/SAFEX in the world's amateur radio TCP/IP network.

In October it became known that a new amateur satellite to be called Maelle was under construction in France. The project had won an important engineering prize a few months earlier. Awarded to commemorate the 100th anniversary of the first radio transmissions, it was presented by Joseph Taylor, Nobel prize winner in physics for the discovery of binary pulsar stars. Joseph revealed that his interest in science had first been wakened by practising amateur radio. Details also came to hand in October of another satellite being built at UoS. Called Merlion, it will carry an amateur radio package including extensive experimental digital comms capable of megabit rates and requiring microwave equipment at the ground station. It will be used for commercial purposes during the week and be switched to amateur bands on weekends.

This summary is not exhaustive, as each new bird would require a complete column to cover adequately. It serves, however, to show that the amateur radio satellite scene is very much alive and well and looking forward to the start of the new millennium.

New MIR Frequency Plan

After much discussion it has been decided by the IARU Region 1 conference that the two metre frequencies used by MIR crews for amateur radio operations should change. In future, packet operations will be on 145.800 MHz FM and voice operations will change to duplex. MIR will transmit on 145.800 MHz and listen on 145.200 MHz.

Next Month

The usual six-monthly update of operational amateur radio satellites.

RMB 1627, Milawa VIC 3678
CompuServe: 100352,3065
Internet: 100352.3065@compuserve.com
E-mail: vk3jt@amsat.org
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Support the WIA in order to protect amateur radio frequencies

Awards

*John Kelleher VK3DP - Federal Awards Manager**

ZL2000 Award

The amateur fraternity is fast heading into a new century, with the year 2000 rapidly approaching. To acknowledge this event, the Gisborne Amateur Radio Club (Branch 11 NZART) have instigated an annual award until the year 2000 using the callsign ZL2000.

The award, to be known as the "Gisborne 2000 Award" highlights the fact that Gisborne, New Zealand, is unique in being the first City in the world to greet the sunrise on a new day, and the New Year. Gisborne will be the centre of attention for much of the world during the New Year period of the year 2000.

As this is an International award, it is therefore open to all amateur radio operators and SWLs. To achieve an annual award, only ONE contact is required with a ZL2000 station during the month of January each year, until the year 2000.

A special complimentary Award will be issued to all stations that contact a ZL2000 station for FOUR out of the possible five years of the award, up to and including the year 2000. One of these complimentary award recipients will receive a very special award in the year 2000, the details of which will be released at a later date.

The fee for the annual award in New Zealand is $NZ5.00. For V.K operators $AUS5.00, and for the rest of the world, $NZ10.00. All correspondence and Award applications should be sent to: Gisborne 2000 Award, PO Box 1017, Gisborne 3815, New Zealand.

Rules for the ZL2000 Award

(1) The Award will be available to all licensed amateurs and SWLs.

(2) Only ONE contact is eligible per year with one of the Gisborne stations using the ZL2000 callsign.

(3) All operators using the ZL2000 callsign must be full members of the Gisborne Amateur Radio Club.

(4) Any valid amateur frequency may be used by Phone or CW.

(5) Contacts can only be made during January of each year.

(6) The Award commences at 0001 hrs (NZ time) 1 January 1997 (1101 UTC 31 Dec 1996) and concludes 2400 hrs (NZ time) 31 January 1997 (1100 UTC 31 January 1997) each year including the year 2000.

(7) All valid contacts with ZL2000 will be sent a QSL card via the NZART QSL Bureau.

(8) The Award for each year will be issued upon receipt of the prescribed application fee.

(9) The application fee for the award should reach the Award Manager by 30 June of the operating year. (Late entries will be processed at the discretion of the ZL2000 Award Committee.)

(10) A different pictorial award will be issued each year.

(11) Any operator or SWL, collecting four awards, including the year 2000, will be issued with a complimentary award.

(12) One amateur operator or SWL, meeting the requirements of Rule 11, will be chosen to receive a special award in the year 2000.

South Korea (Korean Amateur Radio League Series)

General requirements. The fee for each award is $US4.00 or eight IRCs ($US2.00 or four IRCs for each HLA sticker). If cards are submitted, include IRCs for return postage).

HL9s, US military contacts, are NOT VALID. Contacts must be made after 3 February 1959. All contacts must have been made from the same call area.

Apply to: Korean ARL, CPO Box 162, Seoul 100, Korea.

All Korea Award (AKA)

Issued for proof of contact with the seven different HL call areas 1, 2, 3, 4, 5, 8, and 0.

All Province Awards (APA)

Awarded for proof of contact with HL stations in each of the different special cities and provinces of Korea.

Area 1, City of Seoul. Area 2, Inchon City, Kyonggi-do, Kangwon-do. Area 3, Chungchongnam-do, Chungchongbuk-do. Area 4, Chollanam-do, Chollabuk-do, Cheju-do. Area 5, Pusan City, Taegu City, Kyongsangnam-do, Kyongsangbuk-do.

HL Award

Issued for HL (except HL9) contacts. The following classes are available:

Class K = 5 QSLs required; Class O = 10 QSLs; Class R = 20 QSLs; Class E = 30 QSLs; and Class A = 50 QSLs required.

Korean District Number Award (KDN)

Issued for proof of contact with HL stations in each of 50 cities, Guns or Gus in Korea. Available endorsements for 100, 150, etc upon submission of cards with list prepared in order of KDN reference numbers.

The HL9 Award

Contact HL9 stations after 1 January 1987 in one or more of five different endorsements each of which requires five contacts: CW, SSB, RTTY, packet or 5-Band, requiring five per band. GCR list and $US4.00 or four IRCs to: Rainer Herden KB5LIJ, Top Mansion D-1, 135-3 Itaweon-Dong, Yongsan-Ku, Seoul 140-200, Republic of Korea.

Worked All Korea Award

Issued by the Korean DXers Society for contacting Korean stations as follows: before 1 January 1981 you need 1-HL9 and 1-HM station; after 1 January 1981, 1-HL9 and any HL other than HL9 (special endorsement given for each of HL1, 2, 3, 4, 5, 8, 0). You may substitute three different HLs for a missing HL9. SWL OK. No band or mode restrictions. GCR list and $US4.00 or 10 IRCs to: Byong-joo Cho HL5AP, Chairman Korean DXers Socicty, PO Box 4, Haeundae, Pusan Korea 607-04.

Korean Ladies ARC Award

Class A: from each call area HL1, 2, 3, 4, 5, 8 (Portable) and HL0 (Club Station) collect a QSL card from a YL operator. YLs operating from a Club is OK, and a YL station operating portable in a needed district is OK.

Class B: collect 15 different YL operators cards. An HL0 YL operator is valid from a Club station. Contacts after 1 January 1985. SWL OK. GCR list and fee of eight IRCs to: Cho Chun Taek HL1ASD, Korean Ladies ARC, #401 ho, 328 dong, Jukong 3 Danji Apt, Banpo Dong, Seocho-ku, Seoul 137-040, Korea.

Kuwait

The Kuwait Award

Contact any 10 9K2 stations on any band or mode. No date limitations. GCR list and five IRCs to: Kuwait Amateur Radio Society, PO Box 5240, Safat 13053, Kuwait.

Kuwait National Day Award

On 25 February each year, the State of Kuwait celebrates its National Day. On that day you can earn the KNDA by contacting either five different special prefix 9K25 stations or contact two different 9Ks plus the Kuwait ARS station 9K25RA. SWL OK. The eligibility period starts 0001z on 25 February ending at 2400z. The award may be earned annually. GCR list, and a fee of five IRCs to: Award Manager 9K2MJ, Kuwait ARS, PO Box 5240, Safat 13053, Kuwait.

Good hunting.

**PO Box 2175 Caulfield Junction 3161*

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Contests

*Peter Nesbit VK3APN - Federal Contest Coordinator**

Contest Calendar

December 96 – February 97

Dec 6-8	ARRL 160 m Contest	(Nov 96)
Dec 14-15	ARRL 10 m Contest	(Nov 96)
Dec 21-22	Croatian CW Contest	(Nov 96)
Dec 26-Jan 26	Ross Hull VHF/UHF Contest	
Dec 29	RAC Canada Winter Contest	(Nov 96)
Dec 31	ARRL Straight Key Night	
Jan 4-5	ARRL RTTY Roundup	
Jan 10-12	Japan International DX CW (Low Band)	
Jan 11-12	VHF/UHF Field Day Contest	
Jan 19	HA DX CW Contest	
Jan 24-26	CQ WW 160 m DX Contest	
Jan 25-26	UBA (Belgium) SSB DX Contest	
Jan 25-26	REF (France) CW DX Contest	
Feb 1-2	YU DX Contest	
Feb 8-9	PACC CW/SSB DX Contest	
Feb 15-16	ARRL DX CW Contest	
Feb 22-23	CQ 160 Metre SSB Contest	
Feb 22-23	RSGB 7 MHz CW Contest	
Feb 22-23	UBA (Belgium) CW DX Contest	
Feb 22-23	REF (France) SSB DX Contest	
Feb 23	High Speed CW Contest	

The results of the 1996 Remembrance Day Contest have just arrived from Alek VK6APK, and congratulations to VK7 for a great win in this year's event! This month we also have the results of the recent South Pacific 160 m Contest, and the rules of the Ross Hull and VHF/UHF Field Day contests, so there's plenty to read in this month's column.

Many thanks to those who have been sending information to me on disk or via e-mail. It really does make things easier (and a lot quicker), when one does not have to key in hundreds, or thousands, of figures. I often wonder how we managed before computers arrived, but then I suppose we had typists to do the tedious stuff. How times change!

Speaking of changing times, amateur radio continues to increase in prominence on the World Wide Web. A new home grown site is www.uq.edu.au/radiosport/, packed with useful information about contesting, including a comprehensive calendar, rules, hints, related links, and even a sound file which can be downloaded and played through your PC, to hear what a CW contest sounds like from a top-line contest station, at the height of a run of QSOs! The site is the work of prominent contester John Vk4EMM and software expert Peter VK4TPW, and we are indeed fortunate that he is willing to share some of his secrets with the rest of us. Thank you John.

One hears a lot of gloom and doom about the Web drawing people away from amateur radio, and I must confess my on-air time has been partially reduced for that reason. However, having been on the Web for about six months now, the "gee-whizz" factor has largely worn off, and I'm beginning to feel a lot more optimistic about the future of amateur radio. Sure, one can easily lose a lot of time just browsing around; however, I'm finding that the Web is also a very useful tool, which can materially assist our on-air activities, and make the hobby more enjoyable.

For example, as well as many informative Web pages such as the one mentioned above, there are many good discussion groups as well, covering every aspect of our hobby from DXing, to contesting, to RF design. Once you subscribe to some of these groups, you get all sorts of interesting e-mail, and the opportunity to contribute to the group as well. As amateurs, we are already used to communicating, so the Web is almost like another band. I'm finding my personal motivation for amateur activities is increasing, thanks to the Web, not diminishing. And the ability to send and receive e-mail is wonderful; you wonder how you previously survived without it!

One thing I have learned relates to e-mail identifiers. Initially, I signed up with an Internet Service Provider (ISP) as vk3apn, but later changed it to pnesbit when I changed ISPs. In hindsight, that was a mistake! Unless you're certain that you will never use the Web for radio or electronics purposes, I'd strongly suggest you use your callsign. It's something to be proud of (and you will be proud of it), it's unique, you'll be instantly recognised by other amateurs on the Web, and it's raising the profile of our hobby. It also makes you much easier to find if another amateur wants to get in touch but doesn't know your e-mail address. Many are the times when I've wanted to e-mail somebody, but couldn't because they didn't use their callsign. The use of callsigns as e-mail identifiers is commonplace in both the US and Europe.

That's all for now. For news, information, tips, gossip, etc, many thanks to VK3KWA, VK4EMM, VK6APK, ZL1AAS, HA5JJ, OE4BKU, QST, and CQ. Have a very happy Christmas, and I look forward to seeing you all in the New Year.

73s, Peter VK3APN

ARRL RTTY Roundup

4-5 Jan, 1800z Sat to 2400z Sun

This contest takes place on the first full weekend of January each year. The object is to contact as many local and overseas stations as possible on Baudot RTTY, ASCII, AMTOR, and packet (attended). More than one digital mode may be used, but QSOs and multipliers are counted once only regardless of mode. The bands allowed are 3.5 – 30 MHz, on frequencies recommended for digital operation (no 10, 18 or 24 MHz). Categories are: single operator multiband (1) max 150 W O/P, (2) more than 150 W O/P; multi-operator single transmitter multiband. A maximum of 24 hours operating time is permitted. At least two separate rest periods must be taken, with the on and off times clearly marked in the log. Listening time counts

as operating time. "Ten minute" rule applies to multi-ops.

Exchange signal report and QSO number. W/VE stations will send signal report and state/province. Score one point per QSO. A station may be worked once per band for points credit. The multiplier is the total US states, Canadian provinces, and DXCC countries worked. The US and Canada do not count as countries. Multipliers are counted once overall, not once per band. The final score is the total points times the multiplier. Check sheets are required for logs with 200+ QSOs. Mail your log and summary sheet within 30 days to: ARRL RTTY Roundup, 225 Main Street, Newington, CT, USA 06111. Alternatively, logs can be sent on DOS disk, or to the ARRL BBS (203-665-0090), or via Internet to contest@arrl.org.

Japan DX CW Contest (High Band)

10-12 Jan, 2300z Fri to 2300z Sun

The object of this contest is to contact as many Japanese stations as possible on 1.8, 3.5 and 7 MHz CW. Classes include single operator (single and multiband), single operator QRP (5 W max O/P), and multioperator (one Tx). Max operating period for single operator stations is 30 hours (show rest breaks clearly in log); multioperator stations full 48 hours. Multi-op stations must remain on a band for 10 minutes minimum.

Send RST plus CQ zone number; JAs will send RST plus prefecture number (01 - 50). Score one point per JA QSO on 14 and 21 MHz, and two points on 28 MHz. Points are doubled for QSOs with QRP stations (QRP stations must send /QRP). The multiplier equals JA prefectures + Ogasawara Isl (JD1) + Minami- Torishima Isl (JD1) + Okino-Torishima Isl. Send log postmarked by 28 Feb to: Five-Nine Magazine, Box 59, Kamata, Tokyo 144, Japan.

HA DX CW Contest

Sunday, 19 January, 0000z to 2400z

This popular CW contest takes place on the Sunday of the third full weekend of January each year. Categories are single operator single or multiband, multi-operator single or multi-transmitter, and SWL. Bands are 160 - 10 m. Exchange RST + serial number; HA/HG stations will add a two letter county code, unless they are HADXC members in which case they will give their club membership number. Codes for each call area are (1) GY, VA, ZA; (2) KO, VE; (3) BA, SO, TO; (4) FE; (5) BP; (6) HE, NO; (7) PE, SZ; (8) BE, BN, CS; (9) BO; (0) HA, SA.

Score six points per HA/HG QSO, and three points for each non-HA QSO outside your own continent. Multipliers are the total HA counties plus the number of HADXC members worked per band. Final score equals total points x multiplier. Separate logs for each band are requested. Send logs with summary sheet and declaration within six weeks to: Hungarian Radioamateur Society, Box 86, Budapest H-1581, Hungary.

CQ Worldwide 160 Metre DX Contest

CW: 24-26 Jan, 2200z Fri to 1600z Sun
Phone: 21-23 Feb, 2200z Fri to 1600z Sun

The CW and Phone sections of this contest are scheduled for the last full weekend of January and February each year. The object is to contact as many stations worldwide on 160 m as possible. VK to VK contacts are permitted for contest credit. Categories are single and multioperator. The use of packet, a spotting net, or logging assistant makes you multi-op. Suggested DX frequencies are 1830-1835; W/VEs will usually operate outside this window. Look for Japan on 1907-1912.

Exchange RS(T) plus prefix or country abbreviation (VK). W/VE will send RST plus state/province. Score two points for contacts with stations in own country, five points with stations in other countries in the same continent (continental boundary as for WAC), five points for contacts with /MM stations, and ten points with stations in other WAC continents.

Multipliers are US states (max 48); Canadian provinces (max 13); and DXCC and WAE countries. Maritime mobile stations no longer count as multipliers. The final score equals the total QSO points times total multiplier (US states + VE provinces + DX countries). Indicate CW or SSB on the envelope, and mail the log and paper summary sheet to: 160 Metre Contest Director, David Thompson K4JRB, 4166 Mill Stone Court, Norcross, GA 30092, USA. Mailing deadlines are 28 Feb for CW, and 31 March for SSB.

UBA SSB/CW HF Contest

SSB: 25-26 Jan, 1300z Sat to 1300z Sun
CW: 22-23 Feb, 1300z Sat to 1300z Sun

This contest runs on the last full weekend of January and February each year (SSB and CW respectively). Any station may work any other worldwide. Categories are: single operator (single & all band); multioperator single transmitter; QRP max 10 W O/P; SWL. Frequencies: CW 3500-3560, 7000-7035, 14000-14060, 21000-21060 and 28000-28060 kHz; SSB 3600-3650, 3700-3800, 7040-7100, 14125-14300, 21175-21350 and 28400-28700 kHz.

Exchange RS(T) plus serial number. Belgian stations will add their province code. Score 10 points for contacts with Belgian stations, three points with other European stations, and one point with others. The multiplier is the total of Belgian provinces, Belgian prefixes, and European countries. Total score is QSO points times multiplier. Send log, summary sheet, declaration, etc within 30 days to: UBA HF Contest, Oude Gendarmeriestraat 62, B-2220 Heist Op Den Berg, Belgium. Logs on disk in KIEA or ASCII format also welcome.

Ross Hull Memorial VHF-UHF Contest 1996-1997

Presented by John Martin VK3KWA

The summer DX season is about to start, and here again is your chance to join in a friendly contest and see what your station is capable of achieving. The aim of the contest is to get more stations on the air working DX, and everyone is welcome. You can give out contest numbers even if you do not intend to submit a log. If you do not wish to give out numbers, no-one will pressure you. The contest runs for a full month, and the dates are easy to remember: Boxing Day to Australia Day. Plenty of time to enjoy the activity, work some DX, and make new friends.

After the last contest I received three proposals for extensive changes to the rules. The suggestions were radically different, and adopting any one of them would have made it impossible to incorporate any ideas from the others. So I compromised by making virtually no changes this year! However, I invite all entrants to include any suggestions in their logs next time round.

Last year's rule on the use of calling frequencies drew some criticism. It cannot be dropped because it is essential to have a chance of hearing weak signals on the frequency where they are most likely to appear. This year the wording has been changed to make the intention clearer.

Last year the 50 MHz scoring was changed in order to reduce the scoring potential of sporadic E contacts. It did not work as expected, so the rule has now reverted to be much the same as in previous years.

Rules

Overview

The WIA maintains a perpetual trophy in honour of the late Ross Hull and his pioneering achievements in the VHF-UHF field, especially the discovery and investigation of VHF tropospheric propagation. The name of each year's contest winner is engraved on the trophy, and he/she will receive an attractive wall plaque and certificate. Other certificates may also be awarded to top scorers in the various divisions of the contest. The contest is not confined to WIA members.

Duration:

0000 UTC Thursday, 26 December 1996 to 2359 UTC Saturday, 26 January 1997. In Eastern Summer Time, this is 11:00 am on Thursday, 26 December to 10:59 am on Sunday, 27 January.

Sections:

(a) Multiband, (b) Single band. All entrants will be scored for both Sections (a) and (b).

General Rules:

All bands above 30 MHz may be used. Single operator only. One contact per station per band per UTC day. Crossband, repeater and satellite contacts are not permitted. Entrants may operate from any location. Entrants must avoid making contest exchanges on recognised DX calling frequencies unless signal strengths or conditions make it impractical to change frequency. On 50 MHz, no contest activity should occur below 50.150 MHz. A frequency of .150 on each band is recommended as a contest calling frequency. All rulings of the Contest Manager on this subject will be accepted as final.

Contest Exchange:

RS or RST numbers plus a three-digit serial number.

Scoring:

Scores will be based on the best 100 contacts on each band, as nominated by the entrant. Each contact will score one point per 100 km or part thereof (ie up to 99 km: one point, 100 - 199 km: two points, etc). On six metres only, as above, but with a maximum score of 12 points per contact.

The band multipliers are:

6 m	2 m	70 cm	23 cm	13 cm	Higher
x1	x4	x7	x10	x13	x16

Logs:

Logs should cover the full contest period. The

contacts nominated for scoring purposes must be clearly marked in the log, or listed in separate log extract sheets. Logs should have a separate score column for each band, or the logs for each band should be separate.

Logs must contain the following for each contact:

– Date and UTC time;
– Station location (if operating portable);
– Callsign of station worked;
– Operating frequency;
– Location or Maidenhead locator of station worked (if not QTHR);
– Reports and serial numbers sent and received; and
– Estimated distance worked and points claimed.

The Contest Manager reserves the right to make corrections to estimations of distance.

Cover Sheet:

Logs must include a cover sheet containing:

–Operator's callsign, name and address;
– Station location (if different from the postal address);
– A scoring table set out as the example below; and
– A signed declaration that the station has been operated in accordance with the rules and spirit of the contest, and that the contest manager's ruling will be accepted as final.

Deadline:

Logs must be received by Monday, 24 February 1997. Early logs would be appreciated. Post logs to: WIA Ross Hull Contest Manager, PO Box 2175, Caulfield Junction, Victoria 3161.

Penalties and Disqualification:

No penalties will apply in cases of errors in calculations or transcription. Scoring penalties will apply if logs are incomplete or illegible. Local or "easy" contacts made on recognised DX calling frequencies will be disallowed.

Awards:

The overall winner will be the top scorer in Section (a). Awards will also be made to the top scorers on each of the following bands: six metres; two metres; 70 cm; 23 cm; 13 cm; and microwaves (bands above 3 GHz).

Sample Scoring Table:

Band	6 m	2 m	70 cm	etc
"100 best" score	xxxx	xxxx	xxxx	xxxx
Band Multiplier	x 1	x 4	x 7	x x
Total	xxxxx + xxxxx + xxxxx + xxxxx = xxxxx (Grand Total)			

Note on Calculating Distances:

Absolute accuracy is not needed. All you need to know is whether the distance is above or below the nearest multiple of 100 km. One method is to use a compass to draw 100 km circles around your location on a map, although better estimates can be made from six-digit Maidenhead locators, where available.

1997 VHF-UHF Field Day

Presented by John Martin, VK3KWA

The annual VHF/UHF Field Day will be run on the weekend of 11/12 January, 1996. This overlaps the Ross Hull Contest, and any contacts made for one can be counted for the other. Please remember that the Field Day exchange must include your Maidenhead locator, and that repeat contacts are allowed for the Field Day but not the Ross Hull Contest.

There have been several changes as a result of comments received about last year's Field Day. One is to drop the scoring distinction between home and portable stations, which serves no purpose and just makes scoring more complicated. The change made last year to the scoring formula did not achieve its purpose, so a different approach has been taken this year.

The six metre band has been dropped. This will eliminate the QRM problems experienced in the past on and around 50.110 MHz, and will allow portable stations to concentrate on the higher bands with smaller antennas.

The rules have also been changed to provide incentives for stations activating rare grid squares, and "rover stations" operating from more than one square. Provision has also been made for small "team stations" using shared equipment.

Finally, the rule relating to misuse of calling frequencies has been rewritten again, in an attempt to eliminate the interference problems that have occurred in the past.

Duration:

VK6 only: 0300 UTC Saturday, 11 January to 0700 UTC Sunday, 12 January. All other call areas: 0000 UTC Saturday to 0400 UTC Sunday. (Note: The three hour time difference is based on the average difference in *local* time between Eastern and Western Australia, not absolute or sidereal time.)

Sections:

Entrants may submit logs for one of the following sections:

A: Portable station, single operator, 24 hours.
B: Portable station, single operator, 6 hours.
C: Portable station, multiple operator, 24 hours.
D: Home station, 24 hours.

General Rules:

All modes and bands above 144 MHz may be used. Repeater, satellite and crossband contacts are not allowed. Contacts between home stations are not allowed.

Operation may be from any location, or from more than one location. Operation must be for any six or 24 consecutive hours. You may work stations within your own locator square.

A station is portable only if its equipment, including antennas, is transported to a location other than the normal home location(s) of its operator(s). Each station must use only one callsign, and each operator may operate only one station.

If two operators set up a station using shared equipment, they may enter as a multi-operator station or as separate single operator stations.

Help stamp out stolen equipment – keep a record of all your equipment serial numbers in a safe place

Stations with more than two operators must enter section C.

Persistent use of recognised DX calling frequencies for contest exchanges or liaison will result in disqualification. A frequency of .150 on each band is recommended for contest calling.

Contest Exchange:

RS or RST reports, plus a three-digit serial number, plus your Maidenhead locator.

Repeat Contacts:

Stations may be worked again on each band after three hours. If a station is dismantled and moved to a new locator square, repeat contacts can be made immediately. If the station moves back into a previous locator square, the three hour limit still applies to stations worked from that square.

Scoring:

For each band, score 20 points for each square from which your station operates, plus 10 points for each locator square worked, plus one point per contact. Multiply the total by the band multiplier as follows:

2 m	70 cm	23 cm	13 cm	Higher
x4	x7	x10	x13	x16

Then, add up the scores for all bands, to get the final score.

Logs:

Record the following for each contact: UTC time, frequency, station worked, serial numbers and locator numbers exchanged, points claimed.

The front sheet should contain names and callsigns of all operators; the postal address which applies to the callsign used; station location and Maidenhead locator; section entered, the period of operation to be scored; a scoring table; and a signed declaration that the Contest Manager's decision will be accepted as final.

Post your log to the VHF-UHF Field Day Contest Manager, PO Box 2175, Caulfield Junction, Vic 3161. Logs must be received by Monday, 10 February 1997. Early logs would be appreciated.

Awards:

The overall winner will be the highest all-band scorer in Section A. Awards will also be made to the highest scorer on each band in Section A, and the highest scorers in Sections B, C and D.

Results of the 1st South Pacific 160 m Contest

Presented by John Litten, ZL1AAS

This event, held last July, proved to be very popular on both sides of the Tasman Sea. On phone, some 76 different callsigns were logged, while on CW, 68 callsigns were noted. DX was also represented from ZK1 in the East, to VQ9 in the West, and also included many North American stations. For some entrants this was their first attempt at contesting, so welcome to our ranks!

Some of the comments received:

My first solo contest, enjoyed it very much. Every operator was friendly and patient... *VK4WJT*. 160 is very under utilised over here, and contests such as this can only help newcomers appreciate what a great band they have been missing out on... *VK6ABL*. Good fun, plenty of activity, but only a few DX stations on CW. It should be even better next year!... *VK3IO*. Thank you, lots of fun, many congratulations! We look

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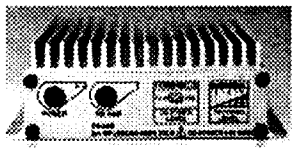

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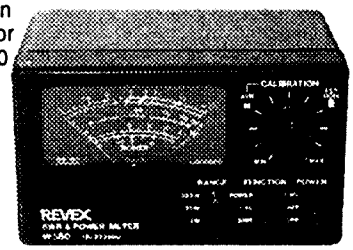

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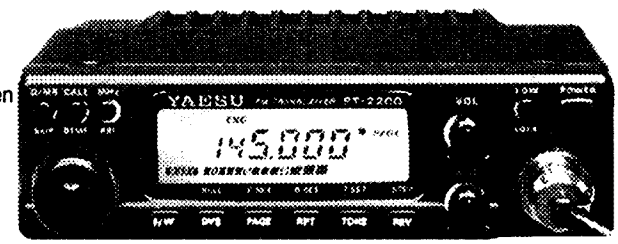

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Whether your interest is in talking through your local repeater, operating SSB DX, or talking to the world via satellite, this high-performance multimode base station transceiver can do it all! In its standard form, the FT-736R provides 25W output on the 2m (144-148MHz) & 70cm (430-450MHz) bands in SSB, CW, and FM modes. Can be expanded to cover the 6m (50-54MHz) & 23cm (1240-1300MHz) bands by installing optional modules.

Features:

- Digital control with keypad frequency entry
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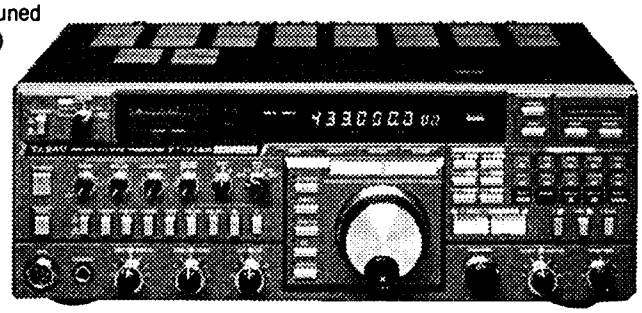

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forward to next year very much... *ZL2JR*. Conditions were very quiet, although no VK6, VK7 or VK8 were heard... *ZL3TX*. Made more 160 m QSOs than in the whole of my life! Will try to stay up all night next time... *ZL4OK/1*. I found the Windom good on receive, but it was hard to make contacts across the pond. Apart from that I enjoyed the contest... *ZL4AV*. I really welcome the idea of a 160 m contest. Conditions deteriorated as the night progressed, with noise over S9 by 0900 UTC. The band was in good shape earlier, although there weren't many early starters... *VK1DT*. Nice to work so many VKs well past my sunrise at 1300 UTC! Looking forward to more activity next year... *AJ6T, ex ZL0AJA*.

Yes, the contest will be run again next year, on the third full weekend of July. For 1997, this will be Saturday, 19th July. I hope to see you all then, and also that many more of those who took part will next time take the trouble to send in a log.

Phone:

(QSOs/Points/Multiplier/Score/Antenna)

VK1DT *	16	77	5	385	3/4 Loop
VK3IO *	24	93	9	837	Dipole
VK3APN	12	51	5	255	Vertical
VK3XB	3	12	3	36	Vertical
VK3DYF	2	7	2	14	Dipole
VK4EMM *	31	119	8	952	Vertical
VK4WJT	20	94	9	846	Inverted V
VK5CRS *	51	240	13	3120	Rhombic
ZL1BRY *	23	103	7	721	Dipole
ZL4OK/1	19	86	7	602	Inverted L
ZL1ALZ	13	59	6	354	
ZL2JR *	40	179	13	2327	3/4 Sloper
ZL2AWH	20	79	8	632	
ZL3TX *	23	109	8	872	Vertical
ZL4PZ *	24	111	8	888	Dipole
ZL4AV	7	32	4	128	Windom

CW:

VK3APN *	31	134	12	1608	Vertical
VK3DXI	16	74	8	592	1/4 Sloper
VK3IO	18	69	8	552	Dipole
VK3XB	12	42	6	252	Vertical
VK3KS	8	25	4	100	Vertical
VK3DID	8	19	2	38	40 m Dipole
VK4EMM *	35	160	12	1920	Vertical
VK5LU *	6	30	4	120	
VK6ABL *	16	80	8	640	3/8 Inverted L
VK8AV *	8	40	6	240	1/4 Sloper
ZL4OK/1*	20	91	9	819	Inverted L
ZL1ALZ	15	66	8	528	
ZL2JR *	44	211	12	2532	3/4 Sloper
ZL4PZ *	13	65	7	455	Dipole
AJ6T * (ex ZL0AJA)	5	25	3	75	Inverted L

Check Log: ZL3DK/2 (thank you)

1996 Remembrance Day Contest Tasmania Triumphs!

Presented by Alek Petkovic, VK6APK

Congratulations to VK7 Division for a tremendous effort in winning the 1996 RD contest. A consistent score on HF and a big push on VHF has resulted in the Tasmanians being premiers for this year. Well done to everyone who participated and made this win possible.

VK4, who were very unlucky to be beaten last year, had it done to them again this year. Right from the very first week of the logs being received, my money was on VK4. With the number of logs received from that division, it seemed that they would be very easy winners. I guess it shows that the contest is not over until the last point has been counted.

Why is VHF activity confined only to the capital cities? Many regional towns have large numbers of amateurs (more than two) who could make a substantial difference to their division's score, if they would just turn their 2 m radios on. Remember that all VHF contacts are virtual double points for your Division, so why not give VHF a go next year?

On the whole, I think that the level of activity was very good, considering the state of the bands at this stage of the solar cycle. It is a great shame that we can't get a higher percentage of participants' logs submitted. Looking through the logs shows that there are large numbers of people who take part on the day, but then don't submit their logs. Some of them had very large scores as well.

Divisional Scores:

Let's now look at the figures for the 1996 RD Contest. The rules explain how the winning Division is determined, based on a set of improvement factors. The procedure is easily understood.

First, we establish the HF and VHF benchmarks for each Division, against which their performance for the current year is judged. The same formula is used for HF and VHF, inserting the HF or VHF figures as appropriate: B = 0.25 P + 0.75 L, where B = this year's benchmark, P = last year's total points, and L = last year's benchmark.

Next, we calculate the improvement factors for HF and VHF, for each Division. Once again, the same formula is used for HF and VHF, inserting the HF or VHF figures as appropriate: I/F = Total Pts (this year) divided by Benchmark. Finally, the HF and VHF improvement factors for each Division are averaged: Overall I/F = (I/F (HF) + I/F (VHF)) divided by two.

After sorting the results, we get the Divisional Ladder:

Table 1: Divisional Ladder

1st	VK7	6.868
2nd	VK4	2.278
3rd	VK5/8	1.171
4th	VK1	1.132
5th	VK2	0.722
6th	VK6	0.587
7th	VK3	0.462

For those wishing to verify the calculations, Table 2 shows all the figures (P and L were obtained from the published results for last year's contest).

Table 2: Divisional Scores

WIA Div'n	HF					VHF					Avg I/F
	P	L	B	Pts	I/F	P	L	B	Pts	I/F	
VK1	2239	212	718.8	1097	1.526	583	176	277.8	205	0.738	1.132
VK2	4619	3803	4007.0	5367	1.339	134	82	95.0	10	0.105	0.722
VK3	6911	4031	4751.0	3397	0.715	9238	16364	14582.5	3034	0.208	0.462
VK4	5471	1908	2798.8	4736	1.692	2330	307	812.8	2328	2.864	2.278
VK5/8	4384	2884	3259.0	5206	1.597	1881	1298	1443.8	1076	0.745	1.171
VK6	3409	3115	3188.5	2272	0.713	4740	9323	8177.3	3779	0.462	0.587
VK7	2238	1724	1852.5	2151	1.161	153	14	48.8	613	12.574	6.868

The "Pts" and "B" figures from Table 2 will become the "P" and "L" figures for next year's contest, respectively. Using the above formula for B, we can already work out the benchmarks for next year's contest, which are shown in Table 3. These are the total scores which must be obtained, by each Division, to achieve an improvement factor of one in next year's contest. They will be reprinted with next year's rules. It will, of course, be in the interests of Divisions to try and exceed the following scores:

Table 3: 1997 Benchmarks

Div'n	HF	VHF
VK1	813	260
VK2	4347	74
VK3	4413	11695
VK4	3283	1181
VK5/8	3746	1352
VK6	2959	7078
VK7	1927	190

Individual Scores:

The individual scores for entrants are listed below. The standard of logs was very high, and few corrections were needed. The CW scoring still had some people confused, and quite a few others were still combining their HF and VHF logs, which made the task of working out the respective scores rather difficult. A handful of operators submitted only a cover sheet. I have accepted these and included them in this year's scores, but they will not be included in the future. Only complete logs with a summary sheet will be accepted from now on. Despite these minor gripes, the job of collating the scores and receiving your comments has once again been a pleasure for me. Certificate winners are denoted by an asterisk (*), and the top Australian scores in each section by a hash (#).

VK1		**VK2**	
HF Phone		**HF Phone**	
PJ *	445	XN *	444
MJ	255	DCL	345
AJM	77	PB	318
SW	52	XT	296
KMA	13	XH	288
HF CW		CAA	286
FF *	146	CM	273
HF Open		DM	212
PK *	109	HV	203
VHF Phone		AGF	125
DO *	92	EJC	107
ZQR	36	ALZ	89
MJ	28	ANK	77
KMA	16	LMA	73
VHF CW		WF	61
ACA #	20	LEE	39
VHF Open		IV	29
FF *	13	NW	16

CF	15
HF CW	
ZC *	262
BHO	212
PS	172
GS	170
CW	136
AIC	130
RJ	104
EL	93
DID	27
AZR	20
HF Open	
BO *	501
VM	244
VHF Phone	
TJO *	10
VK3	
HF Phone	
BML *	252
AHY	243
JK	156
CX	140
ADW	105
FT	101
SM	100
EX	92
CAM	77
LCM	72
HG	66
MSL	58
PDX	53
ABP	50
MID	50
KTO	48
ALD	44
MGZ	37
KH	36
SZ	34
DY	30
GAT	30
NV	30
BF	29
DYF	20
1WD/3	17
BCZ	15
AAJ	11
CRP	11
HF CW	
FCR *	240
APN	218
DID	108
XB	108
DVW	102
AMD	72
FG	66
KS	60
DNG	58
HF Open	
ALZ *	217
IO	115
ANP	26
VHF Phone	
EO #	422
AYF	283
BF	226
GAT	224
DLE	220
TBM	185
JK	175
KBD	123
CAM	120
FT	117
XJU	110
DUQ	103
ER	102
CRP	101
WWW	101
KK	70
KT0	68
SM	63
MGZ	42
DYL	33
DID	26
FR	23
AWS	21
XH	21
AGH	20
AL	16
AHY	11
LCM	8
VK4	
HF Phone	
BB *	290
EJ	281
BAY	228
PJK	208
BTW	105
KEL	79
EII	76
QF	65
PT	64
EWR	61
ACW	58
DO	58
IC	54
5CC/4	46
SJ	45
PJ	39
GZ	38
BX	33
YG	32
EHT	32
ADY	31
IL	30
KD	30
PJK	30
BSH	25
WJG	25
LAA	23
RM	14
WAY	12
IF	11
NEF	11
BBS	10
XZ	10
HF CW	
XA #	364
XW	200
RE	64
XY	36
HF Open	
EMM *	626
LT	416
FW	297
PCB	246
UW	130
ZA	100
OD	71
AJH	32
VHF Phone	
KMA *	337
QH	144
LP	134
YAR	96
ZA	70
NEF	59
EWR	58
IF	55
PCB	55
YEA	55
PT	53
BV	48
PJ	36
UJ	28
ADY	23
KZR	21
BB	16
WAY	11
BBS	10
KD	5
VHF Open	
AR	# 458
2FZ/4	371
IC	121
GWC	64
VK5/8	
HF Phone	
CRS	# 614
CA	475
8DK	322
BWH	243
BJM	214
GRC	137
KGB	115
MH	114
RV	103
UE	87
8KTC	58
BVJ	55
CTY	44
RK	40
ZQ	40
SE	37
LL	30
AKQ	27
TY	25
KJT	22
HO	16
NF	14
HF CW	
BGL *	128
XE	112
AFO	92
BS	68
HF Open	
BRC #	659
8AV	490
ATU	368
GZ	310
WO	147
VHF Phone	
BRC *	320
THA	196
ZBK	126
GRC	125
BW	110
NCA	66
RV	47
TMI	34
AFO	28
ZKK	24
VK6	
HF Phone	
SZ *	428
DA	229
CSW	138
JP	100
RG	87
WJH	67
AR	59
VZ	57
KH	41
APK	28
KG	26
YF	22
NTJ	21
PX	20
HU	18
SAN	17
WZ	11
HK	10
HF CW	
AFW *	184
AF	70
AJ	56
HF Open	
GW *	301
BIK	103
RU	82
WT	60
RZ	37
VHF Phone	
KTN *	328
ZDW	298
HU	211
SAN	210
ANC	158
RG	156
AR	152
TKR	129
FJA	128
JP	116
WIA	110
RRG	106
MIN	100
UV	100
ZPP	96
YF	83
SM	74
LZ	71
ZLZ	71
APK	66
ZIC	66
AHR	58
WT	54
CSW	51
TS	50
RO	44
HK	34
RZ	30
KG	26
DY	24
BW	22
WZ	17
GA	16
RU	12
VHF Open	
CX *	366
AD	146
VK7	
HF Phone	
OTC *	344
RN	276
KZ	193
SHV	193
CK	188
OH	187
KC	177
NDO	139
KV	119
PC	118
JP	70
NGC	55
JGD	41
LS	25
EB	16
RM	10
VHF Phone	
HDM *	119
HIL	108
OTC	108
JGD	71
EB	62
JK/P	50
NDO	35
KSM	27
RM	15
KZ	10
RN	2
VHF Open	
SHV	6

Overseas entries were down in number from last year, and I believe this is due to the fact that the contest was not publicised in *Break In* and *Radio and Communications* magazines. This was my responsibility and I shall make every effort to ensure that this won't be repeated next year. Despite this, I did hear a fair bit of activity from P29 and ZL, with the two leading ZLs giving many VKs a run for their money, in the respective sections:

ZL
HF Phone
1BVK * 235
3TX 99
3AO 32

HF CW

1ALZ *	46
4SB	28

HF Open

2LR *	101

It was pleasing to see some SWL logs this year. I hope that we may see an increase in this area in future years, along with better recognition for the efforts of those who take part in this side of the contest. The three entries received are listed below.

SWL HF

Ian McGovern (VK2) *	352
Peter Kenyon (VK6)	315
VK2TJO (VK2)	89

That's it for another year. I hope you enjoyed the contest, wish you a merry Christmas and a happy and successful 1997, and will close with some of your comments on this year's RD contest.

"Good to take part in another RD contest — Seems to me that numbers were down on previous years"...*ZL1BVK* "Heard no one on 15 m or 10 m" ...*ZL3TX* "Not a lot of activity but all stations worked had good readable signals" ...*ZL1ALZ* "Very lean pickings this year" ...*ZL2LR* "Great to catch up to the regulars — It's a pity non-contestants don't respect that there are those who use "another mode" of amateur radio" ...*VK1PJ* "A good contest – Especially with the 10 m opening. Also a chance to try out new QRP equipment" ...*VK1PK* "I strongly believe that it is time to acknowledge the changing pattern of our lives and aim to concentrate the RD contest as an eight hour only contest" ...*VK1DO* "VK7RN Ron deserves an award for being by far the best operator in the whole contest. He continually gave out very friendly reports and brightened up a sometimes very dull band!" ...*Ian McGovern SWL* "Although condx were patchy, what I heard of the contest was in good spirit" ...*VK2IV* "Both 10 m and 15 m were pretty poor at my location and contacts had to be worked for" ...*VK2ZC* "Not many CW stations this year" ...*VK2AZR* "My second RD contest. Great fun!" ...*VK3FCR* "Always try to be in both the RD and the VK/ZL, on CW not phone" ...*VK3AMD* "Heard P29CPM on 160, but couldn't raise him despite repeated calls" ...*VK3APN* "Had good fun, plenty of activity, great band conditions, although nothing heard from VK9" ...*VK3IO* "For the CW contacts my power was five watts" ...*VK3ANP/QRP* "I was very disappointed that there was no activity on 2 m CW and nothing on SSB" ...*VK3DID* "Always really enjoyed the contest" ...*VK4BB* "Once again a terrific contest but very disappointed with the lack of participation, particularly Novices even though there were good openings on their segments" ...*VK4EJ* "No need for digital surround sound. All bands were open and conditions generally good for bottom of cycle 22" ...*VK4BAY* "I was all set to enjoy this contest until I became the victim of DELIBERATE QRM in the form of a carrier and whistling at 20 over 9 strength" ...*VK4SJ* "Bands which normally open, didn't — this year it was hopeless" ...*VK4BSH* "Good conditions on 15 m helped to improve on last year's score" ...*VK4EMM* "This contest was a disappointment with a lack of operators. Novice CW was non-existent — too much emphasis on VHF/UHF which takes lots of operators off HF" ...*VK4FW* "Always a lot of fun" ...*VK4OD* "Amount of operators was less this year than last year" ...*VK4KMA* "Good openings on 10 and 15. Good to see four P29s on 80 m on Saturday night" ...*VK5CA* "Great to hear 15 and 10 open up for the occasion and catch up on a lot of calls I haven't heard for a long while" ...*VK5RV* "I think activity was well down this year especially on VHF. We had our usual good time and enjoyed it immensely" ...*VK5BRC* "T'was a pity that some of the big scoring, high powered rigs did not use CW!" ...*VK8AV* "My 45th RD contest. Enjoyed it as always. Great to meet up with old amateur radio friends" ...*VK5WO* "VHF activity down on last year" ...*VK5KCX* "I enjoy it every year" ...*VK5THA* "It's a pity that stations that come up for this contest do not do so at other times of the year, particularly for other contests" ...*VK6ZDW*

73, de Alek

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ar

Club Corner

Radio Amateurs Old Timers Club (RAOTC)

A most important item in our monthly broadcast is the Icom model IC-255A FM transceiver located at the QTH of Ken Seddon VK3ACS to receive the 145.700 MHz FM original transmission from myself VK3AMD.

This transceiver was used actively in the amateur radio station VK3AOM in the Science Museum of Victoria in Swanston Street, Melbourne. When this station was closed down about the time the new Scienceworks was building at Spotswood and, sadly, not enough volunteers could be found to recreate VK3AOM, we asked and obtained the loan of the Icom, IC-255A which was booked out care of myself and installed at the QTH of VK3ACS.

As there has not been any enthusiasm for the re-activation of VK3AOM and because members of RAOTC have contributed a lot of material assistance to the Science Museum collection, notably the completely operational Kingsley AR7, the Museum of Victoria has now gifted the transceiver to the RAOTC.

In the letter received from Dr Ian Galloway, Deputy Director, Museum of Victoria, and Director, Research Collections, he says, *"I understand that the transceiver is still used once a month as a relay station, and is an important part of the network which provides a news service to radio amateurs. The Museum of Victoria is pleased to be able to assist your club in this way, and hopes that the transceiver can be of service for many years to come."*

A letter of thanks for this valuable help has been sent to Dr Galloway, including appreciation for the help of Ms Ruth Leveson, a Curator at Scienceworks.

Members are reminded that there will not be a broadcast in January.

Allan Doble VK3AMD
President
ar

QSP News

Special Event Station

2 to 12 January 1997 marks the time slot for the 10th Australian and the 3rd Asia Pacific Scout Venture in Adelaide, South Australia.

The special call sign of VI51OAV has been allocated to the event and this will be run as an on-site activity in the second half of the event from 8 to 12 January inclusive.

A QSL card will be sent to all stations contacted, so please look for us on 3590, 7030, 14070, 21140 and 28190 kHz between 0030z and 0930z. We are also hoping to run a packet station so, for those enthusiasts, please keep a watchful eye.

Dean Whitehorn
Project Commissioner
Scout Association of SA

Divisional Notes

Forward Bias - VK1 Notes

Peter Parker VK1PK

Canberra Hosts Federal Convention

On the weekend of 26/27 October, VK1 hosted the October WIA Federal Convention. Held at the Forrest Lodge Motor Inn in Barton, representatives of all WIA Divisions and Federal Executive were present. Several VK1 committee members took the opportunity to meet the interstate visitors on the Saturday evening.

The convention made a number of decisions that should improve the way that the Institute is administered. VK1WI listeners were the first to know about them in a live report from our Federal Councillor Richard VK1RJ on the Sunday broadcast, transmitted just a few hours after the convention finished. Also carried that evening was an interview with our Federal President, Neil Penfold VK6NE.

VK1s Enjoy Foxhunt Talk

October's General meeting was one of the best ever for the Division, with there being many attractions to interest members and visitors. The main event was a talk by Rob VK1KRM on foxhunting. Now armed with a little more knowledge, we hope that more people will be participating in this fascinating activity.

Those present who booked to attend last month's VK1 Technical Symposium received a five dollar entry fee discount. And talking of discounts, members were able to buy the 1997 WIA Callbook for two dollars less than the recommended retail price, thanks to an order placed by our Federal Councillor, Richard VK1RJ. Copies of the Callbook may still be available by the time you read this - contact Richard on 258 1228 if you would like a copy.

Information Sheet Released

The VK1 Division is pleased to announce the release of an information sheet on the Division's activities. Produced in early October, the sheet promotes the activities of the Division to existing and prospective amateurs. It contains details on repeaters, packet radio, the broadcast, examinations and classes. Members were shown the sheet at the October General meeting. Look for it next time you visit an electronics store or the SMA Area Office - you will normally find it on the counter. The A5-sized sheet has been printed on coloured paper and has a modern, professional appearance.

We encourage other Divisions to produce similar sheets to promote their activities. The information sheet (as well as a draft copy of the much larger Canberra Amateur Radio Guide) was passed around at October's Federal Convention, as an example of what the WIA can and should do to promote amateur radio.

JOTA '96 Successful

Several stations around Canberra and Queanbeyan took part in this year's Jamboree on the Air, held back in October.

New this year was the use of the new UHF linked repeater system. As well, there was extensive use of the packet radio converse server, established by John VK1ET. The new system of transmitting the JOTA opening broadcast appeared to work well, with signals better than last year.

With more repeaters available, VHF/UHF operating seemed to be more orderly than last year. Those involved in JOTA would like to thank other amateurs for making these frequencies available over the JOTA weekend.

VK1 Committee Meeting

The VK1 Committee met on Monday, 14 October at Mawson Primary School. The following were discussed:-

* Interference to amateur operation from Galaxy satellite TV set-top boxes - interference was apparent from 2 MHz right through to VHF, with the problem being worst on 21 MHz.

* A common expiry date for all callsigns held by the Division was arranged. This should make administration easier for all concerned.

* A trip to Mount Ginini by Paul VK1BX, Graham VK1KGT and Gilbert VK1GH is proposed. The main purpose is to document what equipment we have there and so update our assets register.

* Promoting amateur radio and the VK1 Division, including the completion of the new VK1 Information Sheet.

* Federal Matters - particularly the need for there to be changes in administration to contain costs in the face of stagnant membership levels. Federal Council discussed these matters in detail a fortnight later at the Canberra Convention.

VK2 Notes

Peter Kloppenburg VK2CPK

Due to pressures of work and other commitments, Richard Murnane VK2SKY is no longer able to continue as editor of this column. On behalf of everyone concerned, we thank Richard for all the time and effort he spent in compiling this column.

It is my intention, initially, to structure this column around the various services that the NSW Division provides to its members. But I will also include details of future events that affect the amateur community in NSW.

Work is in progress to construct a six metre repeater for the WIA Dural facility. The system will consist of a rack mounted unit, three tuned cavities, and a vertically polarised antenna. The heart of the system is a Philips FM-828E (68 - 88 MHz) mobile transceiver modified to operate on a transmit frequency of 53.850 MHz and receive on 52.850 MHz in duplex mode. Output power is 25 watts. December 1996 is the estimated date of operation.

Presently, at Amateur Radio House, tuition is given in theory and Morse for students wishing to sit for the Novice examinations. Early next year, a combined course will be offered that caters for Novice and Unrestricted examinees. The Institute conducts exams for all exam subjects every six weeks. Concurrent with this activity, work is going on to update the study material

THE
N.S.W. DIVISION
COUNCIL
wishes

All our Members
and our friends in other
Divisions

A
VERY MERRY
CHRISTMAS
and a
Happy & Prosperous
NEW YEAR

that was used in support of the Correspondence Course. This course was successfully run for a number of years until the great upheaval in licensing, examination subjects, and regulations occurred. The plan is to offer the course in the beginning of next year.

It would be useful if anyone who has a copy of "Amateur Radio Operator Theory Handbook" by F Swainston would donate or sell it to the Division, as the book is out of print and no suitable substitute is available.

As most of you know, the service provided by the NSW QSL Bureau is free to members of the Division. Until recently, any non-member radio amateur could use the bureau service by paying an annual fee of $24. However, this form of part-membership turned out to be a hindrance to the smooth operation of the QSL bureau. Its operators were never sure who had paid their fee and when. As the bureau is only contracted to provide the service and not go into any correspondence, Council decided that only members of the Institute could participate in the QSL bureau service. It is pointed out here, that WIA membership is available at a minimum cost of $38.75. This is the (X) grade membership which does not entitle you to receive *Amateur Radio* magazine, but does entitle you to all the other privileges of membership.

The Divisional library is seeing some changes as well. The librarian and archivist, Aub Topp VK2AXT, ably assisted by Barry White VK2AAB, are busy updating the stack with new and old editions of books, manuals, magazines and other periodicals. They are using a computer with appropriate software to replace the catalogue presently in use. From now on, visitors can use the computer to find their way around the library just as easily as in the State Library. The library receives much of its contents through donations. Often it receives more than it can handle. As a result, an impressive number of books and magazines, including *CQ*, *QST* and *Amateur Radio*, will be available at the Trash and Treasure sale in November.

Council has received and accepted the resignation of Councillor Anthony (Tony) Liolio. Pressures of work and family commitments didn't leave much time for Tony to attend Council meetings and perform the duties of Broadcast Officer. The position of Broadcast Officer has now been taken over by Richard Murnane VK2SKY. Tony's place on Council has been filled by Brian Kelly VK2WBK, the next person on the voting list at the last Council election.

Council has taken possession of ten high power VHF linear amplifiers model Philips AM17A. Any member who wants to purchase one should contact the Division in the normal way.

The Division is organising a Christmas Barbecue at the home of Jo Harris VK2KAA. Cost $12 a head. Date to be decided yet, but likely in second week of December. Listen to the Divisional broadcast for details.

The next meeting of the Conference of Clubs for the Southern Region will be held during February 1997 in Goulburn.

VK3 Notes

Barry Wilton VK3XV

Christmas Holidays

The WIA Victoria office will close on 19 December 1996 and re-open on Thursday, 6 February 1997. Membership applications received by post during this period will be processed.

Emergency Contacts

During the Christmas holiday period a recorded telephone message on the WIA Victoria office number 03 9885 9261 will provide emergency contact telephone numbers for various Division Officers and for WICEN.

Sunday Broadcast VK3BWI

The last broadcast for 1996 will be on 1 December and transmissions are scheduled to recommence on 2 February 1997.

The location of the broadcast facility at Lyndhurst is currently under threat, as the property on which it is located has been earmarked for sale by the Victorian Government. WIA Victoria may be able to negotiate with the purchaser, and this matter is currently under review.

A re-transmission of the VK3BWI broadcast in the evening of the day of the broadcast will be trialled for three months commencing with the first broadcast in the new year. There will not be a callback following this re-transmission.

Nominations for Council

Nominations for the 1997/1998 Victorian Division Council close at noon on Thursday, 27 February 1997. Nominations will only be accepted on forms available from the Secretary.

Nomination forms should be obtained prior to close of business on 19 December 1996, or after the office reopens in the New Year.

Notices of Motion 1997 AGM

Notices of Motion for the 1997 Annual General Meeting close at noon on Thursday, 27 February 1997. Notices of Motion must be signed by three financial members of the Victorian Division.

Voting at Meetings

During the 1997 year it is anticipated members will be invited to attend a number of meetings in addition to the AGM. Meeting notices are required to be forwarded to members at least 21 days prior to any meeting, and in some cases notices may be forwarded at an earlier date. Members who are not financial at the time a meeting notice is posted will be deemed ineligible to vote at the meeting in respect of which notice has been given.

1997 Subscriptions

Owing to the financial loss sustained by the WIA Federal Secretariat in 1996, the Federal Council resolved to increase the Federal Component payable by Divisions in respect of each member by $2.00. WIA Victoria incurred unforeseen financial expenditure in 1996 due to the high cost of the 1996 council election conducted in accord with the outdated Articles of Association. We will also be required to meet a significant cost increase in respect of repeater licences after 11 November 1996, and the WIA Victoria subscription component will increase by $1.00. Subscription rates will increase by $3.00 for all grades of membership.

Articles of Association

Members' comments regarding the draft Memorandum of Articles and Association have been received and will be considered during the next eight weeks. It is anticipated a Special General Meeting will be convened early in the New Year to further deal with this matter. All members will be notified of the scheduled date by mail.

November Council Meeting

A meeting of the WIA Victoria Council on 7 November with nine of the 10 councillors and the Federal Councillor in attendance, again expressed its dissatisfaction with the performance of the Directors of the Federal body in the management of the organisation's financial affairs.

In spite of our repeated requests, a Federal budget for 1997 was not forthcoming and no information was provided regarding the future publication of *Amateur Radio* magazine.

The WIA Victoria Council is concerned that actions and decisions made by the Federal directors are without regard to the wishes or needs of this Division, yet VK3 members are a major provider of funds for the Federal body and have little or no effective control over Federal expenditure.

Proper and prudent management of our own finances has been made exceedingly

difficult and the directors of WIA Victoria would be acting without "due care and diligence" in the performance of their legal duty to the membership if they allow this situation to continue.

Major changes are foreshadowed early in the new year and Victorian members can be assured this Council will do everything possible to preserve the WIA Federation, albeit in a changed form. It will, however, act positively in the interest of the membership to ensure the future stability of our own financial resources.

Christmas Greetings

Council wishes all members a Merry Christmas and a Happy New Year. Thanks to all members who have provided support and encouragement during what has been a difficult year.

VK6 Notes

John R Morgan VK6NT

Divisional GM

The attendance at the October GM was not sufficient to form a quorum. Will VK6UU displayed the Division's Internet web pages, into which he has invested many tens of hours of effort.

General Meetings are held on the third Tuesday of each month in the Board Room, 3rd Floor, CWA House, 1174 Hay Street, West Perth, commencing at 8 pm. There is no meeting in December. All interested persons (members and non-members, licensed or listener) are invited to attend, and will be plied with free coffee and biscuits.

Hamfest '96

In an effort to foster greater understanding of our hobby, and thereby to help replenish our ranks and so ensure its survival, Perth's major annual Amateur Radio event is organised each year by the Northern Corridor Radio Group Inc (known as the NCRG, club callsign VK6ANC), which is affiliated to the VK6 Division of the WIA. This year's event occurred on Sunday, 3 November, and more than 500 paying entrants (at a very reasonable $2 each, as it was last year) enjoyed the air-conditioned comfort of the Cyril Jackson Community and Recreation Centre, in Ashfield.

This year's Organising Committee decided to involve, for the first time, computer hobbyists and electronics enthusiasts; during the preceding months, advertising leaflets were distributed at local computer swap-meets, and some of the regular participants there were invited to attend. Commercial traders present included Atkins Electronics (part of Atkins Carlyle Ltd), Jaycar Electronics Pty Ltd, Ford Electronics Pty Ltd, Intelligent Internet Services, and X-On Electronic Services. Once again, Icom Australia Pty Ltd demonstrated its serious commitment to amateur radio, with its managing director and the ever-popular Duncan Baxter VK3LZ meeting many VK6 radio amateurs, and supporting their local authorised dealer, John Tower VK6IM of Tower Communications.

One of the regular features of Hamfest is the "monster" raffle. The first prize was an Icom IC-2000H 2 m FM mobile transceiver (donated by Icom Australia Pty Ltd), won by SWL Chris, of Padbury. The second prize was a Kenwood TH-28A 2 m FM hand-held transceiver (donated by Kenwood Electronics Australia Pty Ltd), which went to Craig VK6PCM. The third prize was a 28.8 k Fax/Modem with six months' membership of the Internet (jointly donated by The Net Effect and Omen Internet Services), which was won by Mel VK6TVA. The fourth prize was a Citizen hand-held LCD colour TV/Radio (donated by Dick Smith Electronics Pty Ltd), won by Bob VK6KRC. The NCRG urges you to support these organisations with your commercial patronage.

Non-commercial regular supporters included the UHF CB Association, WIA Divisional Bookshop, Travellers' Net, Vintage Wireless and Gramophone Club, and VHF Group. This year, the VK6WIA news broadcast was transmitted from the venue by the Division's Broadcast Officer, Tony VK6TS, with assistance from Mel VK6TVA.

Also this year, the "homebrew" competition was well supported, with eight entrants. The first prize was the latest ARRL Handbook, donated by the WIA Bookshop, and was awarded to Neil VK6BHT, from Geraldton, for his 5.7 GHz transceiver. For his power supply, Adrian VK6TCC was awarded the second prize, which was a digital multi-meter donated by Jaycar Pty Ltd. The third prize was awarded to Trevor VK6ZTJ, from Tambellup, for his well-documented modifications to convert an FM-92 to 6 m; he received a different DMM, donated by Atkins Electronics.

A special mention must be made of the excellent IOTA display by Mal VK6LC, featuring photographs and QSL cards from around the world. Mal's efforts in the north-west of WA show the amount of organisation and hardship involved in mounting a DXpedition to a remote location. He has promised to erect his Australian 4 Square phased vertical antenna at next year's Hamfest!

The following NCRG members involved in organising this event are to be congratulated for their efforts: John VK6ATA, James VK6FJA, Mel VK6TVA, Keith VK6XH, Darragh VK6ZDW, and Des VK6ZJ. Special thanks go to Mel VK6TVA for his ATV display, to Robert VK6NAD for his truck-mounted satellite station, and to Phil VK6ZPP for providing much of the above information.

WAADCA

The following was received from Phil VK6AD, who is president of the Western Australian Amateur Digital Communications Association Inc (known as WAADCA, pronounced wad-kah), which is affiliated to the VK6 Division of the WIA.

"We have seen a surge of interest lately in packet radio, from both new-comers to the hobby and from old hands. Our series of presentations on packet radio has resulted in a number of frustrated hams coming forward with their packet radio problems. This is really exciting because many of these people would otherwise lose interest and turn their attention away from radio, towards the Internet or other interests.

"Since implementing our Internet gateway station, which provides packet links to similar stations around the world, we have noticed a dramatic increase in the number of packet bulletins arriving at our BBS. Some days we see over 300 new messages arrive. This is great from the perspective of keeping up-to-date with world Ham radio activities, but it does have a down-side too. Imagine the poor packet operator trying to wade through all of those message headers to find something interesting! On some popular BBS frequencies, users running TPK and similar software usually request a broadcast of the mail headers soon after they switch on, which results in several minutes of extra activity on the channel. It is common to find this repeated throughout each evening as users turn on their systems and re-sync their message lists. Another insidious problem is that the high volume of traffic is being used as an excuse by some sysops to replace existing radio forwarding links with Internet links. Perhaps the most annoying development for some users is the high volume of junk mail bulletins containing trivial jokes and gossip.

"There is a wide range of options open to us to solve these problems. The easiest would be to simply not handle mail addressed for @WW distribution. At least two BBSs in WA have already opted for this solution. Other options include using different BBS software, which puts incoming mail into "pigeon holes" depending on the subject. One pigeon hole can be set up for "humour", another for "antennae", etc.

Each user would also have their own personal mail pigeon hole. Most of the NOS software works this way and the scheme is very popular in Europe and the USA. This is also how the Internet works, with each newsgroup representing a pigeon hole.

"Early in the new year, we hope to implement some changes along these lines at the club BBS (VK6WFH, 144.725 MHz). We shall keep you informed of progress and results.

"WAADCA meets at 8 pm on the first Wednesday of each month, in the Meeting Room of the Wireless Hill Telecommunications Museum, Ardross. As always, non-members are welcome to attend."

If You Have Material...

Material for inclusion in this column may be sent to VK6NT @ VK6ZSE.#PER.#WA.AUS.OC, or to PO Box 169, Kalamunda WA 6076, or via telephone on (09) 291-8275.

"QRM" News from the Tasmanian Division

Robin L Harwood VK7RH

Well, another calendar year is rapidly coming to its conclusion. It has been a rather traumatic one for this State, especially after 28 April. We all are hoping that 1997 will be much better than what has happened over this past year. December is always a very busy month, ending up with Christmas and the New Year festivities and, on behalf of your Divisional Council, I extend Season's Greetings to all members of this Division and their families.

Divisional Council conducted a telephone hook-up in November as the amount of business did not warrant travelling for a full meeting. Telephone conferences have been previously held but were confined to specific issues that needed speedy resolutions. They can be very cost effective in terms of time and money. However, a full face to face meeting will still be necessary before the Divisional Annual General Meeting, which is scheduled for 22 March. There will be further details concerning this in next month's column. The deadline for nominations for Divisional Council will be 22 February and there are some councillors who have indicated that they do not wish to re-nominate. So think now about contributing to your Division.

Subscriptions for 1997 have increased by $2 in all categories. These now are: Full $74, Concession $60, and "X" (that is without *Amateur Radio* magazine) $46. Please note that those who wish to apply for the Concession grade for the first time will have to quote their relevant Social Security number which can be checked.

The Southern Branch is the only Branch scheduled to hold a regular monthly meeting. It will be held as usual at the Domain Activity Centre on Wednesday, 4 December at 2000 hours.

The Northwestern Branch will be holding their annual Christmas Dinner at the Bass & Flinders Motel in Ulverstone on Tuesday, 11 December. I am certain it will be a very well attended function where the annual Joan Fudge Memorial Award will be presented.

The Northern Branch is unable to meet at their regular venue this month and, anyway, it has been the usual practice to have an informal get-together. For details of what activity is planned, listen in to VK7WI on Sundays.

Well, that is all for 1996. A very happy and peaceful Season to all.

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FTAC Notes

*John Martin VK3KWA, Chairman, Federal Technical Advisory Committee**

More Microwave Records

Doug Friend VK4OE and Adrian Pollock VK2FZ/4 have set an inaugural VK4 record for the 13 cm (2.4 GHz) band. The distance is 224.8 km. On 24 GHz, we have two inaugural state records. Alan Devlin VK3XPD and Russell Lemke VK3ZQB have made two contacts over 12.3 km and 48.4 km. Trevor Niven VK5NC and Colin Hutchesson VK5DK have set a VK5 record distance of 38.5 km. Congratulations to all.

Packet Housecleaning - Not an Easy Task

It seems that there always has to be a raging controversy on the packet network. There are some packet operators who wield their keyboards like a crocodile wields his teeth, and any hint of controversy brings them out of the swamps with their jaws clacking.

This time the debate is about the SMA regulations on advertising. The question is basically whether they mean what they say, or whether they can be twisted to mean the opposite.

One of the cornerstones of the amateur service, since long before I can remember, has been that amateur operation is non-commercial. That is what the word "amateur" means, after all. Our licence conditions state quite clearly that we must not use our stations for financial gain, or to transmit any message that is, or includes, an advertisement.

Is this understood on the packet network?

By and large, of course it is. But a significant minority of packet operators do not appear to understand it. Others are trying to find a loophole, so they have been studying the meaning of the word "pecuniary" in their dictionaries.

Not that it matters of course. The phrase "pecuniary interest" is part of the ITU definition of the amateur service, but it isn't the SMA regulation. And for some unfathomable reason, the SMA has never seen fit to publish our licence conditions in dictionaries!

There is another group of packet operators who know full well that advertising is illegal, but go ahead and do it anyway. Some of them give the excuse that if the WIA is authorised to include disposal notices in their broadcasts, then so should everyone. It also gives the anti-WIA brigade an ideal opportunity to sling off about "discrimination" and "WIA privileges".

Of course that isn't the point either. The WIA is an organisation, not an individual. No individual amateur, WIA member or not, is permitted to advertise on the air. So we are all treated equally and no-one is being discriminated against. If the WIA disposal notices are such an annoyance to some packet operators, then they should be dropped. Then there would be no excuse for anyone to knowingly ignore the regulations.

All this might sound authoritarian, but I feel that there are too many amateurs - especially on the packet network - who have forgotten that we are required to play by the rules. Our licences are not for advertising, playing records, conducting business transactions, religious preaching, political commentaries, or anything like that. They are for technical experimentation in generating, propagating and receiving RF. That's it - nothing else!

So to those packet operators who think they have a right to do whatever they like, I would say: KNOCK IT OFF. You are letting the side down. The rules are there for our benefit, and it's time you realised it.

*PO Box 2175, Caulfield Junction, VIC 3161

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How's DX?

*Stephen Pall VK2PS**

During the year one of the many popular discussion subjects in amateur radio circles was the decline of solar cycle 22 and the imminent rise of a new cycle. Everybody wanted to know the exact date of the minimum of the cycle. Had it occurred already? Did they miss the important event without noticing it? Is the minimum still lingering in the doldrums?

To get up-to-date information on this subject, as always I consulted Dr Richard Thompson, a solar scientist with the IPS Radio and Space Services in Sydney (see *How's DX*, May 1995, October 1995 and May 1996 for more information on this subject).

Dr Thompson has just returned from an important meeting of solar and space scientists held in Boulder, Colorado. Scientists from the United States, Germany, United Kingdom and Australia (represented by Dr Thompson) took part. Among other subjects, they discussed the future of the coming cycle 23. It was the considered opinion of these 12 people that we have now passed the minimum of cycle 22, and we are moving along on the bottom of the new cycle 23 without actually observing any significant changes. According to Dr Thompson, it is still difficult to pinpoint the exact date of the minimum of cycle 22 which, according to his opinion, occurred between July and November (most probably in the middle of September 1996).

Scientific data is still coming forward and there will be at least another 6-10 months before the exact date can be established. It has to be noted, however, that in the period of September/October there were 37 straight days without any visible spots on the sun.

Here is what Dr. Thompson says about the spotless days on the sun: *"This 37 days sequence is longer than any during recent solar minima, and is consistent with the current minimum being "deeper" than those during recent solar cycles. But how does this sequence compare with historical sequences from the record of sunspot observations? The following data makes this comparison for observations since 1900.*

(The numbers are year of sequence and number of spotless days.) 1913 (92), 1901 (69), 1902 (49), 1902 (45), 1912 (43), 1901-2 (40), 1924 (39), 1913 (39), 1996 (37), 1933 (36), 1944 (36).

The data shows that the 1996 sequence, whilst impressive, is still considerably shorter than some early in the century. However, a note of caution is required because the coverage of observations was not nearly as good early this century as it is now. A sequence of spotless days can be broken by a single day on which a small spot appears. Lack of coverage by observations could therefore be very important in determining the length of such spotless sequences. With the above qualification, the sequence in 1996 is still the longest observed in the last 50 years during which good observations have been available."

It was the considered opinion of the group of scientists that the peak of cycle 23 will come around early in the year 2000 with a maximum sunspot number of 160. For the immediate future it will be March/April 1997 before we can experience real improvement in propagation.

With these cheerful thoughts I wish all my readers a Merry Christmas and a Happy New Year.

Heard Island - VK0IR

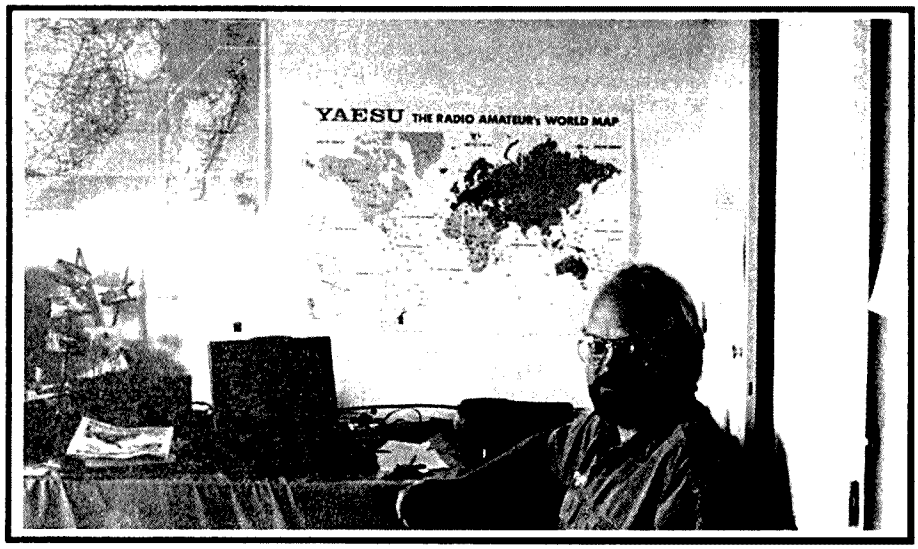
Preparations for the Heard Island DXpedition have been in high gear for most of the past year. Heard Island may represent the most difficult and complicated DXpedition ever attempted. The 1995 attempt on Heard Island was aborted and resulted in financial disaster for the team. The project was then reorganised, and the team enlarged to 20 radio operators in order to reduce the cost per person. Additional equipment, procedures, and travel arrangements were included to ensure safety and success. In September/October 1996, two 20 foot containers with more than 10 tons of equipment were shipped to Reunion Island, the starting point of the expedition. The gear includes complete life support and radio equipment and a multitude of antennas for 20 persons for the two week stay on Heard Island.

The expedition team has been essentially intact since it was formed in January 1996. Currently it includes EA8AFJ, HB9AHL, K0IR, K4UEE, K9AJ, KK6EK, N6EK, N6MZ, NP4IW, OE9AMJ, ON6TT, PA3DUU, RA3AUU, VK2TQM, W60TC, W8FMG, WA0PUJ, WA3YVN, KA6W and 9V1YV. Expedition leaders believe they have assembled a great mix of phone, CW, and RTTY operators with a bias towards low band operations (160, 80, 40 and 30 metres). Good openings are anticipated on 20, 17 and 15 as well, with fair to sporadic openings on 12 and 10 m.

Modem technology will be employed and the team will log using a CT-network. Every day the logs will be uploaded via Pacsat to a central site for posting on the World Wide Web. Anyone will be able to enter basic information about a QSO and receive confirmation that the QSO is in the log. Extensive use of pilot operators will help the Heard Island team to get feedback, to ensure success of the DXpedition.

The team will assemble on Reunion Island during the last week of December. On 3 January 1997 they will leave aboard the 300 ft French vessel *Marion Dufresne* for a 10-day sail to Crozet and then Heard Island. If weather permits, the equipment will be put on the island by helicopter; if not, it will be landed by boat.

The stations will come on the air on or before 15 January 1997, using the callsign VK0IR. The NCDXF five band HF beacon will be set to transmit continuously during



Dan C91CB in his shack in Maputo.

the stay. Departure will occur on 27 January 1997 and, after a brief stop on Kerguelen, will sail to Reunion, arriving on 5 February 1997.

The Heard Island DXpedition team is committed to carry out this operation in an exemplary manner. Every effort will be made to ensure the maximum number of QSOs on as many band/modes as possible while minimising interference to other amateur interests.

It is envisaged that the DXpedition will work the amateurs on a "continent" basis. They have three "continents" in their planning, Asia/Pacific, Europe/Africa/Middle East, and the Americas, and they will use peak propagation periods to do this.

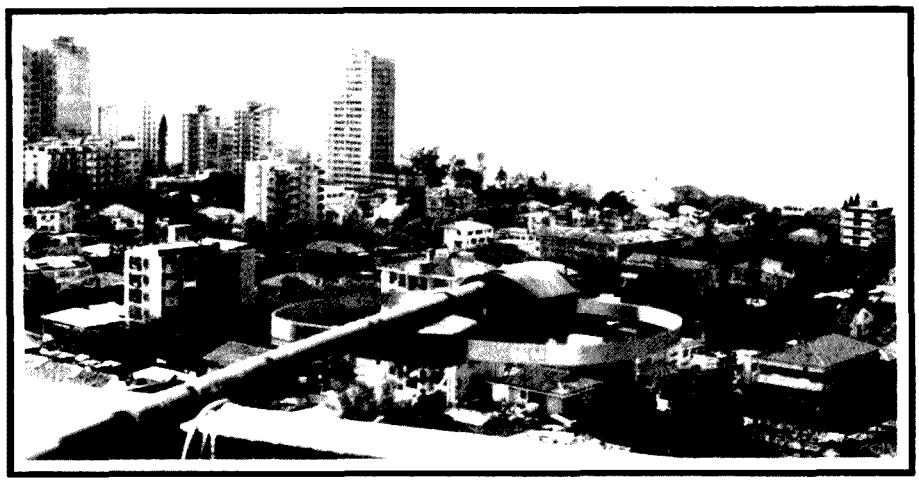
Each one of us in VK/ZL had the experience, when working an Antarctic expedition in the past (Bouvet, South Sandwich, Peter I, Macquarie) of being swamped by powerful USA and Japanese stations. I have approached the organisers of the expedition and suggested they have a separate "VK/ZL only" segment in their band activities when calling for the different "continents". This would separate the many amateurs in Australia and New Zealand from the rest of the Pacific, which sometimes becomes a battleground between amateurs situated on the Eastern and Western rim of the Pacific Ocean. I have been assured that our region will receive special attention as a calling area. Let's hope the promise will translate into reality.

The total budget for the expedition is $US320,000. Almost two thirds of this cost is transportation to Heard Island, which is remote from any normal shipping lanes. The balance of the budget is required for special gear and services, such as shelters, food, fuel and transportation of equipment. An example of the high cost of this operation is the charge for shipping and storing the containers of gear.

As of mid-October 1996, about $US260,000 has been raised or is guaranteed, leaving about $US60,000 to be obtained. Donations will be gratefully accepted via Heard Island DXpedition, c/o Bob Allphin, K4UEE, 4235 Blackland Dr, Marietta, GA 30067 USA. Donations are not at risk. The expedition team is taking all financial responsibility until the expedition is completed. Should the project fail due to other causes than an Act of God, the donors' money will be returned. The most complete set of information about the expedition is available on the Web pages at *http://www.ccnet.com/~cordell/HI*

Mozambique - C91CB

It was around May/June this year when Dan C91CB was almost a daily contact on the ANZA net around 0530 UTC with never too strong but quite workable signals. The biggest problem was QSLing. It seems very few letters have landed in his Maputo post office box, which frustrated his QSO partners who eagerly waited his reply card as proof for the first contact with that country. Some months ago Dan returned to his home town in Canada for a short rest and recuperation and there he managed to organise a QSL manager to look after his cards. His QSL manager is Fred de Wind VE3WFN, Box 182, 201-B-Hammell Road, Red Lake, Ontario, Canada, P0V 2M0.



The AEA Isoloop antenna used by C91CB on the balcony of his apartment.

In a letter posted to me from Maputo on 3 October, Dan has written, among other things, *"I work here in Mozambique as an aircraft engineer for a non-government organisation based in California, but with work stations in Maputo, Djibouti as well as Tbilisi, Georgia. I have been operating as C91CB since July 94 and I have made, so far, about 1600 QSOs. My contract with the company runs for another two years, but there is no guarantee that I will spend all of the next two years in Maputo. I am here with my wife and a six year old son. I operate with a Yaesu FT-900AT, barefoot into an AEA Isoloop antenna (see photo) which hangs off my balcony on the 18th floor, making it about 170 feet up or so, and faces east towards the Indian Ocean. I usually operate on 20 metres these days as things are pretty bleak on the other bands. I cannot work on 40 or 80 metres as this miniature loop antenna will not tune up on that frequency. Well, I must run now. I listened on the ANZA net today; Bill the controller was faint, but the VK6s boomed in as usual as well as a ZL or two".*

Dan closed his letter saying that he now has a South African address for correspondence which, he hopes, will deliver him the letters more safely: Dan Swedberg, PO Box 1276, Nelspruit 1200, Republic of South Africa.

Future DX Activity

* Ulli will be active from Roemoe Island as OZ/DL2HEB (IOTA EU-125) from 22 December to 3 January. QSL via DL2HEB or via the Bureau.

* Gerard F2JD/5R8EN will be going to Panama for at least 6 months and hopes to be active from there.

* Tex 9M2TO has installed his 80/160 dipole and is active. QSL via JA0DMV via the bureau.

* Alex PA3DZN (formerly 9X5EE, 9Q2L, etc) has arrived in Luanda, Angola and received the call D25L. QSL via PA3DMH.

* There are plans to activate Pratas Island BV9P in March 1997.

* Eric F5CCO will be active in November and December from Tahiti.

* The proposed St Paul Island DXpedition CY9 has been postponed because of bad weather.

* Dave KC9IM is now active in Guinea-Bissau as J52IM and has antennas for 80 and 160 metres. QSL via KB9XN.

* The planned Syrian operation of a group of 23 Germans (YK0B) has not taken place due to misunderstanding with local authorities.

* Larry TZ6VV is now active from Mali. QSL to Larry Erwin, BP 395, Segou, Mali, Africa.

* Ray 5R8FK and his wife Donnie 5R8FJ are now active from Madagascar. Their address is Ray Shankweiler, BP B20, 101 Antananarivo, Madagascar. However, they warn that mail pilferage does occur.

* Rick K3IPK is active again from Senegal as 6V6U. QSL via his home call.

* Prabhu VU3PDD is active from the Indian Maitri Antarctic Base with the callsign VU2AXA.

* There will be some activity from French St Martin with the callsign FS/W2QM between 4-11 December.

* Jim ZD9CR is now active from Tristan da Cunha. He can be heard on 14240 at 2000 and on 21335 at 1300 and 1800 UTC.

* Yvette F3YA is on Tokelau Island for the next three years. Her callsign is ZK3YA. She is active sometimes on 7003 kHz between 1000 and 1100 UTC. QSL via home call.

Interesting QSOs and QSL Information

* VQ9WM – Bill – 14250 – SSB – 0606 – Sep (E). QSL via K7IOO, William C Moore, 405 Roosevelt Rt 1, Grand Coulee, WA 99133 USA.

* V44NEF – Earl – 14164 – SSB – 0530 – Sep (E). QSL to Earl Francis, POB 565, Charlestown, Nevis Island, West Indies.

* ET3BT – Telashan – 14250 – SSB – 0530 – Sep (E). QSL via Box 6228, Addis Ababa, Ethiopia, Africa.

* JW8GV – Ola – 14195 – SSB – 1102 – Oct (E). QSL to Ola Johan Ostvig, POB 27, N-9170, Longyeearbyen, Svalbard Island, Norway.

* R1ANT – Yura – 14164 – SSB – 0555 – Oct (E). QSL via POB 600, 198206 St Petersburg, Russia.

* GB800SA – Terry – 14196 – SSB – 1036 – Oct (E). QSL via RSGB QSL Bureau, PO Box 1773, Potters Bar, Herts, EN6 3EP, England.

* HS0/G4JMB – Phil – 14182 – SSB – 1045 – Oct (E). QSL via Box 7, Bangkok, 10506, Thailand.

* SV2ASP/A – Apollo – 14195 – SSB – 0558 – Oct (E). QSL to Apolo Monachos, 1 Moni Dochiariou, GR-63087, Agion Oros, Greece.

* FO0SUC – Joel – 14260 – SSB – 0728 – Oct (E). QSL via F5JJW, Joel Suc, La Grange, 69440, Taluyers, France.

* Z32XX – Dragan – 14222 – SSB – 1336 – Oct (E). QSL via EM6ON, Mike T Jakiela, POB 286, Poway, CA 92074, USA.

* T88T – 14023 – CW – 0658 – Oct (E). QSL via Palau DXpedition, PO Box 88, Morris, OK 74445-0088, USA.

* FW201 – Rich – 14192 – SSB – 0454 – Oct (E). QSL via DJ40I, Richard Hanss, Falkenburgstr 14, D-67122, Altrip, Germany.

From Here and There and Everywhere

* Jack FT5WF told Bill VE4UA that December will see the change-over of the science personnel on Crozet and Kerguelen Islands. A total of 16 new people will come, hopefully some amateur operators amongst them.

* Mirny, the Antarctic Russian base, has 51 personnel and two active radio amateur stations, R1ANZ and R1ANT.

* Jacques FR5ZU/T was active from 25 to 29 October from Tromelin Island, which gave the opportunity to a number of VE stations to work this rare DX country. QSL via FR5ZU.

* The JA1UT DX Group had a successful short operation from Myanmar from 25 October to 4 November using the callsigns of XY1HT, XY1VMY and XY1U. The group consisted mainly of European and Japanese operators. QSL via JA8RUZ.

* The ZS8IR cards have been finally printed and Chris ZS6EZ has started QSLing.

* In 1994 Belau (Palau) declared its independence from the USA. Consequently a new prefix, T8, has been assigned to Palau.

* Gus 5X1D has now left Uganda. QSL via SM0BFJ.

* Dragan ET3YU has moved from Ethiopia back home, so future QSLs for his Ethiopian activity should be sent directly to Dragan Stojanovic, Dusana Vukasovic 82/20 11070 Novi Beograd, Yugoslavia. He made 14,000 QSOs but exchanged only 4,000 QSLs.

* WA4DAN, AH9C, KW2P, AA4VK and VK2BEX were active from Sable Island from 22 to 28 October. Did any VK work them apart from VK3ZC on 7 MHz?

* VK4IS, in a packet bulletin, advised that he is not the QSL manager for the pirate station VK0HD which was active lately.

* Leif SM0BFJ, QSL manager for Gus 9Q5TE for the activities in August 1989 and April 1993, advised that he is closing the logs for those operations on 31 December 1996.

* Martti OH2BH has returned to his new home in Finland after a tour of duty in Hong Kong, Korea and Singapore.

* Phillip Weaver VS6CT, who for years provided many amateurs world-wide with a contact from Hong Kong, retired from the Search and Rescue Group he formed. After a world-wide vacation he took up residence in Thailand and is active now as HS0/G4JMB.

* If you send cards to the Libyan operators direct, use registered mail only. There are three operators with three different addresses. Ali, PO Box 80462, Tripoli, Libya; Usama, PO Box 78665, Tripoli, Libya; and Abubaker, PO Box 74421, Tripoli, Libya.

* KP3 is a new prefix assigned to Puerto Rico. KP3 to extra and advanced classes, NP3 to general and technical licensees and WP4 to novices.

* Bill Kennamer, DXCC manager, said that all operations and QSL activities of Romeo Stepanenko, including those as QSL manager "Roy Rogers" 9H3UP, are now disqualified from the ARRL DXCC program. Cards verified after 23 August 1996 by 9H3UP are not valid for DXCC. EM1KA cards issued by JA2JPA are valid.

* Send your cards to FY5YE via W5SVZ (new manager).

* More and more KH7 calls are heard these days. They are from Hawaii and not from Kure Island. Kure now has the prefix KH7K.

QSLs Received

8R1Z (7 w – op); YW0RCW (30 m – YV5AMH); ZD7VJ (6 m – G4ZVJ); DX9C (10 m – DU9RG); 5V7M (4 m – DL7ALM); J87CQ (4 w – N4FTR).

Thank You

Many thanks to all those who supply me with news and other information. Special thanks to VK2XH, VK2KFU, VK2TJF, VK2TQM, VK4UA, VK8DK, VK8AV, VK9NS, WIA L40370, C91CB, K4UEE, ARRL DX Desk, *QRZ DX, The DX Bulletin, The DX News Sheet, INDEXA, The 425 DX News, and GOLIST QSL Managers list.*

*PO Box 93, Dural NSW 2158

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Novice Notes

*Peter Parker VK1PK**

The Basics of Transmitters – Part Two

Last time you heard about CW and AM transmitters. In this month's column, we discuss double sideband suppressed carrier (DSB) and single sideband suppressed carrier (SSB) modes. The promised coverage of RTTY and digital modes will be held over to a later issue to make room for a new feature, called "Novice Plus".

Double Sideband (DSB)

As the name suggests, a double sideband signal consists of two sidebands, both carrying information. In this regard it is similar to an AM transmission. However, the two modes differ in that AM signals comprise upper and lower sidebands on either side of a steady carrier signal, whereas DSB signals comprise only the two sidebands, the carrier being suppressed by special circuitry inside the transmitter.

Because double sideband is comparatively easy to produce, it finds some use amongst those who build their own equipment. DSB has the following advantages over AM:

* Greater transmitting efficiency – the carrier component of an AM signal carries no information. By removing the carrier and concentrating power in the sidebands, a more effective signal is the result.

* With no high power modulator being required, DSB transmitters are easier to build than those for AM.

* By adding a product detector and audio amplifier, it is possible to convert any DSB transmitter into a direct conversion transceiver, compatible with modern SSB equipment.

A Typical DSB Transmitter

Figure 1 is a block diagram of an eighty metre double sideband transmitter. Like an AM transmitter, it contains an RF (carrier) oscillator, a microphone amplifier and a power amplifier stage. However, the circuitry of the microphone amplifier and the power amplifier stages is different in each case; a power amplifier from an AM transmitter is unsuitable for DSB service, while a speech amplifier from a SSB or DSB transmitter would be unable to fully modulate an AM transmitter unless additional stages were added.

Carrier Oscillator

As with all transmitters, the process starts with the generation of a radio frequency signal. Like CW or AM transmitters, the oscillator's frequency is the same as the desired transmitting frequency. While the transmitter of Figure 1 uses a crystal oscillator, other techniques, such as ceramic resonators, free-running variable frequency oscillators, or frequency synthesisers could be used instead.

Microphone Amplifier

The next stage we will look at is the microphone amplifier. This is simply an audio amplifier that amplifies the low-level electrical impulses from the transmitter's microphone. The amplifier's output must be sufficient to drive the balanced modulator. Fortunately, the output required is not high, and one or two audio transistors or operational amplifier integrated circuits (such as the popular 741) will do the job. This is different from AM transmitters, which require much more powerful audio amplifiers (modulators) to achieve the 100% modulation needed for optimum results.

To reduce occupied bandwidth (and thus lessen band crowding) while maintaining intelligibility, the transmitter's audio frequency response is normally restricted to 300 Hz to 3 kHz. In DSB equipment this is achieved by restricting the frequency response of the audio stages. A judicious choice of component values in the speech amplifier stage and the use of a communications-type microphone will normally suffice here. Note, however, that while the audio bandwidth of a DSB signal is about 3 kHz, the actual signal is 6 kHz wide, due to both sidebands being transmitted.

Balanced Modulator

The heart of a DSB transmitter is its balanced modulator. This stage, which is essentially a mixer, combines the RF signal from the crystal oscillator and the audio signal from the speech amplifier to produce a double-sideband RF signal. The level of this is proportional to variations in the operator's voice.

Ensuring that signals applied to the inputs of a mixer stage do not appear on the output can be difficult. While the audio signal from the speech amplifier is easily dealt with, it can be difficult to obtain proper suppression of the carrier signal generated by the crystal oscillator. The result of this is a transmission sounding more like AM than DSB, as a portion of the carrier signal finds its way through the balanced modulator to subsequent amplifier stages, and then to the antenna.

Balanced modulators normally use some form of balanced (or symmetrical) circuit configuration (eg two or four diodes or transistors) to aid carrier suppression. As well, a "set and forget" trimmer potentiometer may be included to compensate for (or "null out") any remaining imbalances which could harm carrier suppression. This control is set for minimum carrier output, which usually occurs near the middle of its travel. In the past, balanced modulators have been somewhat critical to build and adjust. However, the availability of integrated circuits such as the NE602 has made their assembly much easier.

Driver and Power Amplifier

While both CW/AM/FM and DSB/SSB transmitters require power amplifiers to raise output to a level sufficient to obtain contacts, the amplifier circuitry required in each case is somewhat different. This is because DSB and SSB transmitters require a linear RF power amplifier chain for the transmitted signal to be intelligible.

A linear amplifier is one in which the power output is directly proportional to the strength of the signal applied to its input. Thus, if a hypothetical power amplifier provided 20 watts output for two watts input,

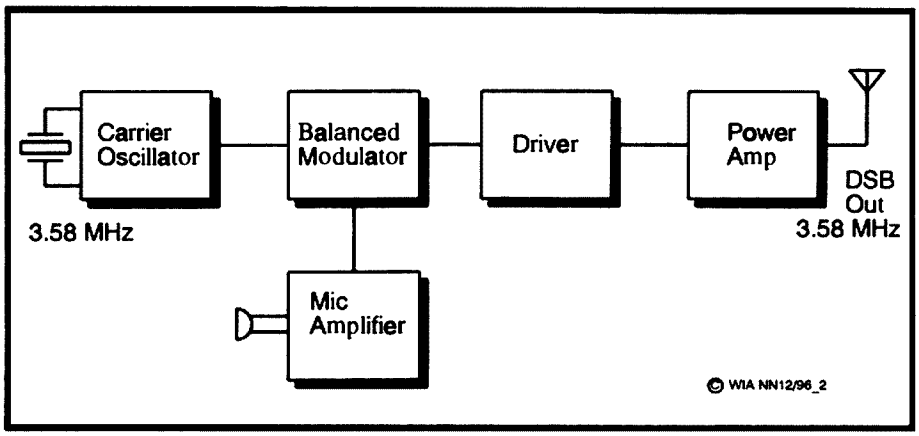

Fig 1 – Double sideband transmitter block diagram.

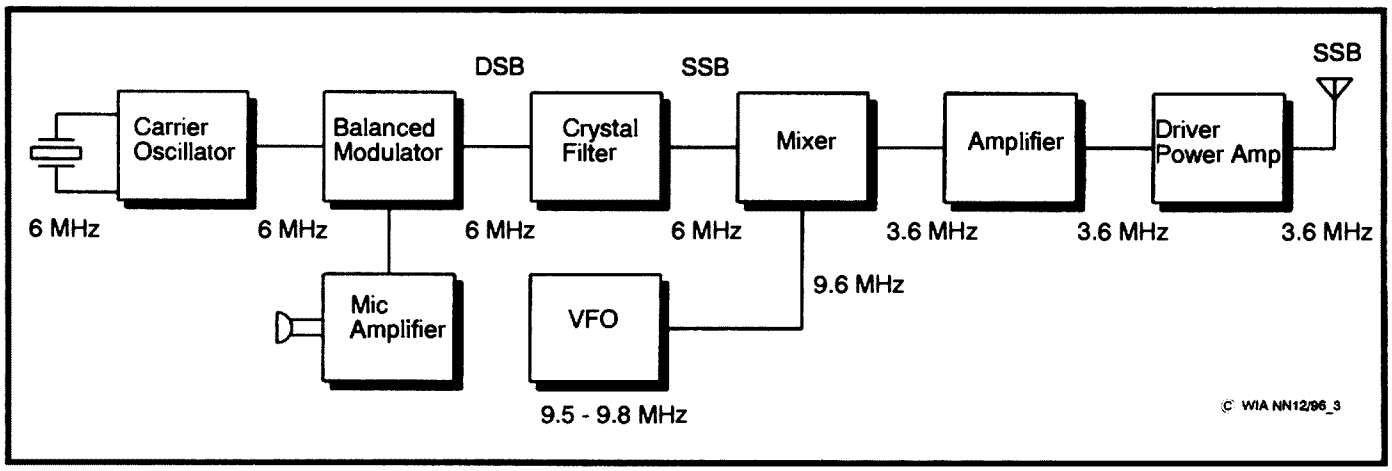

Fig 2 – Single sideband transmitter block diagram.

it should produce 20 milliwatts for 2 milliwatts input; a power amplification ratio of ten in both cases. This characteristic is achieved by applying a bias voltage to the base of amplifying transistors.

Linear amplifiers generally draw more current for a given power output than non-linear amplifiers; ie they are less efficient. This also means that better heatsinking of the power transistors is required. Nevertheless, this drawback is a small price to pay for the greater efficiencies obtainable by suppressing the transmitter's carrier.

Single Sideband

SSB is the most popular mode on the HF bands today. While harder to generate than DSB, it has the advantage of requiring a lesser bandwidth than DSB, making it more suitable for use on crowded bands. Whereas a double sideband signal contains one lower sideband and one upper sideband, both carrying identical intelligence, an SSB signal has just one sideband. This is normally achieved by special filtering circuitry in the transmitter – more on this later.

An SSB Transmitter

A block diagram of a simple 80 metre SSB transmitter is shown in Figure 2. It has many similarities with the DSB transmitter of Figure 1 but contains additional stages, namely a crystal filter, mixer and variable frequency oscillator. The transmitter described here is based on an actual design developed by Drew Diamond VK3XU *(Reference 1)*.

The transmitter produces a low-level DSB signal by mixing the audio signal from the speech amplifier with an RF signal from a crystal oscillator. This is accomplished in the balanced modulator. Note that, in contrast to Figure 1, the carrier oscillator is operating on 6 megahertz.

The 6 MHz DSB signal is filtered by a crystal filter. This filter, with a bandwidth of only three kilohertz, is so sharp that it eliminates one half of the 6 kHz-wide double sideband signal. After the filter we are left with a 6 MHz single sideband signal. Because of the filter's sharpness, the precise frequency of the 6 MHz carrier oscillator is critical. Shifting the oscillator upwards leads to a corresponding rise in the frequency of the DSB signal from the balanced modulator. Because the frequency of the filter is fixed, only the lower frequency sideband is transmitted (Figure 3). The reverse happens when the carrier oscillator frequency is lowered; in this case only the upper sideband is passed by the filter. While there is no longer any justification for it, amateur practice has been to use lower sideband (LSB) on bands below 10 MHz, and upper sideband (USB) above 10 MHz.

As 6 MHz does not fall within any amateur band, and frequency agility is desired, we need to use a second RF oscillator and mixer to shift the frequency to 3.5 MHz. This is accomplished by mixing the 6 MHz SSB signal with a signal from a

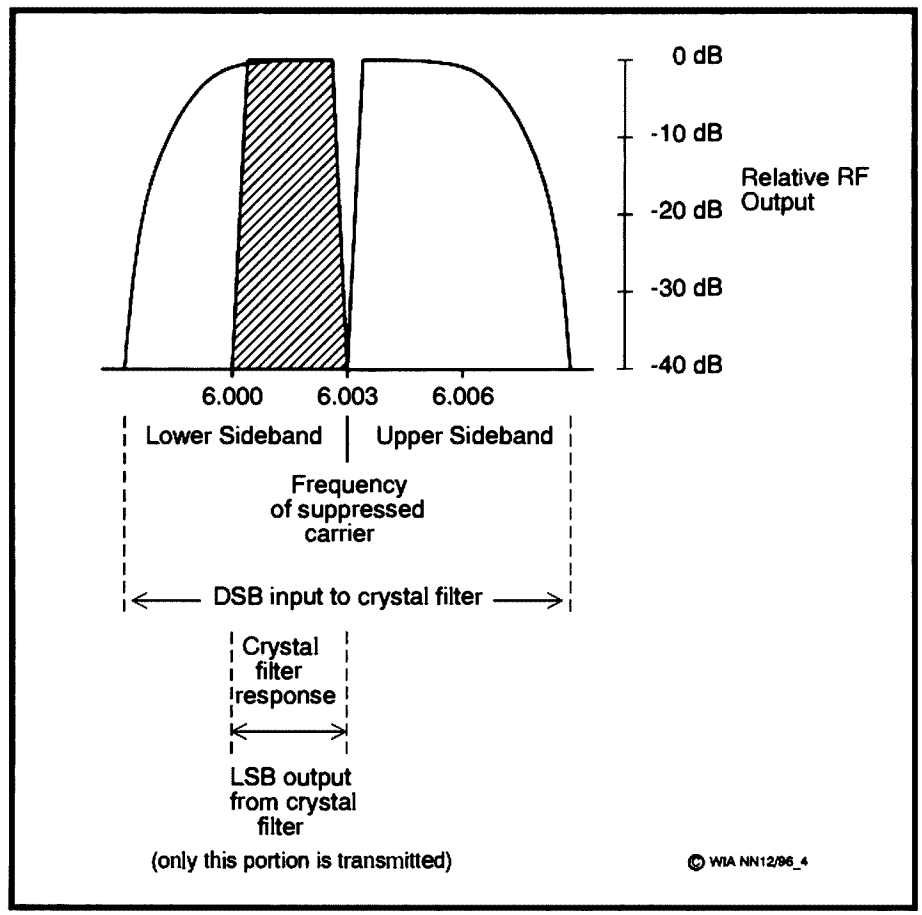

Fig 3 – A crystal filter produces a SSB (LSB) output from a DSB input.

variable frequency oscillator. By making the variable frequency oscillator tune 9.5 – 9.8 MHz, it is possible to obtain an SSB signal in the 3.5 to 3.8 MHz range (9.6 MHz – 6 MHz = 3.6 MHz).

Having generated an SSB signal in the desired amateur band, all that remains is to amplify it to a practical power level. This is accomplished by several linear amplifier stages, which are identical in all respects to those used in the DSB transmitter.

Conclusion

The above has given an outline of the operation of DSB and SSB transmitting equipment. The block diagrams used are based on actual designs built by home constructors. While current commercially-available equipment makes use of other means of generating VFO signals (such as the use of a frequency synthesiser), and more stages of mixing (to permit operation on all bands) the basics as described here remain valid.

Reference

1. Diamond, D Radio Projects for the Amateur, 1995

**7/1 Garran Place, Garran ACT 2605*
VK1PK @ VK1KCM.ACT.AUS.OC

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Novice Plus

Helping You Get More From Your Amateur Licence

VHF/UHF Field Day

* The WIA invites Novice and Novice Limited licensees to participate in its annual VHF/UHF Field Day, being held on the weekend of 11/12 January 1997. The event is a contest where participants make as many contacts as possible on VHF and UHF. The contest favours portable operation, though you may participate if transmitting from home. Take your hand held or mobile rig to the top of the nearest hill, and see how far you can work simplex – you'll be surprised. Or involve your local club in the activity, and establish a multioperator station. Try 146.500 and/or 439.000 MHz for starters – these are the national FM simplex calling frequencies. The rules are in this issue of *Amateur Radio*, in the Contests column. Contest operating procedures were covered in August's *Novice Notes.*

Handheld Antenna

* Can't afford the high cost of commercially-made antennas for your hand-held? Why not build one yourself? A quarter wave whip for two metres offers considerable gain over the supplied helical, and gives a stronger signal into the repeater or on simplex.

Take a standard PL259 plug (preferably the type made for thick cable such as RG8 or RG213) and a 50 cm length of stiff copper wire or rod. This should be thin enough to slide inside the PL259's centre pin. Coat both the inside of the PL259 inner connector and one end of the wire or rod with solder. Then apply heat to the centre pin of the PL259, insert the rod through the rear of the plug and allow to cool. Use either insulating tape or a rubber grommet to ensure that the rod cannot touch the rear of the plug. With the use of an appropriate adaptor, the antenna can now be used on your handheld transceiver.

A finishing touch may be to glue a toothpaste tube cap or toggle switch nipple to the end of the antenna for safety. As the antenna is three-quarters of a wavelength long on UHF, it should also be effective on 70 centimetres.

International Amateur Radio Union Monitoring Service (IARUMS) – Intruder Watch

*Gordon Loveday VK4KAL**

The 80 m band is currently subject to low solar activity, resulting in utility stations in Asia being received at good strength, stronger than usual. There are also five broadcast stations in the 80 m band; they are intruders, so log them! All of the above causes the amateur service to suffer QRM. When the solar activity increases and cycle 23 commences to rise, the above conditions will reduce DX, and possible many amateurs will leave the overcrowded 80 m band for higher frequencies.

This is when the full impact of intruders will be felt. The 7 MHz band is plundered by two way radio stations north of VK. When you add intrusions by other countries, such as Russia with CW beacons, F1B (RDL style), two or three R7B, plus CW using Russian Morse and many others, little space is then available for amateurs. Compounding the issue more will be the migration from 80 m.

What more reason do you need to join your fellow amateurs submitting logs to the Monitoring Service?

Well, here's more reasons. Although solar activity was low in October, short openings on the 14 MHz band did occur, with even shorter openings on 18 and 21 MHz. These brief openings revealed intruders already in operation, giving a sample of things to come. Heavy intrusions from Asian CW, phone, and Russian RTTY (F1B) and CW were heard. When cycle 23 does open up the bands, 28 MHz will reveal the problems encountered in cycle 22 have not gone away, plus harmonics of "rotten" transmitters will resurface.

The main outlet for RDL Moscow Naval Radio (UMS) seems to be on 14.211.5 MHz until 21.032 MHz re-opens for traffic *(information gleaned from VK4AKX October notes).*

Military intruders have been found with increasing regularity over the past couple of months. CW, voice and RTTY type transmissions have been logged. Radio telephony conversations in the 40 m band are a curse and some locals are spending many hours trying to jam them. Most are Asian, Indonesian and Chinese.

Radio Veritas, operating on 7.105 MHz, is quite legal, but the station splatters down to 7.097 MHz which is NOT legal. The station is in the Philippines and information received lists it as "almost an external arm of Vatican Radio". It transmits in Hindi, Urdu, Bengali, Tamil and Teluga.

**Federal Intruder Watch Co-Ordinator, Freepost No 4 Rubyvale QLD 4702 or VK4KAL@VK4UN-1*

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Prevent pirates – make sure you sell your transmitter to a licensed amateur

Pounding Brass

*Stephen P Smith VK2SPS**

My intended article for this issue was the **QRP-Plus Transceiver**. However, due to problems in my Canon camera, this article will now feature in the January issue. This month's issue will contain, instead, a number of articles dealing with different Morse related matters.

A new QRP Club has recently been formed, **The QRP Club of Ireland.** The international QRP week at the Marino Institute of Education in Dublin, Ireland ended with the formation of this club. Further information can be obtained from: Bill Ryan EI8BC, C/o Marino Institute of Education, Griffith Avenue, Dublin 9, Ireland.

On the subject of QRP, Leighton Smart GW0LBI is offering a free award, the **Worked all Wales QRP Award**. To claim the award, you must contact all eight Welsh counties, using five watts or less. Claimants must send a 12x10 inch stamped, self-addressed envelope, plus a certified list of contacts showing all log details to include, power, mode, date, etc which must be verified by another radio amateur. Further enquires can be made to: Leighton Smart GW0LBI, 33 Nant Gwyn, Trelewis, Wales CF46 6DB. With conditions the way they are at present I wish you luck with this one.

I have just finished reading a 19 page booklet on Morse key tensioners by Dennis Coacher G3LLZ which I purchased from Dennis a few weeks back. This booklet is A4 size spiral bound depicting the types of springs used to control the action of Morse key arm levers. I will review this interesting booklet in a later issue. The booklet is available from Dennis for the sum of 3 pounds fifty (UK), including postage. Further enquires can be made to: Dennis Coacher G3LLZ, 27 Glenvum Road, Swindon, Wilts, SN3 4AA England.

Sprat, the official magazine of the G-QRP Club, had an interesting article appearing on page 11 of issue number 85, about **The G0BZF Micro Keyer**, an iambic keyer on a one inch square PCB. Some of the features offered include: a very small PCB, which can be mounted anywhere; five to 50 wpm speed control via paddle input; dot and dash memories and side tone; wide range of operating voltage from 9 to 15 V; option memory message personalised to user; plus many more functions. I have ordered a kit and hope to have it some time in January. When I have completed the kit I will report my findings.

If you are interested in the Micro Keyer, you may be able to obtain a copy of *Sprat* for further reading on this most interesting kit.

I've received some interesting letters from readers seeking information on two Australian made Morse keys, the **Autoplex** by Jock Vail, Burwood, Victoria, and the **AutoMorse**, a three paddle key by N P Thomas of Adelaide (the maker was the Hitchcox Brothers).

The main concern for the collectors is information relating to adjustments. If anyone has any old manuals or information in relation to these keys it would be greatly appreciated and I will pass it on.

On the subject of keys, Brian VK2GCE has informed me that he has acquired a number of British NATO Keys, Key Telegraph 5805-99-591-1939 (made by Price & Edwards Ltd). The key and box weigh 5 lb 9 oz; the key on its own weighs 3 lb 8 oz. Construction material appears to be plated dull brass with the cover being of a blue smooth plastic/fibreglass (see photos).

Further information can be obtained from Brian VK2GCE on 02 9595 2650 or to his address, details of which can be obtained from the Call Book (See photos).

Next month, **QRP-Plus Transceiver**, an honest review.

Coming issues will include information on the MFJ Grandmaster 11 Contest Memory Keyer, Instant Morse on CD Rom by the RSGB, and Morse programs that can really help beginners.

It's amazing how fast the year has gone and 1997 is only a few weeks away. I would like to wish all readers of this column and their families a very merry Xmas and a very safe and happy New Year.

*PO Box 361, Mona Vale NSW 2103

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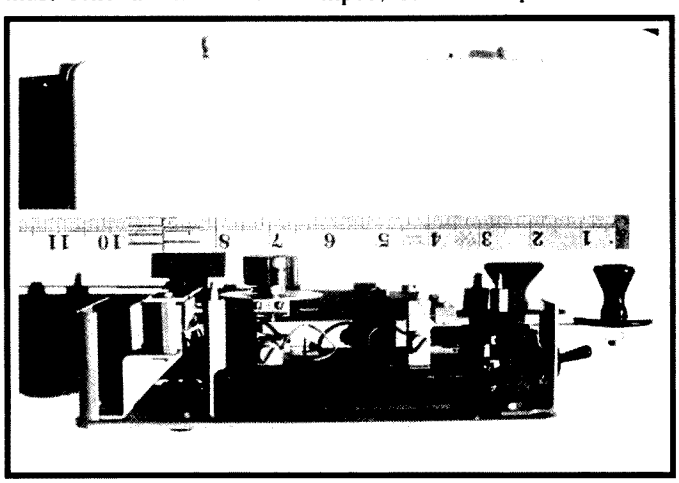
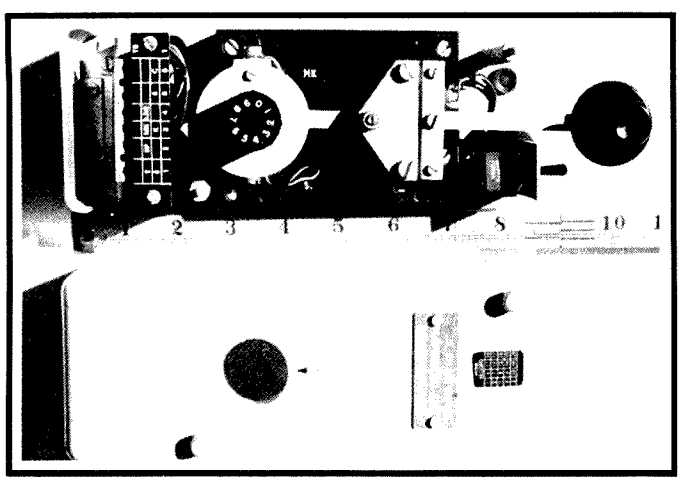


Side view of the British NATO key and case.



Top view of the British NATO key and case.

Stolen Equipment

The following equipment has been reported stolen. If you have any information that may lead to the recovery of the equipment, please get in touch with the advised contact as soon as practicable.

Make:	Sawtron
Model:	999
Serial Number:	3040164
Type:	UHF radio
Stolen from:	Vehicle in Launceston
Date:	8 October 1996
Owner:	John Gelston
Callsign:	VK7JL
Contact details:	QTHR

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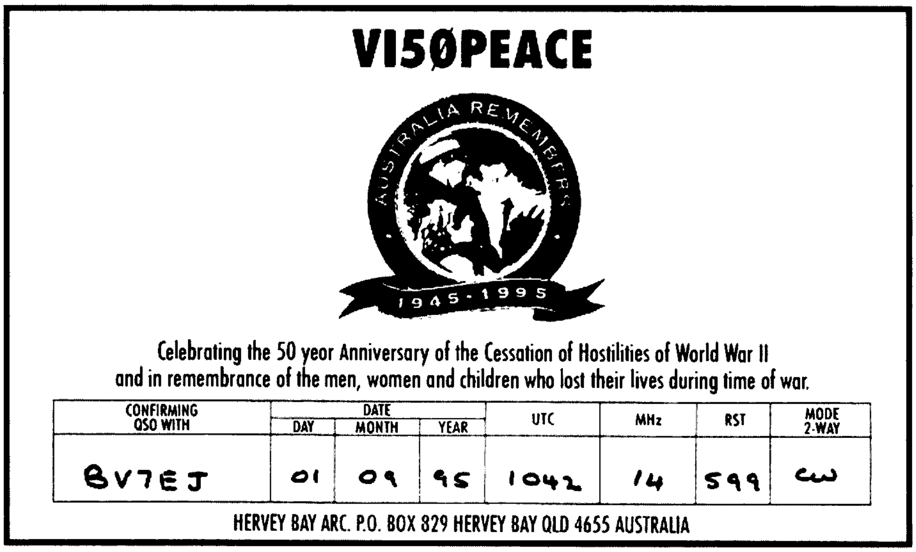
QSLs from the WIA Collection

Ken Matchett VK3TL Honorary Curator WIA QSL Collection*

VI50PEACE

As the photograph shows, the special event QSL from the Hervey Bay ARC celebrated the 50th anniversary of the cessation of hostilities in World War II. The call sign VI50PEACE is the longest ever issued in Australia and one of the longest in the world. The WIA Collection also holds the QSL 4J1700GAT from Armenia (1993) also with an incredible nine characters.

The QSL was donated by Brian VK4LV.



VI5ØPEACE

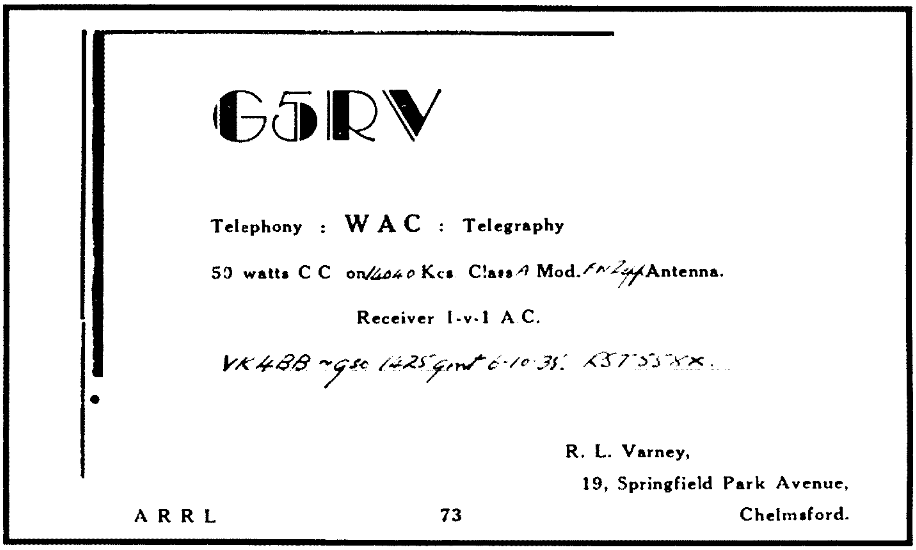
Celebrating the 50 year Anniversary of the Cessation of Hostilities of World War II and in remembrance of the men, women and children who lost their lives during time of war.

CONFIRMING QSO WITH	DATE			UTC	MHz	RST	MODE 2-WAY
	DAY	MONTH	YEAR				
BV7EJ	01	09	95	1042	14	599	cw

HERVEY BAY ARC. P.O. BOX 829 HERVEY BAY QLD 4655 AUSTRALIA

G5RV

This pre-war QSL, dated 6 October 1935, confirmed a QSO by the famous inventor of the G5RV antenna, Louis Varney. This simple wire antenna is probably the most common of its type for use in the HF bands. Invented in the 1960s, it is essentially a dipole antenna which is fed with 300 ohm slotted ribbon or open wire matching section.



G5RV

Telephony : W A C : Telegraphy

50 watts C C on 14040 Kcs Class A Mod. FN 24 Antenna.

Receiver 1-v-1 A C.

VK4BB ~ qso 1425 gmt 6-10-35. RST 55?X

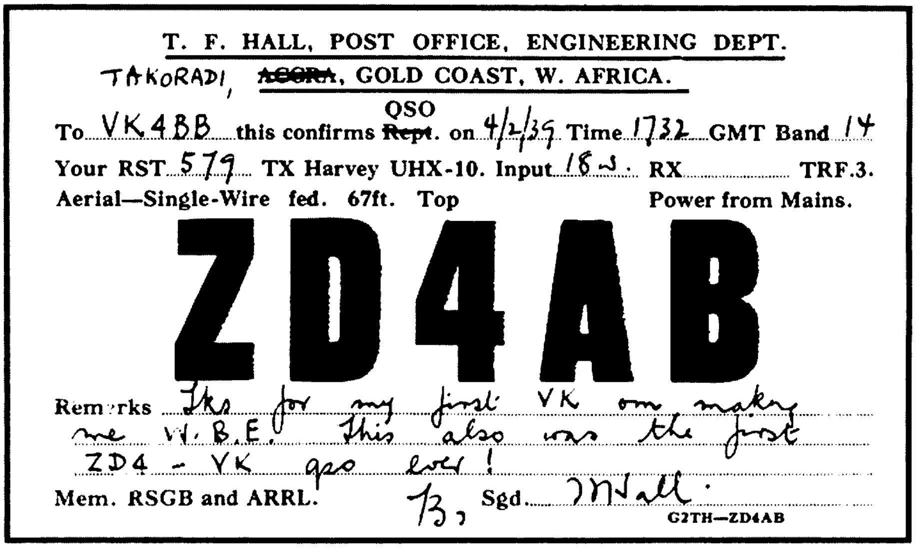
R. L. Varney,
19, Springfield Park Avenue,
Chelmsford.

A R R L 73

ZD4AB

Pre-war QSLs from the African continent are particularly rare, especially ones from what was then the British Colony of the Gold Coast. The name derives from the quest for gold, spices and ivory by Portuguese navigators in the 15th century.

On 6 March 1957 the country gained its independence and its name changed to Ghana. The QSL shown is claimed by the operator, T F Hall, to confirm the first ZD4 - VK QSO ever.



T. F. HALL, POST OFFICE, ENGINEERING DEPT.

TAKORADI, ~~ACCRA~~, GOLD COAST, W. AFRICA.

To VK4BB this confirms QSO ~~Rept~~. on 4/2/39 Time 1732 GMT Band 14

Your RST 579 TX Harvey UHX-10. Input 18 w. RX .... TRF.3.

Aerial—Single-Wire fed. 67ft. Top Power from Mains.

ZD4AB

Remarks Tks for my first VK om making me W.B.E. This also was the first ZD4 - VK qso ever!

Mem. RSGB and ARRL. 73, Sgd. T. F. Hall.

G2TH—ZD4AB

Thanks

The WIA would like to thank the following for their kind donation of QSL cards to the National Collection: Charles VK7PP and the VK7 Bureau; Ken VK3WM (courtesy of Stan VK3SZ); Frank VK4ZAS; Rennie VI5SUB and the Port Adelaide Radio Club; John VK4ZJB (first 6 m QSO Netherlands/VK); Hans L40370; Bill VK2XT; and the friends and relatives of SK Cliff Manning VK3CJ (courtesy of David VK3DY).

**4 Sunrise Hill Road, Montrose VIC 3765
Tel (03) 9728 5350*

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Repeater Link

*Will McGhie VK6UU**

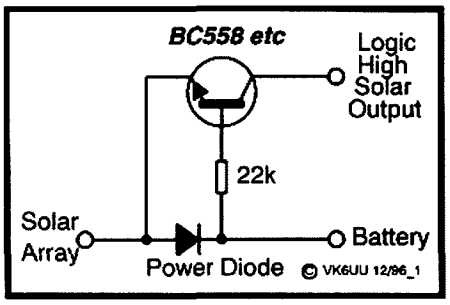

Fig 1 - Solar Panel Detector

Solar

This circuit (Fig 1) must win a prize for using the least number of components and still have a purpose. It detects if a solar panel is charging a battery and produces a logic high out. This logic level could then be used at a repeater site as part of the site monitoring. It could forewarn of solar charging problems at a repeater site, long before the batteries have gone flat, by giving an audible alarm on the repeater's transmission.

As is, of course, it would do that whenever it was cloudy or at night time. The logic output from this circuit needs to be interfaced with a sunlight detector, such as a small solar panel; and by small I mean small. Any simple solar panel external to the main solar array at the site could be installed to provide a voltage when the sun is shining. This, in effect, would be the logic signal to enable the alarm indicator. This small solar panel could, for example, be the power source for the alarm oscillator. You might find the idea useful.

Note the power diode as shown in the circuit needs to be able to carry the full output of your solar array. This diode could be the isolation diode that comes with the solar panel.

A Talk

At a recent VK6 WIA meeting I volunteered to give a talk on the Internet, using examples from the Internet to demonstrate. What better than amateur radio on the Internet and, in particular, voice repeater information on the Internet. I decided to find pictures that related to amateur radio and present, as part of my talk, a slide show. The slide show was presented on the computer that I took along to the meeting.

USA Repeaters

As a result of the research on the Internet I uncovered an endless amount of information on amateur radio and, in particular, voice repeaters. The bulk of this information is from the United States of America. Americans have embraced the Internet in a big way and so have American amateurs. In particular, many radio clubs in the States have home pages for their clubs. Repeater clubs abound on the Internet with home pages. Most of these clubs have their own logos as well, which I must admit do add a degree of prestige. How many clubs in Australia have a logo?

As an overview of voice repeater information on the Internet, most of these clubs take the business of maintaining a voice repeater and links to other systems, very seriously. Serious may be the wrong word; perhaps professional, important, or keen might be a better word or words. It may be that only the big successful repeater clubs have a presence on the Internet. Perhaps most don't and have poor repeater systems, but for what my research is worth, here is what I found.

Big

My comments from this point on relate to what I found on the Internet in relation to voice repeaters. Big is the best word to describe many of the repeater systems. One club maintained 47 voice and digital repeaters. Much of this system was linked over large areas, with remote control by the users to decide the linking destination of some of the links. A system is partially installed to link together all of the state of Alaska. Several photographs showed some of the extreme locations on snow covered mountains, where the antenna masts are completely covered by a large radome some 15 metres high by two metres across.

CTCSS

If the Internet is any guide, there are a lot of repeater systems in the States. They are on all bands from 29 MHz up. A large number are on six metres. Also of interest, most require a CTCSS tone to access them. These are not private repeaters but open access. The CTCSS requirement is for interference protection of the repeater and the prevention of co-channel interference. Even though pagers in the States are not close to any amateur repeater bands, the large amount of RF is a major problem. The co-channel interference is from several repeaters within a few hundred kilometres sharing the same channel. This appears common in the States. With such a large number of repeaters, there are just not enough channels to go round.

The solution is, where required, to allocate the same channel in areas that are relatively close to one another. Each repeater requires a different CTCSS frequency to trigger it. You could be mobile in a particular location where access to two or more repeaters, all on the same frequency occurs. The CTCSS requirement means you only access one repeater at a time. Encoding on the repeaters' transmitters would also allow only the reception of one repeater at a time.

Australia

What might be learned from the repeater scene in the USA that could be applied to Australia? The population density of amateurs in the States is unlikely to occur in Australia, so there might always be fundamental differences; meaning, what is right for the States, may not be right for us.

However there are many advantages to running CTCSS, both encoded and decoded. It would greatly reduce the problems we have with pagers, and there are other benefits as well, such as allowing co-channel operation.

Perhaps the sooner we move towards CTCSS operation on some or all of our repeaters, the sooner we will start to reap the benefits. Making this change, however, is not easy. We all have equipment that has no CTCSS capability and suddenly to find you can no longer access your local repeater is a bit annoying. What is done on some repeaters in the States is a system of dual sensitivity, giving preference to CTCSS inputs.

The way it works, is the normal mute on the repeater, which is what you open by transmitting a signal, and hence keying the repeater, is wound back to low sensitivity. In order now to key the repeater, you require to put a good strong signal into the repeater. In effect the repeater is less sensitive. The repeater is also less susceptible to interference. Still not as good as a CTCSS-only repeater, but at least better. In order to access the repeater at weaker signal levels, you require to have a CTCSS tone on your transmission. These two mutes work in parallel. The normal repeater mute allows you access, but you require a strong signal. The CTCSS mute also allows you access but at weak signal levels, the same as you had before the repeater was modified.

VK6RAP

Consideration is being given to modifying one of our repeaters in VK6 to CTCSS operation. The repeater VK6RAP on 6700 is at a site that contains two pagers and numerous other pieces of radio equipment.

The repeater is a Philips FM880, which is the rack mounting version of the FM828 mobile. They were used as outback radio telephone links and make good repeaters.

However, at this site there is an endless number of interference problems, probably all caused directly or indirectly by the two on-site pagers. The repeater has been fitted with two front end cavity filters and a front end crystal filter, and still the interference persists. There is just so much time that can be spent in tracking down and fixing these problems. You locate and fix one, then another pops up. It is just not cost effective.

The amateur population has had to carry the price for the wrong decision to place pagers so close to our two metre band, a situation which I will continue to mention as being unfair. I know nothing will change until technology changes the requirement for the use of the pager band. Until then we just have to put up with it, but we must continue to protest.

That is my exploration of the Internet as it related to my talk to the VK6 WIA. It is worth saying again, there is a lot of information on the Internet relating to amateur radio. The information is very diverse as well. Individuals and clubs put up home pages and links to other relevant information. You could spend more time reading and looking at amateur radio than doing it.

Internet Repeaters

I have had considerable feedback from a mention of working voice repeaters via the Internet. Once connected to the Internet, and running the right software, you can talk via the Internet to other amateurs through their local repeater.

At the time of writing I have not done this yet, but I do know enough now to add some more. In fact, while writing this column, I'm trying to make a contact via the Internet to amateurs in the States. My experience might be interesting so far.

Firstly, to do this you require to be connected to the Internet, and have sound capability on your computer. Next you require two pieces of software. These are Iphone and Repeater Link. Iphone allows you to talk to other Internet users around the world who are running the same software. I almost forgot, you also have to register your callsign with one of the world wide amateur databases. This is to verify that you are an amateur and can use this system to talk through the amateur repeater systems connected to the Internet. This registration is, of course, not required to use Iphone to talk to non-amateurs on the Internet.

One way to register your callsign is to connect to QRZ. This is a database of amateur callsigns. Australian callsigns are not automatically on this database due to copyright or some other reason. You have to register yourself. It may take a day or so for your callsign to be validated. The Internet addresses of all the software and QRZ is at the end of the column.

Now you are set to try this exciting system. First you run Iphone, then you run Repeater Link. There is the usual configuration involved with both programs, but it is too lengthy to go into here. The Repeater Link software is an add-on to Iphone. You operate the system from Iphone. I spent a long time, after having run Iphone and then Repeater Link, waiting for Repeater Link to do something. If it does not, you must go back to the Iphone window. Silly me. I could easily get a job as a dumb software tester. If it worked for me it would for anybody; trust me on this.

After a bit of a wait, those systems that are on line come up in a window. You will see a mixture of various amateur callsigns and the ones with the -R suffix are repeaters. The other amateur call signs are simply amateurs connected to the system, just like you are. There is also a number of non-amateur people in this window. This chat channel is open to all, so many Internet users enter this chat channel not knowing what it is. However, they cannot access the amateur repeater systems as they do not have a valid callsign. They can, however, talk to you and you to them.

First Contact

At this point my Internet system came back on line. I had been trying all morning to set up the Repeater Link and Iphone software. However, there was a problem with my Internet Service provider, and the links to the rest of the Internet, and the software was doing illegal operations. All in all a lot of time spent, hence I continued writing this article. But all was back on line, so I tried the Repeater Link/Iphone system again, and it worked. There, listed in one of Iphone's windows, was a list of amateur callsigns and a few -R callsigns. My first audio contact was with a repeater in Canada, VE6USE Fort McMurray. I found myself talking to two local amateurs; at last it was working!

Several other repeater systems were then contacted via the Internet. The mode of operation lends itself to amateur type contacts. Iphone contacts on the Internet, even though they can be full duplex, suffer from delays due to the nature of the Internet. Your audio is converted from analogue to digital and packetised. This packet audio is then sent to its destination in segments (packets) and assembled at the other end. Now, if the first packet gets to its destination quickly and the next takes a second or two, what is the result, how does it work and sound? From what I believe there are two ways to get around the variable delays in the Internet.

One is to delay the incoming packets of audio in a buffer and join them together so there is say, 15 seconds of audio waiting. At this stage you have heard nothing. After this wait time, and there is, say, 15 seconds of audio to listen to, you start to hear unbroken audio. Provided this buffer is made large enough, time wise, there is always spare audio waiting its turn to be heard. Any delays in the Internet mean the length of the audio waiting its turn to be heard, shrinks. Provided the buffer size and the expected worst case delay with the Internet is set up correctly, you hear the audio without any breaks. The Internet can send audio faster than it is live. Each packet of say one second, might contain 5 seconds of real time audio. It is all a question of the parameters set with this system, and allowing for compromise between quality, delay and average worse time network transmission delay. This is a function of those who write this clever software. This is what I believe is used for listening to broadcast stations "live" on the Internet. What you hear is perhaps 15 to 30 seconds after it is broadcast live.

With the Repeater Link software and Iphone contacts, this delay is too long and is shortened. As a result, depending on the Internet network usage, there can be breaks. These breaks, however, don't result in any loss of audio, just interruptions. The audio stops from time to time, but picks up where it left off, so you don't miss any of the conversation.

What's It Like?

So how did it work and sound talking via the Internet to repeater systems? You have the choice of using software PTT or VOX. I found the VOX easy to use. Radio amateur contacts work well with this system, as we are used to having half duplex contacts. With the system running, your callsign is verified and you enter the Repeater Link chat room. There in a window are a number of amateur stations and repeater systems. You select one and you hear fast DTMF tones, followed by the distant "phone" ringing. This is all fake of course, but fun. The ringing is to find out if the distant voice repeater is able to accept your call. If the repeater is in use you hear the activity on the repeater and can join in, just like you do through your local repeater. You can wait for the break between overs, or call over the top. If there is no activity on the repeater you have connected to, you hear either a CW ident or a voice ident, and the

usual repeater tail or pip as well. All very familiar. A Canadian system I connected to has a voice ID that says "you are connected to VE6USE via the Internet". Talk into your computer mike and announce your callsign and location, and you're in, talking via the Internet to some of these amazing repeater systems.

Quality is good. What does cause a problem is the delay in the Internet, which varies, depending on usage. If there are large delays, then the audio is broken. You don't miss much but there are breaks, or delays. A little annoying but this system can only get better, as software is fine tuned and, hopefully, the Internet gets faster.

What About Us?

All this begs the question, can we connect the Internet to Australian repeaters? We in VK6 are about to find out. A letter is shortly to go to the local SMA telling them we propose to do just that. We await the outcome and I will let you know.

I nearly forgot, where can you find all this software on the Internet? The QRZ Database is at *http://www.qrz.com/cgi-bin/webcall* The IPhone software is at *http://www.vocaltec.com/* The Repeater Link software is at *http://www.ezl.com/~mebcs/users.html*

I had problems downloading the Repeater Link software. It downloads normally, until the download windows disappears, as if the whole file is now saved on your hard disk. However, the file will not unzip as it is incomplete. A few amateurs have experienced the same problem. I ended up getting my copy from another amateur who had been successful in downloading.

You may be wondering about the Repeater Link software and the name of this column. It is pure coincidence and I have nothing to do with the software.

While checking the Internet addresses of the software above, on the Internet, I came across a home page called, Will's B&W nudes. You would just have to have a look would you not? And may I say this Will is not me. The Internet is like that, you start looking for one thing and end up looking at B&W nudes (all very tasteful). All in a day's work of writing a repeater column for *Amateur Radio.*

**21 Waterloo Crescent, Lesmurdie 6076*
VK6UU @ VK6BBR

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Over to You - Members' Opinions

All letters from members will be considered for publication, but should be less than 300 words. The WIA accepts no responsibility for opinions expressed by correspondents.

Marconi School Re-union

We are trying to organise a re-union of past students of the Marconi School of Wireless which was located in Sydney until it was closed down in 1981. Ces Bardwell VK2IR started teaching at the School in 1939. In 1949 he was appointed Principal/Manager, a position he held until the school closed.

Ces was very active in the NSW branch of the WIA running courses for new amateurs for about as long as I can remember (and I'm 47 years old).

Ces will turning 80 next year and he will be guest of honour at the function we are hoping to organise. I need expressions of interest from those who would like to attend a once-in-a-lifetime function. Could *Amateur Radio* run a promotion asking old students to contact me if they are interested in attending? I would need to know the year/years they attended and whether full or part time.

They can contact me by post at the address below or on fax, marking it attention David Hawksworth on 044 210032, or e-mail *techfm@peg.apc.org*

Hope you can help us organise an event which will recognise an early pioneer of radio/electronic teaching in this country.

David Hawksworth VK2BDJ
84 Duncan Street
Vincentia NSW 2540

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Technical Correspondence

All technical correspondence from members will be considered for publication, but should be less than 300 words.

Choice of Toroid Cores

I read with interest the article by Lloyd Butler entitled The Z Match Using a Toroidal Core (*Amateur Radio*, September 1996, p 11). A statement in the article prompts me to write to explain the significant difference between the use of ferromagnetic cores in tuned applications (filters, matching networks, etc) and broadband transformers (baluns). Most experienced amateurs will be aware of this difference but the less experienced may not. Indeed, I have noted a number of people in the electronics industry who are not.

The statement in Lloyd's article in question refers to the same iron powder core being used in a high power balun application as is used in his tuned Z match, the Amidon T200-2. I agree with the writer that what is required in his application is a core which will result in a low loss inductor with an inductance which is stable with temperature and power level and this will result from using an iron powder core. However, for a balun to be effective it must have a high magnetising inductance such that the reactance of this inductance is at least four times the impedance of the transmission line, be it a pair of twisted wires or coaxial cable, at the lowest frequency. The actual value of the inductance is not important as long as it is high enough and so the stability of iron powder is not required.

What is required is sufficient inductance to meet the above criterion. For a 50 ohm balun at 3.5 MHz, XL(min) = 200 ohms; therefore L(min) = 12 microhenries. Now, the AL value (the inductance of one turn) of the T200-2 iron powder toroid is 12 nanohenries. Hence, the number of turns for an effective balun is 33 minimum. This would be very difficult with coax and cumbersome with twisted wire. Of course the number of turns required reduces with increasing frequency being 16 or so at 14 MHz. But, if a broad band balun is required to cover the HF band (2 – 30 MHz), the T200-2 is not a good choice.

A better choice would be a medium mu (125) ferrite such as Amidon 61, Philips 4C6, Neosid F16 or Indiana General Q1 materials. The Amidon FT240-61 ferrite toroid is 2.4 inches OD and has an AL value of 171 nanohenries. It would make a very effective high power balun covering the HF range with only 8 turns, much more manageable. This is born out by the design for an HF balun in the ARRL Antenna Book which uses a ferrite core.

If you are planning to use an iron powder toroid (T200-2) with significantly less than 33 turns it will not be very effective at the lower frequencies.

Keith Gooley VK5OQ
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Tenafeate Crt
One Tree Hill SA 5114

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Spotlight on SWLing

*Robin L Harwood VK7RH**

I recently obtained a copy of the 1997 edition of *Passport to World Band Radio* from the USA.

This is the first time I have looked at this annual handbook and I am rather impressed. Unlike the *World Radio TV Handbook*, this has been specifically targeted for short wave radio consumers, whether they are newcomers or the more experienced DXers. Newcomers will benefit from the easily understandable explanations on shortwave radio and how to find the various stations. The book is well thought out and is easy to use. As well, there are excellent receiver reviews edited by Larry Magne, who also has contributed to some receiver reviews in the WRTH. Magne happens to be the chief editor of the PWBR. Many of the current shortwave receivers, from the cheap portables to the expensive tabletop sets, have been reviewed. Also some add-on accessories have been tested and their effectiveness is discussed.

There is a section on English language broadcasts and programming information over the 24 hour period. You can look up a specific time slot and easily ascertain who is broadcasting what and where. As well, there is another section devoted to individual broadcasters, complete with programming information and contact points to assist finding a specific broadcaster. In my opinion the presentation of this section in PWBR is superior to that in the WRTH because it gives background information on the particular station and if they reply, based on listeners' replies.

Reports to some broadcasters can be made difficult because the postal system inside a specific country can be erratic due to civil strife or light-fingered postal staff. This is the case within the Russian Federation, depending on the point of entry. Mail through St Petersburg is OK but air mail via Moscow Airport has been known to mysteriously disappear.

Some South American mail routes are also spotty whilst mail to Afghanistan is non-existent. PWBR also states that mail to North Korea is non-existent but this apparently is the situation with US mail. Apparently mail is sent from the States to South Korea and naturally goes no further. From here I have had no problems with mail from Pyongyang!

One part of the broadcasting information concentrates on the so-called alternative political programming, which some regard as being extremely biased. It is aired over WWCR and other private American shortwave broadcasters. I don't know why all this information has been included in PWBR '97. Yet, I presume that, as the bulk of PWBR sales are in the USA, this information may assist listeners especially if these programs are not heard over mainstream American electronic outlets.

There is also a section on the new phenomenon of Web Radio. Strictly it is not radio as it is an Internet audio web site, where PC users can download programming from various radio broadcasters or program makers to play through the sound card. The sound quality is not as crystal clear as existing AM or FM outlets but it is growing, particularly as many entrepreneurs have realised that a net web radio site does not require any licensing and many diverse sources of programming can be found on the Internet. I do not know why this was included in PWBR other than because some international stations also have audio web sites.

However, I was very satisfied with the blue pages at the end of the book. This is a database of all shortwave broadcasting outlets from 2 to 21 MHz. It is very similar to the International Listening Guide that appeared in the mid 80's. Unfortunately, that publication was rather erratic and the ILG stopped altogether, leaving many subscribers in the lurch. The PWBR blue pages have aided me to identify some exotic stations that I have recently heard.

For example, there is an Asian broadcaster on 4045 kHz around 1300z which PWBR has identified as Xizang (Tibet). I heard it whilst the exiled Tibetan spiritual leader, the Dalai Lama, was visiting Australia. Again PWBR '97 came up trumps identifying another station as Nepal on 7164 kHz at 1320 UTC. I have found these blue pages very useful despite the upheaval arising from the planned seasonal frequency alterations that took place on 27 October.

I obtained my copy from Grove Enterprises in Brasstown NC just under a fortnight from placing my order and it may be in Australian bookstores very soon.

On Monday morning, 28 October, I woke up in anticipation of hearing Radio St Helena in the South Atlantic. Turning the receiver on, I was dismayed to hear a strength four power line noise on 11.0925 MHz. As scheduled, a signal commenced at 1900 UTC (Sunday) yet it was well down beneath this local noise and frustratingly I could not pull out any information. Sadly, by 1910 the signal had already disappeared. Perhaps I will have better luck the next time around, that is if there is going to be another shortwave transmission from this remote Atlantic locale, where Napoleon ended his days.

I have just been informed that another broadcaster has abandoned shortwave. The Red Cross Broadcasting Service in Geneva apparently has decided to discontinue shortwave broadcasting after 50 plus years. A domestic South African shortwave station also ceased on 27 October and the new owners are restricted to FM. Transmissions from a Danish commercial station known as ABC Radio, which were being heard on 7570 kHz on Sundays, have also ceased. Apparently the station has new owners who were not interested in continuing hiring air time from the Russian transmitters at Kalingrad.

The BBC Hong Kong relay is still there but as soon as the new Thailand relay is ready, the site will definitely be dismantled. Employees at Radio Canada International are again on the warpath as funding for the Canadian shortwave service does not go beyond 31 March. The employees and their supporters are attempting again to whip up support to keep RCI going beyond that date.

Well, another year has come to an end. Quite a deal has happened on shortwave over these twelve months and I am looking forward to hearing what 1997 will bring.

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VHF/UHF – An Expanding World

*Eric Jamieson VK5LP**

Australian Amateur Bands Beacons

Freq	Call sign	Location	Grid
50.047	VK8AS	Alice Springs	PG66
50.0535	VK3SIX	Hamilton	QF02
50.057	VK7RAE	Devonport	QE38
50.057	VK8VF	Darwin	PH57
50.058	VK4RGG	Nerang	QG62
50.066	VK6RPH	Perth	OF88
50.0775	VK4BRG	Sarina	QG48
50.306	VK6RBU	Bunbury	OF76
52.325	VK2RHV	Newcastle	QF57
52.345	VK4ABP	Longreach	QG26
52.370	VK7RST	Hobart (Heard in ZL 6/96)	
52.420	VK2RSY	Sydney	QF56
52.425	VK2RGB	Gunnedah	QF59
52.445	VK4RIK	Cairns	QH23
52.450	VK5VF	Mount Lofty	PF95
144.022	VK6RBS	Busselton	QF76
144.400	VK4RBB	Mount Mowbullan	QG62
144.410	VK1RCC	Canberra	QF44
144.420	VK2RSY	Sydney	QF56
144.430	VK3RTG	Melbourne	QF20
144.435	VK3SIX	Hamilton	GF02
144.450	VK5VF	Mount Lofty	PF95
144.460	VK6RPH	Perth	OF88
144.465	VK6RTW	Albany	OF84
144.470	VK7RMC	Launceston	QE38
144.474	VK7RAE	Devonport	QE38
144.480	VK8VF	Darwin	PH57
144.485	VK8RAS	Alice Springs	PG66
144.530	VK3RGL	Mount Anakie	GF22
144.550	VK5RSE	Mount Gambier	QF02
144.560	VK6RBU	Bunbury	OF76
145.650	VK5RCW	Mount Lofty	PF95 (1)
432.066	VK6RBS	Busselton	QF76
432.160	VK6RPH	Perth	OF88
432.410	VK1RBC	Canberra	QF44
432.420	VK2RSY	Sydney	QF56
432.440	VK4RSD	Brisbane	QG62
432.450	VK5VF	Mount Lofty	PF95
432.450	VK3RAI	MacLeod	QF22
432.460	VK6RPH	Perth	OF88
432.474	VK7RAE	Devonport	QE38
432.5339	VK3RMB	Mount Buninyong	QF12
1296.198	VK6RBS	Busselton	QF76
1296.410	VK1RBC	Canberra	QF44
1296.420	VK2RSY	Sydney	QF56
1296.440	VK4RSD	Brisbane	QG62
1296.450	VK5VF	Mount Lofty	PF95
1296.460	VK6RPH	Perth	OF88
1296.474	VK7RAE	Devonport	QE38
2306.440	VK4RSD	Brisbane	QG62
2403.450	VK5VF	Mount Lofty	PF95
3456.450	VK5VF	Mount Lofty	PF95 (2)
5760.750	VK5VF	Mount Lofty	PF95 (3)
10300.000	VK6RUF	Roleystone	OF78
10368.450	VK5VF	Mount Lofty	PF95 (4)
10368.460	VK6RPH	Perth	OF88 ?

(1) This is a continuously operating CW training beacon using vertical polarisation.

(2) The 3456 MHz beacon was scheduled to commence on 1/11/96 with three watts to a horizontal omni-directional antenna.

(3) The 5760 MHz beacon was scheduled to commence on 1/12/96 with two watts to a horizontal omni-directional antenna. To have this beacon on the air this year it is sharing the same exciter as the 3 GHz unit, hence the frequency shall be 5760.750 MHz (5/3 x 3 GHz frequency). This is a temporary arrangement during the building process of a separate exciter for 5760.

(4) A direct lightning strike to the Channel 9 tower found its way into the power supply of the masthead unit. The good news is that it only took out the DC supply for the PA; the Qualcomm unit survived due to the shut-down protection for the negative rail working satisfactorily. The 7660 and supply line zeners took the blast. The 10 GHz beacon was scheduled to be re-instated in November at the time of the installation of the 3 GHz unit.

Thanks to David VK5KK for an update of the VK5 beacon situation.

Would other beacon custodians please advise me of any updates to the above list.

John VK3KWA reports news from the Cairns Amateur Radio and Electronics Club that the VK4RIK beacons at Mt Haren are now administered by the Club and not the Queensland Tropical DX Association. The only beacon currently operating is on 52.445 MHz. The others are still licensed but not on air. No information when they will be operating again.

New Records or Latest Update to 29/10/96

1. An inaugural VK4 state record for 2400 MHz: VK4OE/4 NW of Stanthorpe to VK2FZ/4 at Maleny, 13/01/96, 224.8 km.

2. An inaugural VK5 state record for 24 GHz: VK5NC/5 at Mt Graham to VK5DK/5 at Beachport lighthouse, 6/10/96, 38.5 km.

3. 50 MHz Short path: VK4KK to GU7DHI 15/02/92 16791.3 km; VK0IX to VK2QF 14/01/95 4517.5 km. 144 MHz: VK3AUU to VK6HK 14/02/96 2816.8 km; VK6HK to VK3AUU 14/02/96 2816.8 km. 1296 MHz: Mobile – VK3ALM/3 to VK3XXX/3 25/05/96 278.4 km. 2304 MHz: VK4OE/4 to VK2FZ/4 13/01/96 224.8 km. 5650 MHz: VK3XPD/3 to VK5NC/3 11/08/96 145.8 km. 24 GHz: VK3XPD/3 to VK3ZQB/3 21/10/96 48.4 km*; VK5NC/5 to VK5DK/5 06/10/96 38.5 km.

** Spies report that the 24 GHz record has been extended to 57.5 km. More on this later.*

Thanks to David VK5KK for sending the above to me via e-mail.

Notice of Event

Sunday, 29 December 1996 from 2 to 5 pm local, 0430 to 0730 UTC. Venue: Thebarton Seniors College, Thebarton SA. The VK5 Division of the WIA is presently using this venue for its monthly meetings.

Sam Jewell G4DDK is the guest speaker and he will provide a 45 to 60 minute illustrated lecture on the latest European microwave activity, to be followed by a question and answer period. Sam is also into microwave EME. All amateurs welcome, especially from interstate.

There will be displays, buy and sell stalls, equipment supply stand; also demonstrations by the locals on the lower GHz bands. You may phone David Minchin VK5KK on 08 8281 8172 or e-mail at *tecknolt@ozemail.com.au* for further information.

(Sam G4DDK added that microwave conditions were very good around 20-21/10 in the UK. He worked HB9AMH/p on 10 GHz at 684 km both nights. Tests on 24 GHz were unsuccessful, but he is sure the path will eventually be worked.

Sam adds: *"My new 3.4 GHz system appears to be working well, even on the multiband horn (no dish). I estimate the gain at 14 dBi.")*

Six Metres

John VK4FNQ in Townsville reports: *"Conditions relatively quiet. On 20/10 at 0650 heard JA5CMO calling CQ on 50.110 and a 5x9 contact resulted, also 0658 JA1RJU 5x7 with heavy QSB. JA1VOK heard calling CQ. At 0700 listened for beacons and other signals but nil heard. Only a brief opening but good to hear something."*

Glenn VK4TZL reports the following on six metres from Hervey Bay: *"12/7 VK3LK, VK4FNQ; 16/7 VK2ADQ, VK2BHO, VK3ZNF; 18/7 VK4KK; 1/8 VK4AFL. On 3/8 heard VK2BRL on 144.200 at 1955. 19/10 JE9MVA, JE9OYO, JR9PBV and JA0OIK, all on 29 MHz FM); 21/10 JA1FQN (FM); 3/11 on 50.120: JA3JTG, JI2EVL, JA3EGE, JJ3WXG."*

Internet Six News

From the *On-Line Six Meter Magazine* prepared by **Geoff GJ4ICD.**

2/10: Beacon news/change: Perhaps clients of your newsletter might be interested in knowing that I operate a beacon on 50.001 MHz (very stable TXO), consisting of a 25 W Tx feeding an 11 el Yagi pointing due east from Halifax, NS. The antenna has a clear view of the ocean. It is on 24 hours a day, the ID is VE1SMU H, repeating every

two or three seconds. Thus far I have received reports from EH1TA, EH7KW, W3IWU, WB8RUQ, KL7GLL, VE9AA, and VE1ZZ. 73s Bill Lonc VE1WPL.

8/10: Beacon news: John WZ8D plans to "plant" a new beacon in Grenada later this month. The beacon J3EOC has 1.6 watts out and is on 50.0565 MHz. The antenna will be a Halo.

17/10: New Bandwidth in Italy: It has just been reported that, effective this day, Italian amateurs have temporarily been granted the use of the whole 50 – 51 MHz band segment, on secondary basis. Said permission applies to both full licensees (I, IK, IZ) and VHF-only licensees (IW). Previously, Italians were confined in a 12.5 kHz segment (50151.25 – 50163.75). 73, de Tony I0JX.

20/10: JA to VK4: JA5CMO (PM63) worked VK4FNQ on 50.130 at 5x9 at 0653 for the first time this autumn. JA1VOK (QM05) worked VK4JH on 50.110 with 5x9 signals at 0654 by afternoon type TEP today. He said: *"I heard 46.17/VK4 video and 46.24/VK2 video at 0600 for the first time this season, with 46.24 video up to S9+ at 0630 before the opening."*

22/10: High Power in OZ. The power limit in OZ has been raised to 1,000 W output to the antenna.

22/10: Good tropo and Es in Europe – continued all evening until 2030. GJ4ICD worked F6AUS/IN96 5x9+ via tropo and OZ5W/p 5x2/3 via tropo-scatter. Other areas involved were HB9 to LA, PA to YU, G to 4N, GW to EA, GB3LER to OE, CT to G, OZ to LA, HB9 to OZ, I to LA, OZ to I. Zaba OH1ZAA also reports OH1 to Italy-0-4-6, OH2-3-5 to Italy 2 area, also earlier there was aurora propagation to OZ. Later Es to SP and EH7/CT from southern G.

[It's quite surprising the degree of Es activity in the northern hemisphere so late in the season ..... VK5LP.]

24/10: 0106: N6XQ worked KH6IAA 50125.0 5x9 and heard three Mexican beacons.

50 MHz DX Challenge

During the recent European summer a contest was run to see who worked the longest distance via Es. Jose EH7KW and KB5IUA were the winners with a distance of 8057 km!

Geoff GJ4ICD on Jersey Island is offering a similar contest to the southern hemisphere summer period from 1 December to 31 January. All contacts must be below the equator (to exclude TEP), so will normally be in an east-west direction or derivatives therefrom, eg north east, south west, etc, but not south to north unless they are below the equator.

Claims could be sent to me by 14 February 1997 and I can forward them in bulk to Geoff. Please supply appropriate grid squares to six places or your longitude and latitude.

Australian Record Attempt on 5.76 GHz

The *West Australian VHF Group Bulletin* for October reports that **Al VK6ZAY** and **Alan VK6ZWZ** had a successful 5x9 contact on 5.76 GHz on 20/10 over the 237 km distance between Falcon (south of Mandurah) and Cervantes at 0830. This should qualify both for the Australian and West Australian record for that band.

DOS Programs for Homebrewing

Chuck KD9JQ has written four programs for ham homebrew projects, and has made them available via FTP from *oak.oakland.edu/pub/simtelnet/msdos/hamradio/*. The four are asp4.zip (RF weak-signal amplifier design), pll2v2.zip (design of second-order phase-locked loops), pll3v2.zip (design of third-order phase-locked loops), and tap2.zip (triode grounded-grid RF power amplifiers). Thanks to *QST* November 1996 *World Above 50 MHz*.

A Transatlantic Review

From **Emil Pocock W3EP** and *The World Above 50 MHz* in *QST* comes news that the spring and summer of 1996 was another extraordinary season for six metre transatlantic sporadic E. Although individual openings were often not as spectacular as those of 1995, the band was actually open for European contacts on more days! Indeed, the band opened earlier (May 20) and closed later (August 17) than in any previous year. Several days were counted when only a single beacon was heard or one contact was reported, but the statistics are still impressive.

Here is a summary of the 1995 and 1996 seasons by number of days on which European 50 MHz operators observed transatlantic sporadic E from the continental US or Canada:

Number of Days Open

Month	1995	1996
May	0	5
June	16	10
July	16	14
August	0	6
Total	32	35

Although the number of days was greater this past year, the total duration of openings was much longer in 1995. There was nothing in 1996 to match the 14 consecutive hours of European propagation on 7 July 1995, for example, or the number of European contacts made last year by stations west of the Mississippi River.

Europe – Africa Opening

Ted Collins G4UPS reports that six metres opened to southern Africa on 28/9: *"I first heard the V51VHF beacon at 1645 UTC whilst we had an opening into EA7. No actual V51 activity heard, but 7Q7RM was first heard in the UK in IO70 around 1728 and he is known to have worked several French stations and G3ZYY, G6ION and G1KTZ all in Plymouth area. I heard him here at 1733 very weak 339, but no QSO and I did not hear anyone in this area working him.*

"The last southern Africa opening on 6 m was in 1991. In 1993 on 24/9 there was an opening here to CN8ST but the last opening from here to V51/7Q etc in September was in 1991. So a rather pleasant surprise!"

Closure

VK activity has been very low during the month. If we follow the pattern of the northern hemisphere, then November should see a dramatic increase in Es contacts as they did during their May.

Please note there is now an e-mail address for receipt of information, *vk5lp@ozemail.com.au* in addition to fax, packet and ordinary mail. It would be great to have something really interesting to report in the next few months.

With this month I commence my 28th year of compiling these notes. Perhaps I should be considering a change at the helm?

David VK5KK has suggested that, from a tropo viewpoint for the higher bands, the usual summer openings may come earlier this time than that of February last year, perhaps around the end of January as has often been the case in the past. The openings will come as they always do, so be alert during January and February.

There is little doubt that we will see increased activity on 2.4, 3.5, 5.6, 10 and 24 GHz during the next twelve months, and I know there will be concerted efforts to increase the 10 GHz world record to more than 2000 km.

I wish all readers and the Editor and staff at *Amateur Radio* a happy Christmas and may the New Year bring its own blessings.

Closing with two thoughts for the month:

1. The nice thing about a gift of money at Christmas is that it's so easily exchanged, and

2. Not since the days of Red Indian scalp-gathering have so many people been going around with hair that isn't their own!

73 from The Voice by the Lake.

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Silent Keys

Due to space demands obituaries should be no longer than 200 words.

The WIA regrets to announce the recent passing of:-

W F (Bill)	SIEVERS	VK3CB
J R (Jim)	MILWAY	VK3CX
J H (James)	MCNAMARA	VK3DME
L (Leslie)	MAROSVARY	VK4ANT
W B (Barrie)	BESTMANN	VK4LN
W M H (Bill)	WARDROP	VK5AWM

Jim Milway VK3CX

Jim died on 1 November, aged 68, after fighting cancer for 18 months. Born at Gawler SA, he joined the then Adelaide Electric Supply Company (later ETSA) as a junior trainee. Joining the WIA as an Associate Member in 1945, he was first licensed, as VK7ZAM, in 1954.

His life's work was electricity generation and distribution. He joined the Tasmanian Hydro-Electric Commission in 1953 (Tarraleah Power Station), then the SECV (Latrobe Valley) from 1959 to 1961. In 1961 he became District Reticulation Officer at Mornington, ultimately retiring in 1986. From 1959 to 1974 he was active as VK3ZJM, becoming VK3CX in 1974.

Jim had many interests. He was in the Citizen Air Force (No 21 City of Melbourne Squadron) from 1966 to 1983, treasurer of the Mornington Soccer Club for 17 years, Mornington Sea Scouts (particularly in Jamboree on the Air), and an active member of WICEN. And sometime treasurer of St Peters Church, Mornington.

He belonged to three radio clubs (Southern Peninsula, Frankston and Mornington Peninsula, and Moorabbin and District), as well as the RAOTC, and recently took up packet radio.

I also mourn, with his wife Patricia and their four children (Susan, David, Michael and Peter). Jim and I were friends for 52 years and brothers-in-law since 1953.

Bill Rice VK3ABP

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WIA News

US Microwave Band Caught Up in Spectrum Auction

A United States Congress move to put up 30 MHz of microwave spectrum for auction to raise funds to help balance the national budget, has caught up 5 MHz of the 2.3 GHz amateur allocation between 2305 and 2310 MHz.

An American Radio Relay League (ARRL) bulletin in mid-October outlined the congressional action to reallocate 2305-2320 MHz and 2345-2360 MHz to "wireless services that are consistent with international agreement concerning spectrum allocations." There are amateur allocations at 2300-2310 MHz, 2390-2400 MHz and 2402-2417 MHz. The latter two are allocated to US amateurs on a primary basis, won by ARRL action last year, whereas they have access to 2300-2310 MHz on a secondary basis.

The National Telecommunications and Information Administration (NTIA) had identified for re-allocation in 1994 the amateur segments 2300-2310 MHz and 2390-2400 MHz. ARRL Executive Vice President, David Sumner K1ZZ, said that congressional action directing the re-allocation of specific bands was very unusual, even unprecedented, but they had been anticipating something since 1994. He said that this now provided the opportunity to strengthen amateurs' claim to 2300-2305 MHz, which is not listed for auction. The ARRL subsequently announced it would seek a change in the Amateur Service status in this segment, from secondary to primary.

Meanwhile, the battle continues in the US over a satellite industry proposals for low earth orbiting ("Little LEO") communications satellites to share the 2 m and 70 cm amateur bands (see *WIA News*, page 5, July, and page 36, August).

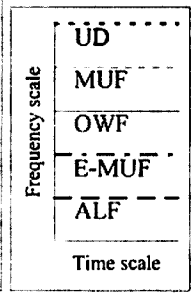
The ARRL Letter Electronic Update for 1 November, said that, while the Little LEO proponents have not backed off, no technical documentation has been submitted to show how sharing with amateurs would actually work. However, the ARRL submitted in September a 42-page technical rationale detailing why sharing would be unworkable. There was no response from the Little LEO industry up to 1 November. Their deadline was 15 November. Under the procedures announced for WRC-97, where satellite spectrum requirements are to be considered, any US proposal must first be subjected to a notice from the Federal Communications Commission (FCC) and a public comment process, along with acceptance from the US Department of State and the NTIA. So there are a few hurdles, if anything further is to happen.

In addition, if other countries are working on sharing studies, these were expected to surface at a meeting of a working party of the ITU held over 29 October to 8 November in Geneva, Switzerland. The ARRL's Technical Relations Manager, Paul Rinaldo W4RI, attended the session as a member of the US delegation, while ARRL International Affairs Vice President, Larry Price W4RA, represented the International Amateur Radio Union. The output from this working party goes to the WRC-97 Conference Preparatory Meeting in May 1997, their report providing the technical basis for WRC-97 decisions. Without a technical basis in the record, ARRL Executive Vice President, David Sumner K1ZZ, said WRC-97 would be "hard-pressed" to agree to a shared allocation (with amateurs) but added, "The Little LEOs still might look for a way to get their camel's nose into our tent."

HF Predictions

Evan Jarman VK3ANI

T Index: 12



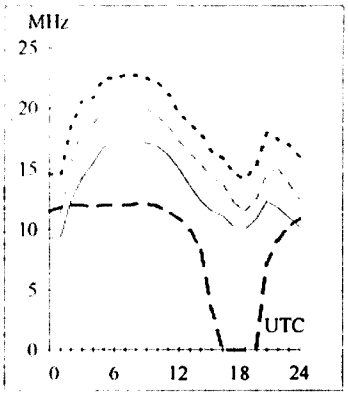
These graphs show the predicted diurnal variation in key frequencies for the nominated circuits. They also indicate a possibility of communication (percentage).

The frequencies identified in the legend are:-

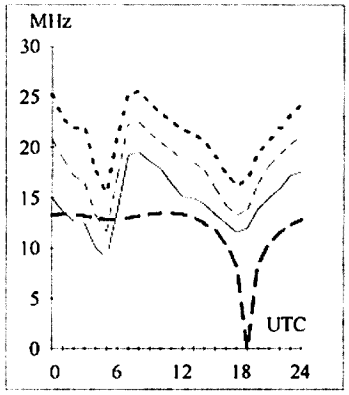
- Upper Decile (10%)
- Maximum Useable Frequency (50%)
- E layer MUF
- Optimum Working Frequency (90%)
- Absorption Limiting Frequency

The predictions were made by one of the Ionospheric Prediction Service Stand Alone Prediction Systems. The T index used is shown above the legend. The Australian terminal azimuth (degrees), path length (kilometres) and propagation modes are also given for each circuit. ar

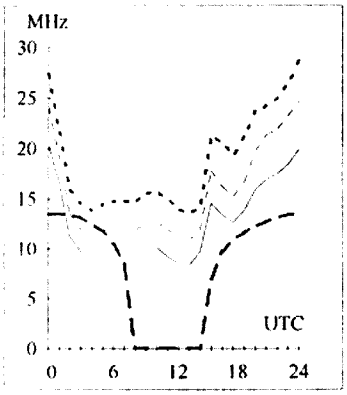
Adelaide-Harare 245
Second 4F5-10 4E0 Short 10390 km



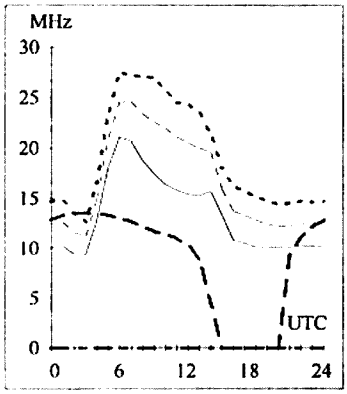
Brisbane-Dakar 217
First F 0-5 Short 18281 km



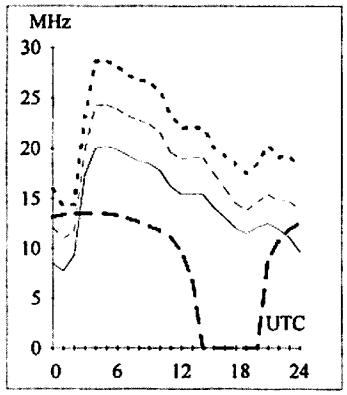
Adelaide-Los Angeles 66
First F 0-5 Short 13158 km



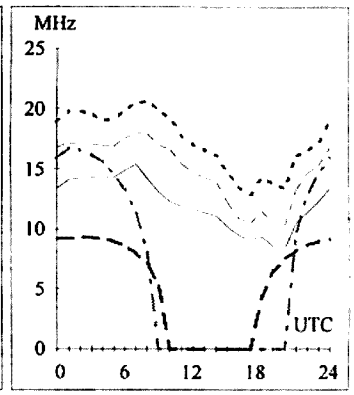
Brisbane-Athens 297
First F 0-5 Short 15190 km



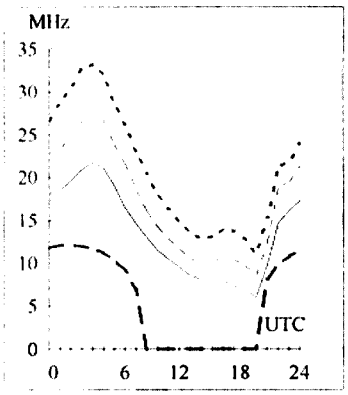
Canberra-Cairo 283
First F 0-5 Short 14266 km



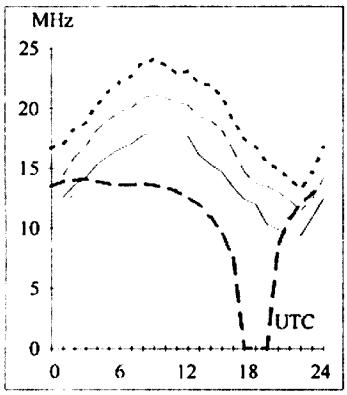
Darwin-Christchurch 139
Second 3F11-16 3E1 Short 5281 km



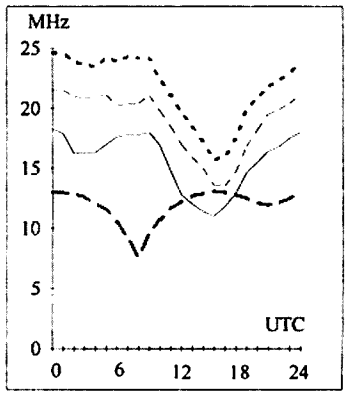
Adelaide-Osaka 357
Second 3F4-8 3E0 Short 7747 km



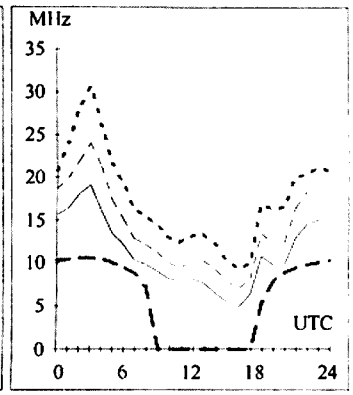
Brisbane-Marion Island 218
First 3F1-6 3E0 Short 9554 km



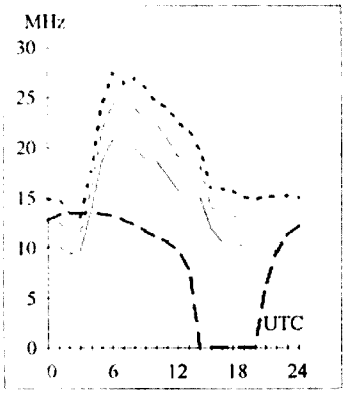
Canberra-Montevideo 159
Second 4F4-5 4E0 Short 11784 km



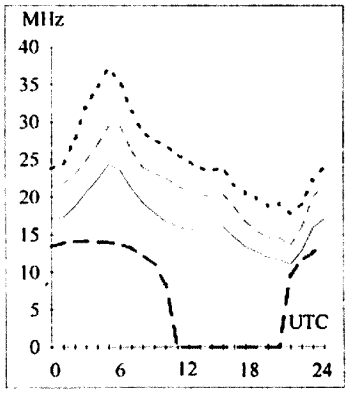
Darwin-Honolulu 65
Second 4F7-13 4E0 Short 8636 km



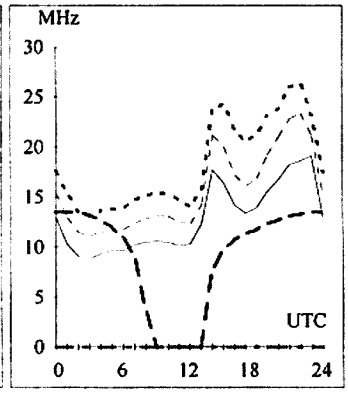
Adelaide-Rome 296
First F 0-5 Short 15336 km



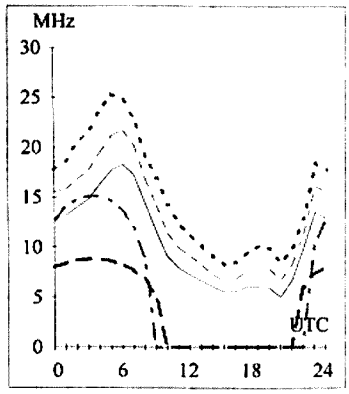
Brisbane-Singapore 293
First 2F2-6 2E0 Short 6146 km



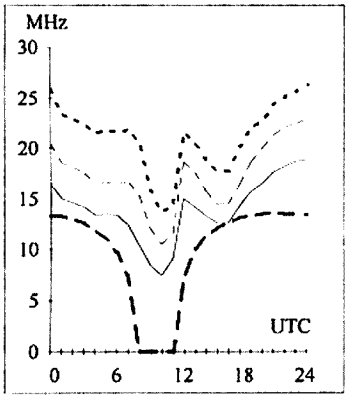
Canberra-Washington 70
First F 0-5 Short 15938 km



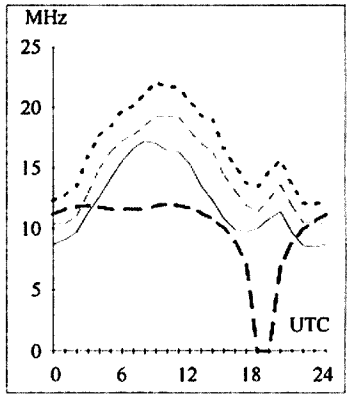
Darwin-Nagasaki 359
Second 3F12-18 3E2 Short 5056 km



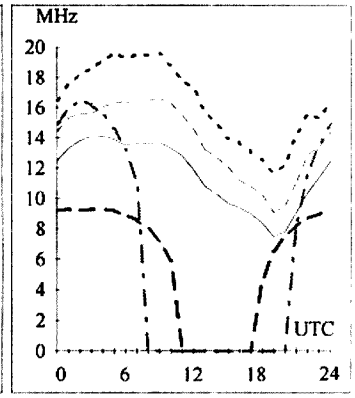
Hobart-Miami 98
First F 0-5 Short 15324 km



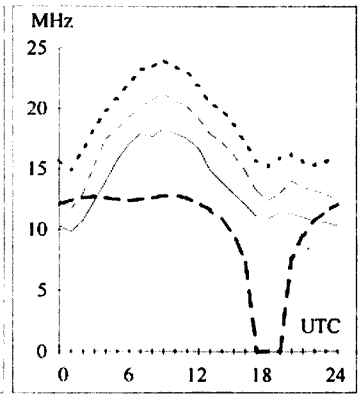
Melbourne-Capetown 222
Second 4F5-10 4E0 Short 10316 km



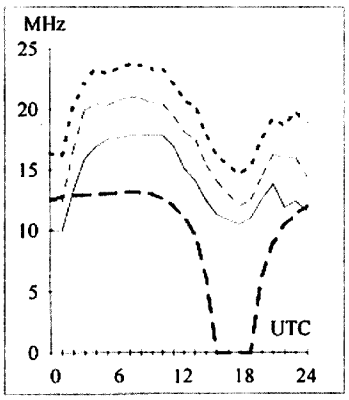
Perth-Auckland 113
Second 3F11-17 3E1 Short 5343 km



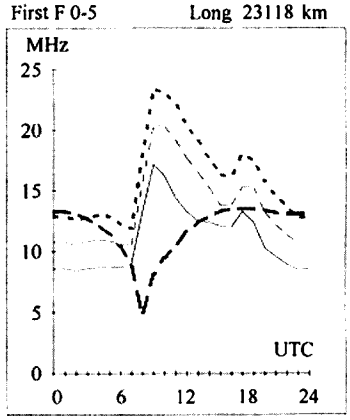
Sydney-Johannesburg 230
Second 4F4-9 4E0 Short 11037 km



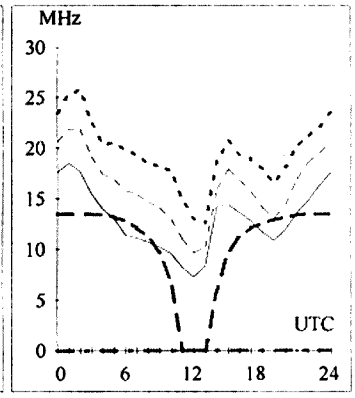
Hobart-Nairobi 255
Second 4F3-7 4E0 Short 11561 km



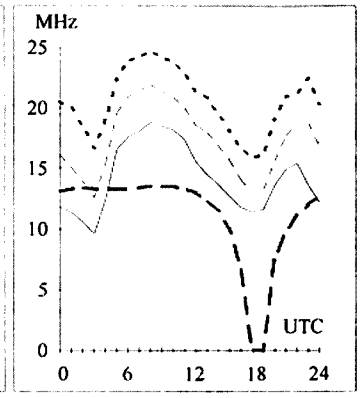
Melbourne-London 131
First F 0-5 Long 23118 km



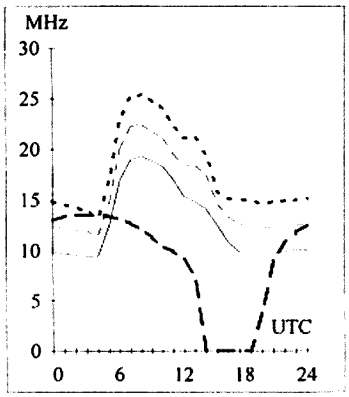
Perth-Mexico City 103
First F 0-5 Short 16180 km



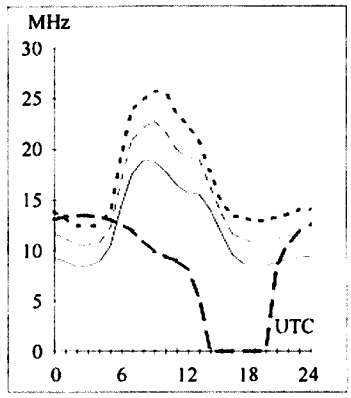
Sydney-Lagos 235
First F 0-5 Short 15511 km



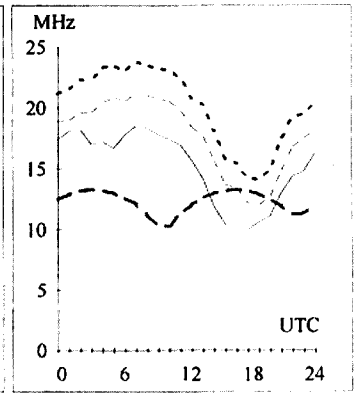
Hobart-Paris 296
First F 0-5 Short 17250 km



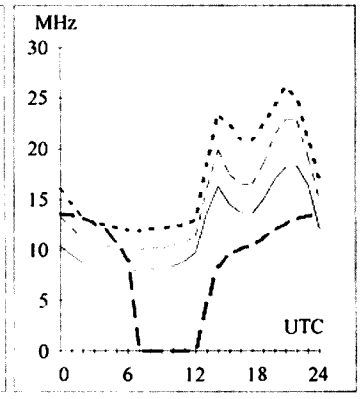
Melbourne-London 311
First F 0-5 Short 16906 km



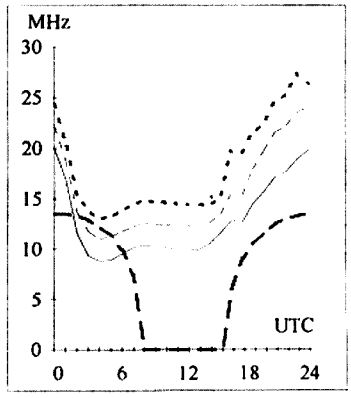
Perth-Santiago 174
First F 0-5 Short 12709 km



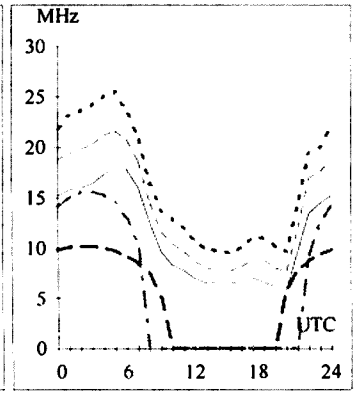
Sydney-Ontario 55
First F 0-5 Short 16197 km



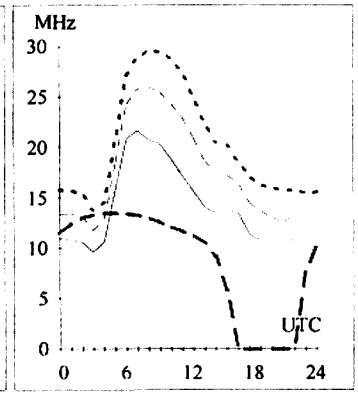
Hobart-Vancouver 49
First F 0-5 Short 13428 km



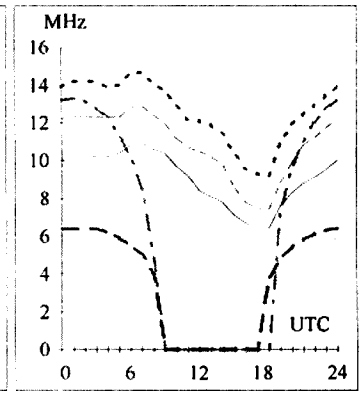
Melbourne-Tokyo 256
Second 4F8-13 4E0 Short 8192 km



Perth-Madrid 298
First F 0-5 Short 14612 km



Sydney-Wellington 119
Second 2F21-28 2E6 Short 2228 km



HAMADS

TRADE ADS

• **AMIDON FERROMAGNETIC CORES:** For all RF applications. Send business size SASE for data/price to RJ & US Imports, PO Box 431, Kiama NSW 2533 (no enquiries at office please ... 14 Boanyo Ave Kiama). Agencies at: Geoff Wood Electronics, Sydney: Webb Electronics, Albury: Assoc TV Service, Hobart: Truscotts Electronic World, Melbourne and Mildura: Alpha Tango Products, Perth: Haven Electronics, Nowra: and WIA Equipment Supplies, Adelaide.

• **WEATHER FAX programs** for IBM XT/ATs *** "RADFAX2" $35.00, is a high resolution shortwave weatherfax, Morse and RTTY receiving program. Suitable for CGA, EGA, VGA and Hercules cards (state which). Needs SSB HF radio and RADFAX decoder. *** "SATFAX" $45.00, is a NOAA, Meteor and GMS weather satellite picture receiving program. Needs EGA or VGA & WEATHER FAX PC card, + 137 MHz Receiver. *** "MAXISAT" $75.00 is similar to SATFAX but needs 2 MB of expanded memory (EMS 3.6 or 4.0) and 1024 x 768 SVGA card. All programs are on 5.25" or 3.5" disks (state which) plus documentation, add $3.00 postage. ONLY from M Delahuntly, 42 Villiers St, New Farm QLD 4005. Ph (07) 358 2785.

• **HAM LOG v.3.1** – Acclaimed internationally as the best IBM logging program. Review samples....AR: "Recommend it to anyone"; The Canadian Amateur: "Beyond this reviewer's ability to do it justice. I cannot find anything to improve on. A breakthrough of computer technology". ARA: "Brilliant". Simple to use with full help, the professional HAM LOG is immensely popular (now in its 5th year), with many useful, superb features. Just $59 (+ $5 P & P), with a 90 page manual. Special 5 hour Internet offer. Demos, brochures available. Robin Gandevia VK2VN (02) 369 2008 BH fax (02) 369 3069.

Internet address rhg@ozemail.com.au.

FOR SALE NSW

Deceased Estate. **Tektronix oscilloscope** model 422 15 MHz dual channel, $350; **TH6 Yagi** mounted 30 ft approx wind-up tower, $900. Purchaser to remove. G Chapman VK2AIT (02) 9876 4785.

Power supply 13.8 volt 25 amp, fully metered, with over-voltage and over- current protection, home brew, patterned on EA Powermaster, transformer secondary rated at 75 amps, buyer to collect, $125. Ken VK2ATK QTHR (02) 9809 4000.

Yaesu FV901DM external VFO, excellent condition in original box with leads and manual, $300 ono; **Yaesu FT901DM** HF xcvr, good condition, manual, YD148 base mic plus all leads, $600 ono; **Icom IC-2GAT** handheld with **BP-70** battery, boxed and in mint condition, includes wall charger ant, manual and ccts, also **BC-36** desk top charger, **AD-12** external pwr adaptor, **HM-46** speaker mic, **HS-51** headset, **MFJ dual bander** ant (1/2 wave) plus LC40 carrycase, cost $1140, sell for $800 ono, all items mint condition, can separate if required; MFJ Tx Ant switch model **MFJ-1700B**, mint cond, $125; Motorola handheld leather carrycase, heavy duty, gd cond, $25; Leson Pwr mike model **TW-205B** boxed, mint cond, $35; **BC-275** 27 MHz freq counter by NACL, gd cond, $35; **Icom LC-40** carrycase for handheld, gd cond, $20. Steve VK2SPS QTHR.

AEA PK232 with Pactor and all manuals, spare EPROMS, $500; **Epson MX-80** printer in good condition with spares, $60; **Epson MX100,** $60; **Icom IC24AT** VHF/UHF hand held with service manual, speaker mike and other bits, $490; **Yaesu FT747GX** with FM board and mobile mount, service manual, $850. Horst VK2HL QTHR (02) 9971 9795.

70 cm Power amplifier RFC/MA440, near new, bought Daycom for special job, excellent performer, handheld in, 15 watts output, $190. Sid VK2SW QTHR (069) 22 6082.

Kenwood TS870 DSP, new in carton full documents, $3,000. Peter VK2FFA (043) 24 4160.

Hy-gain TH3 MK3, Thunderbird 3 element antenna, perfect condition, elements separated from boom, ready to pick-up, manual included, $240 ono. Bruno VK2BPO QTHR (02) 9713 1831.

Collins S line 75S3B (500 Hz filter) Rx, **32S1** Tx, **312B-4** station control (wattmeter, speaker, phone patch), **516F-2** power supply (2nd speaker), **Astatic 10DA** desk microphone (enhanced for SSB), manuals, cables, spare tubes, $1,250. All in A1 condition. Arthur VK2AS QTHR (02) 9416 7784.

Kenwood AT-180 antenna tuner (200 W) s/n 20260, $175; **Kenwood TH25-A** 2 m handheld, s/n 9073547, with case, charger, manual and box, $225; **Tono MR- 1300E** 2 m amp (120 W) with Rx preamp, s/n 75488, $475; **6 m Yagi,** $200. Steve VK2KFJ (02) 9975 3933 AH.

Hewlett Packard sig gen model **606A** 50 kHz - 65 MHz, also digital multimeter model 3476B, pulse generator model **214A**, also **HP612A, HP618C, HP410C** and **AV073** VOM. Peter VK2CPK (06) 231 1790 or (017) 98 3990.

Deceased Estate VK2AHW. **Yaesu FT767GX**, s/n 8L200531, 100 W HF 6 m, 2 m and 70 cm, $1,200; **Yaesu FT470** 2 m, 70 cm handheld, $300; **Tokyo** hi-power 70 cm linear **HL45UC**, $150; **Dick Smith** 2 m linear **K6313**, $100; **Dick Smith** lab scope **Q1280**, $150. All enquiries Kevin VK2BKG QTHR (049) 82 2250.

Yaesu FT990 ec, s/n 1L090231, all optional filters, ATU, desk mike **MD1C8**, original packing, $2,350. Ian VK2UG (043) 92 1234. NOT QTHR.

Deceased Estate VK2JN. **Aiinco** 2 m transceiver, s/n 31073416, ALX-2T, $350; Hustler multiband antenna, $300; **Mobile 1** 40 m antenna, $30. John VK2ETT (02) 9449 3135 after 7pm.

FOR SALE VIC

Satellite receiver dual input low noise, 100 channel remote control with on-screen display, "K" band LNC also supplied, $250. Neil VK3BCU (03) 9390 2873.

Free **Fluke** digital multimeter **8000A; Racal** universal counter 9837, both without handbooks and need some attention; 3 x 3.5" floppy disk drives ex Microbee computer, suspect 720 kb but not tried. Allen VK3SM (03) 9386 4406.

4 El homebrew Yagi, 20 m mono, 8 m boom, 1.5 kW balun, coax, clamps, built to specs, ARA ant book No. 3, page 68, model N2FB ant, dismantled, $200. Willem (03) 9758 5701.

Yaesu FT101E HF transceiver includes CW filter, $400; **Yaesu FT707** HF transceiver with 160 m, $600. Ken VK3DQW (052) 51 2557 AH.

Shack Cleanout. **Icom IC575H** xcvr 6 m/10 m (front panel slightly damaged, but works perfectly) $1,300; **Icom IC25H** 2 m 45 W FM xcvr, $300; **Philips FM321** 70 cm xcvr, $125; **Yaesu FT101,** has been modded, $200; **Yaesu FT290R** together with Mutek SLNA 145sb low noise front end (not fitted), $450; **Yaesu FT10160** 10 watt amp for FT690R, $50; **AOR 2 metre FM handheld,** $200; **Icom BC30** desk charger, $100; **Icom IC202,** $150. Mike Goode VK3BDL (03) 9589 5797; licensed amateurs only.

Nally tower 14 m, $650; **TS430S** (FM board), $950; **FT7,** $380; **RT80** VHF hi band, $50; **Marconi** mod meter **TF 2300,** $650; **Arlec** line conditioner 500 VA 240 V, $550; **Isolation Tfmr** 240 V 100 VA, $12; **FM900** Selcal module, $45; **Amiga 500** mouse, joystick, games, packet s/w, mono monitor, $130; **Amstrad 2286/40** 12 MHz, 40 m H/D, keybd, mouse, 3.5 floppy, no monitor, $120; **CGA monitor,** $50. Lee Moyle VK3GK QTHR (03) 9544 7368.

Yaesu FT707 xcvr w/pwr supply and antenna tuner, $700; **FL2010** 2 m linear, $15; **Realistic AX190** hamband Rx w/spkr, $75; **Lunar** freestanding 17 ft **tower,** $200; **Hy-gain TH3JR** beam, $125; **Chirnside CE35** 5 el 3 band beam, $300; **Emotator** rotator, $175; **CB ant,** $50; **Nally tower** 42 ft, $400. Laurie VK3DPD (03) 9818 6009.

Icom IC2A VHF with **HM46** spkr mic and **BC-36** charger, also two spare battery packs, s/n 2925, $240 post paid; **Pwr xfmr** A & R type PT1371, 2000 VCI, 300 mA DC, has tapped sec, $80. Peter VK3IZ (051) 56 2053. Metung.

Icom IC725 HF all-band transceiver very good condition, $1,100 ono; **Kenwood TS50S** HF transceiver as new, $1,150 ono. Bill VK3WK QTHR (055) 61 1376.

Kenwood TS820S HF tcvr, 740961, digital freq display, excellent condition, recently checked Kenwood, Sydney, original carton, manual, mike, extn speaker in matching cabinet, **DS1A** DC converter, mobile operation, unused in carton, $650. Gordon VK3ABI QTHR (052) 89 1812.

SW Receiver **Philips** 15 bands, digital, model **AE3625/00,** instruction manual, s-wave handbook, s/n KT039419050620, new, $140; **Yaesu** monitorscope **YO-100,** as nc, s/n 6H211190, manual, $240; **Monoband Yagi,** 10 m or CB, new, Werner Wulf, $80. Harry VK3AXJ QTHR (03) 9802 5704.

Yaesu FT707 transceiver, 100 watts output, including WARC bands, in good condition with scanning mike and manual; **FV707DM** digital VFO, 12 memory, very stable, the lot $550. Ray VK3FQ QTHR (054) 36 8301.

FOR SALE QLD

Packet, AMTOR, RTTY, CW HF/VHF/UHF PK64 modem, 2 C64 Commodore computers, 1541-11 disc drive, MPS803 printer, monitor, joystick,

software Geos, satellite, grayline, log book, flight simulator, all manuals, $350. VK4AI QTHR (07) 3284 5688.

4 Stage tilt-over **antenna tower**, fittings, 75ft, $500; **Earth braid** one inch, 7 m to 27 m lengths, $2 metre; 3000+ valves, metal octal miniature catalogue. 12UX/50 **Rola speaker**. Peter Hadgraft, 17 Paxton St, Holland Park Qld 4121, (07) 3397 3751 AH.

Pocom AFR-1000 fully automatic RTTY-Decoder with video outlet, as new, $400; **4-Band Spider antenna**, mobile or limited space (as advertised in QST) w/mount, $120. Hans L40370 (ex HS1ALK) (07) 5479 4561.

Deceased Estate VK4ANT. **Yaesu FT757GX** HF txcvr, pc, $1,000 ono; **Yaesu FL2100Z**, as new, $900 ono; **Yaesu FT270R** mobile, pc, $250 ono; **Yaesu pre amp FRA7700**, gc, $50; **Yaesu** power supply **FP757GX**, pc, $280 ono; **Daiwa** auto tuner 80-10 m model CNA **1001**, gc, $350 ono; **Daiwa** antenna tuner model **CL680**, pc, $110 ono; **Daiwa** mic compressor **MC220**, new, $100 ono; **Daiwa** antenna rotator **DC7011**, gc, $300 ono; **Daiwa** cross-needle SWR meter **CN410M**, pc, $90 ono; **Daiwa** cross-needle model **4301**, 2 and 70 SWR meter and tuner, pc, $150 ono; **Icom IC751** txcvr, HF, with voice synthesiser, gc, $1,000 ono; **Heathkit** dual trace **oscilloscope**, gc, $80 ono; **Tono 7000**, gc, $90; Drake **TR7** txcvr with power supply and external VFO, gc, $750 ono; **Drake low-pass filter**, gc, $40 ono; Antenna **TET Emtron HB35C**, full size tri-bander, pc, $350 ono. Mick VK4NE QTHR (07) 3219 8330 AH.

FOR SALE SA

Cubical Quad dual band 10/15 m, "Bandit" spreader bases, only single coax feeder required, $150 ono. Rob VK5CS (085) 68 5411.

Kenwood TS530S HF xcvr, s/n 2040307; **Kenwood MC50** desk mic; matching **Kenwood** speaker **SP230**; spare PA valves, $650 ono the lot. John VK5FOX (08) 8326 0913.

FOR SALE WA

GAP antenna Titan DX, new, $400; **Commodore C64** with DD, $100; **Amiga 500** with 2 x DD, $200; **Targa beam** 3 el 10-15-20 m, $200; **Terlin** 10-15-20 100 W version, $100. Walter VK6BCP QTHR (09) 341 2054.

WANTED ACT

Marconi video oscillator **TF885A/1** circuit diagram. All costs met. Dave VK1DT QTHR (06) 295 1874.

New **finals** for FT101ZD Yaesu, specially driver **12BY7A** tube as I cannot transmit on SSB, also **YD50** dummy load, will pay any reasonable price. Fred VK1FH QTHR (06) 285 2059.

WANTED NSW

Rotator, medium heavy duty such as Kenpro KR1000, Create RC5A-2, Emotator 1200FXX. Guy VK2BBF QTHR (047) 51 6726 AH or (02) 850 8930 BH.

Kenwood TR-7730 2 m FM tcvr, must be in good working condition with manuals, etc, reasonable price paid. Dan VK2DC QTHR (047) 39 2782 AH.

Bird 4311, 4410 wattmeters, **Levell TM6B** broadband voltmeter - copies of manuals circuits, any technical info, please. Bob VK2CAN QTHR (02) 9416 3727.

Australian Morse Keys, especially Buzza range, Automorse, McDonald Pentograph, PMG and any unusual keys. Pay top dollar for any of the above, must be is good condition. Steve VK2SPS (02) 9999 2933 after 6pm.

WANTED VIC

Amplifier R8 MK2 No 2 to work with Wireless set No 19, has 4 x 807 valves and large genemotor, also headset and mic for A510 radio, alignment information for Wireless set no 19 MK3 (English). Clem VK3CYD QTHR (051) 27 4248 AH.

WANTED QLD

Require **circuit diagram** for signal tracer **University Graham model 378 AST**, Harold VK4VKA QTHR (07) 3265 7798.

Tentec Century 21 CW txcvr and **Icom IC728** txcvr, will also appreciate quantities of copper wire (up to 3000 m) suitable for large HF array. Details to "Doc" VK4CMY, PO Box 24, Dalveen Qld 4374, (076) 85 2167.

WANTED WA

Lend of Old Callbooks prior to 1950 and after 1928. To establish first use of VK6 callsigns. Books will be carefully used and returned. All packing/postage costs will be reimbursed. Neil VK6NE QTHR (09) 409 9333.

From **February 1980** issue of **Ham Radio** magazine a clear copy of the article "New class of coaxial line transformers" (part one). Bob VK6ABS QTHR (090) 75 4136.

WANTED TAS

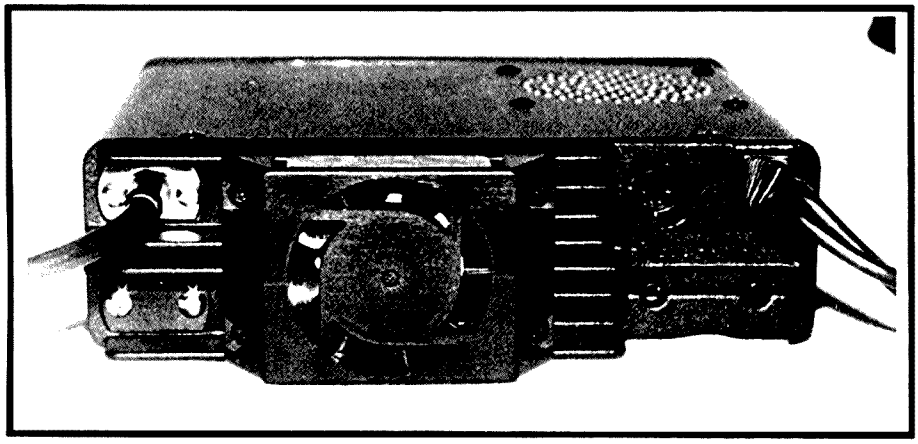
Icom TVR 7000 FM and TV unit for Icom R7000 rcvr scanner. Martin L70067 (03) 63 318705.

MISCELLANEOUS

• THE WIA QSL Collection (now Federal) requires QSLs. All types welcome especially rare DX, pictorial cards and special issue. Please contact the Hon Curator, Ken Matchett VK3TL, 4 Sunrise Hill Road, Montrose VIC 3765, Tel (03) 9728 5350.

ar

Update



Rear panel view of the Yaesu FT-8500 reviewed on pages 9 - 11 of the November 1996 issue of Amateur Radio magazine.

Yaesu FT-8500 Review

Oops! The wrong photo and caption sneaked into the review in last month's *Amateur Radio*. The photo at the top of page 11 is actually of the rear panel of the Yaesu FT-3000, reviewed in this month's *Amateur Radio*. The correct photo of the rear panel of the FT-8500 is reproduced here.

It just goes to show that, no matter matter how we careful we are in proofing your magazine each month, sometimes an error sneaks through all our checks.

ar

WIA MORSE PRACTICE TRANSMISSIONS

VK2BWI	Nightly at 2000 local on 3550 kHz
VK2RCW	Continuous on 3699 kHz and 144.950 MHz 5 wpm, 8 wpm, 12 wpm
VK3COD	Nightly (weekdays) at 1030 UTC on 28.340 MHz and 147.425 MHz
VK3RCW	Continuous on 145.650 MHz, 5 wpm, 10 wpm
VK4WIT	Monday at 0930 UTC on 3535 kHz
VK4WCH	Wednesday at 1000 UTC on 3535 kHz
VK4AV	Thursday at 0930 UTC on 3535 kHz
VK4WIS	Sunday at 0930 UTC on 3535 kHz
VK5AWI	Nightly at 2030 local on 3550 kHz
VK5RCW	Continuous on 144.975 MHz, 5 wpm to 12 wpm
VK6RCW	Continuous on 147.375 MHz, 3 wpm to 12 wpm

WIA Divisions

The WIA consists of seven autonomous State Divisions. Each member of the WIA is a member of a Division, usually in their residential State or Territory, and each Division looks after amateur radio affairs within its area.

Division	Address	Officers			Weekly News Broadcasts		1997 Fees
VK1	ACT Division GPO Box 600 Canberra ACT 2601	President Secretary Treasurer	Phillip Rayner John Woolner Bernie Kobler	VK1PJ VK1ZAO VK1KIP	3.570 MHz LSB, 146.950 MHz FM each Sunday evening commencing at 8.00 pm local time. The broadcast text is available on packet, on Internet aus.radio.amateur.misc newsgroup, and on the VK1 Home Page http://amail.nla.gov.au/~cmakin/wiaact.html	(F) (G) (S) (X)	$72.00 $58.00 $44.00
VK2	NSW Division 109 Wigram St Parramatta NSW (PO Box 1066 Parramatta 2124 Phone (02) 9689 2417 Freecall 1800 817 644 Fax (02) 9633 1525	President Secretary Treasurer (Office hours Web:http://sydney.dialix.ozau/~wiansw e-mail address: wiansw@sydney.dialix.oz.au Packet BBS: VK2WI on 144.850 MHz	Michael Corbin Eric Fossey Eric Van De Weyer Mon-Fri 11.00-14.00 Sat 1000-1300 Mon 1900-2100)	VK2YC VK2EFY VK2KUR	From VK2WI 1.845, 3.595, 7.146*, 10.125, 24.950, 28.320, 29.120, 52.120, 52.525, 144.150, 147.000, 438.525, 1281.750 (* morning only) with relays to some of 14.160, 18.120, 21.170, 584.750 ATV sound. Many country regions relay on 2 m or 70 cm repeaters. Sunday 1000 and 1930. Highlights included in VK2AWX Newcastle news, Monday 1930 on 3.593 plus 10 m, 2 m, 70 cm, 23 cm. The broadcast text is available on the Internet newsgroup *aus.radio.amateur.misc*, and on packet radio.	(F) (G) (S) (X)	$66.75 $53.40 $38.75
VK3	Victorian Division 40G Victory Boulevard Ashburton Vic 3147 Phone (03) 9885 9261 Fax (03) 9885 9298	President Secretary Treasurer (Office hours	Jim Linton Barry Wilton Rob Hailey Tue & Thur 0830-1530)	VK3PC VK3XV VK3NC	VK3BWI broadcasts on the 1st Sunday of the month, starts 10.30 am. Primary frequencies 1.840 AM, 3.615 LSB, 7.085 LSB, and FM(R)s 146.700 Mt Dandenong, 147.250 Mt Macedon, 147.225 Mt Baw Baw, and 2 m FM(R)s VK3RMA, VK3RSH and VK3ROW. 70 cm FM(R)s VK3ROU and VK3RGL. Major news under call VK3WI on Victorian packet BBS.	(F) (G) (S) (X)	$75.00 $61.00 $47.00
VK4	Queensland Division GPO Box 638 Brisbane QLD 4001 Phone (074) 96 4714	President Secretary Treasurer e-mail address: wiaq@tmxbris.mhs.oz.au	Geoff Sanders John Stevens John Presotto	VK4KEL VK4AFS VK4WX	1.825 MHz SSB, 3.605 MHz SSB, 7.118 MHz SSB, 14.342 MHz SSB, 28.400 MHz SSB, 29.220 MHz FM, 52.525 MHz FM, 146.700 MHz FM, 147.000 MHz FM, 438.525 MHz (Brisbane only), regional VHF/UHF repeaters at 0900 hrs Sunday. Repeated on 3.605 MHz SSB & 147.000 MHz FM, regional VHF/UHF repeaters at 1930 hrs EAST Monday. Broadcast news in text form on packet under WIAQ@VKNET.	(F) (G) (S) (X)	$TBA $TBA $TBA
VK5	South Australian Division 34 West Thebarton Rd Thebarton SA 5031 (GPO Box 1234 Adelaide SA 5001) Phone (08) 8352 3428 Fax (08) 8264 0463	President Secretary Treasurer Web: http://www.vk5wia.ampr.org/	Peter Watts Maurie Hooper Charles McEachern	VK5ZFW VK5EA VK5KDK	1827 kHz AM, 3.550 MHz LSB, 7.095 AM, 14.175 USB, 28.470 USB, 53.100 FM, 147.000 FM Adelaide, 146.700 FM Mid North, 146.800 FM Mildura, 146.825 FM Barossa Valley, 146.900 FM South East, 146.925 FM Central North, 147.825 FM Gawler, 438.425 FM Barossa Valley, 438.475 FM Adelaide North, ATV Ch 35 579.250 Adelaide. (NT) 3.555 USB, 7.065 USB, 10.125 USB, 146.700 FM, 0900 hrs Sunday. 3.585 MHz and 146.675 MHZ FM Adelaide, 1930 hrs Monday.	(F) (G) (S) (X)	$75.00 $61.00 $47.00
VK6	West Australian Division PO Box 10 West Perth WA 6872 Phone (09) 351 8873	President Secretary Treasurer	Cliff Bastin Christine Bastin Bruce Hedland-Thomas	VK6LZ VK6ZLZ VK6OO	146.700 FM(R) Perth, at 0930 hrs Sunday, relayed on 1.825, 3.560, 7.075, 14.116, 14.175, 21.185, 29.680 FM, 50.150 and 438.525 MHz. Country relays 3.582, 147.350(R) Busselton and 146.900(R) Mt William (Bunbury). Broadcast repeated on 146.700 at 1900 hrs Sunday, relayed on 1.865, 3.563 and 438.525 MHz; country relays on 146.350 and 146.900 MHz.	(F) (G) (S) (X)	$66.75 $48.60 $32.75
VK7	Tasmanian Division 5 Helen Street Newstead TAS 7250 Phone (03) 634 42324	President Secretary Treasurer	Andrew Dixon Robin Harwood Terry Ives	VK7GL VK7RH VK7ZTI	146.700 MHz FM (VK7RHT) at 0930 hrs Sunday relayed on 147.000 (VK7RAA), 146.725 (VK7RNE), 146.625 (VK7RMD), 3.570, 7.090, 14.130, 52.100, 144.150 (Hobart) Repeated	(F) (G) (S) (X)	$74.00 $60.00 $46.00
VK8	(Northern Territory is part of the VK5 Division and relays broadcasts from VK5 as shown received on 14 or 28 MHz).						

Note: All times are local. All frequencies MHz.

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Needy (G) Student (S)
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Manufactured to rigid commercial grade standards, the FT-50R provides 2m and 70cm band transceive coverage plus an amazingly wide receiver range (76-200, 300-540, 590-999MHz*), all in a compact package with water resistant construction that's tough enough to meet the USA MIL-STD-810 rating for shock and vibration resistance, yet is easy to hold and use.

Measuring just 57 x 99 x 30mm (WHD) with the supplied FNB-40 650mA/H Nicad pack, the FT-50R provides 2.0w RF output on the 2m and 70cm bands as standard, and can provide up to 5.0w output when operated from a 12v source (optional Nicad battery or vehicle lead). It also provides 112 memory channels including two Home memories, an Alphanumeric display for channel naming (ie. repeater locations or callsigns) with Omni-glow backlighting, and CTCSS encode for accessing repeaters that require a tone input. Selectable AM/FM receive modes allow for greater flexibility during extended receive operation.

For ease of use, the FT-50R provides super loud speaker output, an Auto Range Transpond System to determine if you are in range of another ARTS equipped transceiver, a Dual-watch system for monitoring sub-band activity, and four Battery saver systems for longer operating times. A selectable LCD voltmeter also allows you to monitor battery performance under load so you can estimate remaining battery life. You can also use the FT-50R with the optional ADMS-1C Windows based PC software/interface to quickly program features or clone programming to other compatible Yaesu radios.

The FT-50R is tough, easy to use, and one of the most economical dualband handhelds you can buy. There's now only one choice, the FT-50R from Yaesu.

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